McCaffree / Citizens For Renewables / Citizens Against LNG
Index for Exhibits
May 16, 2019
Re: Jordan Cove Channel Navigation Alteration
Coos Bay File No. File No. 187-18-000153-PLNG-01

Exhibit A: April 11, 2019 letter to FERC from Senator Ron Wyden asking for an additional 30 days to review and comment on the Draft EIS making review time 120 days instead of 90.

Exhibit B: March 11, 2019 letter from the Oregon DEQ to Jordan Cove requesting additional waterbody crossing information.

Exhibit C: May 6, 2019 News Release from Oregon DEQ announcing their decision to deny Jordan Cove's application for 401 Water Quality Certification.

Exhibit D: U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration [Docket No. PHMSA-2019-0087] May 2, 2019 Advisory Bulletin: *Pipeline Safety: Potential for Damage to Pipeline Facilities Caused by Earth Movement and Other Geological Hazards*

Exhibit E: *Wastewater pipelines often leak in North Dakota* Breaches in pipelines that carry water away from the oilfields can have devastating consequences. By Emily Guerin High Country News; Feb. 16, 2015

Exhibit F: Photos of environmental impacts of the Coos County Pipeline built in 2003 from Coos Bay to the Williams Lateral In Roseburg

Exhibit G: *Enterprise goes sour*. (Part one of a three-day series on a Coos County pipeline project.) By Winston Ross, The Register Guard 07/25/2004

Exhibit H: *Federal court fines Coos pipeline builder* ; The World, Tuesday, February 24, 2009

Exhibit I: ***Review of noise impacts on marine mammals yields new policy Review of noise impacts on marine mammals***; March 13, 2019 ; https://www.sciencedaily.com/releases/2019/03/190313143307.htm

Exhibit J: ***Even Without Ears, Oysters Can Hear Our Noise Pollution*** Study shows that certain frequencies of noise cause oysters to clam up; By Jason Daley; smithsonian.com; October 27, 2017; https://www.smithsonianmag.com/smart-news/earless-oysters-can-still-hear-our-noise-pollution-180966990/

Exhibit K: ECONorthwest October 16, 2006 *Forecast of the Net Economic Benefits of a Proposed LNG* [Import] *Terminal in Coos County, Oregon*

Exhibit L: August 6, 2012, letter to the U.S. Department of Energy Concerning Jordan Cove's LNG Export Application under FE Docket No. 12–32–LNG.

Jody McCaffree,
Individual / Executive Director
Citizens For Renewables /
Citizens Against LNG
PO Box 1113
North Bend, OR 97459

May 16, 2019

City of Coos Bay Planning Commission

RE: Rebuttal Comments on City of Coos Bay Application File No. 187-18-000153-PLNG-01 - Concurrent Land Use Applications by Jordan Cove Energy Project L.P. Coos Bay Estuary Channel Navigation Alterations

Dear Coos Bay Planning Commission:

Please accept the following rebuttal comments into the record concerning the proposed Jordan Cove Channel Navigation Alterations within the City of Coos Bay Zoning Districts.

Jordan Cove's Application proposes:

(1) Map amendment to the Coos Bay Estuary Management Plan to change the designation of approximately 3.3 acres from 52-NA to DDNC-DA;
(2) Text amendment to the City of Coos Bay Comprehensive Plan to take a reasons exception to statewide planning goal 16 to authorize the proposed map amendment;
(3) Estuarine and Coastal Shoreline Uses and Activities Permit for "New and Maintenance Dredging" in the DDNC-DA
(4) Estuarine and Costal Shoreline Uses and Activities Permit to allow an accessory temporary dredge transport pipeline in the 52-NA, 53-CA, 54-DA and 55-CA Estuarine Zones.

1. Request for Additional Review Time.

On April 25, 2019 the Jordan Cove Energy Project dumped into the record their comments and exhibits totaling 16,845 pages of material involving 1.5 GB (that is Gigabytes not Megabytes). It took me over 5 hours just to upload the document to my computer and that was after several days and hours of trying to upload it and failing due to the slow internet speeds we have in this rural area in which we live.

It is not reasonable to believe that we are able to rebut all this amount of material in only 3 weeks, particularly when Jordan Cove has caused us to have other comment deadlines for applications they have also filed with the County and the city of North Bend. (See listing further below)

I have not been able to look at this file very well because it slows my computer down to where it will not hardly function. I tried for several hours the other day to extract just one of the Exhibits in order to help someone who wanted it in order to be able to review it. I could never get it to extract due to a PDF formatting error that is found within Jordan Cove's Exhibit 14 (electronic

pages 5697 to 7421). Because of that error, I was never able to extract their Exhibits so they were in individual files that could more easily be accessed and reviewed. This has extremely limited what I have even been able to view in this enormous April 25, 2019 filing by Jordan Cove, making it almost impossible to write rebuttal comments. We need Jordan Cove's Exhibits and sub-Exhibits put under separate weblink files so we have at least a chance of being able to review them without the file continually crashing our computers when we try to look through them.

On March 29, 2019, the Federal Energy Regulatory Commission (FERC) released the Draft Environmental Impact Statement (EIS) for the Jordan Cove Project and opened up a **90 day comment period**. The Draft EIS totals 5,636 pages including the appendixes and people are asking for additional time **beyond the 90 days FERC has given in order to review it**. [1] (***See Exhibit A***) The Draft EIS is only 1/3 the size of the information Jordan Cove filed on April 25, 2019 into the Coos Bay record under file No. **187-18-000153-PLNG-01**. The same amount of time and consideration should be given to citizens with respect to this current Coos Bay land use proceeding in order for us to be able to properly evaluate all this data and respond sufficiently.

It appears that the bulk of the information that Jordan Cove submitted is not specific to their dredging project under Coos Bay file No. **187-18-000153-PLNG-01**, or the impact the project would have on fishing, recreation and navigation in the vicinity of the dredging and temporary pipeline.

We citizens are expected to have to comb through all this data that has taken regulatory agencies such as the Federal Energy Regulatory Commission (FERC) over a year to process. Electronic page 17 of Jordan Cove's April 25th submittal has a date of September 21, 2017. This is a year and a half ago. It took the FERC 18 months to review the information Jordan Cove provided before they were able to produce a Draft EIS on the project. **And we are supposed to review all this in just three weeks?** The FERC requested additional information from Jordan Cove multiple times during that 18 month period and the Draft EIS that was released on March 29, 2019, has some 137 suggested Conditions of Approval, showing multiple data gaps still exist. The FERC Draft EIS states on page one that *"..approval of the Project* ***would result in a number of significant environmental impacts***." (Emphasis added)

An agency biological assessment on the project has yet to be completed and released by the cooperating regulatory agencies. The Oregon Department of State Lands has also recently requested additional information from Jordan Cove and has extended their review time on the project's removal-fill permit application until September 2019. (***See McCaffree Exhibit 2 filed on April 25, 2019***) On March 11, 2019, the Oregon DEQ also requested additional information from the Project which included, among other things, that the project conduct a benthic macroinvertebrate assessment to comply with the Biocriteria water quality standard (Oregon Administrative Rule 340-0410-0011). (***See Exhibit B***). On May 6, 2019 the DEQ issued a **denial** of Jordan Cove's application for **401 Water Quality Certification** stating: (***See Exhibit C***)

> *DEQ is denying the requested water quality certification at this time because there is insufficient information to demonstrate compliance with water quality standards, and because* ***the available information shows that some standards are more likely than not***

[1] https://elibrary.ferc.gov/idmws/file_list.asp?accession_num=20190415-0008

> ***<u>to be violated</u>****. Through further analysis, and possibly through project changes and mitigation, the applicant may be able to show the standards for certification will be met, but the current record does not allow DEQ to reach that conclusion today.*
> (Emphasis added)

The DEQ Section 401 Water Quality Certification is required for the U.S. Army Corps of Engineers to issue permits for the project.

How are we supposed to review and critique all this information when our own regulatory agencies are having issues with the information Jordan Cove has provided? Under Coos Bay Estuary Management Plan (CBEMP) 4a, the appropriate state agency is to perform the impact assessment requirements found in CBEMP Policy #4. **DEQ has issued a denial clearly stating that the information is not adequate enough to issue the project a permit**. That should be reason enough for the City of Coos Bay to ALSO issue a denial of the project's land use application which would impact a natural aquatic zoned area in the Coos Estuary. At the time of the permit application, Jordan Cove's application was obviously not in line with local code requirements as indicated by their request for an exemption from those requirements.

The Coos Bay Comprehensive Plan cannot just be changed unless those changes are found to be consistent with the Coastal Management Program and the Coastal Zone Management Act (CZMA). Any changes to the Plan or Ordinance must go through a review process with the Oregon Department of Land Conservation and Development and the U.S. National Oceanic and Atmospheric Administration. The fact that Jordan Cove is seeking to amend an already approved plan shows very clearly that **<u>their project is NOT consistent with the CZMA</u>**.

Below is the current schedule we have been under since Jordan Cove dumped these 16, 845 pages of information into the current Coos Bay record under file No. **187-18-000153-PLNG-01.** We also have two very significant permit hearing/comment deadlines in the next few days. The following schedule does not include when Briefs and Appeals have also been due on the project. This is just hearing and comment deadlines since April 25, 2019:

> **April 25, 2019** Open Comment deadline for Coos Bay file No. **187-18-000153-PLNG-01** (*Channel Navigation Alteration in CB*)
>
> **May 3, 2019** Surrebuttal / Rebuttal Comment (?) deadline for Coos County file No. **AM-18-010/HBCU-18-002** (*Pacific Connector Early Works HDD Route in Estuary*)
>
> **May 8, 2019** Rebuttal Comment deadline for North Bend **FP 2-18 And CBE 3-18** (*Pipeline under NB McCullough Bridge in M/H zone*)
>
> **May 14, 2019:** Open Record Comments due on the limited issue of land ownership in the Estuary under AM-18-009/RZ-18-006/HBCU-18-001 (*Concurrent Land Use Applications by Jordan Cove for Intersections Improvements TransPacific Parkway at U.S. Highway 101*). An initial Hearing on the application was held on: February 1, 2019.

May 16, 2019: Rebuttal Comment deadline for City of Coos Bay file No. **187-18-000153-PLNG-01** (*Channel Navigation Alteration within Coos Bay City limits*)

May 20, 2019: North Bend Planning Commission regularly scheduled Planning Commission meeting. Two hearings are scheduled. The second PUBLIC HEARING is for Jordan Cove's Estuary Impacts at APCO Sites 1 & 2 under File No. **FP 4-19 & CBE 5-19** (*Consolidated Application to authorize Temporary Dredge Transport Pipeline, Temporary Dredge Offloading Facility, and Permanent Bridge and Support Structures associated with the disposal of dredge materials at APCO sites 1 & 2.*)

May 20, 2019 at **7:00 p.m.** the **North Bend Planning Commission will reconvene for deliberations** and make a final decision on the matter at their following regularly scheduled meeting for **FP 2-18 And CBE 3-18** (*Pipeline under NB McCullough Bridge in M/H zone*). No new testimony will be taken.

May 23, 2019: A compilation of the comments received on the Jordan Cove Coos Bay project application file No. **187-18-000153-PLNG-01** (*Channel Navigation Alteration in CB*) will be available at: http://coosbay.org/departments/community-development-department along with a Planning Commission staff report

May 24, 2019: Rebuttal / Open Comment (?) deadline for Coos County file No. **AM-18-010/HBCU-18-002** (*Pacific Connector Early Works HDD Route in Estuary*) The Hearing Officer reopened the record on this due to submittals not being placed into the on-line record until two days before the previous deadline of May 3, 2019. View Record at: http://www.co.coos.or.us/Departments/Planning/PlanningDepartment-Applications2018.aspx

May 30, 2019 at **6:00 p.m. Coos Bay Planning Commission Deliberation**. No new testimony will be permitted, this is not a public hearing but an opportunity for the Planning Commission to review public comments for file No. **187-18-000153-PLNG-01** (*Channel Navigation Alteration in CB*) at the City Council Chambers located at 500 Central Ave in Coos Bay.

May 31, 2019: **1:30 p.m. Hearing on Coos County File No. AP-19-002** Appeal of Coos County Planning approval of *Extension Application for Blue Ridge Alternative Pipeline Route* under **EXT-18-012**. Initial BOC Order No. 14-09-062PL. Hearing will take place in the Owen Building at 201 N. Adams St. in Coquille, OR. View Record at: http://www.co.coos.or.us/Departments/Planning/PlanningDepartment--Applications2019.aspx; and http://www.co.coos.or.us/Departments/Planning/PlanningDepartment-Applications2018.aspx

June 11, 2019 at **5:30 p.m.** the **Coos Bay City Council will hold a work session** to learn the Planning Commission's recommendation and the public testimony received to date on the Jordan Cove project application file No. **187-18-000153-PLNG-01** (*Channel Navigation Alteration in CB*) at the City Council Chambers located at 500 Central Ave in Coos Bay. This work session is not a public hearing.

June 18, 2019 at **7:00 p.m.** the **Coos Bay City Council will hold a public hearing** to review the project application file No. **187-18-000153-PLNG-01** (*Channel Navigation Alteration in CB*) at the City Council Chambers located at 500 Central Ave in Coos Bay. The Council staff report will be posted beforehand at http://coosbay.org/government/search_agendas-minutes The final decision by the City Council may be appealed to the Land Use Board of Appeals pursuant to ORS 197.830.

July 5, 2019 Deadline to file comments on the Draft EIS. The FERC Commissioners will take into consideration staff's recommendations when they make a decision on the Projects: https://www.ferc.gov/industries/gas/enviro/eis/2019/03-29-19-DEIS.asp?csrt=17136630747328713862

Statewide Planning Goal #1 states the following:[2]

* * * *

2. ***Communication*** *-- To assure effective two-way communication with citizens. Mechanisms shall be established which provide for effective communication between citizens and elected and appointed officials.*

3. ***Citizen Influence -- To provide the opportunity for citizens to be involved in all phases of the planning process****.*
Citizens shall have the opportunity to be involved in the phases of the planning process as set forth and defined in the goals and guidelines for Land Use Planning, including Preparation of Plans and Implementation Measures, Plan Content, Plan Adoption, Minor Changes and Major Revisions in the Plan, and Implementation Measures.

4. Technical Information -- To assure that technical information is available in an understandable form.
Information necessary to reach policy decisions shall be available ***in a simplified, understandable form****.* ***Assistance shall be provided to interpret and effectively use technical information****. A copy of all technical information shall be available at a local public library or other location open to the public.* (Emphasis added)

* * * *

C. CITIZEN INFLUENCE

* * * *

4. Implementation *- The general public, through the local citizen involvement programs, should have the opportunity to participate in the development, adoption, and application of legislation that is needed to carry out a comprehensive land-use plan. The general public, through the local citizen involvement programs,* ***should have the opportunity to review each proposal and application for a land conservation and development action*** *prior to the formal consideration of such proposal and application.* (Emphasis added)

Please consider this most reasonable request to allow citizens additional time to review all the data submitted by Jordan Cove into Coos Bay record on April 25, 2019 under file No. **187-18-000153-PLNG-01**.

[2] https://www.oregon.gov/lcd/OP/Documents/goal01.pdf

2. A need (ie., a substantial public benefit) has not been demonstrated

Under Coos Bay Estuary Management Plan (CBEMP) Policy 5 with respect to Estuarine Fill and Removal, where goal exceptions are included within the Plan, the **findings in the exception must be sufficient to satisfy criteria found in "a" through "d" of CBEMP Policy 5:**

> *Dredging and/or filling shall be allowed only:*
>
> *A. If required for navigation or other water-dependent uses that require an estuarine location or if specifically allowed by the applicable management unit requirements of this goal; and*
>
> *B. If no feasible alternative upland location exists; and*
>
> *C.* ***If a pubic need (i.e., a substantial public benefit) is demonstrated and the use or alteration does not unreasonably interfere with public trust rights****; and*
>
> *D.* ***If adverse impacts are minimized****; and*
>
> *E.* ***The activity is consistent with the objectives of the Estuarine Resources Goal and with other requirements of state and federal law****, specifically the conditions in ORS541.615 and Section 404 of the Federal Water Pollution Control Act (P.L. 92-500).*

Identification and minimization of adverse impacts by mitigation, creation, restoration or enhancement of another area to ensure that the integrity of the estuarine ecosystem is maintained must follow the procedure set forth in CBEMP Policy #4a

CB - CBEMP Policy 4a. Deferral of (A) Resource Capability Consistency Findings and (B) Resource Impact Assessments

> *Local government shall defer, until the time of permit application, findings regarding consistency of the uses/activities listed in Policy #4 with the resource capabilities of the particular management segment.*
>
> *Additionally, the impact assessment requirement for those uses/activities as specified in Policy #4 shall be performed concurrently with resource capability findings above at the time of permit application.*
>
> ***This strategy shall be implemented through an administrative conditional use process that includes local cooperation with the appropriate state agencies*** *such that:*
>
> *A. Where aquaculture is proposed as a use, local government shall notify the Oregon Department of Fish and Wildlife (ODFW) in writing of the request, together with a map of the proposed site;*
>
> *B. Where log storage dredging is proposed as an activity, local government shall notify the Oregon Department of Environment Quality)DEQ) in writing of the request, together with a map of the proposed site.*
>
> * * * *
>
> ***For all other uses/activities specified above, local government shall determine appropriate findings whether the proposed use/activity is consistent with the resource***

capabilities of the management segment and shall perform the assessment of impacts required by Policy #4*.*

This strategy recognizes:

A. that resource capability consistency findings and impact assessments as required by LCDC Goal #16 can only be made for the uses specified above at the time of permit application, and

B. that the specified state agencies have expertise appropriate to assist local government in making the required finding and assessments.

This strategy is based upon the recognition that the need for and cumulative effects of estuarine developments were fully addressed during development of this Plan and that no additional findings are required to meet Implementation Requirement #1 of Goal #16. (Emphasis added)

As I previously explained in detail in comments submitted on April 25, 2019, the Jordan Cove LNG Project does not have signed contracts yet and despite them saying they have agreements, nothing they have is binding. They have yet to supply any contractual documents to the U.S. Department of Energy. Several Reports clearly show that the project is not likely to succeed. **We would be significantly altering the Coos Estuary and taking critical fish, clam and crab habitat out of production for a project that is not likely to be successful.**

As explained in our detailed April 25, 2019 comments starting on page 18, it is becoming very apparent that the Jordan Cove project clearly is not needed. Jordan Cove does not have the financial means necessary to build a greenfield LNG project, nor the experience. Pembina, Jordan Cove's parent company, has already announced that it intends to seek partners for both the pipeline and liquefaction facility thereby reducing its 100 percent ownership interest to a net ownership interest of between 40 and 60 percent.

On Sept 10, 2018 article by Gaurav Sharma titled, "*Next Wave Of U.S. LNG Projects Lurks But Market Fistfight is Inevitable*"[3] reported the following:

…Ultimately, whichever way you look at it – the fistfight for offtake agreements, both within and beyond North America, would determine which U.S. LNG project makes it or not. ***Its highly likely many will not****.*

The GJ Sentinel reported on November 26, 2018 in an article titled, "*Jordan Cove about to be overwhelmed by Canadian LNG terminals at Kitimat"*[4]

[3] https://www.forbes.com/sites/gauravsharma/2018/09/10/next-wave-of-u-s-lng-projects-lurks-but-market-fistfight-is-inevitable/#3c008b552fa8

[4] https://www.gjsentinel.com/opinion/jordan-cove-about-to-be-overwhelmed-by-canadian-lng-terminals/article_c6608c2c-f194-11e8-b5a0-cf3bb7245574.html
and; https://fromthestyx.wordpress.com/2018/11/26/jordan-cove-about-to-be-overwhelmed-by-canadian-lng-terminals-at-kitimat/

> *…LNG Canada is now breaking ground while Jordan Cove is still awaiting both FID from its sponsor and a US government OK from the Federal Energy Regulatory Commission.* ***Betting here is that it will never get either one****.*
>
> *Location, location, location is why this happened. Jordan Cove is proposed for a very scenic undeveloped place on the* ***Oregon coast beloved by locals and tourists alike, and they are hollering their disapproval****. But LNG Canada creates no complainers since Kitimat is a brownfield site with a smelter, deep water port and rail….* (Emphasis added)

On November 7, 2018 Reuters reported that Japan's Toshiba Corp will exit its U.S. liquefied natural gas (LNG) business by paying China's ENN Ecological Holdings Co more than $800 million to take over the unit as part of a plan to shed money-losing assets. "***The project posed a huge risk, because no one knows how the situation will be over the next 20 years***," Toshiba's Chief Executive Officer Nobuaki Kurumatani told reporters at a press conference.[5]

Apparently JERA Co, the same company that Pembina states is willing to sign a long term contract with them for JCEP LNG was not able to help Toshiba find buyers for its LNG[6] coming from the Freeport LNG project in the U.S. Gulf Coast. So what does this mean? How can JERA sign a long-term contract with Pembina if they cannot even sell U.S. gas that is already under contract? …?

On Oct 11, 2018, the LNG Law Blog in an article titled, "*Tokyo Gas Signs HOA for LNG Canada Purchases*"[7] the following:

> *Platts reports that Tokyo Gas Tuesday has signed a heads of agreement (HOA) with Diamond Gas International, the trading arm of Mitsubishi Corporation,* ***to purchase LNG from the proposed LNG Canada project in British Columbia.*** *According to the report, the HOA provides that Tokyo Gas will purchase up to 0.6 million metric tonnes/year from LNG Canada for a period of 13 years, from April 2026 to March 2039, delivered on an ex-ship basis with destination flexibility.*

Tokyo Gas is Japan's second-biggest LNG importer, taking in 14 million tonnes per year, after JERA Co, the LNG buying joint venture of Tokyo Electric Power Co (Tepco) and Chubu Electric.[8]

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[5] *Toshiba to pay ENN more than $800 million to exit U.S. LNG business*
Osamu Tsukimori, Jessica Jaganathan; November 7, 2018
https://www.reuters.com/article/us-toshiba-lng-sale/toshiba-to-pay-enn-more-than-800-million-to-exit-u-s-lng-business-idUSKCN1ND0DT

[6] https://newsbase.com/topstories/toshiba-sees-lng-business-big-risk

[7] https://www.lnglawblog.com/2018/10/tokyo-gas-signs-hoa-for-lng-canada-purchases/?utm_source=vuture&utm_medium=email&utm_campaign=vuture-emails

[8] https://www.reuters.com/article/japan-tokyo-gas/tokyo-gas-will-not-accept-destination-clauses-in-new-lng-contracts-president-idUSL4N1MG0O1

The CBC News reported in Oct 2018:

> **$40B LNG facility is the light at the end of a long tunnel for Canada's natural gas sector** - Struggling gas industry faces several more years of low prices until new Asia export project is built[9] by Kyle Bakx · CBC News · Posted: Oct 03, 2018
>
> *On Tuesday morning, hours after LNG Canada announced it would go ahead with its $40-billion export facility on the West Coast, analyst Martin King gave a presentation about the state of the oil and gas industry at the Calgary Petroleum Club in the city's downtown.*
>
> *The LNG announcement is massive for the natural gas sector, but King had some cold truth for hundreds of people who came to hear him despite the heavy snow outside.* ***Until the LNG export facility is up and running, he said, there is little reason for optimism****...* (Emphasis added)

In July of 2017 ConocoPhillips Senior Communications Specialist Amy Burnett made the following statement:

> *"Over the last few years, more facilities have come online to export LNG," Burnett said "So there are* ***more sources available*** *for the product which* ***makes competition more difficult****."* (Emphases added)

Larry Persily, Chief of Staff for the Kenai Peninsula Borough also stated in the same 2017 article:

> *"It's also a hard reminder to Alaskans that no matter how much we want to sell our oil and gas, if the market doesn't want it, doesn't need it or isn't willing to pay a price to make it profitable — we can't sell our oil and gas," Persily said.*
>
> *Prices have tumbled from $15-$18 per million btu, to just over $5.*
>
> *"****You can't buy gas out of Cook Inlet, pay to liquify it, burn up some of it while you're liquefying it, put it in a tanker and deliver it for $5.50 per million btu and make money****," Persily said. "****It is a[n] inhospitable market and will be for the near future****."*[10] (Emphasis added)

RBN Energy reported on March 26, 2019 that a second wave of North American LNG export projects was officially underway. As noted above, LNG Canada took final investment decision (FID) last October and would be the first large-scale LNG export facility in Canada. Golden Pass and Calcasieu Pass followed in February, marking the beginning of the next round of LNG export build on the U.S. Gulf Coast. Sabine Pass Train 6 is expected to get the green light any

[9] https://www.cbc.ca/news/business/lng-canada-gmp-firstenergy-arc-1.4847377

[10] *Facing global gas glut, ConocoPhillips to mothball Kenai LNG plant*
By Rashah McChesney, Alaska's Energy Desk - Juneau - July 13, 2017
http://www.alaskapublic.org/2017/07/13/facing-global-gas-glut-conocophillips-to-mothball-kenai-lng-plant/

day. It still remains to be seen if these projects will all actually make it to completion given the continued glutted LNG market.

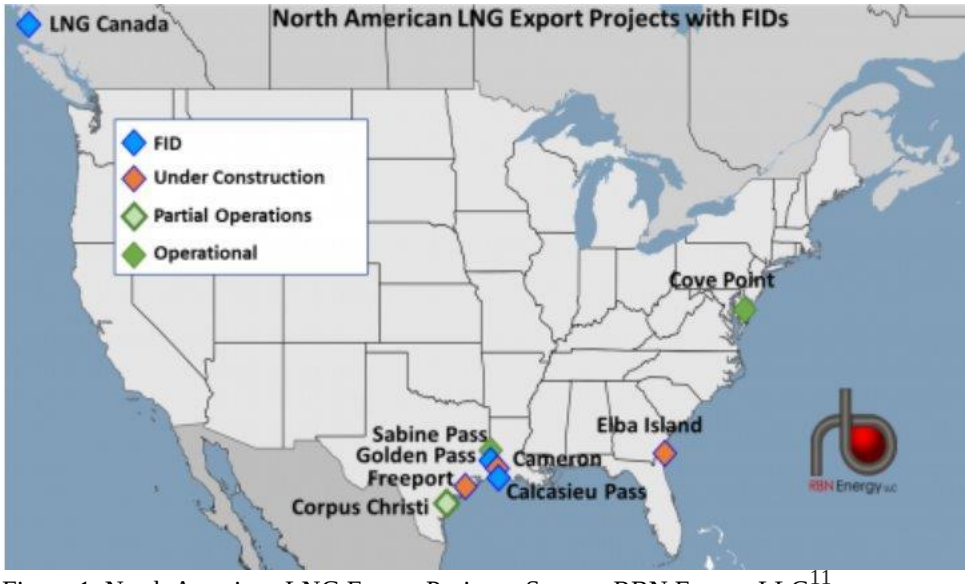

Figure 1. North American LNG Export Projects. Source: RBN Energy LLC[11]

Eversheds Sutherland LNGLawBlog has within the last month reported the following:

- China to Increase Tariff on U.S. LNG from 10% to 25%
- Construction at Golden Pass LNG Terminal to Start May 13
- Cameron LNG Expected to Begin Production Soon
- Final EIS Released for Venture Global Plaquemines LNG Project
- Port Arthur LNG Receives FERC Construction and DOE Export Authorizations
- Driftwood LNG Receives FERC Construction and DOE Export Authorizations
- FERC Releases Final EIS for the Rio Grande LNG Project
- FERC Releases Final EIS for the Annova LNG Project
- FERC Releases Final EIS for the Gulf LNG Liquefaction Project
- Golden Pass Cleared for Initial LNG Terminal Site Preparation
- FERC Releases Final EIS for Eagle LNG Partners Jacksonville Project
- Chevron Canada Proposes to Nearly Double Size of Proposed Kitimat LNG Terminal
- Total and Tellurian Sign LNG Agreements
- Venture Global Starts Construction at Calcasieu LNG Plant
- NextDecade, Developer of the Rio Grande LNG export project in Brownsville, Texas, signs 20-year LNG Contract Indexed to Brent Oil Prices
- DOE Grants Authorization for Non-FTA LNG Re-Exports from Proposed Mexican Terminals
- Elba Island LNG Exports to Begin Late April 2019

On May 13, 2019 Reuters reported that in retaliation for a U.S. increase in tariffs on $200 billion in Chinese goods to 25% from 10%, China is set to increase the tariff on U.S. LNG from 10% to 25% starting June 1. The report states that:

[11] https://rbnenergy.com/catch-a-wave-what-it-takes-for-an-lng-export-project-to-reach-fid

* * * *

So far this year, only two LNG vessels have gone from the United States to China, versus 14 during the first four months of 2018 before the start of the 10-month trade war.

* * * *

On Monday, China said it would boost the tariff on U.S. LNG to 25% starting June 1 versus the current rate of 10%.

U.S. LNG sales had already been affected by a 60 percent collapse in Japan Korea Marker (JKM) LNG prices seen since September.

*"**Weaker JKM spot prices in Asia already killed most of the commercial reasoning for U.S. LNG sales to China**. **The tariff is the knockout blo**w," said Ira Joseph, head of global gas and power analytics at S&P Global Platts.*[12]

Jordan Cove has no experience in LNG or in exporting LNG and has yet to explain how they would compete in the already glutted international LNG marketplace with seasoned gas and oil industry players that have LNG projects far ahead of them in the permitting process. They have also failed to show how China LNG tariff's will impact their project.

3. Use or alteration would unreasonably interfere with public trust rights;

On Friday, March 29, 2019 the Federal Energy Regulatory Commission (FERC) released the Draft Environmental Impact Statement (DEIS) on Pembina's proposed Jordan Cove LNG export project under Docket Nos. CP17-494-000 and CP17-495-000. While the DEIS is not a FINAL Document yet as it **is still under review**, the DEIS for the Jordan Cove/Pacific Connector project shows the following diagram on page 4-709:

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[12] https://www.reuters.com/article/us-usa-trade-china-lng/u-s-liquefied-natural-gas-shipments-to-china-face-mounting-tariffs-idUSKCN1SJ1O4

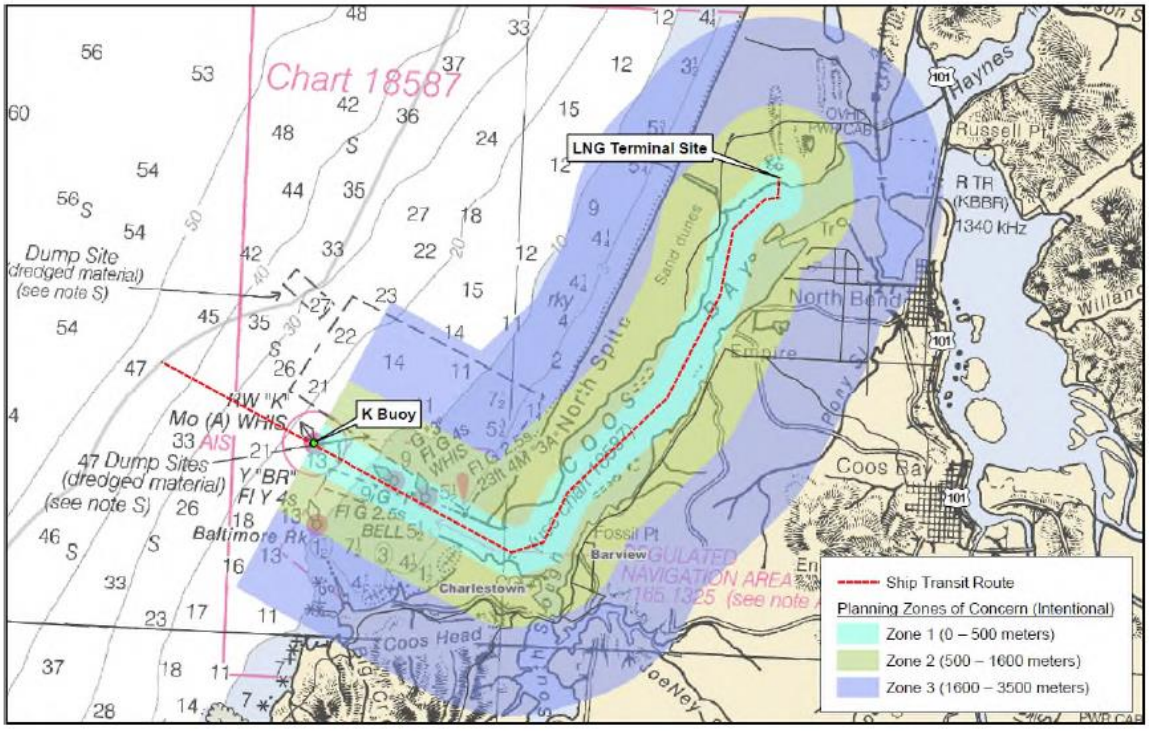


Figure 4.13-2. Intentional Hazard Zones along LNG Marine Vessel Route

On Monday, April 1, 2019, Jerry Havens, Distinguished Professor of Chemical Engineering at University of Arkansas, submitted detailed comments on the DEIS with respect to public safety hazards being underestimated at the proposed Jordan Cove LNG terminal. (***See McCaffree April 25, 2019 Exhibit 67***)

JCEP Computer Modeling Flawed

According to Havens, computer modeling used to predict the Jordan Cove Energy Project (JCEP) LNG export terminal vapor cloud explosion hazards have not been approved for predicting explosion overpressures by the U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA). Havens expressed concerns to both the FERC and to the PHMSA that the Government is failing to adequately provide for the risks of potentially devastating Unconfined Vapor Cloud Explosions (UVCEs) of heavier-than-methane hydrocarbons at the proposed Jordan Cove Export Terminal (JCET) site. **Those hazards appear to be seriously underestimated**.

> *The new Draft Environmental Impact Statement (DEIS) for the Jordan Cove Export Terminal, just issued, continues to seriously underestimate vapor cloud explosion overpressures (damage) that could occur following credible releases of heavy hydrocarbons at the JCET site. The latest predictions that I am aware of appear to be an order of magnitude lower than are indicated by physical evidence of numerous documented UVCEs that have occurred worldwide with the potential to cause injuries*

and deaths to persons and result in destruction of the facility.
Jerry Havens, PhD, April 1, 2019

This not the first time these concerns have been raised by the Distinguished Professor. On January 14, 2015 [13], and February 6, 2015 [14], both Professor Havens and Professor James Venart (Professor Emeritus of Mechanical Engineering at University of New Brunswick) published several papers with respect to the former Jordan Cove LNG Export Terminal Draft Environmental Impact Statement under FERC Docket No. CP13-483 et al. **Professor Havens and Professor Venart found significant discrepancies and problems with Jordan Cove's hazard analysis and determined the hazards had been significantly underestimated.** Safety measures incorporated in the proposed Jordan Cove LNG export terminal actually increased the chance of a catastrophic failure and presented a far more serious public safety hazard than regulators had analyzed or deemed acceptable. On January 16, 2015, Oregonian reporter Ted Sickinger wrote an article summarizing the January 2015 FERC filing; "*Scientists say public safety hazards at Jordan Cove LNG terminal in Coos Bay are underestimated*" (***See McCaffree April 25, 2019 Exhibit 68***)

PHMSA Finds Hazard Concerns Justified

On April 11, 2016, the PHMSA contracted with the British Health and Safety Laboratories (HSL) for an Expert Evaluation of the Risk of Unconfined Vapor Cloud Explosions. On May 18 and 19, 2016, the PHMSA conducted a two day Public Workshop on Liquefied Natural Gas (LNG) Regulations in Washington, DC. The PHMSA stated at that time that:

"*This two-day LNG Workshop is to solicit input and obtain background information for the formulation of a future regulatory change to CFR 49 Part 193, Liquefied Natural Gas Facilities. This workshop will bring federal and State regulators, emergency responders, NFPA 59A technical committee members, industry, and interested members of the public together to participate in shaping a future liquefied natural gas (LNG) rule.*"

On June 7, 2016, E&E reporter, Jenny Mandel, published an article, "*Explosive LNG issues grab PHMSA's attention,*" concerning the two day PHMSA LNG Workshop event. (***See McCaffree April 25, 2019 Exhibit 69***)

After input from the LNG Workshop, the HSL finalized their Report: "*Review of Vapor Cloud Explosion Incidents*" in June of 2016.

Despite the findings found in the HSL Report and multiple comments submitted to the PHMSA with respect to this issue by Professor Havens on July 28, 2016, September 22, 2018, October 2, 2018, December 3, 2018, and now once again on April 1, 2019, nothing has ever been done by the PHMSA to formulate a regulatory change or address these critical hazard issues.

[13] https://elibrary.ferc.gov/idmws/file_list.asp?accession_num=20150114-5038
[14] https://elibrary.ferc.gov/idmws/file_list.asp?accession_num=20150206-5040

Sightline / CSB Confirm Regulatory Gaps

On June 3, 2016, Sightline reporter, Tarika Powell, did a follow-up report on the explosion that had occurred on March 31, 2014 at a much smaller liquefied natural gas (LNG) peak shaving plant in eastern Washington. That explosion forced hundreds to evacuate their homes within a two mile radius of the facility, injured five workers, and caused $69 million in damages.

Powell's 2016 Sightline article[15] states that the Washington Department of Labor and Industries (Washington L&I), which had conducted an investigation into the safety of employees at the Plymouth plant found that Williams endangered its employees, lacked an adequate emergency response plan, and had deficient safety training. The company's track record—not just in the Northwest, but throughout the US—revealed a pattern of failing to heed safety regulations. This illustrates why we should not underestimate the fire and explosion hazards of natural gas processing plants such as LNG facilities. (***See McCaffree April 25, 2019 Exhibit 75***)

On October 21, 2015, the U.S. Chemical Safety Board (CSB) finalized an investigation report into the 2009 massive explosion at the Caribbean Petroleum, or CAPECO, terminal facility near San Juan, Puerto Rico.[16] The report included recommendations for addressing regulatory gaps in safety oversight of petroleum storage facilities by the Occupational Safety and Health Administration (OSHA) and Environmental Protection Agency (EPA). It is not clear to me whether the CSB recommendations were ever addressed by regulators. While the CAPECO incident involved the storage of gasoline, the same overfilling of a storage tank could also occur with LNG, but with even more disastrous results.

Under Coos Bay File No. **187-18-000153-PLNG-01**, Pembina's Jordan Cove LNG Project is proposing additional dredging of the Coos Bay Navigational Channel in order to *allow for vessel transit under a broader weather window to enable JCEP to export the full capacity from JCEP's liquefied natural gas ("LNG") terminal on the nearby North Spit*. Jordan Cove has informed the local Coos Bay Bar Pilots *...that excessive delays in LNG Carrier transits to and from the LNG terminal could result in a* ***shore storage tank topping situation*** ... (July 25, 2018 letter from Coos Bay Pilots Association - Emphasis added) (See Applicant's Feb 4, 2019 Exhibit 3 page 3.)

As we have already explained in detail the proposed channel alternations DO NOT CORRECT the ISSUES with LNG Tanker ships coming in over the Coos Bay Bar. Not only would the proposed alternations put more water volume in the channel and alter the Coos Bay channel's velocity and flow, the changes do not solve the problems with high surf and sneaker waves that commonly occur at the Coos Bay channel jetty entrance. It is not uncommon for the Coast Guard to close all the maritime entrances in Oregon and Washington due to flood debris, high seas.

"My job as a Captain of the Port is to ensure safety throughout the maritime infrastructure and part of that

[15] https://www.sightline.org/2016/06/03/williams-companies-failed-to-protect-employees-in-plymouth-lng-explosion/

[16] https://www.csb.gov/caribbean-petroleum-refining-tank-explosion-and-fire/

is to sometimes close the lanes of traffic that mariners use," said Capt. Dan Travers, commander Sector Columbia River and Captain of the Port for all ports in Oregon and Southwest Washington. "The storms that we all experienced over the last several days have made it dangerous for mariners to transit in and out of our many rivers due to severe sea conditions and debris."

"It's not rare at all to close the ports," said Coast Guard spokesman, Petty Officer 1st Class Levi Read. "The closures usually come with heavy sea conditions and the ships can't get out. The reason for this closure in addition to the heavy seas is because of the amount of the debris." [17]

Photo below is of the Rose Lynn as it crosses the Coos Bay Bar late in the afternoon as a wave breaks behind it in 2014. Photo by Kristal Talbot

Jordan Cove Continues to Ignore Hazard Concerns

Despite all the concerns about safety that have been raised with respect to the proposed Jordan Cove LNG Project over the last 15 years, the Project sponsors have continued to ignore or disregard most of these concerns.

Jordan Cove is proposing to build an LNG export terminal on dredging spoils located on a sand spit (an unstable sand dune area), directly across the bay from an airport runway, in the flight path of the runway, in an extreme tsunami inundation zone, in an earthquake subduction zone, in an area known for high winds and ship disasters, less than a mile from a highly populated city. Thousands of people in the Coos Bay/North Bend area would be put at risk due to living in Jordan Cove's LNG Hazardous Burn Zones. The Project is one of the worst sited LNG export proposals out there.

[17] *Coast Guard closes all maritime entrances in Oregon, Washington due to flood debris, high seas (video)*; Dec 11, 2015
https://www.oregonlive.com/pacific-northwest-news/2015/12/coast_guard_closes_all_maritim.html
* Coast Guard transiting Coos Bay Channel Entrance: https://www.youtube.com/watch?v=qvordhPI8Ds
* Sneaker wave south of Coos Bay Caught on camera: https://www.youtube.com/watch?v=RPypT9dOvSY

FERC's current Draft EIS and suggested unprecedented 137 Conditions of Approval do not alleviate the concerns.

At some point here regulators need to stop catering to the gas and oil industry and stop delaying all the regulatory oversight and updates that are necessary in order to protect the public health, safety and welfare of the American people.

Citizens have a right to have their lives, property and livelihoods protected and not subjected to harm or even death due to improper planning. When the projected Cascadia subduction earthquake occurs off the Oregon Coast this would compound the problem and mean more harm.

4. Feasible alternative LNG terminal locations exist but have not been considered

Alternative Terminal locations were presented on April 25, 2019 as McCaffree ***Exhibit 63***

5. Adverse impacts are not minimal

The Weyerhaeuser's mitigation site on the North Spit was not successful and there is no guarantee that what Jordan Cove has planned will be successful either. They are trying to mitigate habitat that would be located in the lower bay to a site far too upland and fish are not likely to be protected or have the habitat they need to survive in the lower bay.

Jordan Cove has yet to prove a need for their dredging project that outweighs the negative impacts to fishing, recreation and navigation. Jordan Cove's proposed eelgrass mitigation site also lacks sufficient proof that it would be successful.

A March 2019 letter from Shon Schooler, Ph.D., Research Coordinator with the South Slough National Estuarine Research Reserve states:

We are particularly concerned with the potential impacts to eelgrass (Zostera marina) populations as eelgrass is an important habitat for many estuarine species and improves estuarine water quality. The following comments fit under CBEMP Policy 4: Resource Capability Consistency and Impact Assessment. Eelgrass habitat in the Coos Estuary has experienced a net loss since 2005 (from mapping/GIS methods) and abundance has declined more recently since 2016 (from intertidal field surveys). [Photo: S. Jeffery - Copper rockfish swims among eelgrass blades.]

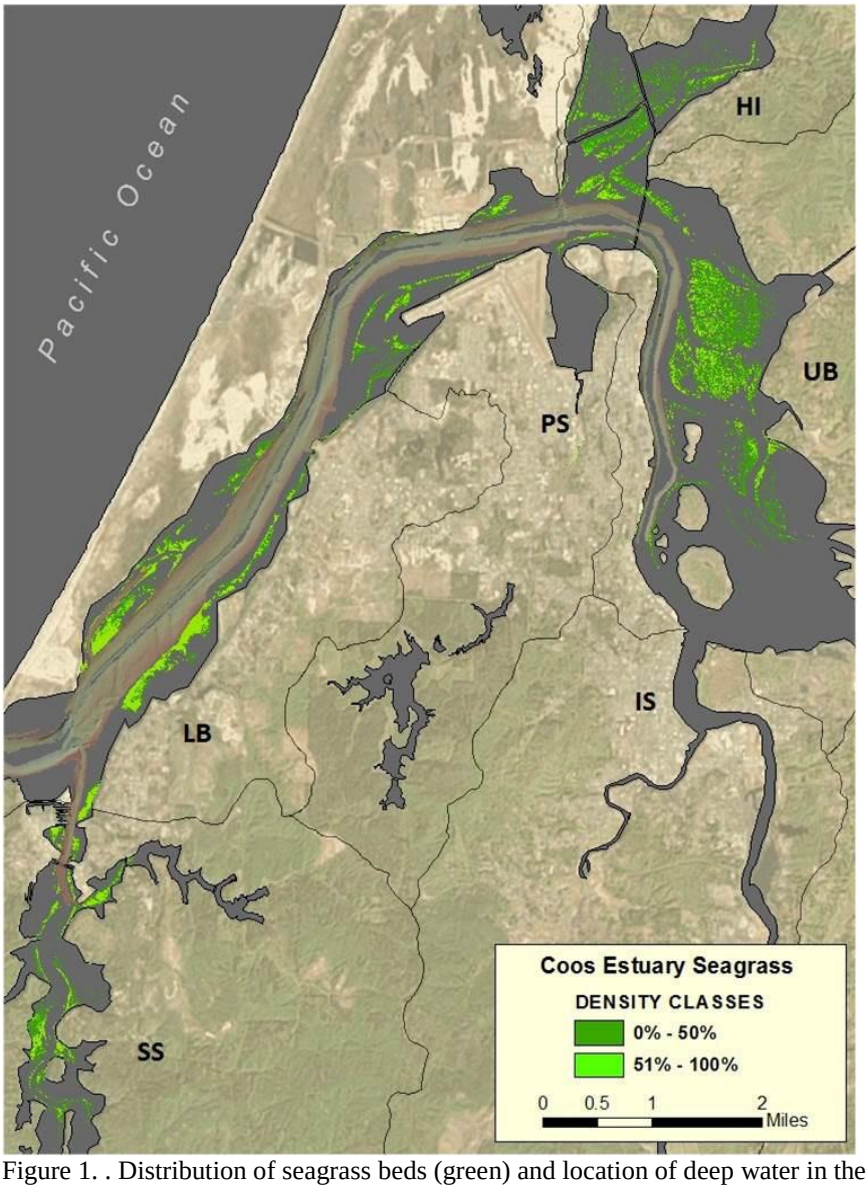


Figure 1. . Distribution of seagrass beds (green) and location of deep water in the shipping channel (tan). Dense beds (> 50% ground cover from seagrasses) are shown in light green. Seagrass data generated from aerial photos taken in 2005. Data: Clinton et al. 2007, NGDC 2014

Jordan Cove's proposed temporary dredge pipeline would transit through much of the Coos Bay. It is unknown how much restriction this will cause to other bay users or how secure this line would be against the vast tidal action of the lower bay. **This temporary pipeline activity is only permitted subject to Coos Bay Estuary Management Plan (CBEMP) Policy #5a**. The temporary pipeline must be consistent with the resource capabilities of the area (see Policy #4) and must also satisfy the impact minimization criterion of Policy #5. The affected areas are to be restored to their previous condition. Jordan Cove is not asking for an exemption for the impact their temporary pipeline alteration would have on the estuary and **they have yet to provide the necessary evidence that they have met the CBEMP requirements**. Jordan Cove's eelgrass mitigation site temporary pipeline would directly impact known eelgrass areas in the Coos Bay as documented by the letter from Shon Schooler, PhD and as shown in the above diagrams. No evidence has been provided as to how these impacted areas would be mitigated.

Jordan Cove's proposed eelgrass mitigation site temporary dredge transfer line support structures are slated to sit on current known eelgrass bed areas. There is no indication how stable this transfer line would be with the swiftness of the tides in our area, nor is there any mitigation being proposed for the negative impacts this temporary line would have on eelgrass and other habitat areas that are to be protected. Eelgrass and other Seagrasses can be negatively impacted by crushing and/or dredging sedimentation that chokes out sunlight.

The Pipeline and Hazardous Materials Safety Administration (PHMSA), a United States Department of Transportation agency, has collected data on more than 3,200 accidents deemed serious or significant since 1987 for natural gas incidents alone.[18]

On May 2, 2019 the PHMSA issued an advisory bulletin with respect to "***Pipeline Safety: Potential for Damage to Pipeline Facilities Caused by Earth Movement and Other Geological Hazards.***" (***See Exhibit D***) The report states among other issues that:

> *Once operational, § 192.317(a) of the pipeline safety regulations for natural gas pipelines states that "[t]he operator must take all practicable steps to protect each transmission line or main from washouts, floods, unstable soil, landslides, or other hazards that may cause the pipeline to move or to sustain abnormal loads…*
>
> *…* ***Land movement, severe flooding, river scour, and river channel migration are the types of unusual operating conditions that can adversely affect the safe operation of a pipeline and require corrective action under §§ 192.613(a) and 195.401(b)****. Additional guidance for identifying risk factors and mitigating natural force hazards on pipeline segments, that could affect high consequence areas, are outlined in Appendix C, section B, to Part 195.* (Emphasis added)

Page 8 of the May 2, 2019 PHMSA Bulletin states:

> *6. Mitigation measures should be based on site-specific conditions and may include:*
> ***Re-routing the pipeline right-of-way prior to construction to avoid areas prone to large ground movement such as unstable slope areas, earthquake fault zones, permafrost movement, or scour.***

Due to issues already raised in this proceeding involving Unstable soils, Earthquake fault lines, Floodplain, Coastal Shorelands, Eelgrass, Endangered Species, Oysters, Fish and Crab impacts, Jordan Cove should have consider the impact of their temporary transport pipeline and considered alternatives that would not have so impacted significant Coastal Shoreland and Estuary areas. Coos Bay Estuary Management Plan Policies 5 and 14 require proof of need and proof that there are no better alternatives than the proposed action (i.e. current pipeline route) found in the application. It is not clear how the temporary pipeline would easily transport rock that will be removed from Jordan Cove's Navigation Alteration sites #1 and #2. The Applicant's current temporary pipeline route would impact known natural hazard areas and could have been rerouted. Jordan Cove does not consider the high probability and negative impact a pipeline failure is likely to have on the Coos Estuary. (***See Exhibits E to H***)

[18] https://en.wikipedia.org/wiki/List_of_pipeline_accidents_in_the_United_States_in_2018

Jordan Cove Memorandum/Reports do not consider ALL impacts.

Jordan Cove has provided a series of reports in with this application that have a reference to Coos County File Number AM-18-011. These are not independent reports or reports from regulatory agencies, so it is unclear just how accurate or reliable these reports actually are. For example, what about the noise from all Jordan Cove's proposed blasting of rock? How will this affect marine life including shellfish in the Estuary? A new study released on March 13, 2019 by the University of California at Santa Cruz found that marine mammals are particularly sensitive to noise pollution because they rely on sound for so many essential functions, including communication, navigation, finding food, and avoiding predators. An expert panel has now published a comprehensive assessment of the available science on how noise exposure affects hearing in marine mammals, providing scientific recommendations for noise exposure criteria that could have far-reaching regulatory implications. (***See Exhibits I***) It is not clear that Jordan Cove has considered the data in this new report's findings. Another study released in October also showed that certain frequencies of noise can cause oysters to clam up even though they don't have ears. (***See Exhibit J***) It is not clear whether Jordan Cove considered this impact in with all their data.

ECONorthwest Analysis likely to be incorrect

Jordan Cove's April 25, 2019 Exhibit G consists of several ECONorthwest Economic reports. Jordan Cove has already demonstrated its inability to predict demand for natural gas imports and exports using ECONorthwest Economic reports. Jordan Cove based the proposed Jordan Cove LNG "Import" terminal in Coos Bay on predictions that an Import facility would be needed to meet growing U.S. demand for natural gas imports from overseas. These predictions turned out to be 180 degrees wrong. (***See Exhibit K for October 16, 2006 ECONorthwest study regarding the Economic Benefits of Jordan Cove Importing LNG.***)

Jordan Cove's assumption about sustained Asian demand for LNG imports is likely to be wrong as well; the same factors that created an oversupply of domestic natural gas would likely also create an oversupply of natural gas in Asia, curtailing demand for LNG imports from the U.S. and rendering a West Coast-based LNG export facility economically unviable.

The testimony we submitted to the U.S. Dept of Energy on the Jordan Cove Energy Project, L.P.'s Application for Long-Term Authorization to Export Liquefied Natural Gas to Non-Free Trade Agreement Nations, under FE Docket No. 12-32-LNG, has for the most part proven to be correct in its assumptions and should be considered fully in with this permit application as it counters a lot of the misinformation being presented by Jordan Cove in their April 25, 2019 submittal. (***See Exhibit L***)

Decommissioning / Bond issue

As mentioned at the hearing held on March 21, 2014, there needs to be some kind of decommissioning bond. This issue is of critical importance. Bonds are required for non-public agencies that have permanent impacts greater than 0.2 acre. Proposed financial instruments need to demonstrate consistency with OAR 141-085-0700. Prior to any permit issuance, a performance bond should be negotiated and put in place.

We do not need Jordan Cove and Pacific Connector to declare bankruptcy and leave tax payers with cleaning up their hazardous LNG and Pipeline mess

Conclusion

Jordan Cove has not met the requirements in order to obtain a Conditional Use Permit within the Coos Estuary. For the reasons stated previously at the hearing on March 21, 2019 and in comments submitted on April 25, 2019 along with those stated above, please deny the Jordan Cove LNG Concurrent land use application filed under **File No. 187-18-000153-PLNG-01.**

Sincerely,

/s/ Jody McCaffree

Jody McCaffree

Exhibit A

CP17-495

Congress of the United States

Washington, DC 20510

April 11, 2019

Chairman Neil Chatterjee
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Dear Chairman Chatterjee:

We write about the need for Oregonians to have genuine public engagement in the Federal Energy Regulatory Commission's (FERC) review of the Jordan Cove LNG Project and the Pacific Connector Gas Pipeline Project (collectively referred to as the Project). To achieve that level of real and robust engagement, we request that FERC give the public with additional time to review and comment on FERC's recent draft environmental impact statement (DEIS).

As you know, FERC released its draft environmental impact statement on March 29, 2019, for the Project's request under the Natural Gas Act to authorize, build, and operate a liquefied natural gas terminal and interstate natural gas transmission pipeline in southwestern Oregon. In its DEIS, FERC proposes a 90-day public comment period that ends on July 5, 2019.

Given the considerable size of this project, the fact that the Project affects landowners in four separate Oregon counties, and the fact that the DEIS document itself is more than 1,000 pages, we believe a 90-day public comment period is an inadequate amount of time for the public to review and make comments. Further, the proposed comment period ends the day after the busy Independence Day holiday, which could impair the public's ability to make comments. Therefore, we request FERC extend the public comment period an additional 30 days, for a total of 120 days. We also request that FERC hold public meetings in each of the affected counties -- Klamath, Jackson, Douglas, and Coos counties.

Oregon tribal members have also contacted our offices. We believe the federal government must continue to engage in strong government-to-government consultation with the tribal governments that will be affected by the construction of the Project. There are several tribes with strong cultural and historical interests in the affected areas, and the federal government has a responsibility to engage in meaningful and robust government-to-government consultation.

Additionally, we have heard from a number of the affected landowners who live in rural areas without access to high-speed internet. They have been told that it is not possible for FERC to make printed copies available. Given that we expect FERC to ensure a level playing field for all stakeholders, we ask that you immediately make 25 printed copies available for interested landowners at easily accessible places such as local public libraries.

We appreciate your consideration of our requests and look forward to your response.

Sincerely,

Ron Wyden
United States Senator

Peter DeFazio
United States Representative

2019-00022

Exhibit B

Oregon
Kate Brown, Governor

Department of Environmental Quality
Western Region Eugene Office
165 East 7th Avenue, Suite 100
Eugene, OR 97401
(541) 686-7838
FAX (541) 686-7551
OTRS 1-800-735-2900

March 11, 2019

Derik Vowels
Jordan Cove LNG, LLC
Consultant, Lead Environmental Advisor
111 SW 5th Ave.,
Suite 1100,
Portland OR 97204

Re: Additional Information Request – Waterbody Crossings
Jordan Cove Energy Project (FERC Project No. CP17-494)
Pacific Connector Gas Pipeline (FERC Project No. CP17-495)
U.S. Army Corps of Engineers (Project No. NWP-2017-41)

Dear Mr. Vowels:

The Oregon Department of Environmental Quality is currently reviewing an application from Jordan Cove LNG, LLC for Clean Water Act Section 401 water quality certification for a Section 404 permit from the U.S. Army Corps of Engineers necessary for construction of the Jordan Cove Energy Project and Pacific Connector Gas Pipeline.

Section 401 of the Clean Water Act bars federal agencies from issuing a license or permit for an action that may result in a discharge to Oregon waters without first obtaining water quality certification from DEQ. DEQ anticipates Jordan Cove's construction and operation will require authorizations from multiple federal agencies, including but not limited to a Section 404 permit from the U.S. Army Corps of Engineers and authorizations from the Federal Energy Regulatory Commission pursuant to the Natural Gas Act. DEQ is conducting a comprehensive section 401evaluation of the project's direct, indirect and cumulative effects on water quality. DEQ expects to develop a single certification decision based on this comprehensive evaluation of the project that will apply to the Corps and FERC decisions on the project.

DEQ is processing the applications pursuant to Section 401 of the Clean Water Act, 33 United States Code §1341, Oregon Revised Statutes 468B.035 through 468B.047, and DEQ's certification rules found in Oregon Administrative Rules 340, Division 048. To certify the project, DEQ must have a reasonable assurance that the proposed project, as conditioned, will comply with Sections 301, 302, 303, 306 and 307 of the Clean Water Act, Oregon water quality standards, and any other appropriate requirements of state law.

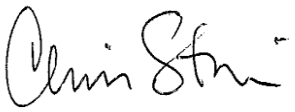
DEQ is reviewing the application submitted Feb. 6, 2018, by David Evans and Associates, Inc. on behalf of Jordan Cove. The information described in the attachments to this correspondence is necessary to complete DEQ's analysis of the project's compliance with applicable standards. Please provide a schedule for a complete response to this additional information request. Please forward your responses to:

Christopher Stine
Oregon Department of Environmental Quality 165
East 7th Avenue, Suite 100
Eugene, Oregon 97401

You may reference previously submitted documents to support your responses to the requests in Attachment A.

DEQ may request additional information as necessary to complete its analysis and fulfill its obligations under state and federal law.

If you have any questions, please contact me directly at 541-686-7810, or via email at stine.chris@deq.state.or.us.



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Sean Mole, sean.mole@oregon.gov
FERC Dockets: CP17-494-000, CP17-495-000

ATTACHMENT A

Jordan Cove Energy Project / Pacific Connector Gas Pipeline Additional Information Request

Horizontal Directional Drilling

1. In September 2017, Pacific Connector submitted Horizontal Directional Drilling Feasibility Analysis reports for the proposed Coos Bay East Crossing and Coos Bay West Crossing. According to the reports, the "conclusions should be considered preliminary pending completion of a subsurface exploration program." Please provide a status update on geotechnical drilling and a schedule for finalizing the reports.
2. Pacific Connector describes two options (i.e., single Horizontal Directional Drilling Option and a Dual Horizontal Directional Drilling Option) to accomplish the Coos Bay East Horizontal Directional Drilling crossing. DEQ expects the design criteria supporting the selected procedure will be presented in the final design report. DEQ requests Pacific Connector address the following considerations in determining their proposed methodology.

   Single Horizontal Directional Drilling Option

   a) The single option places the bottom tangent at elevation -190 feet mean sea level. Pacific Connector expects the underlying geology at this depth will consist of competent bedrock, which is deemed critical to the feasibility of the single option. Please describe whether alternate design measures would allow use of the single option if the geotechnical investigation concludes the underlying geology does not consist of competent bedrock.

   Dual Horizontal Directional Drilling Option

   A final Horizontal Directional Drilling design report that proposes the Dual Horizontal Directional Drilling Option should address the following issues.

   b) The dual option relies on a shared tie-in workspace located in a tidal flat area south of Glasgow Point. Describe how the workspace will be isolated from open water during Horizontal Directional Drilling installation.

   c) The likelihood of inadvertent surface returns of drilling fluid is highest near entry points where drilling pressures can exceed the shear strength and pressure from overburden soils. Describe what special contingency measures will be employed to contain drilling fluids in this inter-tidal environment.

   d) What is the proposed final depth below surface of the installation at the tie-in location? What measures, if any, are proposed to ensure the pipeline remains buried for the life of the project?

   e) Describe the scope of open-water activities such as inter-tidal dredging for barge access to the shared tie-in workspace.

   f) Describe what procedures Pacific Connector will employ to avoid, minimize, or

mitigate the effects of this option on water quality.

3. The Horizontal Directional Drilling Mud Contingency Plan states a berm may be built around the drilling site and hay bales or silt fences may be placed on the river side of the drilling area. Because inadvertent surface returns may reasonably be expected near entry locations, Pacific Connector should identify measures that will be employed and maintained to contain fluids during installation.
4. Inadvertent fluid returns to surface waters are unacceptable. Pacific Connector must develop and implement an Horizontal Directional Drilling plan to continuously monitor engineering conditions during installation and provide for a rapid response in the event fluid loss is confirmed or suspected. The plan should establish procedures to monitor drilling pressure, fluid circulation, pilot hole location, axial loads, visual monitoring or other parameters deemed appropriate to interpret formational or surface loss of drilling fluid.

Waterbody Crossing Plans

The effects of pipeline construction across waterbodies can affect the physical, biological and chemical integrity of the aquatic environment. Pacific Connector will utilize dry open cut methods (fluming, dam and pump, or diverted open cut) on most of the proposed 326 waterbody crossings. Open cutting of streambeds can have direct, indirect and cumulative effects on water quality, habitat and stream hydrology. Changes to channel geometry may cause streams to reestablish equilibrium. These actions can increase sedimentation, reduce water quality, decrease habitat complexity and modify channel hydrology. Because, the effects of open trench waterbody crossings can propagate upstream, downstream, and laterally these impacts, may not be confined to the project area.

Waterbody crossing plans must describe site-specific construction procedures that Pacific Connector will undertake at each proposed crossing. The plans should identify the proposed crossing methodology, dewatering procedures, dewatering discharge sites, spoils placement locations, mobilization and demobilization, and monitoring procedures. The plans should be developed in consideration of local characteristics such as anticipated flow, local, geology, gradient, sensitive environmental conditions, slope stability at dewatering discharge points or other environmental factors that may influence the design and implementation of waterbody crossings. Pacific Connector should describe procedures for crossings that may require unique or challenging procedures (e.g., blasting consolidated rock). Last, site-specific crossing plans must address the removal of dams, dewatering locations, temporary bridges, or other temporary construction elements and include procedures to avoid or minimize sediment mobilization or turbidity

Waterbody crossing plans must also describe site-specific plans to restore each of the proposed waterbody crossings. Each plan must include sufficient local-scale information to provide an accurate baseline assessment of pre-construction environmental and ecological conditions to guide the design of the post-construction restoration. Each stream restoration plan must contain

site-specific designs and specifications to ensure PCGP fully mitigates the impact of open cut trenching in each stream and protects the beneficial uses. The data generated from the information requested below will support the development of site-specific waterbody crossing plans.

To develop a waterbody crossing plan for each open trench cut stream crossing, Pacific Connector must document and use the site-specific field data described below.

Hydraulic Assessment

Pacific Connector must conduct a hydraulic analysis on each proposed waterbody crossing. Site-specific information of local discharge is required to demonstrate that proposed pumping and fluming designs can adequately bypass anticipated flows. Pre-development local hydrology must also be characterized to inform stream restoration actions.

Pacific Connector should conduct the analysis using one of the following methods:

- Rational Method (for drainages up to 200 acres)
- NRCS Peak Flow Method using HydroCAD (for drainages larger than 200 acres)
- USGS StreamStats for Oregon

The hydraulic analysis should provide the following information:

- Drainage area above each proposed crossing
- Peak flow estimate at the time of construction
- Bankfull width, stage, and corresponding discharge
- Average gradient within the temporary crossing easement
- Mean two-year, five-year and 10-year discharge and velocity at the proposed crossing

Based on the hydraulic conditions at each crossing, Pacific Connector should confirm the design pumping capacity of the proposed fluming or pumping bypass system can sufficiently transfer maximum anticipated flows around the work area. Pacific Connector should further describe alternate or contingency methods in the event field conditions prevent successful dewatering. Waterbody crossing plans must include engineering data to support design criteria of proposed conveyance structures based on gradient, bypass length and anticipated flow.

Pacific Connector must also measure bankfull width, stage, and corresponding discharge at each crossing. Recognizing the bankfull width at each crossing is critical in designing and implementing restoration plans that maintain the geomorphological function of the stream segment.

Topographic Survey of Stream Channel

Restoring a stream's natural form and function requires a topographic survey of the pre-construction stream channel and floodplain form.[1] Pacific Connector provided this information for the South Umpqua Number 2 River crossing. However, this information is lacking for other crossings involving open trench cutting. This survey information will assist in the reconstruction of the natural stream channel. At minimum, Pacific Connector should include in each topographic survey a longitudinal survey of the stream profile, top and bottom of banks, and the top and bottom floodplain slopes. This topographic information should also include geometric data downstream and upstream of the pipeline crossing to assist the restoration design and to identify potential interactions with adjacent reaches.

Stream Function Assessment

Trenched waterbody crossings can alter stream function in ways that negatively affect aquatic habitats and ecosystems. Potential effects may include modified stream channel geometry, reduced habitat complexity, reduced streambank stability, impaired benthic production and increased sedimentation.

Pacific Connector must conduct a pre-construction ecological assessment of each waterbody crossing using the methodology presented in Stream Function Assessment Method for Oregon Version 1.0.[2] SFAM was developed jointly by EPA and Oregon Department of State Lands. The method provides a scientifically supported rapid assessment tool for gathering information on the functions and values associated with wadeable streams that may be subject to regulatory jurisdiction under Section 404 of the Clean Water Act and Oregon's Removal-Fill Law.

The assessment is needed to establish a pre-development ecological baseline and to inform site-specific practices necessary to mitigate the environmental effects of the action. Pacific Connector can also use this assessment method for post-construction monitoring of Pacific Connector's stream restoration actions over time.

More information can be found at:
https://www.oregon.gov/dsl/WW/Pages/Resources.aspx#assessment.

Biological Assessment

Oregon water quality rules prevent discharges to waters of the state that may reduce support for beneficial uses or cause changes in residential biological communities. To establish pre-construction conditions, Pacific Connector must conduct a benthic macroinvertebrate assessment to comply with the Biocriteria water quality standard (Oregon Administrative Rule 340-0410-0011). Benthic communities form the basis for food webs that support aquatic life and are susceptible to changes in sedimentation. Oregon DEQ has developed procedures to characterize

[1] Yokum, S.E. 2018. Guidance for Stream Restoration. Technical Note TN-102.4. National Stream Aquatic Ecology Center. USDA Forest Service

[2] Stream Function Assessment Method for Oregon Version 1.0. June 2018. U.S. Environmental Protection Agency and Oregon Department of State Lands. EPA 910-D-18-001.

the health of benthic communities to comply with this standard. Using procedures found in Methodology for Oregon's 2018 Water Quality Report and List of Water Quality Limited Waters,[3] Pacific Connector must perform pre-development benthic surveys using to the PREDictive Assessment Tool for Oregon (PREDATOR). The results of the PREDATOR surveys will enable DEQ to evaluate the direct, indirect, and cumulative effects of the action caused by stream channel modification, habitat loss, sedimentation or other potential project effects.

Streambed Material Assessment

Pacific Connector must characterize bed material composition at each trenched waterbody crossing. Substrate composition is critical to stream hydrology and provides interstitial refuge for egg incubation. Characteristics can vary considerably based on gradient, stream channel geometry, watershed hydrology and other factors. For this reason, site-specific knowledge of local bed material characteristics are necessary to inform restoration and mitigation actions following construction.

For streambeds characterized by unconsolidated substrates, Pacific Connector must conduct a pre-construction quantitative assessment of substrate material. The assessment should address the particle size, sorting, vertical variability and distribution of material.

Open cut trenches in bedrock-dominated stream channels are susceptible to upstream propagation of knickpoints created by joints in the stream's bedrock.[4] Knickpoint propagation in bedrock-dominated streams can cause changes in stream geomorphology and, potentially, barriers to fish migration. Pacific Connector should describe in detail how bedrock-dominated stream channels will be restored to prevent the creation of a joint in the bedrock that leads to the formation and propagation of a knickpoint in these channels.

Habitat Assessment

Naturally occurring material such as large wood and boulders provide gravel recruitment, cover for juvenile fish, thermal refugia, and hydraulic control. Pacific Connector must conduct a detail inventory of aquatic habitat features within the project area of each proposed crossing. Habitat features identified during this predevelopment inventory should be used to ensure restoration efforts result in no net loss of habitat function or complexity. In its Stream Crossing Risk Analysis document, Pacific Connector provides only general descriptions to address, for example, the reinstallation of boulders to maintain an existing bed profile and cascade/pool morphology during the stream restoration process. However, Pacific Connector's habitat assessments must capture such habitat features as noted above in sufficient design detail so that the construction contractor has clear direction in site-specific drawings to restore these habitat

[3] Methodology for Oregon's 2018 Water Quality Report and List of Water Quality Limited Waters, November 2018. Oregon Department of Environmental Quality: https://www.oregon.gov/deq/FilterDocs/ir2018assessMethod.pdf.
[4] Selander, Jacob. 2004. Processes of Knickpoint Propagation and Bedrock Incision in the Oregon Coast Range. Department of Geologic Sciences. University of Oregon

features during the stream restoration process.

Water Quality

Site-specific water body crossing plans should address the following water quality issues at each crossing proposed:

- Oregon DEQ may issue a section 401 water quality certification that allows the numeric turbidity criteria to be exceeded provided all practicable turbidity control techniques have been applied. Please identify what engineering controls (e.g., settling, filtration, flocculation, etc.) are proposed to reduce turbidity in streams during mobilization and removal of construction equipment.

- Describe procedures to backfill trenches in a manner that maintains predevelopment streambed material and habitat function. For example, backfilling procedures must clearly address how Pacific Connector will prevent the restored stream flow from moving completely into the subsurface of restored streambed material and creating a fish passage barrier. Additionally, crossing plans should clearly describe how fill material will be placed to prevent streambed and bank scour, sedimentation, and channel modification.

- For trench dewatering structures, please identify how sediment and fines removed from the isolated work area will be permanently managed following work completion.

Comments

1. Appendices C.2 and D.2 (Stream Fluming Procedures, Dam and Pump Procedures) of Resource Report 2 state, "Turbidity sampling will be conducted during all . . . crossings in accordance with the Stormwater Pollution Prevention Plan." DEQ cannot find the Stormwater Pollution Prevention Plan in Pacific Connector's application submittal to evaluate the proposed turbidity sampling.
2. Fluming and dam and pump procedures rely on upstream and downstream dams to isolate temporarily work areas during construction activities. Oregon's fish passage requirements found in Oregon Revised Statute 509.585 prevent activities that impede the volitional movement of fish. Pacific Connector should describe how proposed fluming and dam and pump procedures will comply with Oregon fish passage law.
3. Stream Classifications in Table A.2-2 in Resource Report 2 reference methods established by Oregon Department of Forestry and the Northwest Forest Plan. DEQ's biologically based numeric criteria are based on fish distribution maps developed by Oregon Department of Fish and Wildlife. Please consult with ODFW to identify fish use and classifications at the proposed waterbody crossing locations.
4. Appendix C.2 of Resource Report 2 (Fluming Procedures) indicates that scrap metal pipe may be used to construct flumes and that pipes may be steam-cleaned to remove oil and grease. Please identify on the crossing plans where Pacific Connector will discharge this wash water. DEQ expects that Pacific Connector will apply for and obtain coverage under the appropriate permit (i.e., either Water Pollution Control Facility or National

Pollutant Discharge Elimination System) based on the proposed activity.

5. Figure 8 of Appendix C.2 of Resource Report 2 (Fluming Procedures) illustrates procedures to divert stormwater runoff from the construction easement into the isolated stream section. Please note that NPDES 1200-C General Permit does not authorize the discharge of stormwater to waterways. Pacific Connector must control runoff from upland work areas to prevent discharge to stream channels.

Exhibit C

DEQ issues a decision on Jordan Cove's application for 401 Water Quality Certification

May 06, 2019

Statewide, OR—Today the Oregon Department of Environmental Quality issued a decision on Jordan Cove's application for a Section 401 Water Quality Certification. The certification is required for the U.S. Army Corps of Engineers to issue permits for the project.

DEQ's decision is to deny the requested certification at this time. However, DEQ's action is being made "without prejudice." This means that the applicant may reapply for the certification, and submit additional information that could result in a different decision.

If Jordan Cove resubmits an application along with information addressing DEQ's concerns, DEQ will work to keep the timing of its review in line with the overall federal schedule for the project, but this will depend on the applicant submitting the requested information in a timely manner.

DEQ had expected to make its decision on certification in September of this year. However, DEQ has accelerated the schedule and is making a decision now in order to ensure that we do not unintentionally waive Oregon's authority to review the water quality impacts of the proposed project. The U.S. Army Corps of Engineers initially instructed DEQ to complete its review by May 7, 2019. However, in fall 2018 the U.S. Army Corps of Engineers extended that date to Sept. 24, 2019 following the applicant's withdrawal and resubmittal of its application. Recent federal court and agency decisions have raised significant questions about whether this extension was valid. As a result, DEQ is making a decision by the date initially provided by the Corps – May 7, 2019.

DEQ is denying the requested water quality certification at this time because there is insufficient information to demonstrate compliance with water quality standards, and because the available information shows that some standards are more likely than not to be violated. Through further analysis, and possibly through project changes and mitigation, the applicant may be able to show the standards for certification will be met, but the current record does not allow DEQ to reach that conclusion today.

DEQ's specific concerns, among others, include:
• Expected effects of the construction and operation of the proposed pipeline and associated road and work areas on water temperature and sediment in streams and wetlands
• The risk of release of drilling materials from the construction of the proposed crossing of the Coos Bay estuary

DEQ requested additional information from Jordan Cove in September 2018, December 2018 and March 2019 relevant to the project's effect on water quality. Jordan Cove has provided some, but not all, of the information requested.

The proposed project calls for a liquefied natural gas export facility in Coos Bay and would include a 229-mile, 36-inch diameter pipeline from Malin in Klamath County to the facility in Coos Bay. Under Section 401 of the Clean Water Act, DEQ has the authority to certify whether

federally permitted activities that may result in a discharge to state waters comply with applicable water quality standards.

Visit **https://www.oregon.gov/deq/wq/wqpermits/Pages/Sect... (https://www.oregon.gov/deq/wq/wqpermits/Pages/Section-401.aspx)** to learn more about the 401 Water Quality Certification.

Visit **https://www.oregon.gov/deq/Programs/Pages/Jordan-C... (https://www.oregon.gov/deq/Programs/Pages/Jordan-Cove.aspx)** to view the denial letter, evaluation report and other information on Jordan Cove. Other documents, including previous information requests and Jordan Cove's responses are also available on this webpage.

Contacts: Katherine Benenati, DEQ, 541-600-6119, **benenati.katherine@deq.state.or.us (mailto:benenati.katherine@deq.state.or.us?subject=RE:%20)**

Attachments

Categories:
Environment & Energy

Exhibit D

Billing Code: 4910-60-W

DEPARTMENT OF TRANSPORTATION

Pipeline and Hazardous Materials Safety Administration

[Docket No. PHMSA-2019-0087]

Pipeline Safety: Potential for Damage to Pipeline Facilities Caused by Earth Movement and Other Geological Hazards

AGENCY: Pipeline and Hazardous Materials Safety Administration (PHMSA), DOT.

ACTION: Notice; Issuance of Advisory Bulletin.

SUMMARY: PHMSA is issuing this advisory bulletin to remind owners and operators of gas and hazardous liquid pipelines of the potential for damage to pipeline facilities caused by earth movement from both landslides and subsidence in variable, steep, and rugged terrain and for varied geological conditions. These conditions can pose a threat to the integrity of pipeline facilities if those threats are not identified and mitigated.

FOR FURTHER INFORMATION CONTACT: Operators of pipelines subject to regulation by PHMSA should contact the appropriate PHMSA Region Office. The PHMSA Region Offices and their contact information are as follows:

- Eastern Region: 609-771-7800

  Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, Virginia, and West Virginia

- Southern Region: 404-832-1147

  Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, Puerto Rico, South Carolina, and Tennessee

- Central Region: 816-329-3800

Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, South Dakota, and Wisconsin

- Southwest Region: 713-272-2859

  Arkansas, Louisiana, New Mexico, Oklahoma, and Texas

- Western Region: 720-963-3160

  Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, Oregon, Utah, Washington, and Wyoming

Intrastate pipeline operators should contact the appropriate state pipeline safety authority. A list of state pipeline safety authorities is available at http://www.napsr.org/state-program-managers.html.

For general information about this notice contact Mike Yazemboski, Project Manager, PHMSA Eastern Region, at 609-771-7800 or by email at Mike.Yazemboski@dot.gov.

SUPPLEMENTARY INFORMATION

I. Background

The purpose of this advisory bulletin is to remind owners and operators of gas and hazardous liquid pipelines, particularly those with facilities located in inland areas, about the serious safety-related issues that can result from earth movement and other geologic hazards.

Natural gas and hazardous liquid pipelines are required to be designed to withstand external loads including those that may be imposed by geological forces. Specifically, natural gas pipelines must be designed in accordance with 49 CFR 192.103 and hazardous liquid pipelines must be designed in accordance with § 195.110. To comply with these regulations, the design of new pipelines, including repairs or replacement, must consider load that may be imposed by geological forces.

Once operational, § 192.317(a) of the pipeline safety regulations for natural gas pipelines states that "[t]he operator must take all practicable steps to protect each transmission line or main from washouts, floods, unstable soil, landslides, or other hazards that may cause the pipeline to move or to sustain abnormal loads. In addition, the operator must take all practicable steps to protect offshore pipelines from damage by mud slides, water currents, hurricanes, ship anchors, and fishing operations." This advisory bulletin addresses those protective requirements associated with damage caused by geological factors.

In addition, § 192.705 requires operators of gas transmission lines to have a patrol program to observe surface conditions on and adjacent to the transmission line right-of-way for indications of leaks, construction activity, and other factors affecting safety and operation and the frequency of patrols must be based upon the size of the line, operating pressures, class locations, terrain, seasonal weather conditions, and other relevant factors. One of the primary reasons for this patrol requirement is to monitor geological movement, both slowly occurring or acute changes, which may affect the current or future safe operation of the pipeline.

Furthermore, § 192.613(a) states that "[e]ach operator shall have a procedure for continuing surveillance of its facilities to determine and take appropriate action concerning changes in class location, failures, leakage history, corrosion, substantial changes in cathodic protection requirements, and other unusual operating and maintenance conditions." Section 192.613(b) further states that "[i]f a segment of pipeline is determined to be in unsatisfactory condition but no immediate hazard exists, the operator shall initiate a program to recondition or phase out the segment involved, or, if the segment cannot be reconditioned or phased out, reduce the maximum allowable operating pressure in accordance with § 192.619(a) and (b)."

Section 195.401(b)(1) of the pipeline safety regulations for hazardous liquid pipelines states that "[w]henever an operator discovers any condition that could adversely affect the safe operation of

its pipeline system, it must correct the condition within a reasonable time. However, if the condition is of such a nature that it presents an immediate hazard to persons or property, the operator may not operate the affected part of the system until it has corrected the unsafe condition." Section 195.401(b)(2) further states that "[w]hen an operator discovers a condition on a pipeline covered under [the integrity management requirements in] § 195.452, the operator must correct the condition as prescribed in § 195.452(h)." Land movement, severe flooding, river scour, and river channel migration are the types of unusual operating conditions that can adversely affect the safe operation of a pipeline and require corrective action under §§ 192.613(a) and 195.401(b). Additional guidance for identifying risk factors and mitigating natural force hazards on pipeline segments, that could affect high consequence areas, are outlined in Appendix C, section B, to Part 195.

Sections 192.935 and 195.452(i) require an operator to take additional preventative and mitigative measures to prevent a pipeline failure and to mitigate the consequences of a pipeline failure that could affect a high consequence area. An operator must base the additional measures on the threats the operator has identified for each pipeline segment. If an operator determines there is a threat to the pipeline, such as outside force damage (e.g., earth movement, floods), the operator must take steps to prevent a failure and to minimize the consequences of a failure under these regulations.

PHMSA is aware of recent earth movement and other geological-related incidents/accidents and safety-related conditions throughout the county, particularly in the eastern portion of the United States. Seven of the more notable events are briefly described below:

- On October 21, 2016, a pipeline release of over 1,238 barrels of gasoline spilled into the Loyalsock Creek in Lycoming County, Pennsylvania. The release was caused by extreme localized flooding and soil erosion.
- On December 5, 2016, approximately 12, 615 barrels of crude oil was released into Ash Coulee Creek in Billings County, North Dakota. The metallurgical and root cause failure analysis

indicated the failure was caused by compressive and bending forces due to a landslide impacting the pipeline. The landslide was the result of excessive moisture within the hillside creating unstable soil conditions.

- On April 30, 2018, a pipeline failure occurred in a remote mountainous region of Marshall County, West Virginia resulting in the release of 2,658 barrels of propane. The failure and subsequent release was caused by lateral movement of the 8-inch intrastate pipeline due to earth movement along the right-of-way.
- On June 7, 2018, a rupture occurred on a 36-inch pipeline located in a rural, mountainous area near Moundsville, West Virginia, resulting in the release of approximately 165,000 MCF of natural gas. The failed sections of the pipeline were sent to a metallurgical laboratory to determine the probable cause behind the failure of the pipeline. According to the analysis, the cause of the rupture was due to earth movement on the right-of-way due to a single overload event. Overloading of the pipeline likely resulted from a series of lateral displacements with accompanying bending.
- On January 9, 2018, a failure occurred on a 22-inch transmission pipeline in Montecito California. The incident resulted in a fire and explosion and the release of an estimated 12,000 MFC of natural gas within a Class 3 location.[1] It is believed that heavy rains and localized flooding contributed to the incident. Automated safety equipment designed to stop the flow of gas to the effected segment activated to shut off gas flow to the damaged segment of pipeline.
- On January 31, 2018, a portion of a pipeline experienced an in-service rupture near the city of Summerfield, Ohio. The rupture of the 24-inch interstate pipeline resulted in the release of approximately 23,500 MCF of natural gas in a rural forested area. A root cause analysis concluded that the girth weld failure was caused by axial stress due to movement of the pipe

[1] *See* 49 C.F.R. § 192.5(b)(3) (defining Class 3 locations).

that exceeded the cross-sectional tensile strength of the net section weld zone surrounding the crack initiation location. This determination is supported by metallurgical analysis, strain capacity evaluation and geotechnical findings.

- On January 29, 2019, a pipeline ruptured near the town of Lumberport in Harrison County, West Virginia. The rupture was located at a girth weld of an elbow on the 12-inch interstate pipeline. The root cause investigation concluded that a landslide about 150 yards from the rupture moved the pipeline approximately 10 feet from its original location causing excessive stress on the pipe resulting in the rupture.

II. Advisory Bulletin (ADB-2019-02)

To: Owners and Operators of Gas and Hazardous Liquid Pipeline Systems.

Subject: Potential Damage to Pipeline Facilities Caused by External Loads Imposed by Earth Movement and Other Geologic Hazards on and Adjacent to Pipeline Right-of-Way Corridors.

Advisory: All owners and operators of gas and hazardous liquid pipelines are reminded that earth movement, particularly in variable, steep, and rugged terrain and with varied geological subsurface conditions, can pose a threat to the integrity of a pipeline if those threats are not mitigated. Pipeline operators should consider taking the following actions to ensure pipeline safety:

1. Identify areas surrounding the pipeline that may be prone to large earth movement, including but not limited to slope instability, subsidence, frost heave, soil settlement, erosion, earthquakes, and other dynamic geologic conditions that may pose a safety risk.
2. Utilize geotechnical engineers during the design, construction, and ongoing operations of a pipeline system to ensure that sufficient information is available to avoid or minimize the impact of earth movement on the integrity of the pipeline system. At a minimum, this should include soil strength characteristics, ground and surface water conditions, propensity for erosion or scour of underlying soils, and the propensity of earthquakes or frost heave.

3. Develop design, construction, and monitoring plans and procedures for each identified location, based on the site-specific hazards identified. When constructing new pipelines, develop and implement procedures for pipe and girth weld designs to increase their effectiveness for taking loads, either stresses or strains, exerted from pipe movement in areas where geological subsurface conditions and movement are a hazard to the pipeline integrity.
4. Monitoring plans may include:
    - Ensuring during construction of new pipelines that excavators do not steepen, load (including changing the groundwater levels) or undercut slopes which may cause excessive ground movement during construction or after operations commence.
    - Conducting periodic visits and site inspections; increased patrolling may be necessary due to potential hazards identified and existing/pending weather conditions. Right-of-way patrol staff must be trained on how to detect and report to appropriate staff the conditions that may lead to or exhibit ground movement.
    - Identifying geodetic monitoring points (i.e. survey bench marks) to track potential ground movement;
    - Installing slope inclinometers to track ground movement at depth which may otherwise not be detectable during ROW patrols;
    - Installing standpipe piezometers to track changes in groundwater conditions that may affect slope stability;
    - Evaluating the accumulation of strain in the pipeline by installing strain gauges on the pipeline.

- Conducting stress/strain analysis utilizing in-line inspection tools equipped with Inertia Mapping Unit technology and High Resolution Deformation in-line inspection for pipe bending and denting from movement.
- Utilizing aerial mapping light detection and ranging or other technology to track changes in ground conditions.

5. Develop mitigation measures to remediate the identified locations.
6. Mitigation measures should be based on site-specific conditions and may include:
    - Re-routing the pipeline right-of-way prior to construction to avoid areas prone to large ground movement such as unstable slope areas, earthquake fault zones, permafrost movement, or scour.
    - Utilize properly designed horizontal directional drilling (HDD) to go below areas of potential land movement.
    - Installation of drainage measures in the trench to mitigate subsurface flows and enhance surface water draining at the site including streams, creeks, runs, gullies or other sources of surface run-off that may be contributing surface water to the site or changing groundwater levels that may exacerbate earth movement.
    - Reducing the steepness of potentially unstable slopes, including installing retaining walls, soldier piles, sheet piles, wire mesh systems, mechanically stabilized earth systems and other mechanical structures.
    - Installing trench breakers and slope breakers to mitigate trench seepage and divert trench flows along the surface to safe discharge points off the site or right-of-way.
    - Building retaining walls and/or installing steel piling or concrete caissons to stabilize steep slope areas as long as the corrosion control systems are not compromised.

- Reducing the loading on the site by removing and/or reducing the excess backfill materials to off-site locations. Soil placement should be carefully planned to avoid triggering earth movement in other locations.
- Compacting backfill materials at the site to increase strength, reduce water infiltration, and to achieve optimal moisture content.
- Drying the soil using special additives such as lime-kiln dust or cement-kiln to allow the materials to be re-used and worked at the site. Over-saturated materials may require an extensive amount of time and space to dry.
- Regrading the pipeline right-of-way to minimize scour and erosion.
- Bringing the pipeline above ground and placing them on supports that can accommodate large ground movements, (e.g. transitions across earthquake fault zones or unstable slopes, without putting excessive stress or strain on the pipeline).
- Reducing the operating pressure temporarily or shutting-in the affected pipeline segment completely.
- Re-routing the pipeline when other appropriate mitigation measures cannot be effectively implemented to maintain safety.

If a pipeline has suffered damage or is shut-in as a precautionary measure due to earth movement or other geologic hazards, the operator should advise the appropriate PHMSA regional office or state pipeline safety authority before returning the line to service, increasing its operating pressure, or otherwise changing its operating status. Per § 190.239, PHMSA may propose additional safety measures, including testing of the pipeline, or design changes to address external loads induced by ground movement, be taken to ensure that the serviceability of the pipeline has not been impaired or

that the condition will not worsen over time. Furthermore, reporting a safety-related condition as prescribed in §§ 191.23 and 195.55 may also be required.

Issued in Washington, DC on April 29, 2019, under authority delegated in 49 CFR 1.97.

Alan K. Mayberry,
Associate Administrator for Pipeline Safety.
[FR Doc. 2019-08984 Filed: 5/1/2019 8:45 am; Publication Date: 5/2/2019]

Exhibit E

High Country News

FOR PEOPLE WHO CARE ABOUT THE WEST

Wastewater pipelines often leak in North Dakota

Breaches in pipelines that carry water away from the oilfields can have devastating consequences.

Emily Guerin | **Feb. 16, 2015** | *From the print edition*

Joanne Njos noticed something was wrong with Blacktail Creek in late September. The water had turned a rusty orange. In mid-November, when temperatures dipped below 20 degrees for nearly two weeks, the creek didn't freeze. Weeks later, Njos dipped her finger in the water and tasted it. It tasted like "pure, pure salt," she said, "worse than table salt." She brushed her teeth immediately.

Njos and her husband, Larry, live on a farm encircled by pumpjacks about 20 miles north of Williston, North Dakota, the heart of the Bakken oil boom. Initially they suspected that the Army Corps of Engineers, which they'd heard was fiddling with an upstream dam, was responsible for the changes in the creek rather than the oilfield. Then, on Jan. 7, a man from Summit Midstream, a pipeline company, knocked on their door. He said workers had detected a major break in a gathering line, which carries wastewater away from oil wells. Nearly 3 million gallons of salty, oily wastewater had spilled into Blacktail Creek — as much as spilled in North Dakota throughout the previous year. The incident was eclipsed in the news by the pipeline that leaked oil into Montana's iconic Yellowstone River the same month, although this spill was as much as 100 times bigger.

Three weeks after the spill was detected, Njos walked Blacktail Creek, the sun glaring off melting snow. She pointed out a telephone pole, gnawed by beavers, and said that she and Larry used to bring logs to the creek, because they felt bad for beavers living on the treeless prairie. "I never even thought about the spills before," she said. "It never affected us."

Large pipeline spills are not uncommon in North Dakota. But watchdogs say it doesn't have to be that way. "I think everyone in the industry agrees the ultimate goal is zero incidents," said Carl Weimer, executive director of the nonprofit Pipeline Safety Trust. "But they're not doing everything they could to (get) to zero."

Cleanup continues in North Dakota, where 2.9 million gallons of drilling wastewater leaked from a pipeline into Blacktail Creek.

Andrew Cullen/Reuters

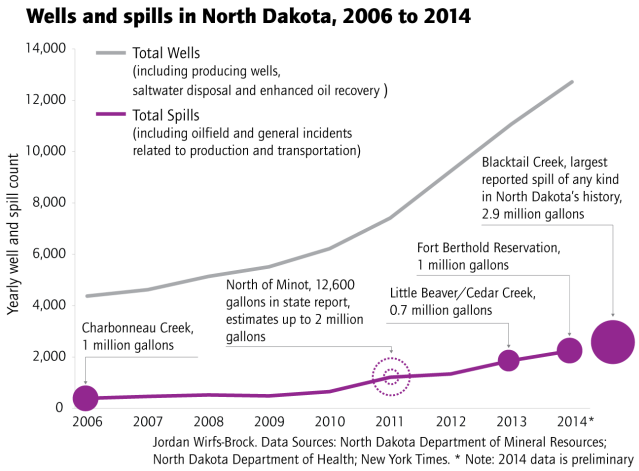
"Produced water" or "saltwater" is a waste product of oil production. In 2013, North Dakota's 10,000 or so oil wells produced more than 15 billion gallons of it. Some comes from the fracking process, but some is sucked up from briny aquifers with the oil.

What's in wastewater can vary with local geology. In North Dakota, the water is over 13 times saltier than ocean water and laced with fracking chemicals, oil and radioactive material. It gets separated from the oil and is either trucked or moved by pipeline to an injection well, where it's pumped back underground.

Most of the time, the process works like it's supposed to. But spills are becoming increasingly common. According to an analysis by the public media team Inside Energy, the spill rate per well was nearly twice as high in 2013 as it was in 2006, at the start of the boom. The rise seems to be a function of increased drilling and the ongoing rush to lay thousands of miles of new pipelines in a short construction season, which can result in sloppy installation practices.

The spills are also getting larger, which worries Derrick Braaten, a Bismarck-based lawyer who represented ranchers affected by the state's first million-gallon-plus wastewater spill, in 2006 in Charbonneau Creek, just east of the Montana border. That spill, like the recent one, was from a brand-new plastic pipeline that leaked for at least two weeks before being detected. It was caused by a failed welding job.

Afterward, it looked like someone had sprayed herbicide for miles along Charbonneau Creek, a tributary, as it happens, of the Yellowstone River. Bleached plants wilted on the bare ground. Fish died. "It was years before the cattle went back and started drinking from the creek," Braaten said. When salty wastewater leaks directly into the soil on agricultural land, another type of common spill in North Dakota, the results can be even more devastating, sterilizing the ground for decades.



North Dakota well counts have surged; spill counts and quantities have gone up even faster. In 2006, there was one spill reported for every 11 wells; in 2013, one spill for every six wells.

Because federal regulators have no authority over rural wastewater gathering lines, it's up to states to require inspections or monitoring. North Dakota lawmakers declined to do so in 2013, when they overwhelmingly voted down a bill that would've mandated flow meters and switches to isolate leaking parts of gathering lines.

Such devices wouldn't detect the smallest leaks, they said. And while that's true, they could at least be installed on the highest-risk pipelines, said Richard Kuprewicz of Accufacts Inc, a consulting firm that investigates pipeline breaks. "The quandary here is

everyone wants a sound bite answer to a complex problem," Kuprewicz said. "(And) some people will take advantage of that complexity to not do anything."

State regulators did enact new construction standards for gathering lines. Companies now must document where they are, what they carry, and certify that they were built correctly. But the state doesn't employ any pipeline inspectors. It's tried to hire some, for $43,000 a year, but anyone with the requisite skills can double their money in the industry. So the checklists are a new form of self-policing: pieces of paper a pipeline company fills out and the state signs off on without ground-truthing.

The latest spill, combined with the recent Yellowstone River incident — the second in less than four years — might represent a tipping point. "There's a lot of dissatisfaction in our department about the current spill rates," said Lynn Helms, director of the state's Department of Mineral Resources. Gov. Jack Dalrymple echoed that sentiment, saying the recent spills "raised the question of whether there should be a higher (construction) standard when we know there is a pipeline going under a significant body of water."

Dave Glatt, the head of the North Dakota Department of Health's Environmental Health Division, was even more frank: "I can see where the public would say, 'How come our state government isn't protecting us?'"

Oily wastewater collects at a cleanup berm on Blacktail Creek, North Dakota.

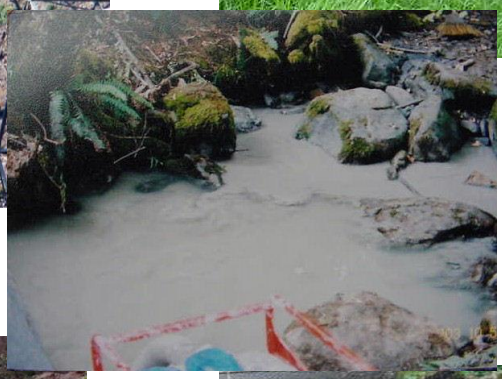
Emily Guerin/Inside Energy

This story was originally titled "Built to spill" in the print edition.

Exhibit F

There was no salmon season for fishermen (a vital industry in Coos Bay) in 2008 and 2009 due to poor fish runs. Even when the season has been open, salmon fishing has been poor.

The currently underused twelve-inch gas pipeline that was built in 2003 and which runs from Coos Bay to Roseburg had environmental impacts that were severe and many vital ecological (fish bearing) streambeds suffered damage. Mastec, the pipeline builder was ordered to pay 1.5 million in penalties. This was far short of the actual damage caused and the amount sought by plaintiffs. Judge Hogan ruled that there had been failure of all parties concerned and that the lack of government oversight was a factor in the low penalty amount he awarded to the plaintiff.



Photos shown above show environmental impacts of the Coos County Pipeline built in 2003 from Coos Bay to the Williams Lateral in Roseburg.

Exhibit G

http://winstonross.wordpress.com/2009/05/page/3/
(May 14, 2009 at 3:28 am · Filed under Uncategorized)

Enterprise goes sour. (Part one of a three-day series on a Coos County pipeline project.)

By Winston Ross, The Register Guard
07/25/2004

Enterprise goes sour
Cost overruns, environmental damage and lawsuits tangle gas project

By Winston Ross The Register-Guard

COOS BAY – First it was just a foot. Then an ankle. Before long, Gladys Wood was up to her hips in muck.

The 52-year-old Coos County nurse was house-sitting for a friend earlier this spring and had wandered into an unfilled ditch left by the builders of a natural gas pipeline between Roseburg and Coos Bay.

Like quicksand, the more she struggled, the more stuck she became.
For four hours, Wood remained in the mud pit until a neighbor finally heard her screams. Firefighters had to build a wooden platform around the woman and hoist her out with a makeshift harness.

“It put a lot of strain on me, coming out of there,” Wood says.
She laughs about the ordeal now. It lasted only a half-day. Coos County’s ordeal is likely to last for years.

The county is stuck in a sinkhole of its own, facing at least six lawsuits and the potential for millions of dollars in fines for environmental damage along the 60-mile pipeline route. For months, county commissioners and their Colorado consultants assured the public that all was well on a project conceived as the centerpiece of the region’s economic recovery.

But a review of hundreds of documents by The Register-Guard reveals a project plagued by escalating costs, sloppy construction and lapses in environmental protection that were repeatedly ignored or dismissed by the contractor and the county’s advisers in their haste to meet a fast-track schedule.

From dangerous mud pits to dead farm animals to once-pristine streams flowing thick and dark like chocolate milk, the complaints poured in. Inspectors routinely reported inadequate water protections, shoddy cleanup and questionable welding techniques that could jeopardize the pipeline’s integrity.

“It was a dream,” said county Commissioner Nikki Whitty, who has served as point person on the $51 million taxpayer-funded project. “Now it’s a nightmare.”

New contractor already on job

Whitty’s coastal county of 63,000 people remains the largest in the western United States without one of the cheapest, cleanest, safest energy sources available.

She and her fellow commissioners are working to salvage the project, the most expensive public works undertaking in Coos County history. It will tap into a supply line in Roseburg and carry natural gas from Canada and the Rocky Mountains to the southern Oregon Coast.

The pipeline was 95 percent complete, but at least $5 million over budget, when commissioners fired the original contractor, Miami-based MasTec Inc., earlier this year. A new contractor is on the job and the county hopes to finish up by Oct. 1 in time for the winter’s heating season. Commissioners chose a well-known Oregon firm, Rockford Corp. – one of the pipeline’s original bidders – to help restore faith in the project.
But the new crews have their work cut out for them. Before construction stopped last December in a rain-soaked shambles, correspondence between county officials, their consultants and members of the public show that people reported problems almost every day during MasTec’s tenure.

They complained about speeding construction workers, fire danger, polluted water systems, trespassing, damaged property, sexual harassment at the job site, improper welding techniques, careless handling of the pipe, unfair wages, ruptured stream beds, eroded hillsides and illegal dumping of excavated mud and drilling lubricant onto private property.

The county even paid a rural resident $5,000 to compensate for the loss of six goats that died after drinking muddy runoff because construction crews left streams exposed to erosion.

“It was like, `What’s gonna happen next?’ ‘ Whitty said. “And every day, you wait.”

Residents wary of ‘frac-outs’

The root of many of the complaints arguably goes back to the very choice of the pipeline route: the 130-year-old Coos Bay Wagon Road, a narrow, landslide-prone byway that rises and falls along the Coquille River.

The road – once the best way to reach the Willamette Valley from Coos Bay – winds past gorgeous stands of big-leaf maples and an old-growth Douglas fir forest.
It became the route only after Coos County commissioners went against the

recommendation of their first consultant, RMI of Portland, to build the pipeline underneath state Highway 42.

Not long after the public approved using $27 million in property tax bonds to pay for part of the project, two other consultants, Industrial Gas Services and Pipeline Solutions, recommended a different route. They said the project's price tag would fall at least $8 million by switching to the wagon road – despite an outcry from residents who lived along the new path.

IGS President Bob Oxford said Highway 42 posed too many problems, including traffic delays and fiber-optic lines already buried beneath the road, which would get in the way of pipeline construction. But crews quickly discovered that the wagon road was no picnic, either.

The pipeline had to cross two wetlands and 188 Coos and Douglas County streams. And it would traverse the property lines of at least 200 landowners. Shortly after construction began a year ago, drills began rupturing streambeds, polluting a half-dozen creeks and rivers in Coos and Douglas counties on dozens of separate occasions. Ironically, the ruptures happened because MasTec was trying to use a less-invasive technique to cross streams, known as directional or horizontal drilling: burrowing beneath the waterways rather than digging through them to lay the 12-inch pipe. But drills often fractured the rock bed and a substance called bentonite leaked into the water, choking the creeks and ruining sensitive salmon habitat. Bentonite is a naturally occurring clay found in parts of Arizona and Wyoming and is used to lubricate the heads of drills.

The so-called "frac-outs" also occurred on dry land, forming puddles of bentonite on several different parcels of private property. When the mud dries, it turns to a fine powder.

Residents were worried about this particular brand of bentonite-based lubricant, Gel-Ex, because it contained crystalline silica, a naturally occurring mineral-based dust that can cause a disabling, irreversible and sometimes fatal lung disease by breathing it, according to the U.S. Occupational Safety and Health Administration. At least 1.7 million U.S. workers, mostly in the mining industry, are exposed to the particulate each year and 250 die from silicosis.

Coalition mounts protest

In August, officials from the state Department of Environmental Quality and the U.S. Army Corps of Engineers warned county and company officials that the frac-outs violated state and federal water quality laws and that they could face fines of up to $75,000 per day.

By then, McKinley resident Del Knight and others along the route were calling for a shutdown of the project, because of the ruptures and other problems they'd begun to investigate.

“It’s an environmental disaster,” said Knight, who helped found a union-backed citizen watchdog group called the Coos County Coalition. “We repeatedly begged the commissioners and talked to MasTec, saying, `You’ve got to stop this.’ They just continued to go on.”

But MasTec and county officials scoffed at the concerns, calling the bentonite spills “dirt” and “harmless."

“I do not see the urgency of cleaning up Wyoming dirt from Oregon dirt,” wrote MasTec project manager Clark Besack in an Aug. 19 e-mail to the county’s advisers. “If however you can explain the dangers presented by Wyoming dirt, I might feel differently.”

The danger, county officials quickly told Besack, was of clogging area streams with sediment, preventing fish passage.

The state didn’t step in at that point because it doesn’t have the authority to halt a construction project – only to issue penalties after the fact. But regulators weren’t happy with the contractor, said Ruben Kretzschmar, natural resource specialist with the DEQ. “MasTec really had no one in charge of environmental controls,” Kretzschmar said. “The first goal was to get the pipeline in. It’s a major problem for the environment.”

To date, the DEQ has levied only an $11,400 fine against the project after noting increases in turbidity – a measure of how muddy the water is – of up to 2,400 percent after a Sept. 16 rupture in Rock Creek, a tributary of the Umpqua River in Douglas County.

Frustrated by this “slap on the wrist,” Knight and his Coos County Coalition partnered with the Sierra Club’s Oregon chapter to mount a protest and filed a $4.3 million lawsuit against the county and MasTec.

“These are some of the most important salmon spawning streams in the state,” said Sierra Club conservation chairman Brent Foster of Hood River. “Fines of $12,000 are a joke. They make a mockery of Clean Water Act enforcement.”

Shortly after the frac-outs stopped, county commissioners and Oxford, the IGS consultant, said crews did everything they could to clean up streams, including using sandbags and hay bales to contain the sediment. County attorneys also said the impact was minimal and that the amount of bentonite released into streams had few if any environmental repercussions.

But earlier this year, one of more than a dozen pipeline inspectors working for IGS said the ruptures were avoidable and caused by carelessness and haste.

MasTec used smaller, inadequate drilling equipment to burrow beneath streams, said inspector Jack Collier, who oversaw drilling and welding operations during his tenure on the project. As a result, the company’s pumps couldn’t handle the thickness of bentonite

required to avoid breaching the streambed, he said in a deposition taken in the Sierra Club lawsuit.

Further, construction crews didn't stop drilling as required by their contract when frac-outs occurred, he said.

The goal was getting the job done as quickly and cheaply as possible, Collier said. In one case, a MasTec superintendent bet the drill foreman $100 that his crew couldn't finish drilling by day's end beneath Brummet Creek, a tributary of the east fork of the Coquille River in Coos County. The foreman won the bet, but the drilling caused a rupture, Collier said.

On a different day in nearby Rock Creek, crews filled up a 3,000-gallon truck with spilled bentonite every half-hour, Collier said. In that location, he testified, "they fraced-out every day for two or three weeks."

After raising objections, Collier said he was "escorted off the job by the foreman" and his job title was changed to "observer," stripping him of any oversight. Steve Shute, owner of the county's second consultant, Pipeline Solutions, kicked another inspector off the job for raising similar complaints, Collier testified.

Army Corps flexes muscle

In December, as construction ground to a halt because of the onset of winter rains, the Army Corps of Engineers cracked down on the pipeline project, meeting with county officials to tell them that the federal government would seek civil penalties of more than $1 million – "perhaps many millions" – for water quality violations including frac-outs and other problems, according to a Jan. 7 letter from the county to MasTec.

The pipeline project has become a major issue for the agency, largely because of the sheer amount of territory it covers, Army Corps of Engineers spokesman Luke Elliott said.

"In terms of size and complexity, this is one of the larger cases we've had in the last 10 years" in Oregon, Elliott said. "There are so many stream crossings, and each one is a potential impact."

In response, Tim Sullivan, a Portland attorney representing the county, said the spills occurred because the stream banks were steep and deep, requiring bores of up to 1,000 feet long.

"The underlying rock is hard – which requires high drilling fluid pressure to turn the drill bit motor – but heavily fractured, which increases the chance of mud releases," Sullivan said in a letter to the corps.

Michael Nearing, an attorney for MasTec, said frac-outs are an expected by-product of such a project. The company planned to address the issue when the pipeline was finished, he said.

“It happens all the time. A frac-out isn’t a horrible environmental event,” he said. “It’s something that generates mud. We’re not talking environmental cataclysm here.

“What normally happens is you plow through and get it done,” he said. “Then at the end, you bring in experts that say who was at fault for what, and we finish our accounting.”

Speeding up the construction time line wasn’t the solution, the Sierra Club’s Foster said. “What they needed to do is stop, take the time to figure out what was going on and do the job right,” he said.

The county is banking on its new contractor to do just that. After six weeks of cleanup, the complaints have subsided.

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ABOUT THIS SERIES (in 2004)
A three-day look at the costly problems surrounding the pipeline project:
Today: Environmental factors and trouble with the company that installed the pipeline
Monday: The county’s battles with the contractor
Tuesday: What’s ahead for the pipeline

Exhibit H

http://www.theworldlink.com/articles/2009/02/24/news/doc49a43bff79acb590941605.txt

Federal court fines Coos pipeline builder

The World
Tuesday, February 24, 2009 |

EUGENE (AP) — MasTec Inc., the contractor fired not long after being hired to build a natural gas pipeline from Roseburg to Coquille, has been ordered to pay $1.5 million in penalties. The money will go to the U.S. Treasury because of damage caused to pristine streams and rivers.

Government agencies from the feds on down to Coos County had a hand in the debacle, too.

U.S. District Judge Michael Hogan, who issued the order, also found that government agencies provided inadequate oversight of the $51 million project. But, though the contractor violated the Clean Water Act, the judge said there did not appear to be serious environmental harm.

A MasTec attorney declined comment about the ruling Monday.

The project was dogged with problems since the summer of 2003, when work began on the 60-mile long, 12-inch pipeline. Crews contaminated streambeds with drilling spoils, threatening fish habitat. Regulators later discovered project managers had not taken adequate steps to protect hillsides from erosion. That led to even more sediment in fish spawning grounds.

Coos County terminated its contract with the Coral Gables, Fla.-based company in April 2004. An Oregon company finished the project.

Residents and environmental groups complained early and often about the project, contending the state Department of Environmental Quality, the U.S. Army Corps of Engineers and Coos County were lax in oversight of a project that crossed sensitive terrain, including many parcels of private property.

Officials initially maintained the project was on track and that state and federal clean water laws were being followed. But as contrary evidence piled up, legal battles ensued.

MasTec and the county sued each other in a case settled last year.

Then the Sierra Club, along with other environmental groups, filed suit in the case Hogan settled this week.

The $1.5 million fine fell well short of the amount sought by the plaintiffs. Their case was based in part on assertions the company had saved $6 million by avoiding its Clean Water Act obligations. Hogan, however, wrote that MasTec lost $9.23 million on the project.

The lack of government oversight was another factor Hogan used in determining the size of the penalty.

“In this case, there was a failure of all parties concerned,” Hogan wrote.

Exhibit I

ScienceDaily
https://www.sciencedaily.com/releases/2019/03/190313143307.htm

Review of noise impacts on marine mammals yields new policy recommendations

Date: March 13, 2019

Source: University of California - Santa Cruz

Summary: Marine mammals are particularly sensitive to noise pollution because they rely on sound for so many essential functions, including communication, navigation, finding food, and avoiding predators. An expert panel has now published a comprehensive assessment of the available science on how noise exposure affects hearing in marine mammals, providing scientific recommendations for noise exposure criteria that could have far-reaching regulatory implications.

FULL STORY

A trained spotted seal (Phoca largha) cooperates in an underwater hearing test at Long Marine Laboratory, UC Santa Cruz. (NMFS permit 18902)
Credit: B. Wakefield

Marine mammals are particularly sensitive to noise pollution because they rely on sound for so many essential functions, including communication, navigation, finding food, and avoiding predators. An expert panel has now published a comprehensive assessment of the available science on how noise exposure affects hearing in marine mammals, providing scientific recommendations for noise exposure criteria that could have far-reaching regulatory implications.

Published March 12 in *Aquatic Mammals*, the paper is a major revision of the first such assessment, published in 2007 in the same journal. Both efforts were led by Brandon Southall, a research associate at the Institute of Marine Sciences at UC Santa Cruz and senior scientist at Southall Environmental Associates.

"One of the things we did in 2007 was to identify major gaps in our knowledge, and we now have considerably more data. We thought there was enough new science to reconvene the panel and revisit these issues," said Southall, who served as director of NOAA's Ocean Acoustics Program from 2004 to 2009.

Concern about the potential for ocean noise to cause hearing damage or behavioral changes in marine mammals began to mount in the 1990s, focusing initially on activities related to the oil and gas industry. In the early 2000s, the association of sonar with mass strandings of deep-diving whales became another focus of concern. Shipping and construction activities are other important sources of ocean noise pollution.

Loud noises can cause temporary or permanent hearing loss, can mask other sounds, and can disturb animals in various ways. The new paper focuses on direct effects of noise pollution on hearing in marine mammals. Separate papers addressing behavioral effects and the acoustics of different sound sources will be published later this year.

"Noise-induced hearing loss occurs in animals the same way it does in humans. You can have a short-term change in response to exposure to loud noise, and you can also have long-term changes, usually as a result of repeated insults," said coauthor Colleen Reichmuth, a research scientist who leads the Pinniped Cognition and Sensory Systems Laboratory at UC Santa Cruz.

Because animals vary in their sensitivities to different types and frequencies of sound, the panel categorized marine mammal species into groups based on what was known about their hearing. The new paper includes all living species of marine mammals.

"The diversity of species is such that a one-size-fits-all approach isn't going to work," said coauthor Darlene Ketten, a neuro-anatomist with joint appointments at Woods Hole Oceanographic Institute and Boston University's Hearing Research Center. "We need to understand how to avoid harm, and the aim is to provide guidelines to say, if this or that species is in your area, here's what you need to avoid."

Over the past decade, the number of scientific studies on hearing in marine mammals has grown rapidly, enabling the panel to refine and improve its groupings and assessments. Accompanying the paper is a set of appendices compiling all the relevant information for 129 species of marine mammals.

"We did a comprehensive review, species by species, for all living marine mammals," said Reichmuth, who led the work on the appendices. "We pulled together the available knowledge covering all aspects of hearing, sound sensitivity, anatomy, and sound production. That's the scientific basis for the species groupings used in the noise exposure criteria."

"The appendices are a really important resource that does not exist anywhere else," Southall said. "The 2007 paper was the most impactful single paper I've ever published -- it's been cited in the literature more times than all my other papers combined -- and I expect this new paper will have a similar impact."

The 2007 paper covered only those species under the jurisdiction of the National Marine Fisheries Service (NOAA Fisheries). NOAA Fisheries issued U.S. regulatory guidance in 2016 and 2018 based on the 2007 paper and a 2016 Navy technical report by James Finneran, a researcher at the U.S. Navy Marine Mammal Program in San Diego and a coauthor of both papers.

In addition to covering all marine mammals for the first time, the new paper also addresses the effects of both airborne and underwater noise on amphibious species in coastal environments, such as sea lions. According to Southall, publishing the new noise exposure criteria along with a comprehensive synthesis of current knowledge in a peer-reviewed journal is a major step forward.

"There are regulatory agencies around the world that are thirsting for this kind of guidance," Southall said. "There are still holes where we need more data, but we've made some big strides."

Research on seals, sea lions, and sea otters at the UCSC Pinniped Lab now run by Reichmuth has provided much of the new data on hearing in amphibious marine mammals. Working with trained animals at UCSC's Long Marine Laboratory, Reichmuth's team is able to conduct controlled experiments and perform hearing tests similar to those used to study human hearing.

Finneran's program in San Diego and coauthor Paul Nachtigall's program at the University of Hawaii have provided much of the data for dolphins and other cetaceans.

But some marine mammals, such as baleen whales and other large whales, simply can't be held in a controlled environment where researchers could conduct hearing tests. That's where Ketten's research comes in. Ketten uses biomedical imaging techniques, including CT and MRI, to study the auditory systems of a wide range of species.

"Modeling an animal's hearing based on the anatomy of its auditory system is a very well-established technique that can be applied to baleen whales," Ketten explained. "We also do this modeling for the species that we can test in captivity, and that enables us to hone the models and make sure they're accurate. There has been a lot of resistance to modeling, but it's the only way to study hearing in some of the species with the greatest potential for harm from human sounds."

Southall said he regularly hears from people around the world looking for guidance on regulating noise production by activities ranging from wind farm construction to seismic surveys. "This paper has significant international implications for regulation of noise in the ocean," he said.

Story Source:

Materials provided by **University of California - Santa Cruz**. Original written by Tim Stephens. *Note: Content may be edited for style and length.*

Journal Reference:

1. Brandon L. Southall, James J. Finneran, Colleen Reichmuth, Paul E. Nachtigall, Darlene R. Ketten, Ann E. Bowles, William T. Ellison, Douglas P. Nowacek, Peter L. Tyack. **Marine Mammal Noise Exposure Criteria: Updated Scientific Recommendations for Residual Hearing Effects**. *Aquatic Mammals*, 2019; 45 (2): 125 DOI: 10.1578/AM.45.2.2019.125

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Exhibit J

Smithsonian.com

SmartNews Keeping you current

Even Without Ears, Oysters Can Hear Our Noise Pollution

Study shows that certain frequencies of noise cause oysters to clam up

(Wikimedia Commons)

By Jason Daley
smithsonian.com
October 27, 2017

Of course, oysters don't have ears. They've never heard the cowbell in Blue Oyster Cult's "Don't Fear the Reaper" or heard a recitation of the oyster classic, *The Walrus and the Carpenter*. But as Teresa L. Carey at PBS Newshour reports, a new study suggests that oysters may still suffer one of the downsides of having ears: noise pollution.

As Carey reports, researchers have long known that noise pollution can impact a range of sea creatures—and might even be responsible for some mass strandings of whales. Researcher Jean-Charles Massabuau of the University of Bordeaux and his team wanted to see if the sound created by boats, ships and other human activities on the water also impacted invertebrates.

Massabuau brought 32 Pacific oysters into his laboratory and used a loudspeaker to play various frequencies to the bivalves. Happy oysters tend to keep their shells cracked open; when they are stressed or face a threat, they slam their shells shut. So the team played a range of frequencies, measuring the how quickly the oysters closed their shells.

It turned out, the oysters reacted most strongly to noises between 10 and 1000 hertz, showing the most sensitivity to sounds between 10 and 200 hertz. As Douglas Quenqua at *The New York Times* reports, those lower frequencies are often produced by cargo ships, seismic research, wind turbines and pile driving. Higher frequencies created by jet skis and small boats, however, did not seem to bother the animals. They published their results in the journal *PLOS ONE*.

“They are aware of the cargo ships,” Massabuau tells Carey. “What is for sure is that they can hear. The animals can hear these frequencies.”

Of course oysters don’t hear like humans. Instead, they have hair cells on the outside of their shells that sense vibration. The researchers believe the oysters use these hairs to detect things like breaking waves and ocean currents caused by rising tides giving them cues for when to feed.

“To hear the current arriving could prepare them for eating and digesting, possibly as when we hear and smell that somebody is preparing dinner,” Massabuau tells Quenqua. Noise pollution, however, could muddle the oysters' ability to read the tides, affecting their long term health.

University of Hull marine biologist Mike Elliott, however, says it’s not clear if the noise pollution is having an impact. He has conducted similar studies on mussels and hermit crabs, who have similar reactions to certain frequencies. “It is quite a big leap from detecting a response [to sound] to if the animal is being harmed by it,” Elliott tells Carey. “The big challenge is converting this into a response that denotes harm to the organism.”

Massabuau agrees with this conclusion and plans to continue the study, focusing on whether the long-term exposure negatively impacts the oysters.

It's not just shellfish feeling the vibes. A 2015 study on general noise pollution in the oceans suggests it could be having significant impacts on a variety of species. In particular there’s growing evidence that air guns, which are used for seismic surveys, can cause hearing damage in whales and fish and stress from chronic noise pollution can negatively impact reproduction in many other species.

Perhaps, to help the creatures of the sea we first need to learn a lesson from the oysters, and just pipe down.

About Jason Daley

Jason Daley is a Madison, Wisconsin-based writer specializing in natural history, science, travel, and the environment. His work has appeared in *Discover*, *Popular Science*, *Outside*, *Men’s Journal*, and other magazines.

|

Exhibit K

Forecast of the Net Economic Benefits of a Proposed LNG Terminal in Coos County, Oregon

An Economic Impact Analysis Prepared for the South Coast Development Council

October 16, 2006

ECONorthwest
ECONOMICS • FINANCE • PLANNING

888 SW Fifth Avenue
Suite 1460
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Section I

Introduction

The South Coast Development Council ("SCDC") engaged ECONorthwest to forecast the net economic benefits, which would arise in a typical year from the operations of a proposed liquefied natural gas ("LNG") terminal in Coos County and its associated Pacific Connector Gas Pipeline.

The question this white paper answers is: What would be the effect on the local economy if an LNG terminal were built in Coos County rather than in Northern California? This report addresses three key issues in answering that question:

1. Research on LNG terminals and property values is discussed beginning on page 5.

2. On page 9 is the start of a section on the economic impacts of the LNG terminal project in 2016—chosen for the analysis because it would be a typical future operating year.

3. Because an LNG terminal would change the competitiveness of Coos County, this report concludes with a review of the longer-term effects a terminal would have of the local economy (page 16).

Major Findings of This Analysis

This analysis measures the economic impacts arising from the delivery, storage, and regasification of LNG into natural gas at Coos Bay, the shipping of the natural gas through a connector pipeline, and the cost savings to Oregonians due to having the LNG terminal in Coos County instead of Northern California. Furthermore, the analysis includes research into the other effects the presence of an LNG terminal might have. The principal findings of this analysis are:

- There is no evidence that LNG facilities hurt nearby property values or deter economic development. This finding is based on reviews of academic literature and county assessors' data for two existing LNG operations in Oregon.

- The proposed LNG facility for Coos County, during 2016 (a typical operating year), will supply 292 billion cubic feet of natural gas into the market. Natural gas prices on the western side of Oregon would be less than if LNG were to be brought into a port in California. However, prices elsewhere in Oregon and on the California border are not expected to be markedly less.

- Overall, Oregonians would save $17.0 million in 2016 on their energy bills if the terminal were built in Coos County instead of California. Local businesses in the State would save $31.5 million. Savings of this magnitude will occur each year the terminal operates.

- Because of lower natural gas prices, Oregonians, especially those living in southwestern Oregon, will be better off economically and will spend much of the money they would save on utility bills on other goods and services in the local economy.

- The combination of lower utility prices and better supply stability would make businesses in Oregon more competitive. They would increase both their output and employment.

- Since natural gas is the primary source of industrial hydrogen, the availability of LNG at Coos Bay could stimulate the development of a hydrogen industry. Hydrogen is a non-polluting fuel.

- Access to LNG would make power plants fueled by natural gas more feasible and potentially stimulate the decommissioning of dams to enhance salmon habitat.

- Overall, by placing the LNG terminal in Coos County instead of California, the County's economy would be able to support 400 additional jobs with above-average wages.

- Statewide, the terminal would raise annual employment by 1,173 and, in the year 2016, total economic output would be $488 million greater.

Section II

Background

LNG Project Description

The Jordan Cove Energy Project, L. P. ("JCEP") is planning to build and operate an LNG import terminal on 170 acres of industrial land on the North Spit of Coos Bay. The land area would be sufficiently large to accommodate the terminal facility and a required exclusion zone (buffer area) around it.

The terminal would have two large containment storage tanks and a regasification facility. Regasification is the process of taking LNG and warming it up to normal outside temperatures, thus, converting it into the conventional form of natural gas familiar to homeowners. The gas would then be shipped out by pipeline to consumers in Oregon, Washington, northern California, and Nevada. A 37-megawatt ("MW") plant at the terminal would capture waste heat from the regasification and use it to make electricity.

LNG terminals are designed to supply natural gas on an uninterrupted basis to power plants, factories, and homeowners via local utilities. To do so, they must receive LNG at a competitive price, which is only possible if shipped in large quantities. Modern, efficient LNG carriers (ships) do this and each holds about 160,000 cubic meters of LNG.

The size of terminals is dictated by the size of the carriers. Storage tanks onshore must be able to hold one shipload of LNG. These tanks constitute up to half the total cost of construction of a terminal.[1] To ensure steady gas supplies and flexibility in deliveries, at least two storage tanks are typically built at import terminals.

The terminal in Coos Bay would be designed to sendout, or put into the pipeline system, one billion cubic feet ("BCF") of natural gas a day or 365 BCF a year. However, because energy demand fluctuates with the weather and seasons, it is assumed that in a normal year the terminal would average 292 BCF. To achieve that volume, the terminal would unload about 80 carriers a year.

The economies of scale of LNG tankers and import terminals are such that the proposed facility would sendout volumes that exceed local demand in Coos County. Therefore, a connector pipeline is necessary so that gas from the terminal can reach a critical mass of customers. By doing so, most of the costs of building and running the LNG project would be incurred by consumers outside the County. Without access to large end-use markets, an import terminal would be uneconomic.

[1] U.S. Department of Energy, Energy Information Administration website accessed on August 30, 2006 at http://www.eia.doe.gov/oiaf/analysispaper/global/lngindustry.html

To move 292 BCF of natural gas a year the terminal would need to be connected to the existing large natural gas pipelines that deliver Canadian gas down the west coast. For this reason, the Jordan Cove project also entails the construction of a 223-mile natural gas pipeline that would run through parts of Coos, Douglas, Jackson, and Klamath counties. It would connect to the Williams Pipeline near Myrtle Creek, which would then bring gas mostly to points north on the western half of Oregon, and to the Pacific Gas & Electric ("PG&E") Pipeline in Malin, Oregon, that moves gas south into California through the Tuscarora Pipeline into Nevada.

Natural gas consumption in Oregon has tripled from 79 BCF in 1984 to 235 BCF in 2004.[2] Besides the natural growth of the economy and expansion of gas distribution systems into more communities, natural gas use has also grown in Oregon over the last twenty years because it has been generally more economical than other forms of energy.

Natural gas has also benefited from its growing use in electric power generation. With few opportunities to expand hydroelectric power plant capacity and major gains in the efficiencies of gas-fired power plants, natural gas use in power plants has risen. Natural gas is also less polluting than other conventional fuels. Unlike coal and biomass, it is essentially free of sulfur and particulate matter[3] and has a high hydrogen-to-carbon ratio that minimizes CO_2 emissions.[4]

Industrial Displacement

This analysis considered the possibility that an LNG terminal might displace other industries. Presumably, if an LNG terminal would occupy 170-acres of industrial land on the North Spit, that property would not be able to be used by other industries and, thus, potentially cause a net loss or displacement in industrial employment.

Displacement can only happen if there is no alternative land supply. Oregon law ensures that there is. The State requires that every city have a 20-year supply of industrial lands for development. Cities may expand their urban growth boundaries or convert existing lands to industrial uses to meet that 20-year supply.

The development of an LNG terminal would not absorb all of the available industrial land in the Coos Bay area. Indeed, even after taking 170 acres for an LNG terminal, there would be 1,130 acres left on the North Spit and most could be used for new industrial developments. There are also available industrial parcels available in the nearby cities of North Bend and Coos Bay.

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[2] Energy Information Administration, U.S. Department of Energy website accessed on September 23, 2006 at http://www.eia.doe.gov/oil_gas/natural_gas/data_publications/historical_natural_gas_annual/hnga.html.

[3] Jensen, James, The Development of a Global LNG Market, 2004. Oxford Institute from Energy Studies.

[4] Todd Gabe, Jonathan Rubin, Charles Morris, and Lisa Bragg. Economic and Fiscal Impacts of a Proposed LNG Facility in Robbinston, Maine. Department of Resource Economics and Policy, University of Maine. November 2005. Page 7.

Since Oregon law would preclude any displacement of industrial development because of the LNG terminal, this analysis finds that there would not be any negative consequences to industrial employment because of the LNG terminal operations occupying 170 acres on the North Spit.

Impact on Neighboring Properties

Common in disputes over major commercial or industrial developments are claims by detractors that such projects would hurt local property values. They point to attributes they perceive as so undesirable that the market as a whole would factor them in causing real estate prices to fall—a process that economists call "capitalizing disamenities." Since the perceptions of individuals can differ from economic realities, this analysis sought good evidence whether an LNG facility would be a disamenity or not.

Published Research

There is one report by an anti-LNG group that postulates that an LNG terminal would be a disamenity and, as such, should adversely affect property values. However, the report did not offer any data in support of that belief, did not examine property values around existing LNG terminals, and indeed made only a loose comparison to earlier research on a coal-fired power plant in a residential neighborhood.[5]

Currently there are five LNG import terminals and almost 100 LNG storage facilities in the United States, so there is ample data for testing whether LNG is a disamenity.[6] However, most research on disamenities focuses on the more common sources for consideration such as toxic waste sites, landfills, airports, and social factors (poor schools, high crime rate areas, *etc.*).

Thus, a search of the economic literature for this analysis uncovered only one academic study, which sought to quantify potential disamenities associated with LNG facilities. It was a peer reviewed research paper published in the *Journal of Environmental Economics and Management* that analyzed residential property values near eleven LNG liquefied natural gas storage facilities throughout the United States.

The researchers found that there was no disamenity impact. Indeed, their analysis revealed that when adjusted for other factors, the presence of LNG storage facilities is "found to positively affect annual housing rents." They also found that the presence of LNG did not adversely affect wage rates.[7]

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[5] Yellow Wood Associates, Report on Potential Economic and Fiscal Impacts of LNG Terminals in the Whole Passamaquoddy Bay, Report for "Save Passamaquoddy Bay." June 20, 2006.

[6] Mike Hightower, *et al.*, Guidance on Risk Analysis and safety Implications of a Large Liquefied Natural Gas (LNG) Spill Over Water, Sandia National Laboratories. December 2004. Page 26.

[7] David E. Clark and Leslie A. Nieves, "An Interregional Hedonic Analysis of Noxious Facility Impacts on Local Wages and Property Values," Journal of Environmental Economics and Management. November 1994, p. 235-253.

The researchers were unsure why the data show a positive relationship between property values and proximity to LNG terminals. One possibility is that there are exclusion zones around LNG storage facilities and these open-space buffers eliminate any possible disamenity effect. The LNG storage tanks proposed for Coos Bay, for example, would occupy about three acres of a 170-acre site. The bulk of the land area would be open space.

LNG Storage in Oregon

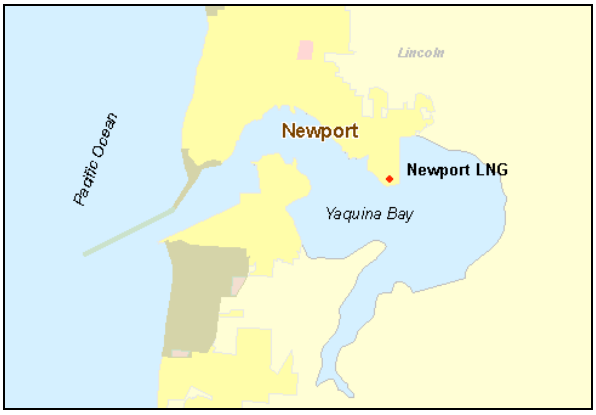
To explore whether LNG storage tanks hurt nearby property values or employment, this analysis collected data from county tax assessors on the two LNG storage facilities that have long operated in Oregon.

One is in Newport and the other is in Portland. Both are used for peak shaving—a way of storing a lot of gas for use in emergencies or when demand is extremely high. The LNG facilities in Oregon take natural gas off pipelines, liquefy it, and store it on-site. When demand surges, such as on a very cold winter night, the LNG is converted into a gaseous form and put back into the pipeline system. By doing so, utilities can assure customers of reliable supply. Although peak shaving is expensive, it is nonetheless cheaper for consumers than having to pay for setting aside pipeline capacity that would be needed only for brief peak demand periods.

Newport

The Newport LNG facility is located on a point of industrial land that juts out into Yaquina Bay. The Port of Newport owns and leases land in the area, which supports Newport's lumber, fishing, and tourism industries. The Port offers a variety of shipping terminal facilities including two berths with the capability of serving large ocean-going vessels, and over 500 berths for commercial and sport boats. The location of the LNG facility in Newport is shown on Figure 1.

Figure 1: LNG Facility in Newport Oregon



Source: ESRI US Base Map

The local utility, Northwest Natural, operates the LNG facility in Newport. It takes natural gas from a pipeline, liquefies it, and stores it in an above ground tank.

A review of data from the Lincoln County Assessor's Office indicates that property values near the LNG facility are not depressed. The area immediately around the LNG tank includes the normal exclusion zone. Nearby there are several industrial and commercial businesses. The largest is Trident Seafoods, which has a plant that processes Pacific whiting. The plant employs 120 workers seasonally.[8]

Overlooking the LNG facility and within a half mile of it are about 25 homes. They have above average market values according to the assessor's data. Consequently, the notion that the LNG facility serves as a disamenity to the surrounding residential community seems unlikely.

Portland

Northwest Natural operates an LNG facility, similar to the one in Newport, on a 40-acre site in Portland five miles from downtown. It is in the Portland Harbor industrial area, which is home to manufacturers, metalworking companies, and petroleum product facilities.

Within a half-mile radius of the site, there is a park and the Willamette River. According to data from the Multnomah County assessor,[9] there are many businesses in the area including five industrial properties on parcels exceeding six acres. They are shown in Table 1. Among them is Siltronic Corporation. It is the second largest industrial employer in Portland. Next door to the LNG facility, Siltronic manufactures silicon wafers for the semiconductor industry and employs about 970 workers.

Table 1: Five Industrial Properties Within a Half-Mile of the Portland LNG Facility

Owner	Business/Use
Siltronic Corporation	Semiconductor wafer manufacturing plant
U.S. Army Corps. Of Engineers	Willamette River dredging operations
City of Portland	Vehicle storage yard
Advanced American Construction	Marine construction company
Columbia Forge & Machining	Manufacturer of steel forgings

Source: Metro Data Resource Center. 2002a. RLIS Lite: Data for Mapping and Analysis (August 2006).

Advanced American Construction is a marine construction firm in close proximity to the LNG facility. They recently moved into the area. Columbia Forge & Machine Works is right across the river from the LNG facility, employs 17, has sales of about $1.6 million a year, and has been operating continuously at its present site since 1957.[10]

[8] Trident Seafoods website accessed October 9, 2006 at http://www.tridentseafoods.com

[9] Assessor data was accessed through: *Metro Data Resource Center. 2002a. RLIS Lite: Data for Mapping and Analysis (August 2006)*

[10] Dun & Bradstreet Market Identifiers. Accessed September 2006.

Conclusion

A search of academic literature uncovered only one paper that analyzed data on properties near LNG terminals and it found no negative consequences.

An examination of data on the two LNG storage facilities currently in Oregon found no evidence of a disamenity. In fact, there are a variety of industrial businesses located in close proximity to both. In Newport, there is very expensive housing within a half mile of the LNG storage tank. In Portland, the second largest industrial employer in the city is adjacent to an LNG storage tank property.

As a result, this analysis has no basis for considering disamenities in its assessment of the net economic impact of placing an LNG terminal in Coos County. Indeed, for some industries, the presence of an LNG terminal could be a positive amenity by supplying large and steady amounts of natural gas at very competitive prices. It may well attract more employment to the region. This dynamic impact is explored in a section beginning on page 16, although it was not included in the net impact analysis which follows.

Section III

Net Economic Impacts

The LNG project will cause increased economic activity in Coos County and much of the rest of Oregon through the spending by the project's operators and employees, but also because of lower natural gas prices if the LNG were brought into Coos Bay rather than to a port in California. To quantify these impacts an economic analysis was done, which predicts the effect of the LNG facility on economic activity in a particular year.

In this section, we first review what an economic impact analysis is and what it measures. This is followed by a discussion of the findings of the analysis.

What is a Net Impact Analysis

In simple terms, an economic impact analysis is a way of accounting for all the effects that a project, such as Jordan Cove, would have on an economy. A net impact analysis counts only the net increase in economic activity because of a project compared to what would happen if some other alternative project were built. In this report, the alternative would be to build an LNG terminal and pipeline in Northern California instead of Coos County.

There are several common measures of economic activity. The one that is important to most people is jobs. Impact studies can also measure the impacts of a project on employee compensation (wages and benefits), taxes, self-employed worker income, property income, and output, which is the value of services done and things produced in an economy. The impact analysis for this report tracked all of these.

Economic Impact Model

An impact analysis uses a computer model. It is a mathematical description of an economy, for example, the economy of Oregon, which follows how money in a given year is spent and made as it goes from the project being studied to other workers, households, and businesses in the State. It does this by taking information from the U. S. Census and other sources, and carries out the dollar flows to nearly every possible segment of the economy by tracing how money is spent and re-spent.

Impact models are specific to an economic area. Therefore, if a worker at the LNG terminal spends money on a vacation in Washington, an impact model of Oregon would not count any of that spending as affecting the Oregon economy even if some of those dollars could potentially come back to the State in some way.

Economies Measured in this Report

For this report, the economic impacts were measured for three economic areas.

Since the SCDC is most interested in Coos County, the first model used was one of Coos County.

However, the pipeline will extend through other parts of Southwestern Oregon, so a second model was developed to measure the project's impacts on a four county region of the State.

Finally, because there is interest in the project elsewhere in the state, a model that would measure the economic impacts of Jordan Cove on Oregon was also created and run.

Year Analyzed

Economic impacts are normally measured for a given year. This provides a good snapshot picture of how a project like Jordan Cove affects an economy. However, it is understood that those impacts would reoccur year after year, as the terminal continues to operate.

For this report, the impacts were measured for the year 2016. This would be about the fifth year of the terminal's operation. It is normal for large energy projects, particularly those in new markets, to take up to five years to reach a routine level of operations—a point where the rapid growth period ends and business stabilizes. That is why 2016 was chosen.

All the dollar values reported in the analysis include the effects of the inflation expected between this year, 2006, and 2016.

Types of Impacts

The analysis begins by estimating the direct impacts of a project. Direct impacts are the basic facts of a project such as the number of workers, total payroll and benefits, and output for a given year. The direct impacts are then run through the model of the economy.

The model calculates all the downstream impacts that are felt in the economy that arise from the jobs, output, and spending at the project. The results fall into one of three types of impacts, which are:

(1) Direct impacts are activities that occur primarily on-site at the location of the project. For this report, we also count the savings in natural gas prices and those direct impacts are going to be spread out throughout the region.

(2) Indirect impacts are the result of successive rounds of purchases of goods and services that start with the spending done by the project, but quickly disperse throughout the economy. The indirect impacts representing what the JCEP would spend money on, including payments to local governments and emergency service crews, were incorporated into the impact models.

(3) Induced impacts come from the increased spending of money made by workers, either directly or indirectly, because of a project.

For this analysis, only the changes in direct and some indirect impacts that would occur if the terminal were placed in Coos County instead of the alternative in California were put into the economic impact model.

Economics of the Alternative

The alternative is an LNG terminal in California. As with Jordan Cove, if an LNG terminal were built in Northern California, a new connecting pipeline would be needed to link it to the PG&E Pipeline. Because of this, the economics are similar.

Transmission costs to take gas from the Northern California coast to the PG&E Pipeline near the California-Oregon border at Malin would be about the same as the cost of getting gas to Malin from Coos Bay. Thus, this analysis assumes that only consumers in Coos, Douglas, and Jackson Counties, and other Oregon counties along the Williams Pipeline, which runs from Grants Pass north up through the Willamette Valley, would save money from having the LNG terminal in Coos Bay instead of Northern California.

Net Direct Impacts

For this analysis, the Jordan Cove project is viewed from the perspective of counting all of the activities associated with the direct handling of the LNG and resulting natural gas from the point at which the LNG tankers come into Coos Bay through to the points at which the natural gas goes onto the Williams and PG&E pipelines.

Therefore, the direct net impacts of the Jordan cove project in 2016 would be the sum of the following five sources:

1. The employment, payroll costs, and output of the LNG terminal all would count as net direct impacts because, if the project were built in California instead, none of these impacts would occur in Oregon.

2. Similarly, the employment and output of the Pacific Connector Gas Pipeline are all net direct impacts.

3. If built in Coos County instead of California, the terminal would result in lower natural gas prices in much of Oregon because Oregonians would be closer to the source of the gas. Gas utilities are regulated and pass-on such savings to residential customers. For people, lower gas bills would leave some extra money in their pockets. Some of it would be saved and some of it would probably be taxed, but much of it is going to be spent. The portion that would be spent locally is going to stimulate the economy and is counted here as a net direct impact.

4. The energy cost savings for businesses are going to make them more competitive, especially relative to companies in higher energy price states like California. As a result, Oregon businesses that see lower natural gas prices, because the terminal is in Coos County instead of further away in California, are going to be able to increase their output and, in doing so, employ more people. This is a direct impact.

5. The analysis includes the employment, payrolls, and output of vessel service activities done in Coos County for the purposes of delivering LNG to the terminal as net direct impacts. If the terminal were in California, none of this economic activity would benefit Oregon. Vessel services include pilots, dockworkers, stevedores, chandlers, and others that serve ships.

The five sources of direct impacts all feed into the impact models, which trace and sum all the indirect and induced impacts.

To illustrate the relative size of the five direct impacts, Table 2 shows the number of jobs for each in Coos County and statewide. It indicates that in Coos County, the direct employment at the terminal and for vessel service providers is particularly important, but in the rest of Oregon, the benefits of lower natural gas prices on direct jobs are more significant.

Table 2: Direct Employment Impact by Activity in Coos County and Oregon, 2016

Activity	Coos County	Oregon
Direct employment by LNG terminal company	57	68
Direct employment of those providing vessel services	26	26
Direct employment by the natural gas connector pipeline	1	4
Higher economic activity from lower gas prices for households	19	52
Higher economic activity from lower gas prices businesses	21	224
Net direct labor	124	374

Source: ECONorthwest Impact Analysis. October 2006.

In total, the direct employment impact of the JCEP in Coos County would be 124 jobs. Statewide, the net direct impact would amount to 374 additional jobs. For both, however, the indirect and induced impacts more than triple the benefits on employment.

Results of the Net Impact Analysis

Table 3 shows the net effects on jobs, output, and personal income that would arise in 2016 because of the direct, indirect, and induced impacts of the JCEP.

Table 3: Net Economic Impacts by Type, 2016

Study Area / Type of Impact	Output	Personal Income	Jobs
Coos County			
Direct	$202,143,900	$11,777,900	124
Indirect	16,711,400	11,060,200	180
Induced	8,708,700	3,450,600	96
Total	227,564,000	26,288,700	400
SW Oregon			
Direct	$375,225,000	$17,335,800	242
Indirect	28,543,900	18,138,700	298
Induced	20,223,700	7,756,400	195
Total	423,992,600	43,230,900	735
Oregon			
Direct	$395,816,200	$24,288,100	374
Indirect	53,164,200	32,113,700	475
Induced	38,915,500	15,056,000	324
Total	$487,895,900	$71,457,800	1,173

Source: ECONorthwest Impact Analysis. October 2006.

In total, Coos County would see a net increase of 400 jobs in 2016. Personal income would be about $26 million higher as a result—this includes pay, benefits, and proprietors' (self-employment) income. Output would be nearly $228 million higher in 2016 if the terminal were built in Coos County instead of California.

Southwest Oregon would capture many of the benefits from Jordan Cove because much of the savings on natural gas prices would accrue to people and businesses in that part of Oregon. Southwest Oregon would see a net gain of 735 jobs or about 63 percent of the total gain in Oregon. This region would also experience a $424 million increase in economic output in 2016.

Statewide, personal income would be over $71 million higher with the LNG terminal in Coos County instead of California. The net benefit would indirectly stimulate 475 jobs around Oregon and, through income induced means, another 324 jobs.

Net direct economic output would be $396 million. Indirect output would be $53 million higher in the State because of the project whereas the increase in economic activity induced by higher labor income would spark almost another $39 million in net output in 2016.

The direct impacts of the JCEP are high relative to the total impacts because LNG terminals and pipelines are very capital intensive—involving hundreds of millions of dollars in construction and equipment installations. Most of the spending on the project occurs during that construction phase, which causes a large burst of indirect and induced economic impacts in the economy. However, once up and running, spending on ongoing operations is comparatively lower, and the indirect and induced impacts are more modest.

Total Economic Impacts

Table 4 shows the total impacts. In Coos County, employee compensation would be almost $25 million higher in 2016 than if the LNG project were not built. Compensation includes wages, health insurance, and retirement benefits. That compensation averages $62,470 a year for the 400 workers affected by the JCEP in 2016. With inflation taken out, that would be the same as $44,878 a year in today's dollars—well above the current average wage in Coos County of $27,248.[11] One reason why the compensation would be so high is that many of the jobs connected with the LNG terminal are high skilled and high paying. Many are union jobs.

Table 4: Total Economic Impacts, 2016

Type of Impact	Coos County	SW Oregon	Rest of Oregon	Total Statewide
Output	$227,564,000	$423,992,600	$63,903,300	$487,895,900
Employee Compensation	24,988,000	39,782,100	25,709,800	65,491,900
Proprietors' Income	1,300,700	3,448,800	2,517,100	5,965,900
Other Income	3,649,600	7,160,600	9,080,900	16,241,500
Jobs	400	735	438	1,173

Source: ECONorthwest Impact Analysis. October 2006.

In the rest of Oregon, outside of the four counties, the net increase in economic output due to the terminal would be nearly $64 million in the year 2016. About $21 million of this would be attributable to the reduction in the cost of natural gas to homeowners, businesses, and local governments throughout western Oregon.

The analysis does not assume any savings in central or eastern Oregon, because getting gas to those markets from an LNG terminal in Northern California would cost as much as getting it from Coos Bay. Thus, there is no net benefit to gas utility customers. However, because of the indirect spending effects and the economic activity resulting from higher payrolls caused by the Coos Bay operation, there would be an additional $43 million in economic output statewide in 2016.

[11] Oregon Employment Department covered payroll per employee in Coos County for the first quarter of 2006 annualized.

Net Tax Impacts

The incremental taxes arising from the LNG project would exceed $43 million in 2016 alone. Much of it would come in the form of property taxes on the real estate and equipment of the terminal and pipeline. However, property taxes will also come about because the higher value of housing of workers benefiting from the induced impacts of the LNG project. So too would the properties of various industries that would increase their output because of the availability of lower cost energy in the State.

Table 5: Tax Impacts, 2016

Taxing Jurisdiction / Type of Tax	Coos County	SW Oregon	Oregon
Federal Government			
Business	$499,100	$1,141,700	$2,457,900
Personal	883,300	1,325,053	2,053,291
Social insurance taxes	3,199,300	5,864,300	9,260,900
Total Federal	$4,581,700	$8,331,053	$13,772,091
State and Local Government			
Business income, property & other	$8,674,600	$15,957,100	$26,069,800
Personal income, property & other	834,400	1,438,400	2,498,400
Social insurance taxes	540,400	1,668,000	779,700
Total State and Local	$10,049,400	$19,063,500	$29,347,900
Total All	$14,631,100	$27,394,553	$43,119,991

Source: ECONorthwest Impact Analysis. October 2006.

The boost in economic activity forecast here for 2016 would reoccur each year the terminal operates. In the long run, the economy would benefit in other ways. Most notably, having LNG would offer Coos County and Oregon an absolute competitive advantage over nearby states that lack such a stable and cost effective energy source.

Over time, the local economy will respond to this advantage and new industries will take hold. We may see not only traditional energy intensive industries expand, but alternative energy sources—most notably hydrogen manufacturing—may also become feasible. These dynamic impacts are discussed in the following section.

Section IV Long-Term Dynamic Impacts

Investments of the size and nature of the LNG terminal fundamentally alter the economic landscape allowing new employers to establish themselves that would otherwise have never considered Coos County. What had formerly been an isolated, high-energy cost county would become a better location for industries.

LNG would lower the cost of energy and assure consumers of a secure, ample supply of natural gas. The flow of ships would enhance the economic viability of the Port of Coos Bay and further improve the area's attractiveness as a business location. Together, these would expand the range of goods and services that could logically be produced in Coos County.

Economists call this effect an expansion of the production possibility frontier. Effectively, it means that the possibilities for how the economy can grow are fundamentally improved by the permanent advantage in energy costs that Coos County would enjoy because of the LNG terminal. This triggers a series of changes in the structure of the economy as new businesses emerge.

The dynamic process occurs over many years and their evolution can be carried out in innumerable directions. In this section, the dynamic impacts are discussed.

Dynamic Impacts

Dynamic impacts are the result of a stimulating business investment in an area that affects economic structural changes in that area's economy. Although often requiring years to "play out," the ultimate result is further industrial production and supportive infrastructure investments that would otherwise not have occurred.

The consequences include growth in investment, expansion of career and employment opportunities, and subsequent improvements in the standards of living. The dynamic impacts make it possible for participants to engage in an expanded range of productive wealth creating activities.

For purposes of this analysis, the proposed LNG terminal project at Coos Bay is the subject economic opportunity stimulus. That investment would include a marine docking facility for tankers, natural gas conditioning equipment, handling and storage facilities, a cogeneration power plant, and a gas pipeline for connecting the terminal to gas transmission facilities.

Topics of interest include the economic advantage offered the Coos Bay and Oregon South Coast areas by such a stimulus, and the nature and impacts of further investment and expansion that could be anticipated.

Elements of a Healthy Economy

A healthy economy has the ability and community support to foster growth. Most communities hope that they can have ample living wage jobs for their citizens and for their children to take on when they reach adulthood. Hope, however, is not enough. Certain elements in support of a healthy economy need to be in-place.

Historical Perspective

Coos Bay and the South Coast of Oregon need to look no further than the recent past to understudy the elements of a healthy economy. Until the early 1980's, the region experienced economic health through the auspices of a natural resources based economy. Logging, mill production, log exports, and healthy fisheries and agricultural industries provided for productivity, employment, and provision of public services.

Necessary elements included:

- General community support for economic growth
- Solid foundation for productive economic activity
- Diversity of activities
- Worker availability and employment participation
- Supportive education system
- Adequately funded social services

The area economy prevailed for years despite cycles of prosperity and recession. However, change was inevitable. New competitors emerged, natural resources dwindled, environmental rules intervened, and the character of the economy changed over time to reflect today's reality.

The evolving question for the past two decades has been, "how does the area re-establish its economic vitality." Tourism and retirement induced employment have been helpful albeit remain insufficient.

This is reflected in the payroll employment data that show a decline of 3,998 manufacturing jobs between 1976 and 2005. While total employment grew 5,165, much of it had been in lower paying sectors. Indeed, in 1976, the average fulltime job in Coos County paid $248 more a year than the average job paid in all of Oregon. In 2005, jobs in the County were paying an astounding $9,176 a year less than the average job in Oregon.[12]

[12] Data from the covered employment and payrolls reported by the Oregon Employment Department website as accessed on September 10, 2006 at http://www.qualityinfo.org/olmisj/CEP.

Furthermore, much of the relatively high-paying job growth was confined to the government sector. Indeed, 45 percent of the growth in Coos County between 1976 and 2005 came from government jobs—a ratio far higher than the norm (about 13 percent statewide) and unsustainable without significant private sector income growth.

Re-engaging the Economy

Coos County would benefit from a structural economic change that would facilitate high-wage job growth. The long-term answer may well be found by reestablishing in the area the key elements necessary for successful economic engagement.

Support in the community for industrial activity would have to be forthcoming. A broad-based desire to seek opportunities is fundamental. Resources, assets, and financing on which to establish new ventures are basic. A willingness to share in investment and risk is equally relevant.

The proposed LNG project at Jordon Cove offers a venture that can once again economically engage and invigorate the South Coast region.

Energy and Economies

The LNG terminal being proposed for the North Bay Marine Industrial Park at Coos Bay will set it apart from other major west coast ports. As the gateway of a natural gas based energy resource, the area will acquire the advantages and characteristics of an energy supplier region. The west coast of the U.S. is energy deficient. The LNG facility would place Coos County in a unique regional situation as the equivalent of an energy producer.

To be anticipated are investments in sectors in which energy is important. Of particular attraction are energy supplies that are both secure and offer pricing stability over the long term. The LNG facility will afford these attributes by virtue of long term contracting and capacity sizing. To operate at an efficient scale, the LNG terminal would have to handle more natural gas than the entire Oregon economy currently consumes. This would put businesses in the Coos Bay area in the enviable position of having access to more than ample supplies of natural gas at what are likely to be at or near the lowest prices on the coast.

The importance of energy cannot be understated. As a critical input of manufacturing and many other key economic sectors, having stable, low-priced natural gas would allow Coos County to become more competitive in the global market.

International & U.S. Situation With Natural Gas

Unlike petroleum, which has seen declining reserves, the global situation for natural gas is quite different. New reserves continue to be discovered and total proved reserves have more than doubled in the last 25 years.[13] World proven reserves now equal about 70 years of current consumption. Discoveries are adding to this faster than gas production is being consumed.

Proved reserves are known, measured deposits that can be brought to market using current technology and infrastructure at a competitive price. In addition to these there are less certain reserves and resources including between 3,000 to 4,500 trillion cubic feet of known gas that can be brought to the surface, but from wells that are too far from markets. When this gas is brought to the surface, it is considered "stranded," and, as such, it is either flared (burnt off on-site) or injected back into the ground.

Stranded gas is a problem in the remote locations of the more recent discoveries, the challenge being economical transport of the gas to markets. It is also an issue for many petroleum-producing counties. Throughout the Gulf Countries, natural gas is extracted as a necessary byproduct of oil production only to have to be burnt off in the atmosphere because there are no practical markets reachable by pipelines for it. The undisputed solution is use of the LNG option.

Several countries today rely on LNG for natural gas supplies. Examples include France – 32 percent, Spain – 59 percent, Taiwan – 80 percent and Japan – 96 percent. Japan has relied on LNG for natural gas supplies in excess of 35 years. LNG incorporates mature technology that continues to be improved.

Considering the energy situation in the U.S., proven natural gas reserves and production are little changed over the last 25 years. However, demand is up and imports are filling the gap. LNG currently supplies only about three percent of domestic demand. Because of the growing world reserves of natural gas, concerns over petroleum supplies, high natural gas prices domestically, and improved means of producing and transporting LNG, the situation is about to change. It is projected that by 2025, 14 percent of the U.S. natural gas needs will be supplied by LNG.

Local Situation

At the state level, Oregon has only 15 producing natural gas wells that fill just 0.2 percent of its annual consumption. Nearly all the state's natural gas comes from the Rocky Mountain Basin and Canada—places where the costs of producing natural gas have been on the rise. Indeed, natural gas prices in Oregon increased 168% between 1999 and 2004. Price swings have become more volatile, a situation destined to continue. It is apparent that actions, which bring security and stability of supply, and pricing stability, will be advantageous to the state economy. LNG could contribute a meaningful response.

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[13] From the U.S. Department of Energy report accessed on the Internet on September 10, 2006 at http://www.eia.doe.gov/oiaf/ieo/nat_gas.html.

In reviewing the energy situation in the Coos Bay area, the results of recruitment efforts over recent years attest to the importance of having available a secure, stable, and price competitive energy supply. Following is a list of industrial recruitments that had been lost by the Coos Bay area because natural gas was not available. This activity took place before its availability in January 2005. The firms are indicative of the types of manufacturers that LNG would attract:

- US Gypsum – 200 jobs – sheet rock manufacturing – went to the Port of St. Helens.
- Pohang Steel – 200 jobs – steel mill.
- BHP Steel – 200 jobs – coil mill – went to Kalama, Washington.
- Hokishen – 120 jobs – secondary wood products.
- Project Vision – 250 to 300 jobs – glass production.

These losses were significant and point to the importance of securing a viable energy future for the region.

South Coast Development

The economic opportunity presented to Coos Bay and the South Coast as an LNG host site is substantial. The availability of a secure and stable natural gas supply with pricing advantages would act as a catalyst for attracting downstream development and stimulating economic growth. The significance of such a response is not to be underestimated.

It is conceivable that the response would be immediate with companies locating near the LNG terminal. In addition to the gas resource, these players would be seeking to take advantage of the industrial land available on the North Spit and the other assets available including the deepwater port, fresh water resources, and land transportation infrastructure.

Downstream industrial and commerce development would necessitate a continuum of both private and public investments in industrial plant construction and infrastructure. Such activity could readily result in the establishment of a major west coast industrial park and the re-establishment of Coos Bay as a major seaport with modern facilities.

Indeed, with LNG tanker operations, potential ship transport of natural gas liquids products, the delivery of raw materials and shipments of manufactured product associated with sited industry, yearly shipping as a separate activity could become substantial. It is conceivable that operations could once again return to numbers approaching the 450 ships annually of years past as compared to today's 45 ships.

Some idea of the types of industry that would be attracted can be acquired by evaluating what industrial processes are reliant on natural gas, and what supportive industries might follow. The significance of supplier and secondary support enterprises can be equally important to targeted growth.

A goal of importance is the achievement of a critical mass of economic activity, fundamental to ensuring continued success. The lack of a sufficient critical mass is a significant contributor to economic initiative failure.

Industry accounts for 43 percent of domestic natural gas use including use as a feedstock for such important everyday products as fertilizers, plastics, and synthetic fabrics. As an energy resource for industry, a greater percentage entails provision of the basic requirements of heating, cooling and cooking as stages of industrial processing.

This application scenario is not unlike that of the commercial and residential sectors. In the residential sector, natural gas is applied to our fundamental needs of keeping homes warm, supplying hot water, drying clothes, and preparing foods.

From past experience, the types of industries that would be attracted to Coos Bay because of the LNG resource include wood products, metals, food processing, glass, ceramics, building products manufacturing, metal fabrication, paper, hydrogen production, and energy-intensive forms of recycling.

Many innovative options are utilized in other parts of the U.S. for both attracting new industrial investments and retaining successful operations. One example of a program that has been successfully applied in excess of ten years in the state of New York is the provision of subsidized electricity as practiced by the New York Power Authority.

The program was started in the 1990's, has been substantially effective over the period, and continues to the present time. Another example is a series of utility and transportation programs being utilized in Suffolk County, NY. Involved are gas and electric utility rate incentives for assisting business development initiatives.

Comparable programs could be derived for the South Coast using the natural gas supply as an economic incentive to encourage industrial development in the area. Such an initiative strategy would effectively turn the LNG natural gas energy resource into an economic development tool.

The net effect of a Jordan Cove LNG project and follow up industrial investment is that Coos Bay and the South Coast areas would once again have "at work" the elements of a healthy economy. Involvement, investment, and participation would prevail to the benefit of employers, employees, and area residents. A sound economic and social services foundation would be constructed for the benefit of the next generations.

The Environment and Alternative Fuels

With large surplus reserves of natural gas coming on the market and onshore at Coos Bay, opportunities to expand end-uses arise and none is as promising as alternative fuels. LNG is a source of nearly pure methane, which is a simple hydrogen rich compound that burns cleanly. As such, it is a low polluting alternative to gasoline and diesel, and is the most cost effective feedstock in commercial hydrogen production.

Air pollution is a concern locally, domestically, and at the international level. It is being driven by increasing levels of harmful pollutants in our immediate surroundings, and the accumulation of greenhouse gases in the upper atmosphere through the measured onset of global warming being made evident by the scientific community.

Vehicle Fuel

The single largest contribution to air pollution is forthcoming from transportation, principally vehicular traffic operating on gasoline and diesel fuels. It is estimated that vehicles on the road today in the U.S. account for 50 to 60 percent of carbon monoxide pollution, 30 percent of hydrocarbon pollutants that contribute to the greenhouse effect, and 31 percent of nitrogen oxide emissions, a major contributor to ozone formation.

The situation in Oregon is similar. Gasoline and diesel fuel use account for 40 percent of the state's total energy requirements. Gasoline consumption accounts for 60 percent of the total petroleum use in Oregon. The State's need to cut vehicular pollution emissions is great.

State and federal mandates call for more stringent emission standards. However, because neither gasoline- nor diesel-fueled vehicles as currently operated can meet those standards, options are being evaluated. One of the more promising alternatives is to fuel vehicles with natural gas. In fact, vehicles have been operated on a limited scale for years using both compressed natural gas ("CNG") and LNG as alternative fuels.

The reason for the interest in natural gas is overall reduced emissions. Natural gas vehicles produce, on average, 70 percent less carbon monoxide, and 80 percent fewer nitrogen oxides than traditional powered vehicles. Furthermore, since natural gas is hydrogen rich, water is its primary combustion product. Thus, natural gas vehicles generate less carbon dioxide than do gasoline or diesel ones. Additionally such harmful emissions as sulfur dioxide, volatile organic compounds, and particulate are substantially less. It is further noteworthy that natural gas operated vehicles are superior in performance to gasoline.

On an equally positive note, natural gas is cheaper. The energy content of a thousand cubic feet of natural gas equals that of about six gallons of gasoline. Thus, if natural gas were priced at $5, it would be the equivalent cost of 63 cents a gallon for gasoline. In most places the costs of compressing and delivering the natural gas plus motor fuel taxes raises the final cost to a CNG vehicle owner as much as four-fold. However, with LNG delivered into Coos Bay, the costs of delivering CNG to users would be much less.

The latest national price data, for June 2006, show that CNG cost $1.90 a gasoline gallon equivalent. Gasoline sold nationally for $2.84 then. Diesel, when adjusted for energy content (better road mileage because it contains more BTUs per gallon) cost the equivalent of $2.65. B99 biodiesel was being sold for an average energy equivalent price of $3.71. E85 ethanol was $3.43. Thus, natural gas was the least expensive.[14]

Fuel Cells

An emerging technology that would produce clean energy is the fuel cell. These devices are very energy efficient and produce electricity from hydrogen gas. They are sold commercially on a limited scale, but advances are being made to bring their costs down. Ultimately fuel cells could find widespread use in electric vehicles and in powering homes.

The key material needed in fuel cells is hydrogen gas. Hydrogen is produced commercially in a process called steam methane reforming, which uses methane from natural gas. Methane has the highest ratio of hydrogen to carbon of any hydrocarbon. Some fuel cells, such as the one operated by the City of Portland that runs off methane from a wastewater treatment plant, have small reformers that make hydrogen on-site. As with any chemical process, however, it is more efficient to produce hydrogen on a large scale. The benefits of using natural gas in large-scale plants to make hydrogen are low emissions, high energy efficiencies, and low costs.[15]

With a steady and substantial supply of low cost methane at the LNG terminal, Coos County would be a logical place to build a hydrogen plant. This would complement the State's interest. In July 2006, Governor Kulongoski expressed a strong support for moving Oregon toward a "hydrogen economy."[16]

[14] U.S. Department of Energy. Clean Cities Alternative Fuel Price Reports. June 2006.

[15] International Energy Agency—OECD, Hydrogen Production, and Storage, 2006. Page 8.

[16] State of Oregon Governor's Office. Press release. July 28, 2006.

Report Summary

Having an LNG terminal in Coos County would alleviate a major hindrance to economic growth. It would effectively create a means by which natural gas, a stranded natural resource in Asia, could be economically brought to the west coast of the United States and in doing so make Coos County the lowest cost location for LNG in the west. It could fundamentally change the County's competitiveness, especially in attracting industrial jobs.

An analysis done for the SCDC reveals that in a typical operating year (2016) the LNG terminal and its associated elements would, in net terms, stimulate an additional 1,173 jobs and $488 million in economic output for Oregon. Most of this would be felt in Coos, Douglas, Jackson, and Klamath Counties. Furthermore, these benefits would reoccur for many years into the future.

From an economic perspective, a review of economic literature and of actual property data for two LNG liquefaction facilities in Oregon, both show no negative consequences on employment or property values. Furthermore, because of the large supply of developable industrial lands in Coos County, the citing of an LNG terminal on 170-acres of the North Spit would not hinder industrial growth.

On the contrary, an LNG terminal would make the Coos Bay area a more desirable place for some industries because of its proximity of cost effective, reliable, and substantial supplies of natural gas. Such assuredness of competitive supply would set Coos County apart. The result would be long term economic benefits that would change the dynamics of the local economy and attract good paying jobs. Such dynamic impacts would be in addition to the net economic impacts forecast in this report for a typical operating year.

Finally, an LNG terminal would position Coos County as a center for alternative energy. LNG and compressed natural gas are recognized as practical, low-polluting alternative fuels under known and proven technologies. More importantly, methane, the main constituent of natural gas, is hydrogen-rich and the source from which hydrogen gas is most economically produced. If Oregon pursues a "hydrogen economy" plan, Coos County would be the most logical place to build a large-scale plant.

Exhibit L

Citizens Against LNG Inc
PO Box 1113
North Bend, OR 97459

August 6, 2012

By Email and by Electronic Filing on the Federal
eRulemaking Portal under FE Docket No. 12–32–LNG:
fergas@hq.doe.gov
http://www.regulations.gov

Ms. Larine A. Moore
Docket Room Manager
FE-34
U.S. Department of Energy
PO Box 44375
Washington, D.C. 20026-4375

Re: Application of Jordan Cove Energy Project, L.P. for Long-Term Authorization to Export Liquefied Natural Gas to Non-Free Trade Agreement Nations, FE Docket No. 12-32-LNG

Dear Ms. Moore:

Please accept for filing the following protest of Citizens Against LNG Inc regarding the application of Jordan Cove for Authorization to Export Liquefied Natural Gas to Non-Free Trade Agreement Nations. For the following reasons, we believe the Department of Energy should reject Jordan Cove's application because it would be detrimental to the public interest.

1. Jordan Cove's proposed export facility would hurt consumers in the United States by increasing the prices for domestic natural gas

It is not in dispute that Jordan Cove's proposed LNG export facility would increase the price for domestic natural gas in the United States. The only question is how much domestic natural gas prices in the United States would increase and how badly this would impact consumers. According to the latest assessment of the U.S. Department of Energy, allowing LNG export facilities, including Jordan Cove's proposed LNG export facility, would raise domestic natural gas prices substantially, by as much as 54% under certain scenarios:

> "Increased exports of natural gas lead to increased wellhead prices in all cases and scenarios. The basic pattern is evident in considering how prices would change under the Reference case (Figure 3):
>
> • The pattern of price increases reflects both the ultimate level of exports and the rate at which increased exports are phased in. In the low/slow scenario (which phases in 6 Bcf/d

of exports over six years), wellhead price impacts peak at about 14% ($0.70/Mcf) in 2022. However, the wellhead price differential falls below 10 percent by about 2026.

• In contrast, rapid increases in export levels lead to large initial price increases that would moderate somewhat in a few years. In the high/rapid scenario (which phases in 12 Bcf/d of exports over four years), wellhead prices are about 36 percent higher ($1.58/Mcf) in 2018 than in the no-additional-exports scenario. But the differential falls below 20 percent by about 2026. …..

• Slower increases in export levels lead to more gradual price increases but eventually produce higher average prices, especially during the decade between 2025 and 2035. The differential between wellhead prices in the high/slow scenario and the no-additional-exports scenario peaks in 2026 at about 28 percent ($1.53/Mcf), and prices remain higher than in the high/rapid scenario. ….

"In particular, with more pessimistic assumptions about the Nation's natural gas resource base (the Low Shale EUR case), wellhead prices in all export scenarios initially increase more in percentage terms over the baseline case (no additional exports) than occurs under Reference case conditions. For example, in the Low Shale EUR case the rapid introduction of 12 Bcf/d of exports results in a 54 percent ($3.23/Mcf) increase in the wellhead price in 2018; whereas under Reference case conditions with the same export scenario the price increases in 2018 by only 36 percent ($1.58/Mcf). But the percentage price increase falls in later years under the Low Shale EUR case, even below the price response under Reference case conditions. Under Low Shale EUR conditions, the addition of exports ultimately results in wellhead prices exceeding the $9 per Mcf threshold, with this occurring as early as 2018 in the high/rapid scenario."[1] (Emphasis added).

In a recent Congressional Report prepared by the staff of Representative Edward J. Markey, the Department of Energy's findings were summarized as follows:

"The United States faces a critical decision about whether to export natural gas following the rapid expansion of domestic production in recent years. The Department of Energy has already approved one export application and is currently considering eight others. If these applications are approved and the companies export at full capacity, the United States could soon be exporting more than 20 percent of current consumption. The Energy Information Administration has estimated that exporting even less natural gas than what is currently under consideration could raise domestic prices 24 to 54 percent, which would substantially increase energy bills for American consumers and could potentially have catastrophic impacts on U.S. manufacturing."[2]

[1] U.S. Department of Energy (January 2012) "Effect of Increased Natural Gas Exports on Domestic Energy Markets." http://www.fossil.energy.gov/programs/gasregulation/authorizations/2011_applications/exhibits_11-128-LNG/15._EIA_Effects_of_increased_NG_exports_.pdf

[2] Representative Edward J. Markey (March 2012) "Drill Here, Sell There, Pay More: The Painful Price of Exporting Natural Gas." http://democrats.naturalresources.house.gov/sites/democrats.naturalresources.house.gov/files/2012-03-01__RPT_NGReport.pdf

Therefore, proposed LNG export facilities, including Jordan Cove's proposed facility which could 'substantially increase energy bills for American consumers and could potentially have catastrophic impacts on U.S. manufacturing' are simply not in the public interest.

2. Jordan Cove's proposed LNG export facility would likely cause a net loss in U.S. employment by causing job losses in manufacturing

Jordan Cove argues that its proposed LNG export facility would be in the public interest by creating jobs in Coos County. According to Jordan Cove's application:

> "The jobs impact of construction of the Jordan Cove Project will be consequential. On average, the Project will employ 1,768 workers a year, and it will create 1,530 indirect and 1,838 induced jobs a year. ….
>
> "The employment impacts of the Jordan Cove Project in the typical operating year will include 99 direct jobs at the Jordan Cove terminal and the PCGP pipeline, 51 indirect jobs paid by Jordan Cove (Sheriff's deputies, firefighters, tugboat crews and emergency planners), 404 other indirect jobs and 182 induced jobs for a total of 736 total jobs in Coos County."[3]

What Jordan Cove did not consider is how these possible jobs gained in Coos County would be more than offset by jobs lost in U.S. manufacturing generally. According to the Industrial Energy Consumers of America:

> "In regards to using natural gas for export as LNG, IECA supports free trade. At the same time, affordable, abundant natural gas is critical to U.S. manufacturing growth, which in turn is critical to the U.S. economy. The manufacturing sector uses one-third of all of the natural gas and one-third of all electricity (of which one-third is produced from natural gas) which fuels the employment of 12 million high-paid workers. As with any resource that is critical to America's economic growth, <u>any decision to approve the export of natural gas should include a rigorous analysis of the potential impact on the domestic economy and job creation, and place a high priority on the manufacturing sector</u>. ….
>
> "<u>Affordable and abundant natural gas is vital to the recent renaissance in the nation's manufacturing sector. This renaissance has already contributed to up to a half million new American jobs.</u> In fact, for every manufacturing job created, three to five additional jobs across the broader economy are also created. Natural gas is used as a fuel for the entire manufacturing sector, to make nitrogen fertilizer, and it is also used as a raw material for the production of chemicals that are converted into an immense array of products that are used every day. Manufacturing natural gas consumption creates far more jobs per unit of gas consumed than any other application. The chemical industry

[3] Application of Jordan Cove Energy Project, L.P. for Long-Term Authorization to Export Liquefied Natural Gas to Non-Free Trade Agreement Nations, FE Docket No. 12-32-LNG, at pages 21-22.

alone has estimated that over $35 billion dollars of U.S. investments will be made by abundant, affordable supplies of natural gas."[4]

The Industrial Energy Consumers of America has concluded:

> "Jobs created by natural gas export facilities are small, relative to the opportunities to increase manufacturing jobs. Higher resulting natural gas prices will negatively impact U.S. manufacturing employment and ultimately additional jobs across the broader economy as well."[5]

Therefore, Jordan Cove's proposed LNG export facility, which could cause job losses in U.S. manufacturing that outweigh job gains locally, is not in the public interest.

3. Coos Bay would suffer the aftermath of unemployment that follows temporary employment in large-scale construction works

Unemployment impacts after the construction phase of the Jordan Cove / Pacific Connector project will not be in the public interest. The high unemployment in rural areas such as Coos Bay would be devastating to the local economy and clearly would not be in the public interest.

In 2003/2004 Coos County built a natural gas pipeline from Coos Bay to the Williams Northwest Grants Pass lateral pipeline that that runs along the I-5 hwy. The Coos County pipeline was a $51M gamble sold to the public with the promise of 2,900 jobs for the county. Despite all the promises made by industry speculators, those jobs never materialized and that pipeline currently is only operating at 5 to 7 percent of its capacity.

Jordan Cove estimates that 1,110 different jobs would need to be filled to build their project but the average job would only last 14 months. (FEIS 4.8-11)[6] After that there would be massive unemployment in the area and more people would be out of work than what we have now. The few jobs the facility would estimate to have as permanent jobs in no way justifies the public need for the facility. The Pacific Connector gas pipeline is estimated to end up with only 5 permanent employees after the construction phase of the pipeline is over. [7]

The Portland State University Population Research Center estimated that in July 2007, the population of Coos County was 63,050 people; which represented about a 4 percent increase since 2000. The two closest cities to the proposed Jordan Cove LNG terminal are North Bend, with a population estimated at 9,830 people, and Coos Bay, with a population of about 16,210 in

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[4] July 16, 2012 letter from the Industrial Energy Consumers of America to the Brookings Institute. Re: Hamilton Project: "A Strategy for U.S. Natural Gas Exports" by Michael Levi. http://www.ieca-us.com/wp-content/uploads/07.16.12_IECA-Response-to-Brookings.pdf

[5] Ibid.

[6] FERC Final Environmental Impact Statement (FEIS) for Jordan Cove LNG Import Facility; http://www.ferc.gov/industries/gas/enviro/eis/2009/05-01-09-eis.asp Page 4.8-11

[7] FERC Jordan Cove Import Terminal Final EIS -http://www.ferc.gov/industries/gas/enviro/eis/2009/05-01-09-eis.asp Page 4.8-22

July 2007 (Proehl 2008). (FEIS 4.8-11) The 56 to 99 jobs promised by Jordan Cove would not make a significant impact to what is truly needed in the area and when you count the jobs that will be lost due to the facilities impacts, the project most likely will end up being a job loser.

There is already high unemployment in the area which has been a continual example of plundering by industry speculators who come to town with big promises of jobs and prosperity and leave us with boondoggles and rotting infrastructure and eyesores. It has been so bad here that several books have been written about our area, the most recent being Wim de Vriend's book, "The Job Messiahs", which came out just this last December and is now in its second edition. Other books include, "Plundertown, USA: Coos Bay Enters the Global Economy" and David Cay Johnston's New York best selling book, "Free Lunch: How the Wealthiest Americans Enrich Themselves at Government Expense (and Stick You With the Bill)," where Johnston devoted two full chapters to Coos County.

4. Jordan Cove's economic analysis rests on the mistaken assumption that U.S. water supplies will be adequate to sustain increased production of natural gas by hydraulic fracturing

Jordan Cove argues that domestic natural gas prices in the United States would not increase that much because the burgeoning use of hydraulic fracturing will continue to create a vast oversupply of domestic natural gas. However, hydraulic fracturing consumes large quantities of water and the continued burgeoning use of hydraulic fracturing rests on assumptions that water supplies will, in the future, be adequate to sustain the continued increased use of this technology.

However, this assumption is likely to be wrong. According to the Pacific Institute:

> "There is some evidence that the water requirements for hydraulic fracturing are already creating conflicts with other uses and could constrain future natural gas production in some areas. For example, in Texas, a major drought in 2011 prompted water agencies in the region to impose mandatory reductions in water use. Water agencies, some of which sold water to natural gas companies, indicated they might have to reconsider these sales if the drought persisted. Natural gas companies also tried to purchase water from local farmers, offering $9,500 to nearly $17,000 per million gallons of water (Carroll 2011). Likewise, at an auction of unallocated water in Colorado during the spring 2012, natural gas companies successfully bid for water that had previously been largely claimed by farmers, raising concerns among some about the impacts on agriculture in the region and on ecosystems dependent on return flows (Finley 2012).
>
> "Concerns over water availability are not limited to drier climates. Pennsylvania is generally considered a relatively water-rich state. However, in August 2011, 13 previously approved water withdrawal permits in Pennsylvania's Susquehanna River Basin were temporarily suspended due to low stream levels; 11 of these permits were for natural gas projects (Susquehanna River Basin Commission 2011). While parts of the state were abnormally dry, the basin was not experiencing a drought at the time, suggesting that natural gas operations are already creating conflict with other uses under normal conditions. In many basins, the application of fracking is still in its infancy and

> continued development could dramatically increase future water requirements and further intensify conflicts with other uses."[8]

The United States is experiencing one of the worst droughts in 60 years, and this is affecting energy production in the United States. According to a recent editorial in the New York Times:

> "We're now in the midst of the nation's most widespread drought in 60 years, stretching across 29 states and threatening farmers, their crops and livestock. But there is another risk as water becomes more scarce. Power plants may be forced to shut down, and oil and gas production may be threatened.
>
> "Our energy system depends on water. About half of the nation's water withdrawals every day are just for cooling power plants. In addition, the oil and gas industries use tens of millions of gallons a day, injecting water into aging oil fields to improve production, and to free natural gas in shale formations through hydraulic fracturing."[9]

If Jordan Cove's application is approved and an LNG export facility is built in Coos Bay, then this facility would be contractually bound to continue LNG exports to Asia regardless of whether future drought conditions would constrain the use of hydraulic fracturing to produce natural gas domestically. This would drive up U.S. natural gas prices and would hurt consumers and businesses in the United States by indirectly causing water shortages and exacerbating water scarcity. This would not be in the public interest.

5. If Jordan Cove is mistaken about Asian demand for imported LNG, then the proposed export facility would be mothballed, but after causing substantial impacts during its construction

Jordan Cove cites to Asian demand for imported LNG as the rationale for building its proposed export facility. In its application, Jordan Cove stated:

> "The Jordan Cove facility is the only LNG export terminal proposed for the U.S. West Coast. It is thus uniquely positioned among United States terminals, not only to source its natural gas from Canadian and U.S. Rockies supply basins and to serve Asian demand without the longer routes and Panama Canal transits necessary from the Gulf Coast, but also to provide specific advantages (in addition to the economic benefits already detailed) for gas markets in the United States, in the country's two non-contiguous states of Alaska and Hawaii and in Oregon along the route of the new PCGP pipeline.
>
> "Given North America's enormous shale gas resources and the Asian demand for its production, there is little doubt that Pacific Northwest LNG export facilities will be built."[10]

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[8] Pacific Institute (June 2012) "Hydraulic Fracturing and Water Resources: Separating the Frack from the Fiction." http://pacinst.org/reports/fracking/full_report.pdf

[9] Webber, E. (July 23rd, 2012) "Will Drought Cause the Next Blackout?" The New York Times.

[10] Application of Jordan Cove Energy Project, L.P. for Long-Term Authorization to Export Liquefied Natural Gas to Non-Free Trade Agreement Nations, FE Docket No. 12-32-LNG, at page 27.

Jordan Cove has already demonstrated its inability to predict demand for natural gas imports and exports. Jordan Cove based the proposed Jordan Cove LNG import terminal in Coos Bay on predictions that an import facility would be needed to meet growing U.S. demand for natural gas imports from overseas. These predictions turned out to be wrong.

Jordan Cove's assumption about sustained Asian demand for LNG imports is likely to be wrong as well; the same factors that created an oversupply of domestic natural gas would likely also create an oversupply of natural gas in Asia, curtailing demand for LNG imports from the U.S. and rendering a West Coast-based LNG export facility economically unviable. According to a recent report of the International Energy Agency:

> "The size of unconventional gas resources in China is at an early stage of assessment, but it is undoubtedly large. At end-2011, China's remaining recoverable resources of unconventional gas totalled almost 50 tcm, comprised of 36 tcm of shale gas, 9 tcm of coalbed methane and 3 tcm of tight gas.5 This is around thirteen times China's remaining recoverable conventional gas resources. China's shale gas resources lie in several large basins spread across the country, with plays in the Sichuan and Tarim Basins believed to have the greatest potential.
>
> "The Chinese government has outlined ambitious plans for boosting unconventional gas exploration and production. These call for coalbed methane production of more than 30 bcm and for shale gas production of 6.5 bcm in 2015; the targets for shale gas output in 2020 are between 60 and 100 bcm. They are accompanied by the goal to add 1 tcm of coalbed methane and 600 bcm of shale gas to proven reserves of unconventional gas by 2015. In support of this effort, China plans to complete a nationwide assessment of shale gas resources and build nineteen exploration and development bases in the Sichuan Basin in the next four years. Efforts are also supported by the international partnerships that Chinese companies have formed in North America to develop shale gas acreage, which will provide valuable development experience. ….
>
> "China's huge unconventional gas potential and strong policy commitment suggest that these resources will provide an increasingly important share of gas in the longer term, though the pace of development through to 2020 – the key period of learning – remains uncertain. Because of China's highly centralised regulatory and policy-making framework and the high priority placed on industrial and economic development, unconventional gas projects may face fewer hurdles stemming from environmental concerns than those in Europe or the United States."[11]

Eastern Europe and Eurasia are also poised to vastly increase production of natural gas from unconventional gas resources. Unlike Jordan Cove, production of natural gas from these locations can supply Asia with natural gas by pipeline.[12]

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[11] International Energy Agency (2012) "Golden Rules for a Golden Age of Gas: World Energy Outlook Special Report on Unconventional Gas," at pages 115-120. .http://www.worldenergyoutlook.org/media/weowebsite/2012/goldenrules/WEO2012_GoldenRulesReport.pdf

[12] Ibid., at page 87.

The State of Oregon has found that Jordan Cove's proposed LNG import facility would have had adverse impacts on private landowners and the environment because of this facility's construction.[13] If Jordan Cove is mistaken (again) about future demand for LNG exports and imports, then the proposed facility would cause adverse impacts on private landowners and the environment by building a facility that would not be economically viable to operate. This would not be in the public interest. (See Exhibits A-G)

6. Liquefaction of natural gas for export/import is energy intensive and greatly diminishes the benefits of using natural gas

The liquefaction of natural gas requires a great amount of energy to compress methane into a liquid. This inherently wastes a substantial portion of the natural gas, which is burned in order to provide power to run compressors at liquefaction facilities. According to Jordan Cove's own study:

> "Approximately 6.2 percent of the gas delivered to the JCEP terminal would be either consumed as fuel to operate the liquefaction process or be removed from the feed gas stream (trace sulfur compounds, carbon dioxide, nitrogen and water) prior to or during the liquefaction step. Any hydrocarbons recovered that have a higher molecular weight than methane will fuel the power plant."[14] (Emphasis added).

Transoceanic transport and regasification of LNG are also energy intensive processes. According to a life-cycle assessment prepared by researchers with the Tepper School of Business, and Department of Engineering and Public Policy Carnegie Mellon University comparing coal and LNG:

> "The rated power of the LNG tankers ranges between 20 and 30 MW, and they operate under this capacity around 75% of the time during a trip (24, 25). The energy required to power this engine is 11.6MMBtu/MWh(26). As previously mentioned, some of this energy is provided by BOG and the rest is provided by fuel oil. A loaded tanker with a rated power of 20MW, and 0.12% daily boil-off rate would consume 3.88 million cubic feet of gas per day and 4.4 tons of fuel oil per day. The same tanker would consume 115 tons of fuel oil per day on they way back to the exporting country operating under ballast conditions. A loaded tanker with a rated power of 30 MW, and a 0.25% daily boil-off rate would get all its energy from the BOG, with some excess gas being combusted to reduce risks of explosion (22). Under ballast conditions, the same tanker would consume 172 tons of fuel oil per day.
>
> "For LNG imported in 2003 the average travel distance to the Everett, MA LNG terminal was 2700 nautical miles (13, 27). In the future LNG could travel as far as far as 11,700 nautical miles (the distance between Australia and the Lake Charles, LA LNG terminal (27)). This range of distances is representative of distances from LNG countries to U.S.

[13] State of Oregon's Motion to Reopen the Record and Request to Set Aside Order. December 2, 2011.
[14] ECONorthwest Construction Impact Study, at page 4.

terminals that could be located on either the East or West coasts. To estimate the number of days LNG would travel (at a tanker speed of 20 knots (22)), these distances were used. This trip length can then be multiplied by the fuel consumption of the tanker to estimate total trip fuel consumption and emissions, and these can then be divided by the average tanker capacity to obtain a range of emission factors for LNG tanker transport between 2 and 17 lb CO2 equiv/MMBtu.

"Regasification emissions were reported by Tamura et al. to be 0.85 lb CO2 equiv/MMBtu (21). Ruether et al. report an emission factor of 3.75 lb of CO2 equiv/MMBtu for this stage of the LNG life-cycle by assuming that 3% of the gas is used to run the regasification equipment (28). The emission reported by Tamura et al. differs because they assumed only 0.15% of the gas is used to run the regasification terminal, while electricity, which maybe generated with cleaner energy sources, provides the additional energy requirements. These values were used as lower and upper bounds of the range of emissions from regasification of LNG."[15]

These researchers with Carnegie Mellon University concluded.

"In addition to LNG, SNG has been proposed as an alternative source to add to the natural gas mix. The decision to follow the path of increased LNG imports or SNG production should be examined in light of more than just economic considerations. In this paper, we analyzed the effects of the additional air emissions from the LNG/SNG life-cycle on the overall emissions from electricity generation in the United States. We found that with current electricity generation technologies, natural gas life-cycle GHG emissions are generally lower than coal life-cycle emissions, even when increased LNG imports are included. However LNG imports decrease the difference between GHG emissions from coal and natural gas."[16]

The magnitude of the environmental benefits of natural gas fade away when natural gas is liquefied for export and importation. In general, natural gas supplies should be consumed on the continent they are produced, without liquefaction. For this additional reason, the proposed Jordan Cove export facility is contrary to the public interest.

7. Because Jordan Cove is owned and controlled by foreign investors, any profits from the project would only benefit non-U.S. investors.

The N-FTA Federal Register notice for Jordan Cove states the following:

"…Both Jordan Cove and its general partner are owned by the two limited partners in Jordan Cove. The first, Fort Chicago LNG II U.S.L.P., a Delaware limited partnership owns seventy-five percent. It is wholly owned and controlled, through a number of

[15] Jaramillo, P., et al (Sep 2007) "Comparative Life-Cycle Air Emissions of Coal, Domestic Natural Gas, LNG, and SNG for Electricity Generation Environ Sci Technol. 41(17):6290-6. http://www.fossil.energy.gov/programs/gasregulation/authorizations/2011_applications/exhibits_11-128-LNG/32._Jaramillo_ComparativeLCACoalNG.pdf

[16] Ibid., at page 6294.

> intermediate wholly owned and controlled companies, by Veresen, Inc., a Canadian corporation based in Calgary, Alberta, which, prior to its organization as a corporation, was Fort Chicago Energy Partners L.P., a Canadian limited partnership (**although the name of the parent changed, the name of the subsidiary owning Jordan Cove did not**)…'" (Emphasis added)

Fort Chicago Energy Partners L.P. is a Canadian limited partnership in which "only Canadians" are allowed to invest.

> "Fort Chicago is organized in accordance with the terms and conditions of a limited partnership agreement which provides that no Class A Units may be held by or transferred to, among other things, a person who is a "non- resident" of Canada, a person in which an interest would be a "tax shelter investment" or a partnership which is not a "Canadian partnership" for purposes of the Income Tax Act (Canada)."[17]

Profits projected to be made by Jordan Cove would then be funneled out of the country to only foreign investors. This would not be in the public interest. [18]

8. Obtaining natural gas from Hydro-Fracking techniques is not in the public interest

Jordan Cove Energy Project is currently proposing to export hydro-fracked gas from shale beds in Canada or the United States in the form of Liquefied Natural Gas (LNG). The LNG would be exported from their proposed LNG terminal to be located on the North Spit of Coos Bay in Coos County. Just because the industry has learned how to extract fossil fuel natural gas from shale bed formations does not mean this is a reliable, sustainable or environmentally friendly process. There are loads of factors that affect how much natural gas will actually be produced, and for how long.

The wave of fracking that is currently gong on across the country may soon find limitations due to the detrimental impacts of the fracking process itself. New research was recently published in the Proceedings of the National Academy of Sciences that concluded fluids from the Marcellus Shale are likely seeping into Pennsylvania's drinking water.[19] This means hydro-fracking contaminants will find their way into Pennsylvania's water supply also. This issue has create a storm of controversy and after months of research and discussion, Nationwide Insurance issued a memo stating they had determined that the exposures presented by hydraulic fracturing were too great to ignore and they would not be covering fracking damage.[20] Issues such as these

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[17] CNW Group, "*Canadian Newswire Fort Chicago announces monthly cash distribution for September 2009"* September 21, 2009 http://www.newswire.ca/en/releases/archive/September2009/21/c7157.html

[18] Bloomberg - "*Exports of LNG May Raise U.S. Prices as Much as 54%, Agency Says*" - By Katarzyna Klimasinska – Jan 19, 2012 http://www.bloomberg.com/news/2012-01-19/lng-exports-may-spur-higher-u-s-natural-gas-prices-report-says.html

[19] ProPublica – "*New Study: Fluids From Marcellus Shale Likely Seeping Into PA Drinking Water"* by Abrahm Lustgarten; July 9, 2012; http://www.propublica.org/article/new-study-fluids-from-marcellus-shale-likely-seeping-into-pa-drinking-water

[20] The Huffington Post – "*Nationwide Insurance: Fracking Damage Won't Be Covered*" AP | By MARY ESCH; 07/12/2012; http://www.huffingtonpost.com/2012/07/13/nationwide-insurance-fracking_n_1669775.html?utm_hp_ref=green

could spell a reduction or even a halting of fracking in some areas and as quickly as the shale bed fracking natural gas market has emerged; it could be gone, leaving fast amounts of land taken by the gas industry, possibly by eminent domain, and fossil fuel infrastructure to lay fallow.

9. Jordan Cove's proposed LNG export facility will negatively impact existing local and sustainable jobs and industries in the Coos Bay area

9.1 Tourism and Recreation

According to a 2011 study by Dean Runyan Associates for the Oregon Tourism Commission, during the period of 2007 to 2011, direct spending from tourism travel brought in more than a billion dollars into Coos County, Oregon alone.[21] Tourism travel dollars spent in the area have steadily increased every year going from 94.5 million in 1991 to 220.1 million in 2011. There are 3,090 employment jobs in Coos County related to this industry, a direct result of not developing our beaches, dunes and coastline.

Adjacent to the proposed Jordan Cove LNG export facility is a designated Dunes National Recreation Area that is used year round. In addition to this there is the Sunset Bay State Park and Campground which is also used year round along with multiple trails and beach areas in the area, some directly adjacent to the proposed Jordan Cove project. Other examples in the area include the Shore Acres State Park which has a Christmas light show every year that goes from Thanksgiving until New Years. The Park had an estimated 57,768 visitors for the 2011 light show. People came from 25 countries (other than the U.S.) and 42 states.[22] Winter months can see just as many recreational and tourist activates as summer months in our Coos Bay area.

The Final Environmental Impact Statement (FEIS) for Jordan Cove's Import Facility stated the following with regard to this issue: (Emphasis and photos are added)

FEIS Page 4.7-5: "*...The top five recreational activities along southern Oregon beaches include* ***walking (43 percent), relaxing in a stationary location (24 percent), walking dogs (10 percent), driving OHVs (8 percent), and beachcombing (3 percent)*** *(OPRD 2002).*"

FEIS Page 4.7-6: "*…Sunset Bay State Park includes a beach, picnic tables, hiking trails, 27 full recreational vehicle (RV) hookups, 66 tent spaces, and eight yurts. A public golf course is next to the park.* ***An OPRD study indicated that Sunset Bay State Park receives 800,000 visitors a year*** *(Hillmann 2006)*"

FEIS Page 4.7-6: "*...The Oregon Islands National Wildlife Refuge is administered by the FWS, and covers 1,850 rocks, reefs, islands, and two headlands, spanning a total of 320 miles along the Oregon coast. The* ***Oregon Islands National Wildlife Refuge provides sanctuary for seabirds and marine mammals****.*..."

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[21] Oregon Travel Impacts *1991-2011p* –May 2011; Dean Runyan Associates; *Prepared for the* Oregon Tourism Commission, Salem, Oregon; Page 83 - http://www.deanrunyan.com/impactsOR.html

[22] Shore Acres State Park Holliday Light Show Stats: http://www.shoreacres.net/images/pdf/stats-hol-lts-2011-wp.pdf

Birds swim just off of tidal sand areas at low tide and several species leave footprints in the wet tidal sands where the LNG slip dock is proposed to be built.

According to the World Newspaper; Monday, November 02, 2009:

> "Coos Bay got a bit of a tourism boost over the last several days, as 200 or so birders came to the bay to see a rare brown booby that is hanging out near Charleston. People came to scope out the tropical bird from places including Eugene, Portland, Bend, McMinnville, Coos Bay and Washington. The rare tropical bird showed up last week and

is the fourth verified sighting of this species of bird in Oregon. The last local sighting was in October 2008, when a dead female washed ashore at Lighthouse Beach."[23]

The Weyerhaeuser site where the Jordan Cove LNG Export facility is proposing to build is arguably one of the best birding destinations in Coos County and attracts a multitude of breeding, migrant and vagrant species year-round.[24] There are species like Wilsons Phalarope and Ring necked Duck. This is a crucial stop-over location for shorebirds during migration where they can rest and refuel, building fat reserves to last them on the next leg of their migration flight.

Oregon has lost much of its shorebird habitat through urban development and filling in wetlands and this site is one of the last significant "refueling stations" left on the Oregon Coast. Shorebirds by the thousands feed in late summer and fall here…

FEIS Page 4.7-7: *Figure 4.7-2 list* ***34 Recreational Areas that are within*** *the* ***LNG Zones of Concern*** *along the waterway for the proposed LNG Marine Traffic.*

FEIS Page 4.7-16: "…*The Siuslaw National Forest administers the* ***Oregon Dunes National Recreation Area (NRA)****. It extends 40 miles along the Oregon Coast between Florence and Coos Bay. The Oregon Dunes NRA contains the largest expanse of coastal sand dunes in North America, as well as a coastal forest and over 30 lakes and ponds.* ***Recreational opportunities at the NRA include OHV use, hiking, camping, horseback riding, angling, canoeing, sailing, water-skiing, and swimming.*** *Thousands of OHV owners take advantage of the three main off-highway riding areas within the Oregon Dunes NRA.* ***The day use and overnight camping facilities are used by over 400,000 visitors a year****…*"

For an Oregon Department of Fish and Wildlife listing of county expenditure estimates for Fishing, Hunting, Wildlife Viewing, and Shellfishing in Coos County and Oregon, see footnote below[25]

Coos County Local Recreation Expenditures, 2008

Category	Value	% of State Total*	% of All Travel**
Hunting	$904,977	2.90%	N/A
Fishing	$2,551,433	3.30%	N/A
Wildlife Viewing	$1,637,158	4.90%	N/A
Shellfishing	$1,080,963	20.60%	N/A
Total	$6,174,531	4.20%	N/A

[23] "*Flocking to see a rare bird*"; The World Newspaper; Monday, November 02, 2009 http://theworldlink.com/news/local/flocking-to-see-a-rare-bird/article_4c58af85-d571-52c5-b820-3301baf6f9d3.html

[24] "*Site Guide: Weyerhaeuser Settling Pond Site on the North Spit of Coos Bay",* Tim Rodenkirk: Oregon Birds 32(2): Pg 68 - 72, Summer 2006

[25] "*Fishing, Hunting, Wildlife Viewing, and Shellfishing in Oregon - 2008 State and County Expenditure Estimates*"; Prepared for the Oregon Department of Fish and Wildlife - Travel Oregon; DeanRunyan Associates; May 2009 http://www.dfw.state.or.us/agency/docs/Report_5_6_09--Final%20%282%29.pdf

Coos County Travel-Generated Expenditures, 2008

Category	Value	% of State Total*	% of All Travel**
Hunting	$2,534,940	2.40%	1.40%
Fishing	$12,253,254	4.60%	6.70%
Wildlife Viewing	$14,110,950	3.10%	7.70%
Shellfishing	$4,552,379	14.70%	2.50%
Total	$33,451,523	3.90%	18.30%

The Jordan Cove Project will clearly negatively impact this industry and all the permanent and sustainable jobs it supports as well as many others. Incredulously, the ECONorthwest study did not take into account the economic impacts of Jordan Cove's proposed LNG export facility on local tourism and recreation.

9.2 Commercial and Recreational Fishing

The ECONorthwest study did not include negative impacts to our commercial and recreational fishing fleet. This could include negative impacts from transiting LNG tankers, the negative impacts from additional Bay dredging, or negative impacts to salmon bearing streams crossed by the pipeline. **This is despite the fact Coos Bay is the third most important harbor in the state of Oregon in terms of total personal income generated from commercial fishing** (exceeded only by Astoria and Newport). Commercial landing data compiled by ODFW indicate that a total of $20.1 million worth of fish and shellfish were landed at Charleston in 2006.[26]

Landowners and non-profit groups who have done restoration projects to help restore fish runs in Southern Oregon will have their projects and efforts destroyed by the pipeline construction. This would not be in the public interest. (See Exhibits A, B)

FEIS Page 4.7-4: "*…According to a 2005 study by the Oregon State Marine Board (OSMB)* ***recreational boaters in Coos Bay took a total of 30,996 boat trips the previous year. Nearly 90 percent of the boat usedays involved fishing*** *(including angling, crabbing, and clamming), 9 percent was for pleasure cruising, and the remainder was for sailing and water skiing. Forty percent of the boating activities in Coos Bay originated from the Charleston Marina, and 20 percent at the Empire ramp…*"

FEIS Page 4.7-4: "*...****Recreational clamming and crabbing occurs year-round and brings tourism based revenue to the region. Crabbing occurs in the main channel areas from the Southern Oregon Regional Airport to the mouth of the bay around slack tides. Clamming occurs year-round in the mud flats of Coos Bay,*** *but is subject to closure as necessary by the ODA Food Safety Division for reasons of public health (Oregon Department of Agriculture Food Safety Division 2008)….*"

[26] FERC Final EIS for Jordan Cove LNG Import Facility; http://www.ferc.gov/industries/gas/enviro/eis/2009/05-01-09-eis.asp - Page 4.8-8

Photo to Left:
People clamming at low tide in the Lower Coos Bay along Cape Arago Hwy.

Photo to Right:
Evidence of Clams in the tidal areas where the LNG slip dock is proposed to be built.

The ECONorthwest study did not account for the total time it would take homeland security to clear the bay before an LNG tanker would transit through the bay, nor did the study account for an accurate number of potential ship transits through the bay. When Freeport LNG import terminal began operating in April of 2008, Petty Officer Second Class Richard Ahlers said it would probably take up to three hours for the boat and its security perimeter to pass through in the first arrivals. Each time a LNG ship crawls into the harbor there, water-borne authorities like the Coast Guard plan on shutting down all boat traffic in a 1,000-meter radius of the transiting LNG vessel. Surfside Beach Mayor Jim Bedward said the village boat ramp, once it opened, would be closed as the ships pass. The City Hall in Freeport would get a 92-hour warning of the oncoming ships but would keep knowledge of the high-security vessels' arrival to themselves — for obvious reasons. [27]/[28]

Likewise the Jordan Cove LNG facility consultants have shown that ship transits would have security zones that are very similar to Freeport except that in some cases security zones for Jordan Cove would encompass the entire width of the Coos Bay and would take from 90 minutes to two hours. This would be an extreme hardship on the Commercial fishing fleet that also need high slack tides in order to transit the Coos Bay.

In Coos County the Pacific Connector is slated to directly negatively impact native Olympia oysters in Haynes Inlet and also Clausen Oyster Company's highly productive silver point Pacific oyster beds. Coos Bay is the largest commercial producer of shellfish in the state of Oregon. Pacific oysters are commercially raised in the mudflats of South Slough and Haynes Inlet and the upper bay east of McCullough Bridge. Clamming also occurs at Haynes Inlet. (FEIS page 4.7-17) In recent testimony provided by the Clausen Oyster Company, Lilli Clausen stated the following:

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[27] "*Coast Guard preparing for port shutdowns*", The Facts, by Hunter Sauls, April 14, 2008 http://thefacts.com/story.lasso?ewcd=f482d0ca682cb716

[28] Platts LNG Daily April 11, 2008 [subscription required] reports that the Sabine Pass LNG terminal expects to receive its commissioning cargo aboard the LNG carrier Celestine River today. In preparation for the arrival of the ship, the U.S. Coast Guard will impose a security zone at the Sabine Pass in Louisiana for approximately three hours between noon and 7 p.m…

"When the engineer and some other people representing LNG were in our office a few weeks ago my husband, Max, and I tried to explain that the proposed line was too destructive to our oyster business…" (See Exhibit E)

9.3 Timber Production

The Jordan Cove proposal will force a significant change and a significant cost increase in accepted tree farm and forest practices on agricultural and forest lands. Including but not limited to:

- Permanent loss of timber in pipeline right of way.
- Increased loss in timber production due to increased wind in the pipeline right of way. Coos County Commissioner, Fred Messerle, who is also a local private timber operator stated recently in public testimony,

> "Cutting and maintaining an extended "hard edge" in an existing and/or new stand of timber will dramatically increase the wind loss over the 40 year rotation and thus increase cost and decrease yield."

- Increase risk of foot traffic and spread of disease and root rot. Pacific Connector's plan will significantly change the accepted practices involved in raising a 40-year crop and/or in a worst case, eliminates the value of the land all together for timber production.
- Increased risk of noxious weed growth which negatively impacts timber production.
- An open vector (right of way) with dry grass and brush creates a path for fire to "run on." This means an increase in fire hazard exposure and risk in currently high timber production areas.
- Project significantly changes and or increases the costs of accepted practices overall. According to Commissioner Messerle,

> "Timber harvesting (logging) has always had a very "thin margin" of profit. Logging is not a "get rich quick" proposition. Any change to accepted logging practices will increase costs, decrease margins and significantly change the cost of accepted forest practices." (See Exhibit F)

Yankee Creek Forestry also issued similar statements with regard to the negative impacts this proposed LNG project and pipeline will have on timber production. (See Exhibit G)

Construction of the Pacific Connector pipeline would affect about 3,035 acres of forest and woodland, 623 acres of agricultural lands, 488 acres of grasslands-shrubland, and 131 acres of non- riparian vegetation. (FEIS page 5-9). Approximately 151 miles, or 66 percent, of the proposed pipeline route would cross private property, which could be taken by eminent domain. The remaining 79 miles (34 percent) of pipeline route would cross public lands administered by the BLM (18 percent), USFS (12 percent), BOR (0.14 percent), (FEIS page 4.8-25)

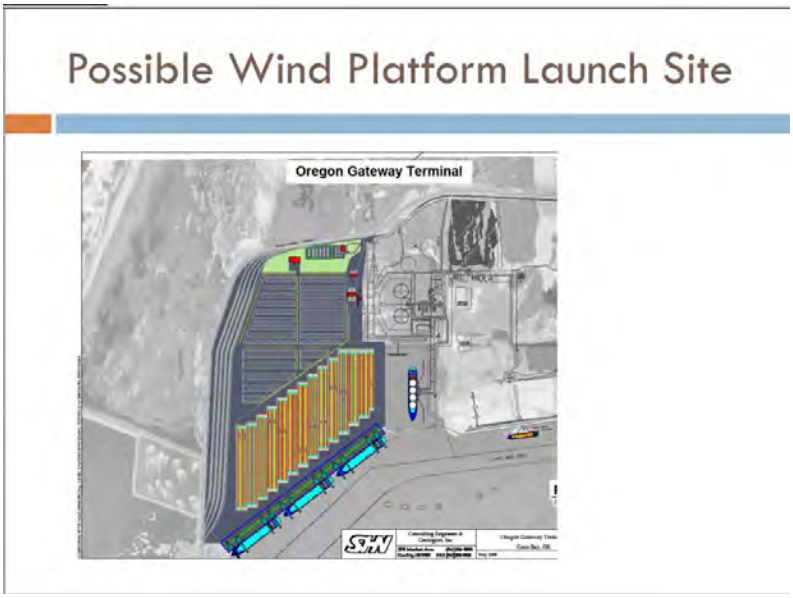
It is difficult enough for a small family owned operation to monitor and oversee its base operation. The Jordan Cove / Pacific Connector project will change family owned and operated practices and increase costs to timber production. Some businesses are likely to go out of business due to this increased cost.

In addition, Jordan Cove did not analyze timber jobs that will be impacted and lost from the flooding of the market with 144 miles of forestlands that will be clear-cut for pipeline construction. This will force timber prices to an all time low which will negatively impact the industry even more than it already has been. It could take years to recover.

9.4 Loss of other Proposed Port Developments

The negative impacts of the Jordan Cove Energy / Pacific Connector pipeline project to bay area businesses, including future potential businesses, industries and land owners was not considered in Jordan Cove's economic reports.

For example, on January 20, 2011 the Oregon International Port of Coos Bay presented the following diagram at their Port Commission meeting concerning a proposed Wind Project the Port is currently working on potentially developing.[29]



Unfortunately the proposed Jordan Cove Energy LNG Project Thermal Radiation Zones and Vapor Dispersion Zones would negatively impact the above proposed development as shown in the following diagrams below taken from the Final EIS of the Jordan Cove Import facility.[30]

[29] January 20, 2011, Oregon International Port of Coos Bay Wind Development presentation: http://www.portofcoosbay.com/minutes/wind.pdf

[30] FERC Final EIS for Jordan Cove / Pacific Connector - Diagrams of Jordan Cove's Thermal Radiation Zones and Vapor Dispersion Zones - Pages 4.12-19 and 4.12-21 : http://www.ferc.gov/industries/gas/enviro/eis/2009/05-01-09-eis.asp

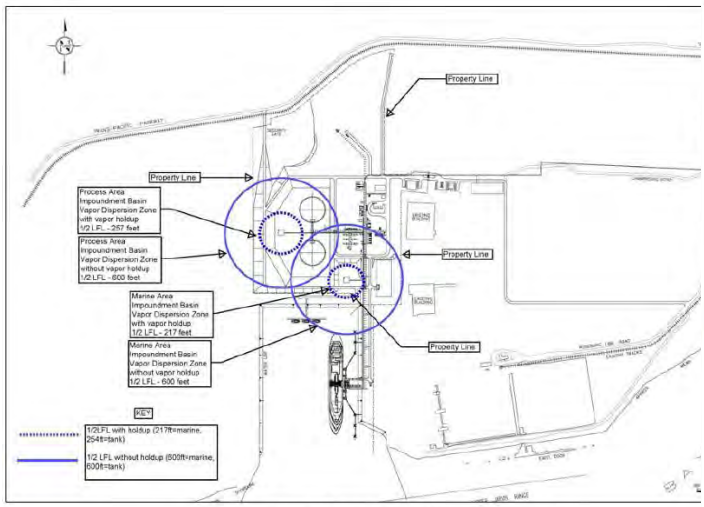


Figure 4.12-2. Vapor Dispersion Zones

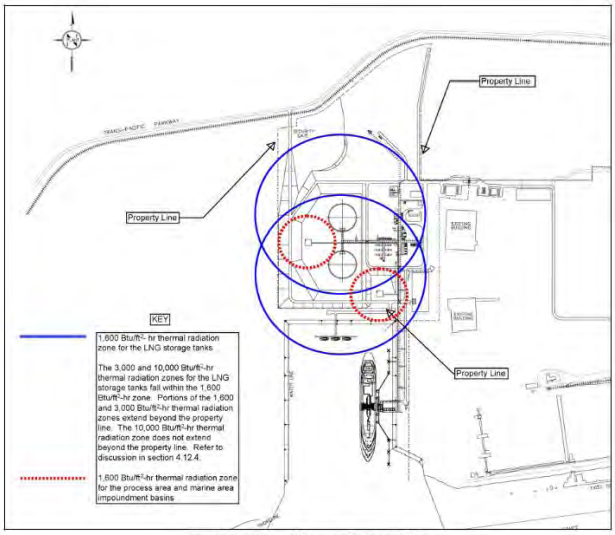


Figure 4.12-1. Thermal Radiation Zones

On October 8, 2010, FERC sent a letter to Jordan Cove requesting that Jordan Cove revise their Flammable Vapor-Gas Exclusion Zone requirements and modeling to be in compliance with PHMSA Recent Guidance contained in Title 49 CFR Part 193.2059.[31] It is highly likely that the Jordan Cove facility's hazard exclusion zones will end up being much larger than they currently are when they are calculated properly to be in compliance with PHMSA**.** This could have devastating impacts to other users of the harbor, adjacent landowners and industrial development including the Port's proposed Oregon Gateway cargo terminal, which would not be allowed to operate in these hazard zones. Jordan Cove has not to date filed with FERC their revised Flammable Vapor Gas Exclusion Zone requirements and modeling. Clearly Jordan Cove is aware of this problem and by now the Port should be.

In December 2011, a revised Land Option Agreement with the Jordan Cove Energy Project took back a large portion of Henderson Marsh to the west of the Jordan Cove facility to satisfy these thermal radiation and flammable vapor gas exclusion zone requirements. These thermal radiation and flammable vapor gas exclusion zones must be controlled by the Jordan Cove Energy Project at all times and must remain within the property boundaries of the facility. This will put any planned development to the west of the proposed Jordan Cove facility, including the above proposed wind turbine development, at risk.

The Oregon International Port of Coos Bay says its proposed Marine Terminal Slip is being designed for the Jordan Cove LNG docking facility and other potential marine uses on the west side berth. But the Marine Slip will not likely be usable for purposes other than those associated with and/or controlled by the Jordan Cove Energy Project. At a recent site tour held on March 27, 2012, that was sponsored by the Jordan Cove Energy Project, Bob Braddock from Jordan Cove stated that the current proposed Marine Terminal Slip was only designed to handle one vessel. Presumably this is due to Jordan Cove's thermal radiation and vapor dispersion exclusion

[31] October 8, 2010 letter requesting Jordan Cove Energy Project, L.P. provide the informing described in Enclosure 3 to assist the FERC in their review re the PHMSA Interpretations on the Part 193 Exclusion Zone Regulations under CP07-444. http://elibrary.FERC.gov/idmws/file_list.asp?accession_num=20101008-3036

zones referenced above and also the Coast Guard safety and security hazard zones proposed for the LNG facility and berth that will preclude the use of the berth for other purposes.

The safety and security hazard zones the Coast Guard has proposed to impose will encompass the LNG vessel both while the vessel is moored and even when the LNG vessel is not moored. When the LNG vessel is at the docking facility there will be a 150 yard security zone around the vessel to include the entire terminal slip and when there is no LNG vessel moored, the security zone shall cover the entire terminal slip and extend 25-yards in the waterway. (CG-WSA page 2)[32] In addition, the Coast Guard has also set a moving safety/security zone for the LNG tanker ship that extends 500-yards around the vessel but ends at the shoreline. No vessel may enter the safety /security zone without first obtaining permission from the Coast Guard Captain of the Port who resides in the Portland, OR office.[32]

As a result of the above safety zones, the Port's proposed Marine slip can realistically serve only LNG terminal purposes.

In addition, the ECONorthwest study assumes there will be only 80 - 90 shipments per year and not the more realistic number of between 186 - 232 LNG vessel harbor disruptions that would include LNG vessels both coming and leaving the lower Coos Bay during high slack tides. (See Exhibit J)

Detailed issues concerning Pollution, Noise, Visual Impacts, Security, LNG Hazards, Natural Hazards and Emergency Response were filed with the Federal Energy Regulatory Commission for the Jordan Cove LNG Import / Pacific Connector Docket numbers CP07-444-000 and CP07-441-000. Most of these issues were never fully addressed and would apply whether you were importing or exporting LNG.[33]

FERC's Order[34] that was recently pulled had 128 Conditions of Approval, many highly unlikely that Jordan Cove would ever be able to meet. The impacts of these issues and the true negative effects of the Jordan Cove LNG proposal on jobs in tourism, recreation, real estate, fishing, clamming, crabbing, oyster harvesting, timber, etc, were not addressed or considered fully in any economic study.

10. The proposed project will not provide tax revenue to local government

The Jordan Cove LNG facility will not increase the tax base of Coos County. The facility will sit in an Enterprise Zone and will be exempt from paying taxes for 3 or more years. The facility

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[32] Coast Guard - LOR / WSR / WSA for Port of Coos Bay / Jordan Cove Energy Project: http://homeport.uscg.mil/mycg/portal/ep/contentView.do?contentTypeId=2&contentId=63626&programId=12590&pageTypeId=16440&BV

[33] January 15, 2010, letter to FERC with detailed information on LNG Hazard information and studies; http://elibrary.FERC.gov/idmws/file_list.asp?accession_num=20100115-5057

[34] December 17, 2009, FERC Order on the Jordan Cove / Pacific Connector LNG Import Project - Dockets CP07-441-000; CP07-444-000 et al: http://elibrary.FERC.gov/idmws/file_list.asp?accession_num=20091217-3076

also will sit in an Urban Renewal District for the North Spit, which is administered by the Oregon International Port of Coos Bay. Money received is to go to Urban Renewal for the North Spit. The Oregon International Port of Coos Bay has already announced at Port meetings how they plan on spending this money. It will not go into the County general fund for roads, schools, sheriffs, and other necessary county expenditures.

11. Jordan Cove proposed LNG export facility would create substantial risks to public safety

Building an LNG import-export terminal on dredging spoils located on a sand spit (an unstable sand dune area) directly across the bay from an airport runway, in the flight path of the runway, in an extreme tsunami inundation zone, in an earthquake subduction zone, in an area known for high winds and ship disasters, less than a mile from a highly populated city not only violates multiple safety codes and regulations but is not in the public interest.

The Jordan Cove LNG facility is not following gas industry recommended guidelines for the safe siting of LNG Ports and jetties, putting thousands of people in the Coos Bay area at risk.

11.1 Tsunami and Earthquake Hazards

The Jordan Cove Energy Project has never complied with FERC's request to show that that their facility which will be located on dredging spoils on a sand spit in a natural hazard zone has met engineering designs in order to withstand a Cascadia subduction 9.0 earthquake event and/or a tsunami.[35] Since it is not a matter of "if" but a matter of "when" a Cascadia subduction event will occur off of our Pacific West Coast, placing a hazardous LNG facility in these natural hazard zones would not be in the public interest.[36] (See Exhibit H)

It is estimated to take 90 minutes to 2 hours for an LNG tanker to transit from K Buoy to the marine slip dock. It is also estimated that it will take around 15-20 minutes from the time of a Cascadia subduction earthquake event until a tsunami would come ashore in the Coos Bay. A new study from Oregon State University says that the South Coast has a 40 percent chance of experiencing a major earthquake and resulting tsunami sometime in the next 50 years. The study further suggests that that tsunami could have a greater impact on the South Coast — around Coos

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[35] December 17, 2009, FERC Order - pages 79-84, Conditions 52-65,70,74: http://elibrary.FERC.gov/idmws/file_list.asp?accession_num=20091217-3076

[36] The World, Coos Bay – **"***Not a matter of 'if' It's a matter of when. What will the South Coast look like after a major disaster?*" Stories by Jessica Musicar, Nia Towne, Andy Rossback and Nate Traylor. Illustrations by Jeff Trionfante, Benjamin Brayfield and Andy Rossback The World | Posted: Saturday, August 7, 2010 http://theworldlink.com/news/local/not-a-matter-of-if/article_d4b8e520-a1f3-11df-89f5-001cc4c03286.html

● *"Oregon geology: 'The next 'Big One' is imminent'":* Story Published: Oct 16, 2009; *Courtesy OSU News & Communications*; http://www.kval.com/news/tech/64534977.html: *"...The release of pressure between two overlapping tectonic plates along the subduction zone regularly generates massive 9.0 magnitude earthquakes – including five over the last 1,400 years," Corcoran said. "The last 'Big One' was 309 years ago. We are in a geologic time when we can expect another 'Big One,'... ... "Prudence dictates that we overcome our human tendencies to ignore this inevitability," he added…".*

● Visit www.oregontsunami.org for more information on current tsunami maps and hazards in the vicinity of the Jordan Cove Energy LNG project.

Bay — than other areas of the west coast.[37] According to the study's authors, the clock is ticking fast. There is no consideration for this LNG ship transit hazard in the FERC FEIS or the Coast Guard Letter of Recommendation (LOR) or Water Suitability Assessment (WSA) or Jordan Cove's 3/31/09 Emergency Response Memorandum of Understanding (MOU). There is no Emergency Response plan that encompasses this and/or other safety issues in regard to transiting LNG tanker ships, floating objects, adrift vessels, barges, etc. Effects of tectonic subsidence (prolonged changes in tidal elevation inherent in the earthquake source scenarios used for tsunami generation) were also not considered in the FERC FEIS.

11.2 LNG Safety and Security Hazard Guidelines and Impacts

Industry SIGTTO Guidelines,[38] Sandia National Laboratory Guidelines,[39] GAO Report Guidelines[40] and the most recent U.S. Department of Energy report to Congress, "Liquefied Natural Gas Safety Research"[41] are not being considered or followed. The FERC Final EIS did not address the project's notable departures from **industry standards or comments to them on those departures.**[38] It is not in the public interest to proceed with this proposed project until these issues are fully addressed.

If the Jordan Cove LNG project should proceed, LNG tanker ships will be transiting our Coos Bay harbor carrying around 39 million gallons of LNG. If only about 3 million gallons of LNG was to spill onto the water from an LNG tanker ship, flammable vapors from the spill could travel up to three miles[42]. If a pool fire was to develop, people up to a mile away would be at risk of 2nd degree burns in 30 seconds.[39/40/41]

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[37] *Study: Coos Bay region in danger of megaquake*" By KATU.com Staff, Published: Aug 1, 2012 http://www.kpic.com/news/local/Study-Coos-Bay-region-in-danger-of-megaquake-164645456.html
● Oregon State University - "*13-Year Cascadia Study Complete – and Earthquake Risk Looms Large*" 8-1-12 - http://oregonstate.edu/ua/ncs/archives/2012/jul/13-year-cascadia-study-complete-%E2%80%93-and-earthquake-risk-looms-large

[38] "*Site Selection & Design for LNG Ports & Jetties – Information Paper No. 14*" - Published by Society of International Gas Tanker and Terminal Operators Ltd / 1997 http://www.dma.dk/themes/LNGinfrastructureproject/Documents/Risk%20analyses/sigtto-site%20selection%20and%20design%20lng%20ports%20jetties.pdf

[39] SANDIA REPORT "*Guidance on Risk Analysis and Safety Implications of a Large Liquefied Natural Gas (LNG) Spill Over Water"*; Mike Hightower, Louis Gritzo, Anay Luketa-Hanlin, John Covan, Sheldon Tieszen, Gerry Wellman, Mike Irwin, Mike Kaneshige, Brian Melof, Charles Morrow, Don Ragland; SAND2004-6258; Unlimited Release; Printed December 2004; http://www.fossil.energy.gov/programs/oilgas/storage/lng/sandia_lng_1204.pdf

[40] United States Government Accountability Office, Report to Congressional Requesters, Maritime Security; "*Public Safety Consequences of a Terrorist Attack on a Tanker Carrying Liquefied Natural Gas Need Clarification*", February 2007; GAO-07-316: http://www.gao.gov/new.items/d07316.pdf

[41] U.S. Department of Energy report to Congress, "*Liquefied Natural Gas Safety Research*" ; May 2012 : http://www.fossil.energy.gov/programs/oilgas/storage/publications/DOE_LNG_Safety_Research_Report_To_Congre.pdf [NOTE: Based on the data collected from the large-scale LNG pool fire tests conducted, thermal (fire) hazard distances to the public from a large LNG pool fire will decrease by at least 2 to 7 percent compared to results obtained from previous studies. In spite of this slight decrease, people up to a mile away are still at risk of receiving 2nd degree burns in 30 seconds should a LNG pool fire develop due to a medium to large scale LNG breach event.]

[42] "*LNG and Public Safety Issues – Summarizing Current Knowledge about Potential Worst Case Consequences of LNG spills onto water*". Jerry Havens, Coast Guard Journal Proceedings, Fall 2005

11.3 Airport Issues and Hazards

The proposed Jordan Cove LNG facility and South Dune Power Plant and liquefaction facility are directly across the Bay in close proximity to the Southwest Oregon Regional Airport in North Bend. Airport airspace and hazard issues were not addressed properly in the FERC FEIS. LNG Tank Heights clearly violate Title 14 Code of Federal Regulations (CFR) Part 77, Objects Affecting Navigable Airspace. Many issues concerning this and other airport hazards were raised in comments to FERC (Docket # CP07-444-000 and CP07-441-000)[43] The airport will clearly be impacted negatively in order for LNG vessels to safely transit our Coos Bay harbor. This would greatly affect many businesses in the area including the Bandon Dunes World Renowned Golf Course. Currently, there are no plans to prevent this impact and protect citizens in this area and that is not in the public interest. Issues involving LNG tanker passage and air space issues were also not addressed in the Coast Guard's LOR, WSA or considered in Jordan Cove's economic analysis.

11.4 Inadequate Emergency Response Resources

Emergency Response is inadequate with most Emergency Responders located in the Hazard Zones of Concern of the facility and LNG tanker transit. See Hazard Zone maps on FEIS pages 4.7-3,-7,-15.[44] The Coast Guard WSA is not in line with the Gas Industry SIGTTO guidelines and recommendations nor the Sandia National Laboratories guidelines and recommendations. The Coast Guard did not account for many LNG potential hazards in the waterway, air and shoreline and they failed to consider or mention hazard issues listed in the Coos County Natural Hazards Mitigation Plan. They underestimated the number of annual vessel calls and included no plans for handling tsunamis and earthquakes in their reports.

"*Once ignited, as is very likely when the spill is initiated by a chemical explosion, the floating LNG pool will burn vigorously…Like the attack on the World Trade Center in New York City,* ***there exists no relevant industrial experience with fires of this scale from which to project measures for securing public safety***." – Statement by Professor James Fay, Massachusetts Institute of Technology

Sandia Laboratory's Dec 2004 Report; "*Guidance on Risk Analysis and Safety Implications of a Large Liquefied Natural Gas (LNG) Spill Over Water",* states on page 83; "*... The distance from the fire to an object at which the radiant flux is 5 kW/m2 is 1.9 km"* (1.181 miles).

To clearly understand this one must understand that 5 kW/m2 is the heat flux level that can cause 2nd degree burns on exposed human skin in 30 seconds.

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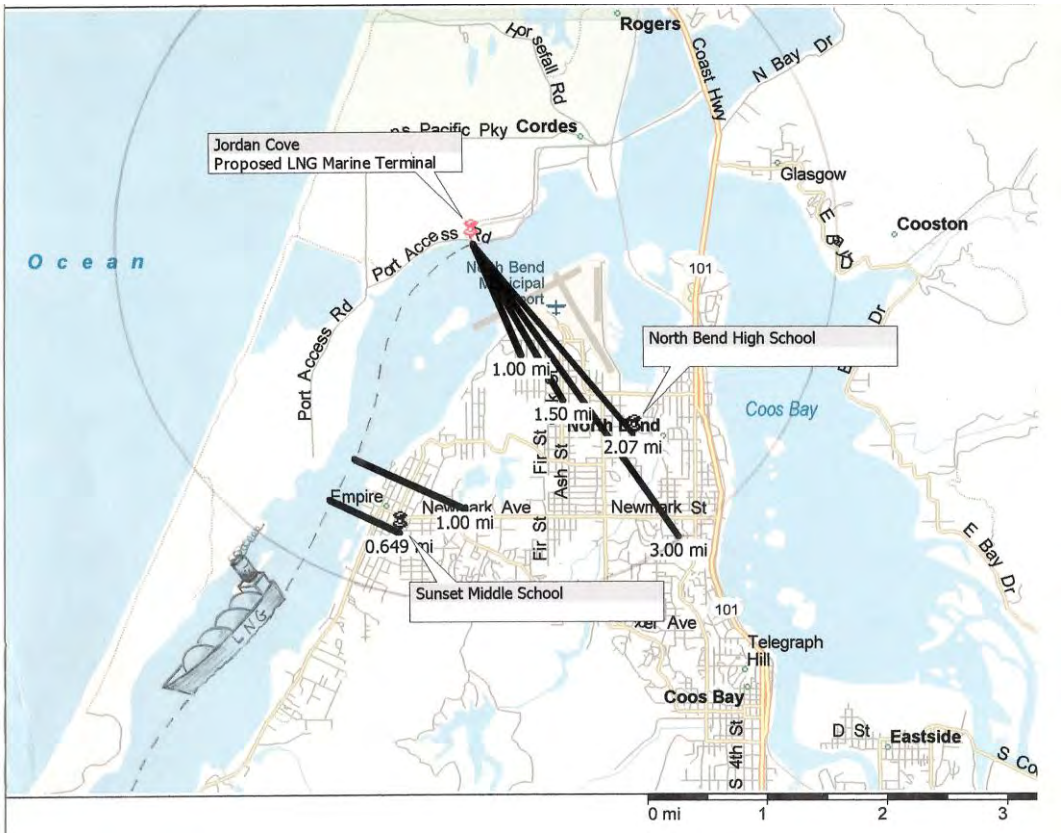
[43] March 31, 2009 comment letter to FERC addressing Safety and Security issues / Airport Hazards / Tsunami and Earthquake hazards:
http://elibrary.FERC.gov/idmws/file_list.asp?accession_num=20090331-5160 - &
http://elibrary.FERC.gov/idmws/file_list.asp?accession_num=20090401-5170

[44] FERC Final EIS for Jordan Cove / Pacific Connector http://www.ferc.gov/industries/gas/enviro/eis/2009/05-01-09-eis.asp Pages 4.7-3,-7,-15



The FERC Jordan Cove Energy (Import) Project Final Environmental Impact Statement (FEIS) - Section 4-7, pages 4.7-3 and 4.7-15, has maps with diagrams of the structures that are within the LNG Ship Transit Route Hazard Zones of Concern.[45] (See Exhibit I) <u>According to the FERC Final Environmental Impact Statement for Jordan Cove (FEIS page 4.8-2), 16,922 people live in these hazard zones along the waterway and yet there is little concern given for their safety</u>. Trees and burnable scrub brush cover our area. Secondary fires will be paramount should an LNG accident occur. The FERC FEIS ignored comments on these dangers. The Coos Bay area has one hospital; it does not have a "Burn Unit." Neither the FEIS nor any public communication from Jordan Cove Energy Project, Inc. ("JCEP") has suggested how the medical response to even a minor LNG hazardous event could be handled in light of our area's obvious insufficiency of appropriate medical facilities and personnel.

Many of the guidelines for safety that are suggested in the gas industries "Society of International Gas Tanker & Terminal Operators" (SIGTTO)[46] Information Paper No. 14 have been completely ignored in this terminal siting, including the following:

1) **Approach Channels**. Harbor channels should be of uniform cross-sectional depth and have a minimum width, equal to five time the beam of the largest ship

[45] FERC Jordan Cove LNG Import FEIS pages 4.7-3 and 4.7-15: http://www.ferc.gov/industries/gas/enviro/eis/2009/05-01-09-eis.asp

[46] **Site Selection & Design for LNG Ports & Jetties – Information Paper No. 14 -** Published by *Society of International Gas Tanker and Terminal Operators Ltd* / 1997

2) **Turning Circles**. Turning circles should have a minimum diameter of twice the overall length of the largest ship, where current effect is minimal. Where turning circles are located in areas of current, diameters should be increased by the anticipated drift.
3) **Tug Power**. Available tug power, expressed in terms of effective bollard pull, should be sufficient to overcome the maximum wind force generated on the largest ship using the terminal, under the maximum wind speed permitted for harbor maneuvers and with the LNG carrier's engines out of action.
4) **Site selection process** should remove as many risk as possible by placing LNG terminals in sheltered locations remote from other port users. Suggest port designers construct jetties handling hazardous cargoes in remote areas where ships do not pose a (collision) risk and where any gas escaped cannot affect local populations. Site selection should limit the risk of ship strikings, limiting interactive effects from passing ships and reducing the risk of dynamic wave forces within mooring lines.
5) **Building the LNG terminal on the outside of a river bend** is considered unsuitable due to fact that a passing ship may strike the berthed carrier if the maneuver is not properly executed.
6) **SIGTTO Examples given for reducing risk factors** beyond normal operations of ship/shore interface include LNG terminal patrols of the perimeter of the offshore safety zones with guard boats and to declare the air-space over an LNG terminal as being a restricted zone where no aircraft is allowed to fly without written permission.
7) **Restriction of the speed of large ships passing** close to berthed LNG carriers.

Also ignored were some of the safety guideline preventative measures in the Sandi National Laboratories Report – "Guidance on Risk Analysis and Safety Implications of Large Liquefied Natural Gas (LNG) Spill Over Water" – Dec 04:[47]

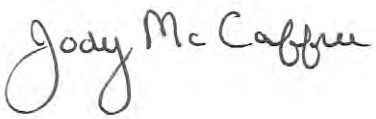
1) Appropriate off-shore LNG ship interdiction and inspections for explosives, hazardous materials, and proper operation of safety systems;
2) Appropriate monitoring and control of LNG ships when entering U.S. waters and **protection of harbor pilots and crews**;
3) Enhanced safety zones around LNG vessels (safety halo) that can be enforced;
4) **Appropriate control of airspace over LNG ships**; and
5) Appropriate inspection and protection of terminal areas, tug operations prior to delivery and unloading operations.

[47] Without an emergency response plan to review it is hard to know if some of these recommendations have been met. Page 4.8-9 of FEIS states, "The Coos County Airport District, which operates the airport, has stated that the airport would not have to stop operations while an LNG carrier was transiting in the waterway past the airport." "…and the Coos Bay Pilots Association foresees no delays for airplanes using the airport resulting from LNG marine traffic in the waterway." This clearly violates Sandia's safety guideline preventative measure recommendations.

Conclusion

It may be in the financial interest of some Canadian energy company to export domestic natural gas across the United States and across Oregon landowner's private property. But it is contrary to the public interest. Exporting Canadian and domestic natural gas from Jordan Cove will (1) put Coos Bay area residents at risk in the event of a Magnitude 9 earthquake and tsunami; (2) deprive many landowners of the full use of their private property; (3) negatively impact Oregon forests and waterways; (4) increase the costs for residential, commercial, and industrial natural gas users; and (5) negatively impact businesses and industries in Oregon and in other parts of the United States. The DOE should not grant such a permit for Jordan Cove to export LNG to non-free trade agreement nations when it is clearly not in "*the public interest*" both nationally and locally to do so.

Sincerely,



Jody McCaffree
Executive Director,
Citizens Against LNG Inc

HEARLEY Henry O

From: Carolyn Johnson <cjohnson@coosbay.org>
Sent: May 16, 2019 5:02 PM
To: CALLISTER Jacob (LCOG); HEARLEY Henry O
Subject: FW: Exhibits under Jordan Cove 187-18-000153-PLNG-01
Attachments: CB_ExbA_Wyden-letter-FERC-Asking-for-more-time_20190415-0008.pdf; CB_ExbB_DEQ letter to FERC_re-HDD_Other_20190312-5123.pdf; CB_ExbC_DEQ News Release concerning Water Quality permit_May 6 2019.pdf; CB_ExbD_PHMSA Advisory Bulletin_Pipelines and Geologic hazards.pdf; CB_ExbE_Wastewater pipelines often leak in North Dakota_Feb-16-2015.pdf; CB_ExbF_Photos_of_Coos_County_Pipeline_Impacts.pdf; CB_ExbG_RegGuard_Enterprise-goes-sour_7-25-2004.pdf; CB_ExbH_Federal Court Fines Pipeline Builder.pdf; CB_ExbI_Review of noise impacts on marine mammals yields new policy recommendations.pdf; CB_ExbJ_Oysters and Noise Pollution Impacts.pdf; CB_ExbK_ECONorthwest Jordan Cove - SCDC Impacts_.pdf; CB_ExbL_CALNG_Aug_6_2012_Testimony_to_US-DOE.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

FYI and matrix

From: Jody McCaffree <mccaffrees@frontier.com>
Sent: Thursday, May 16, 2019 4:55 PM
To: 'HEARLEY Henry O' <HHEARLEY@Lcog.org>
Cc: Carolyn Johnson <cjohnson@coosbay.org>
Subject: RE: Exhibits under Jordan Cove 187-18-000153-PLNG-01

Please find attached Exhibits A to L for Coos Bay File No. 187-18-000153-PLNG-01. (Jordan Cove Channel Navigation Alteration)

Please let me know that these have been received.

Thanks,

Jody McCaffree
PO Box 1113
North Bend, OR 97459