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June 10, 2019

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Hand-delivered

Re: County hearing on remand from the Land Use Board of Appeals in regards to 76 OR LUBA 346 (217), County file No. HBCU-15-05/CD-15-152/FP-15-09, regarding Jordan Cove LNG export terminal

Dear Mr. Stamp:

This letter is in addition to any spoken remarks I may deliver at the hearing on this matter scheduled for June 10, at the Owen building in Coquille. The two issues I want to address are #1 and #7 on LUBA's list of the County Commissioners' failures, as quoted from the Notice of Land Use Hearing. I deal with #1 first, and with #7 towards the end of this letter. These are my conclusions, each one followed by the reasons for it:

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(1) On balance, the terminal's disadvantages will outweigh the advantages.

The first problem, # 1 on LUBA's list, states (with emphasis and highlighting added):

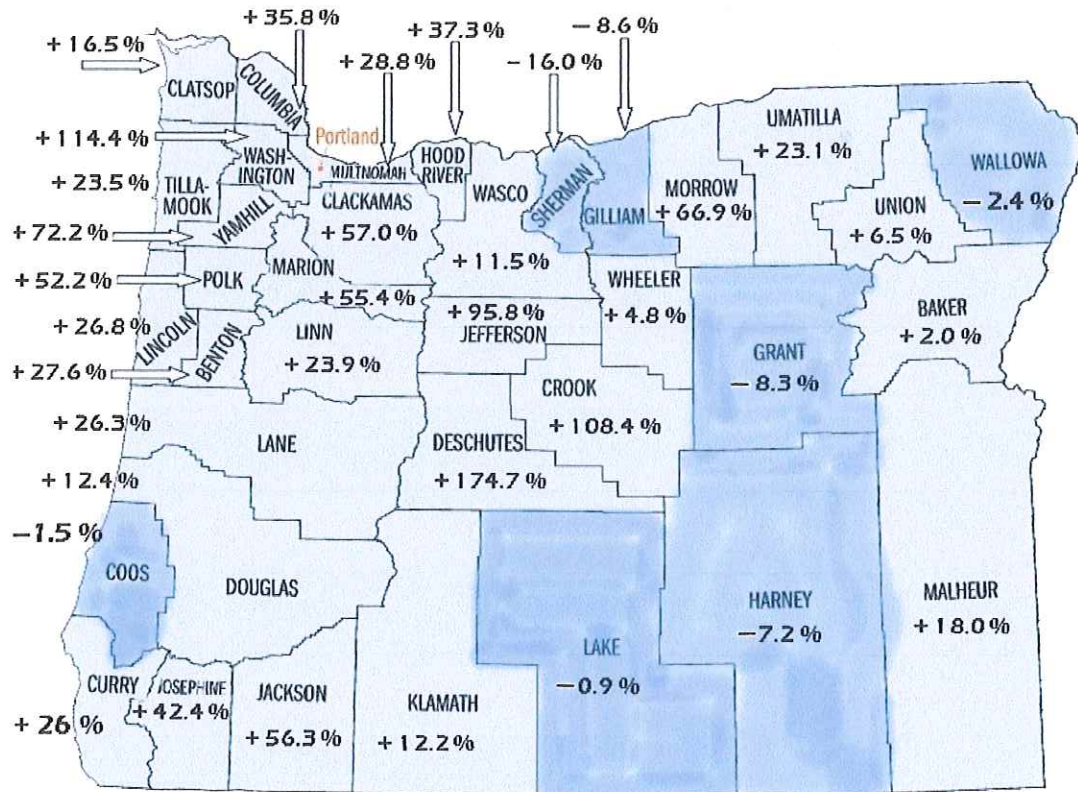
1. Failed to correctly interpret and adopt adequate findings supported by substantial evidence in response to Coos Bay Estuary Management Plan ("CBEMP") Policy 5. The Board [of Commissioners] erred by: (1) interpreting CBEMP Policy #5.I.b to require an evaluation only of the public benefits of the dredging itself and not the public benefits of the upland use served by the dredging activity; (2) concluding that the "public need" standard is met if the dredging is needed to enable construction of a use that is permitted or conditionally allowed on

Exhibit: 10
Date: 6/10/19

adjacent upland or shoreland property; and (3) failing to adopt adequate findings supported by substantial evidence in the whole record that the Project would **not unreasonably interfere with public trust rights**. OSCC, 76 Or LUBA at 352-358(OSCC second assignment of error).

With regard to Coos County's failure to consider the public benefits of **the upland use** served by the dredging activity, it seems certain that whatever public benefits may be alleged by Jordan Cove's proponents, they will be dwarfed by the public **drawbacks** of this project, which range from considerable inconveniences inflicted on other waterway users, including professional and recreational fishermen, to the neglectful and willful exposure of almost 17,000 local residents to a highly hazardous substance that, if released at the plant or from any LNG tanker sailing down the bay, may kill and maim thousands.

To consider the alleged public benefits first, there can be little doubt that we will get a short-lived economic boost from the construction of the Jordan Cove facility, followed by not much else except sizable payments by the company in lieu of taxes, for funding various public building projects and services of as yet uncertain usefulness. It is also claimed that the plant will bring economic benefits through its disproportionately small payroll, estimated at various times between 150 and 250. Part of that payroll will consist of pipeline managers who will not necessarily live in Coos Bay. Moreover, it is quite likely that the financial boost from that modest payroll will be offset by jobs losses in other sectors of the local economy so that in the end, the net result will be negative.



29 years of population growth in Oregon, by counties, 1980-2009.
(dark-shaded counties lost population. State population growth during this time: +45.2%)

Source: Oregon Blue Book

The economic sectors where employment is at risk of shrinking include fishing, tourism and retirement; and these in turn will produce declines in related sectors. For example, tourists who like what they see often become permanent residents, but that tendency, already less common in Coos County than elsewhere on the coast, will diminish further; and retirees are the age group that consumes health care services at the highest rate, so reducing Coos County's attractiveness will affect that key sector of the local economy – among others, such as real estate and retail.

I use the expression “less attractive” because Coos County has long been the exception to the trend of healthy economic growth on the Oregon coast. Since 1980 all other coastal Counties have seen their populations grow by an average of over 20%, mainly thanks to an influx of retired people who had discovered reasonably priced housing, recreational opportunities and the country's cleanest air, which their often-impaired respiratory systems required. And often those retirees' first introduction to the area had been as tourists. While visiting they liked the area well enough to make it their permanent home.

Unfortunately, Coos County's permanent obsession with recruiting new heavy industries and restoring the local harbor to its former glory, which was based on an unrealistic appraisal of the area's economic potential, seems to have caused us to miss out on such growth, for during those same years Coos County's population stagnated. From 1980 to 2009 Coos County's population declined by 1.5%, or about 1,000 people, which caused it to join several declining desert counties, all marked in dark blue on the map; and those desert counties have nothing like our scenic and recreational assets.

So Coos County could have followed the other coastal Counties' example, for we do get lots of tourists:

Travel Oregon provides us with annual research data which shows just how important these tourists are to our communities. In 2017, visitors to Coos County spent more than \$258.1 million on hotel stays, food & beverage, shopping, recreation, fuel, and more. ... Even more importantly, visitor spending in Coos County supports more than 3,300 jobs, that's more jobs than Bay Area Hospital and the forestry/wood products industry combined. It generates \$1.5 million in local tax revenues. ... For every resident in Coos County, approximately 63,310 visitors to the county spent \$4,076 per resident.¹⁾

“This project is bad for Newport's tourism, economy and quality of life. Don't make Newport look like Coos Bay!”

A commenter during a hearing in 2014, on a proposal for a log export terminal on Newport's scenic harbor.

It's true that since the map on the previous page was made, Coos County's population has grown modestly. Between 2009 and 2017 it gained 823 people, probably an effect of the economic recovery since the 2007 recession. That increase of a little over 1% almost made up for the decline of the previous 29 years, but not quite. In 2017 Coos County's population reached 63,888, still short of the number reached in 1980, which was 64,047.

The point of all this is that more people coming to an area, especially people who bring money, skills or enterprise (or some combination of those assets) will spur economic

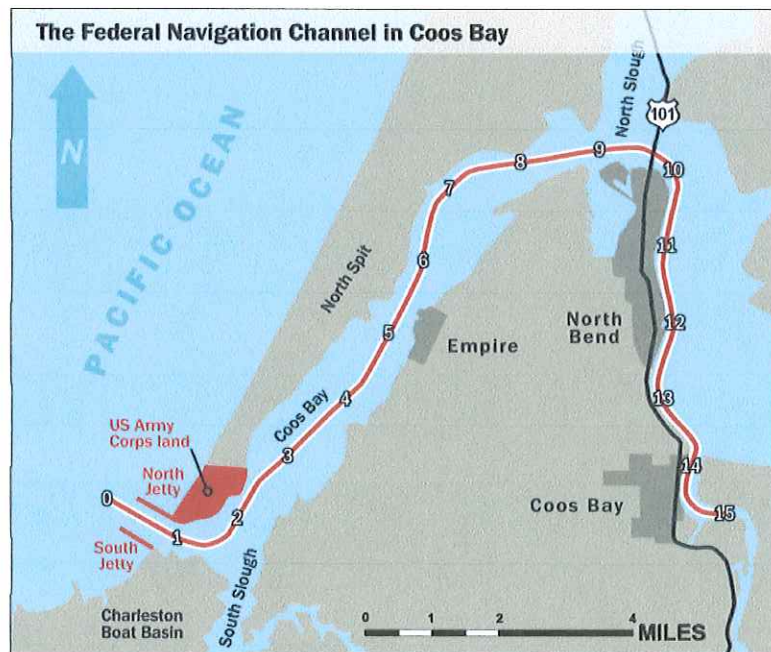
¹⁾ “Tourism: Good for Coos County's economy? You bet!” *The World*, May 9, 2018.

growth; and a naturally attractive area has a natural advantage there. But in Coos County, although we've drawn benefits from tourism, we have clearly not turned as many tourists into permanent residents as the other coastal counties have; and it has been the recurring threats of recruiting new, dirty or dangerous industries all through the past 40 years that have discouraged people from settling. Eventually a few did choose to live here, but now the question is: how many of those will stay, if Jordan Cove is built? I personally know several people who have told me they will leave because their health will not tolerate what has been announced as the biggest future air polluter in the state of Oregon. Dr. Joseph Morgan, the now-retired local allergist, has testified to that as well.

People with specialized knowledge of marine biology have also asserted that Jordan Cove's tanker traffic – which will monopolize most of the slack high tides – will seriously detract from in-bay crabbing and clamming activities, which take place at those same slack high tides. This amounts to even more economic damage.

Moreover, once Jordan Cove is approved, it is almost certain to push for getting the ship channel deepened from the present -37 feet to -45 feet while also widening it. That radical plan is not part of its present proposal, to the County or to other public agencies, but the company has been paying all of the costs of planning the project, which is allegedly being done independently by the Port of Coos Bay. The Port's '*channel modification project*'

would be very destructive to our public trust, the estuary, requiring the removal of millions of tons of rock; but it would be done only in the lower bay, to end just past the proposed terminal site, at channel mile 8.2. Obviously Jordan Cove would be the only beneficiary, although in theory the adjacent Roseburg chip export facility could receive bigger chip ships.



Even so, the Port of Coos Bay's website conceals these awkward facts, with jargon on its website about the channel modification being necessary for "facilitating future economic development in Oregon" and to "accommodate the growing global fleet," which has shown no great eagerness to start visiting Coos Bay. But the threat to the bay, an important public trust, remains.

In summary, the dredging project should NOT be considered in isolation, because aside from the highly problematic LNG terminal it is undeniably part of a much bigger plan.

The other big issues that should be part of a balancing act between public benefits and public losses are the national interest, and public safety.

(2) The project will not serve the national interest

It has often been claimed that by improving the U.S. balance of payments and creating demand for our domestic natural gas drillers, the nation will benefit. This assumes that Jordan Cove will export American-produced natural gas as LNG through its Coos Bay terminal. But this is not at all what Jordan Cove plans to do. It has long been an open secret that all, or nearly all, of the gas Jordan Cove will turn into LNG at its Coos Bay terminal will come from Canada, where excitement over its plan is palpable, due to its:

... benefits for Canada, Western Canada's natural gas producers, and Alberta's petrochemical industry. By utilizing existing natural gas transmission systems in Alberta and British Columbia, natural gas supplies for Jordan Cove can be entirely sourced from the Western Canadian Sedimentary Basin ("WCSB"), keeping pipelines and related facilities used and useful²⁾

It's true that Jordan Cove threw a small bone to drooling drillers in Colorado, by promising to buy a tiny portion of its natural gas from them. In September 2018 company representative Stuart Taylor had traveled to Grand Junction, Colorado, promising to "hold space in the project for Rockies producers":

That space currently may amount to about 75 million to 150 million cubic feet a day, which Taylor acknowledged doesn't sound like a lot in the context of a project that could initially ship 1.3 billion cubic feet a day.³⁾

Amazingly, Mr. Taylor's honesty did not ruin his



²⁾ 'Project Description' appended to a 'Letter Decision' by Canada's National Energy Board, which granted Jordan Cove a license to export up to 1.55 billion cubic feet of Canadian gas per day, for 25 years. *Letter Decision, 20 February 2014, National Energy Board/Office national de l'énergie, File OF-El-Gas-GI-J705-2013-01 01*, to Kevan King and L.E. Smith, Q.C.

³⁾ Dennis Webb "Geopolitical case for Jordan Cove", *G.J.sentinel* (Grand Junction, Colorado), September 12, 2018. As a percentage of 1.3 billion cubic feet a day processed (other estimates are a bit lower), 75 to 150 million cf/d of Colorado gas will make up between 5.8% and 11.5% of the total volume.

mission, since the Colorado frackers, many of whom are financially hard up, sounded excited about merely supplying between 5.8 and 11.5% of Jordan Cove's gas. Obviously this was a political stunt, one of many performed by Jordan Cove in recent years, including some of dubious legality.⁴⁾ Colorado's tiny gas input would go through the Ruby pipeline from Opal in western Wyoming to Malin in southern Oregon, and from there to Coos Bay through the new PCCP pipeline; see the map on the previous page, 5. But the reasons why Jordan Cove plans to use all or almost all Canadian gas must include that it is likely to be much cheaper too.⁵⁾

Jordan Cove has not been a member of the Society of International Gas Tanker and Terminal Operators, or SIGTTO, the LNG industry's safety agency, for very long. According to the biannual magazine "SIGTTO NEWS", the company only joined on November 1, 2015, more than a decade after arriving in Coos Bay. The magazine's description of Jordan Cove's business plan, most likely provided by Jordan Cove itself, supplied further evidence of its Canadian gas supply:

Jordan Cove LNG plans to build an LNG export terminal at Coos Bay in the US state of Oregon. ... Gas for liquefaction would be piped overland from deposits in western Canada.⁶⁾

"A lie travels halfway around the world before the truth has got its boots on."
British Army saying

(3) Jordan Cove poses severe, unusual risks to public safety

While Jordan Cove claims to have followed the safety standards formulated by the LNG industry's safety agency SIGTTO, the U.S. Coast Guard has confirmed that the company used standards for the petroleum industry instead:

"Jordan Cove used the American National Standards Institute (ANSI)/American Petroleum Institute (API) Standard 780 Security Risk Assessment (SRA) Methodology, as the basic approach for assessing risk. The standard was published in June of 2013 as a U. S. standard for security risk assessments on petroleum and petrochemical facilities. The standard is a tool used to evaluate all security risks associated with petroleum and petrochemical infrastructure and operations ..." ⁷⁾

Adding to the strangeness of this was the Coast Guard's observation, in that very same document, that "LNG is not considered oil".⁸⁾ And that is not only true, but it makes a huge difference for the project's safety aspects that Jordan Cove and its experts, including

⁴⁾ My February 1, 2019 submission to DSL described those on pages 13-15.

⁵⁾ On average, throughout 2018 AECO (Canadian) gas sold at less than half the price of Opal Rockies gas. Connor McLean: "PG&E's bankruptcy spelling trouble for Ruby?" *BTU Analytics*, January 29, 2019.

⁶⁾ *SIGTTO News*, Spring 2016, page 11.

⁷⁾ U.S. Coast Guard *Analysis to supporting the Letter of Recommendation of May 10, 2018*, by W.R. Timmons, Captain of the Port, Sector Columbia River, at § #5 on page 5 (= PDF page 441), in Jordan Cove's May 10, 2019 rebuttal. The CG document including LOR and Analysis is found on PDF pages 433 - 446.

⁸⁾ *Ibid.*, in § #4 on page 2 of its Analysis (= PDF page 438).

the U.S. Coast Guard, seem determined to ignore. In a few words, natural gas coming off spilled LNG burns 10 to 15 times hotter than spilled oil because it burns so cleanly, without smoke to absorb most of the heat. This is based on scientific measurements of



the heat radiation of oil vs. gas, which I can provide if needed.

Real-life illustrations of the difference in burning characteristics can easily be found. While sailing through the Gulf of Aden near Yemen in

2002, the oil tanker Limburg was attacked by terrorists. Suicide bombers in a dinghy loaded with explosives blew a hole in the side of the double-hulled, 1100-foot long tanker. Out through the breach poured an estimated 90,000 barrels, or 14,000 m³ (= cubic meters) of crude oil, which ignited. The photo shows that it made for a very smoky fire on the water.

But although the exploded terrorists received prolific posthumous praise from the late Osama bin Laden, they had not achieved much. Besides inflicting nasty but temporary pollution on local air and sea, they had wounded 12 of the oil tanker's crewmen and killed one, but there were no other casualties. And the ship was repaired and used for 16 more years.

But notice the small boat, close to the black oil fire billowing off the tanker. If the Limburg had been an LNG tanker, carrying *Liquefied Natural Gas* that had spilled the same volume of LNG instead of oil (14,000 m³) and was on fire, there would have been very little smoke, but that boat would not have been there. Or if it had been there, those on board would have been dead and burned. The same goes for the LNG tanker itself, and its entire crew. In fact, anybody within 2.2 miles of a fire from a breached LNG tanker would have run those same risks: death and/or severe burns.

And just last month, oil tankers in that part of the world have been damaged by limpet mines, something that could be done to LNG carriers in Coos Bay. Sailing within 1/3 mile of residential areas including schools, a breached, burning LNG carrier could cause a lot of collateral damage. This is why Jordan Cove's claims about having followed SIGTTO's safety recommendations not only ring hollow; they are dangerously irresponsible.

(4) Instead of applying SIGTTO's safety standards, Jordan Cove uses semantic confusion to evade them

Instead of following SIGTTO's key safety standards, Jordan Cove has given itself a permanent exemption, by means of semantic trickery. For instance, on page 20 (= p. 26 PDF) of a recent rebuttal dated May 9, 2019 to the Department of State Lands, Jordan Cove boasted:

JCEP is a member of Society of International Gas Tanker and Terminal Operators (SIGTTO) and adheres to its principles.

“When a man says he approves of something in principle, it means he hasn't the slightest intention of carrying it out in practice.”
Otto von Bismarck

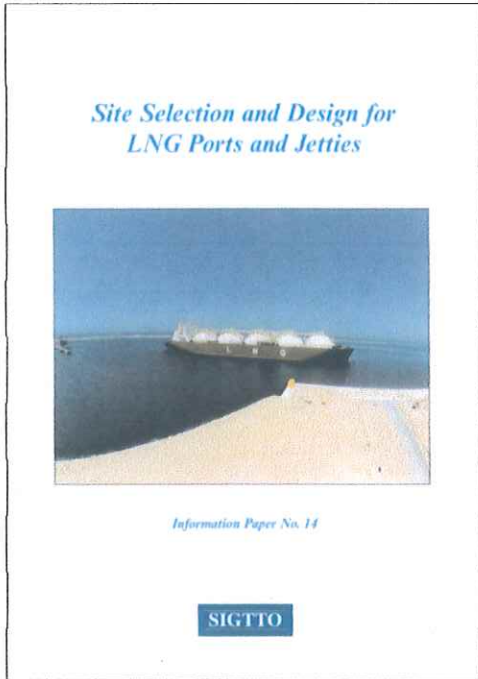
In truth, Jordan Cove is continuing its long-time non-adherence. Like all new members, Jordan Cove was given free copies of all SIGTTO publications, including *“Information Paper 14, “Site Selection and Design for LNG Ports and Jetties”*, for which I myself had to pay \$70. But instead of applying Paper 14's principles, Jordan Cove has used that publication to exempt itself from them. A careful reading of this part of Jordan Cove's recent rebuttal to DSL will bring this out. It starts with a quote from SIGTTO's Paper 14 (again, I added all the highlighting):

“This paper addresses safety issues for LNG ports. It focuses on the elimination of spillages both at the ship/shore interface and in navigational approach channels. The paper concentrates on issues which can be solved when a port is being designed and is, therefore, of benefit to harbor planners and port authorities. Flowing from these considerations, the paper outlines a way forward for the site selection of LNG terminals, establishes a basis for safe jetty design and considers safety factors in the port approach.” The paper was developed for LNG projects where ports do not yet exist and are being developed. The Port of Coos Bay is not within this category. JORDAN COVE has, however, used the paper's concepts in addressing risk.

(Page 20, or PDF page 26, of Jordan Cove's May 9, 2019 rebuttal to Oregon's DSL)

Please notice that this has two parts. The first part, in quotation marks and with red and yellow highlighting, is from Paper 14's Summary, on page 2. Next comes Jordan Cove's interpretation, which I highlighted in blue, with red letters to emphasize what's wrong.

The reason it's wrong may be due to paper 14's British origin. Just as from one English-speaking part of the world to another, pronunciation and spelling may differ somewhat, so may the local meanings of certain words, which is what *semantics* is about: the study of the *meaning of words*, in order to reduce confusion in communications. This is why we must study two confusion-inducing words, *both found throughout Paper 14 and in its title*. Those words are *jetty* and *port*. An attentive reading will reveal that the first word, '*jetty*', refers to a maritime facility for mooring, loading and unloading LNG carriers, so SIGTTO's *jetty* is what we would call a *dock*. Other words like pier and wharf could work, but '*dock*' would be the most common, and hence the most accepted term in our part of the world. On the other hand, the British would call the two rock '*jetties*' at our harbor entrance '*breakwaters*', admittedly a more descriptive term. And these differences explain why SIGTTO's Information Paper 14, starting on page 24 under



the caption "**The Jetty**", lists many safety recommendations for '**jetties**' that clearly are not **our** kind of jetties. To cite just a few:

Jetty location should be remote from populated areas and should also be well removed from other marine traffic and any port activity which may cause a hazard.

The maximum credible [LNG] spill and its estimated gas-cloud range should be carefully established for the **jetty** area.

River bends and narrow channels should not be considered as appropriate positions for LNG carrier **jetties**. ...

- - -

The other confusion-inducing word is '**Port**', and especially '**LNG Port**', which needs

clarification even more badly than '**jetty**'. Like '**jetty**', it is used throughout Information Paper 14, and also in its title: "**Site Selection and Design for LNG Ports and Jetties**".

Ordinarily in America a 'Port' describes a harbor or an authority in charge of it, which is usually public but can be private. Such a port may handle general cargo or bulk cargo or containers, or all of those; many ports also berth cruise ships, fishing boats, yachts and other craft. But a careful reading of Paper 14 makes clear that what it calls an '**LNG Port**' is not that kind of port – like the Ports of Coos Bay or Portland. An '**LNG Port**', in SIGTTO's book, describes a specific maritime facility, belonging to an LNG terminal and only for its use, which consists of mooring, loading or unloading LNG carriers, at what SIGTTO calls that **LNG Port's jetty**. The **LNG Port** will include a few more elements, including moorage for tugboats and a suitable body of water, either created or there all along. But it does not accommodate other uses, not normally anyway.

It's also obvious in SIGTTO's Paper 14 that whether or not an **LNG Port** is located inside an existing commercial harbor is irrelevant as long as its own moorage facilities have deep water access and no close neighbors, whether industrial, maritime, or human. That's because SIGTTO strongly discourages nearby industries, ships, and populations, as I have also pointed out in earlier submissions to the County. Other industries and ships pose dangers to the LNG operation, and the local population may be seriously harmed by spills of LNG and gases, no matter for what reason y occur. After all, LNG is classified as a hazardous product. It follows that, given of SIGTTO's siting advice, it usually makes the most sense **not to locate** an LNG Port **in an existing harbor**, so the LNG operator will be free to create his own 'Port', from scratch. This is implied in Paper 14's demands that all potentially

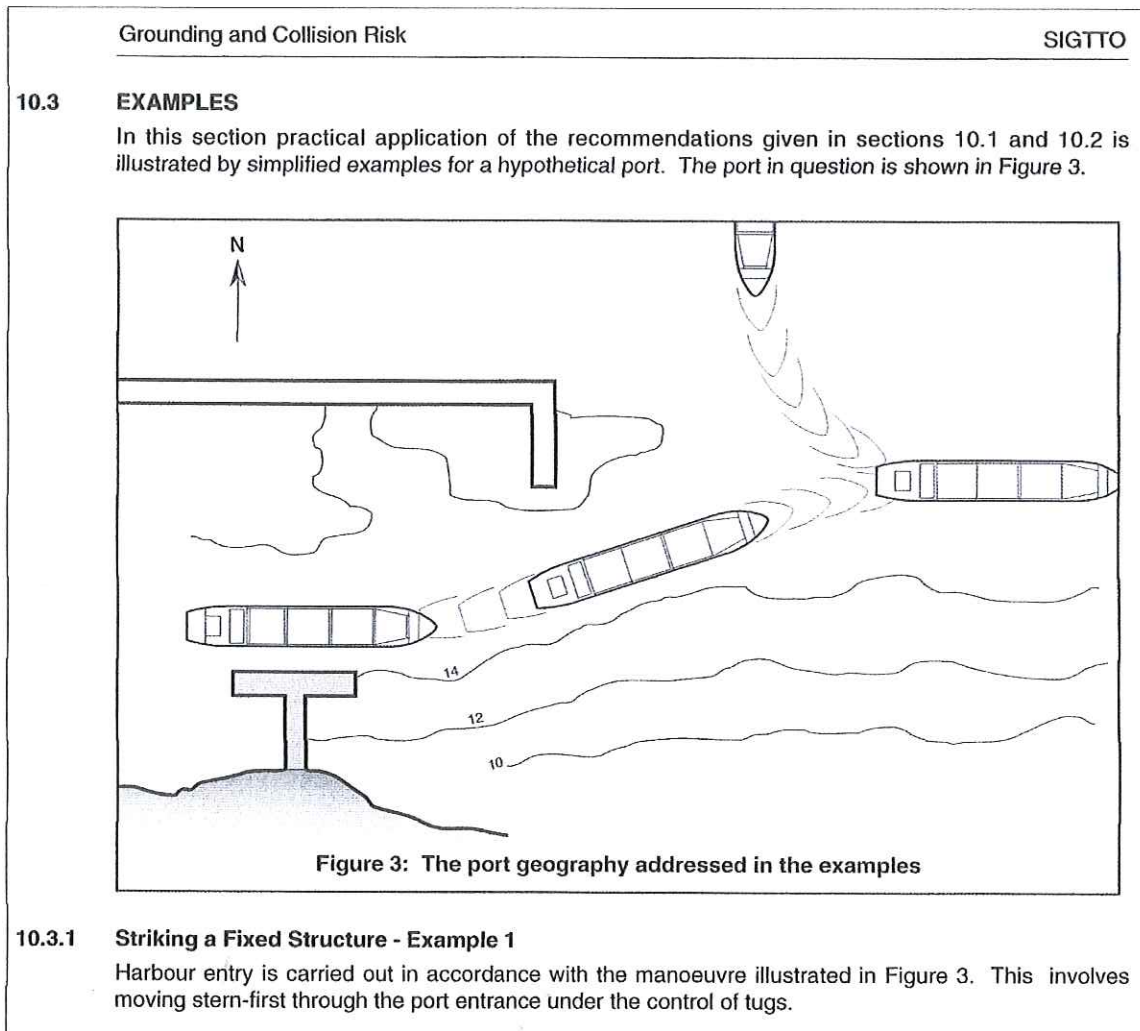
"England and America are two countries separated by the same language."

George Bernard Shaw
attributed, 1942

hazardous port activity be kept away from 'LNG jetties' and 'LNG Ports', demands that would likely create conflicts if the LNG facility were to be planned inside an existing general-purpose harbor. In far fewer words, an 'LNG Port' in Paper 14 is what we call a **moorage slip or a carrier basin**, but not a 'Port' in **OUR** meaning of the word.

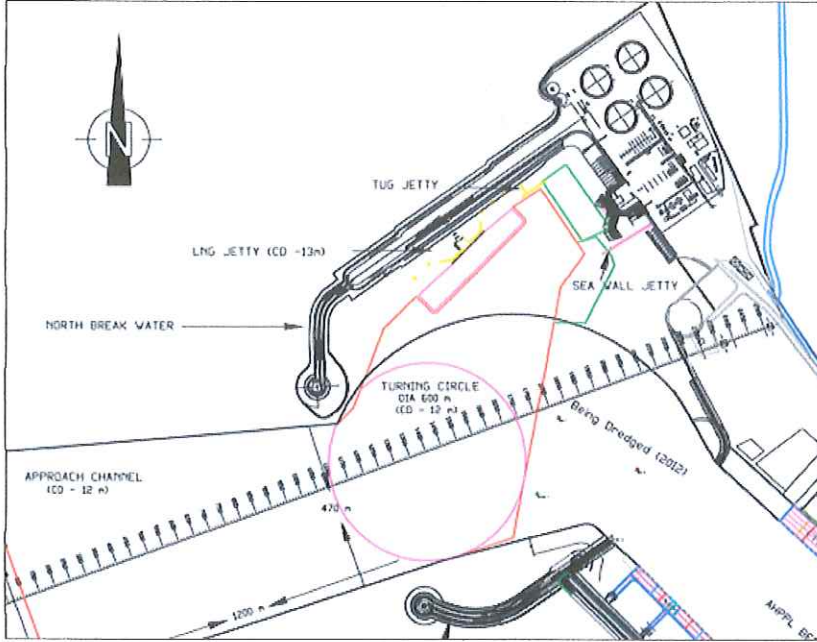
That SIGTTO's Information Paper 14 does distinguish between "LNG Ports" and ports in the sense of "harbour" is confirmed at the top of its page 24, under "Port Procedures":

Traffic control and VTS systems should be strictly enforced to ensure safe **harbour** manoeuvring between the pilot boarding area and the jetty.



In this graph, from page 19 of Information Paper 14, SIGTTO refers to the channel through which a vessel sails to the **LNG Port** as a 'Harbour'. It also shows the procedure for moving an incoming LNG carrier into the LNG '**port**'. After '**Harbour entry**' the ship is turned in order to back it 'stern-first' into the LNG '**port entrance**', to be moored at its 'jetty'. (The numbers in the graph are water depths, in meters.) Also note the protective separation structure between the '**Port**', or the LNG carrier moorage basin with its '**jetty**', and the '**harbour**', i.e. the navigation channel, to prevent ship collisions.

The graph below shows the Shell-owned Hazira LNG import 'Port' on India's west coast, built in 2005. It illustrates several SIGTTO terms. From top left downward it identifies a **tug jetty**, an **LNG jetty**, a **break water** and an **approach channel** for the LNG carriers. That approach channel is only 1200 meters or ¾ mile long, infinitely better than



Coos Bay's narrow and curvy 8-mile channel.

While the northern part of the Hazira port is exclusively for the LNG carriers, its southern part has moorage for other types of cargo vessels, including container ships. While at first glance this may seem less than ideal, the layout of this recently planned harbor minimizes chances of collisions between the

LNG carriers and the other ships, due to the wide separation between the two moorages, and the shortness of Hazira's navigation channel. And that channel meets SIGTTO's demand for offering carriers a quick escape route in emergencies like tsunamis. The aerial photo also shows considerable vacant land around the LNG Port, increasing public safety. Besides Hazira LNG, Shell Oil also owns Hazira Port, the company in charge of the other cargo docks, so it can control their use, including timing the movements of the LNG ships and other vessels so as to avoid conflicts.



The next page shows many other **LNG Ports** that were sited in conformance with SIGTTO's standards, so they don't put the public at risk. Besides the Hazira plan four other 'LNG Port' layouts seem to be common across the world today, and all satisfy SIGTTO's safety recommendations. And the common, simple, effective reason is that every one is surrounded by vast stretches of uninhabited land and/or water.

There are several ways to create "LNG Ports" compliant with SIGTTO safety standards outside existing harbors. Below are aerial illustrations of each method: (1) Build a long pier from a coastal LNG terminal to deep open water, which requires a long pipeline from the terminal to the "jetty", but is common at Australian export terminals and at import terminals elsewhere. (2) Dig a moorage basin next to a deep-water inlet, as was done at LNG export terminals in Louisiana. (3) Create an LNG import island, as in China and western Europe. (4) Site floating liquefaction-export vessels (FLNGs) or floating regasification units (FSRUs) offshore, with undersea pipelines.



To recap, as used in Paper 14, 'LNG Port' does **not** describe an entire harbor, but only **an LNG terminal's own moorage and loading facilities**, which include a 'jetty' or what we call dock. *But Jordan Cove has taken SIGTTO's term **Port to mean Harbor*** in the sense of a general-purpose harbor that may have an LNG terminal inserted into it. This is a handy way for Jordan Cove to grant itself an exemption from SIGTTO's key safety principles, since following those would preclude siting its terminal **anywhere in Coos Bay**. For clarity I repeat part of Jordan Cove's self-serving interpretation, cited earlier on page 8:

The paper was developed for LNG projects where **ports do not yet exist and are being developed**. **The Port of Coos Bay is not within this category.**"

Although the first sentence contains truth, Jordan Cove's semantic confusion about the word '**ports**' enables it to add the second sentence, which is wrong and deceptive, although I cannot say that it is knowingly so. In any case, **this is how Jordan Cove gives itself a pass**.

In an unplanned defense of Jordan Cove, I also need to admit that it took me years to fully understand the SIGTTO terms, above all the meaning and implications of '**LNG Port**'. And it is not just with regard to 'port' and 'jetty' that Paper 14 could have used more clarity. The document reads like something put together by a committee of insiders, as many trade publications do. But Paper 14 was intended for a multi-national audience dealing in a highly hazardous product, so the insiders should have worked harder at producing a document that communicates effectively where different linguistic customs prevail. They should have consulted with editors and with overseas SIGTTO members. They should also have expanded the skimpy 'Nomenclature' on Paper 14's page 1, which merely explains 16 industrial acronyms, half of them professional organizations, including SIGTTO. That low-information 'Nomenclature' should have been expanded into a **Glossary** that included definitions of 'ports' and 'jetties' and their equivalent terms elsewhere in the English-speaking world, along with more detailed but plain-English explanations of LNG industry tools like 'hard arm', 'ERS system', VTS system, and others used in Paper 14. While I cannot speak for people in New Zealand or South Africa, I'm convinced that the shortage of such information has needlessly fostered confusion among American readers, thus constraining Paper 14's effectiveness.

But beyond doubt the worst, most dangerous result of the semantic muddle about '**ports**' is that it enabled Jordan Cove to declare Coos Bay, as a long-established port, immune to SIGTTO's safety principles. It's a grandfathering of the applicant by the applicant; and while very convenient for Jordan Cove, it should not have survived scrutiny. Clearly Paper 14's authors do **not** consider a port like Coos Bay, or many other existing ports, suitable **LNG ports**. Instead, the sense in which they used the term '**LNG Port**' was as a preferably new waterside facility exclusively for the shipping of LNG, the planning of which should be done from the ground up, following all or else most of the siting principles in their paper. Essentially, whether that 'LNG Port' is inside or outside an established harbor is unimportant as long as its location conforms to the great majority of SIGTTO's standards. If it can't conform, that **LNG port** shouldn't be built there.

In striking contrast, Jordan Cove’s approach says that if Jordan Cove decides to site an LNG ‘Port’ into an existing port like Coos Bay, which offers no locations substantially conforming to SIGTTO’s fail-safe public safety standards, then Jordan Cove should be exempted. Their LNG terminal should be entitled to ignore SIGTTO’s calls for proper distances from populations and other ships and industries, for fast escape routes in emergencies like tsunamis, for avoiding long narrow channels and moorage on outside curves, along with recommended ship channel dimensions much roomier than are achievable in Coos Bay – and more.

It’s circular reasoning. And it’s irresponsibly wrong and self-serving.

For unlike Jordan Cove, Paper 14 admits:

... although LNG has an enviable record it is not risk free. Not only are some hazards difficult to eradicate; an accident, albeit rare, is possible as a result of human error or catastrophic event such as an earthquake. ...”

(SIGTTO Information Paper 14, p. 2)

And in time, those initial decisions may be the key to survival of the local population:

At the time of site election, the level of marine risk is determined by the position chosen for the terminal and this is especially true of terminals handling hazardous cargoes such as LNG. Once the port is in operation, the risks identified during planning should be controlled by suitable equipment and pre-arranged procedures. This should include the on-going need to keep other industry or populations remote from the plant.”

(SIGTTO Information paper 14, p. 4, 5th §)

“On-going” means that once an LNG terminal and its ‘Port’ have been sited at a safe distance from other industries and local populations, that separation must be preserved during the facility’s economic life. And this strongly suggests that if the land in the safety zone might be profitably used for other purposes, the terminal owner should block those, preferably by owning that land outright, because counting on politicians’ wisdom to block other business developments is unwise. And in fact, many LNG terminals have achieved just that, as seen in the aerial photos on page 12 of this letter, which show them surrounded by many miles of vacant land and/or water.

... in some circumstances, such as a large LNG release close to a populated area, it may be impossible to devise a realistic contingency plan because of the nature of the problem. Herein lies a conundrum which may only be resolved by further reducing the chance of a major release by designing-out the problem.

(SIGTTO Information Paper 14, p. 5, 3rd §)

✂

“A very great part of the mischiefs that vex this world arises from words.”

Edmund Burke

Once again, “designing-out the problem”, i.e. the hazards of unforeseen LNG spills, comes to the same thing: creating a permanent exclusion zone, so few people except

those at the terminal can get hurt. There is no way that can be achieved in Coos Bay; the place is simply unsuitable. But then, it must have been built-in problems like Coos Bay's that caused Paper 14's authors to urge 'LNG Port' designers to:

"... construct **jetties** handling hazardous cargoes in **remote areas** where other ships to not pose a (collision) risk and where any gas escape cannot affect local populations."

(SIGTTO Information Paper 14, pp. 5/6)

"References (6), (7) and (8) all direct **port** designers to **construct jetties** handling hazardous cargoes in **remote areas** where other ships do not pose a (collision) risk and where any gas escape cannot affect local populations." ⁹⁾

"**Jetty location** should also be chosen to reduce the risk of passing ships striking a berthed LNG carrier ... However, as far as **port design** is concerned, **some features** are clear cut. For example, positioning an LNG terminal on the outside of a river bend raises the risk that a passing ship may strike the berthed carrier if the manoeuvre is not properly executed. This is possible because, at some point on the bend, the manoeuvring ship must head directly at the berthed LNG carrier."

(SIGTTO Information Paper 14, p. 7, 2nd §)

I have raised all these issues including the "river bend" before, but Jordan Cove continues to ignore it. The company also cherry-picked SIGTTO's work to butter its own bread:

What is not considered in the SIGTTO Information Paper 14 is the risk assessment conducted based upon the conditions at the specific port where any LNG marine terminal is proposed. SIGTTO states, "Once the **port** is in operation, the risks identified during planning should be controlled by suitable equipment and prearranged procedures."

(Jordan Cove rebuttal to DSL of 5-9-19, p. 21 (= PDF p. 27))

True enough, SIGTTO did state that; it is in the second quote I reproduced on the preceding page, 14. But on the heels of it came this SIGTTO rule, no doubt purposely omitted by Jordan Cove:

"This should include the on-going need to keep other industry or populations remote from the plant."

"The capacity of the human mind to screen out what it does not want to see is formidable."
Theodore Dalrymple

By leaving out that part, Jordan Cove again exempted itself from conforming to the SIGTTO standards. Instead it continued to pretend that they are just 'concepts' that may be applied or not. While there is a smidgen of truth in that, this being an imperfect world, with Jordan Cove it is code

⁹⁾ SIGTTO Information Paper 14, p. 6, at bottom. References (6), (7) and (8) are three publications on harbor safety and dangerous cargoes, found in Information Paper 14's source list on page 21. They are:
6: "Recommendations on the Safe Transport of Dangerous Cargoes and Related Activities in Port Areas – 1995, (IMO Ref 290E);
7: "Dangerous Goods in Ports: Recommendations for Port Designers and Port Operators – 1985, PIANC;
8: "Guidelines for Environmental Planning and Management in Ports and Coastal Area Developments – 1989, IAPH.

for not applying SIGTTO's major standards at all, although it hides this with a lot of verbiage about 'mitigation' and 'modeling':

JCEP has worked for 14 years with federal, state, and local agencies, and the Coos Bay Pilots in developing the **proper mitigation measures to overcome and mitigate the potential risks** identified. ... simulation modeling has been witnessed by those same federal and state agencies and the Coos Bay Pilots. JCEP has described and has demonstrated to the waterway **experts** (USCG and Coos Bay Pilots) the ability to effectively implement the mitigation measures to ensure the waterway is suitable for LNG carrier traffic. The SIGTTO-recommended values in the Information Paper do not consider the location-specific risk assessments conducted and the mitigation measures that have been agreed with the maritime experts of these agencies.

(Jordan Cove's May 9 response to Oregon's DSL, p. 21 (PDF p. 27), third §)

"When you put a hazardous facility in a tsunami zone, it won't really get its test flight until the tsunami rolls in. And that's the problem. In my mind, it's like Boeing building a new airplane and saying: *"Well, we've done all the computer models and now we're going to sell tickets on the test flight."* No matter how much engineering you throw at a facility on the coast, whether it's an LNG tank or whatever, things may just not go according to plan when the event really happens."

Chris Goldfinger, the marine earthquake scientist who led OSU's Cascadia Subduction Zone research team that found in 2012 that the southern coast of Oregon was overdue for a massive earthquake-tsunami. Goldfinger was in Japan when the 2011 Tohoku earthquake-tsunami struck that country's coast.

The statement's first line already is a misrepresentation; SIGTTO's Paper 14 does not recommend "**mitigation measures to overcome and mitigate the potential risks**", if those measures are intended to replace the fail-safe distance standards that Jordan Cove ignores. Quotes from Paper 14 throughout this letter drive home SIGTTO's awareness that despite all the protocols and electronic devices in the world, accidents and mistakes will happen, so **the need to keep other industries and population centers remote from 'LNG Ports' and 'LNG Jetties' is permanent.**

(5) Jordan Cove has no proven plan for handling a loaded LNG carrier during the expected tsunami.

From Jordan Cove's 2015 Final EIS:

"It is calculated that it would take **25 minutes for a large tsunami** generated from the CSZ [= Cascadia Subduction Zone] to reach Coos Bay after the earthquake event occurs, **which would provide time for LNG vessels to disconnect** from the berth and to reconnect with the tug boats. The tethered LNG vessel and **the three tug boats** would hold their position under power to offset the advancing wave and currents. The tsunami wave is predicted to impact the bow of the ship head on. **If the LNG vessel is traversing the channel during the tsunami, the tugs would also provide assistance as described above.**"¹⁰⁾

¹⁰⁾ Jordan Cove FEIS of 2015, pp. 4-251/4-252. (= pp. 601/602 in the 7891-page PDF).

The alleged 25 minute interval between earthquake and tsunami is a vast overestimate, since the scientific consensus says 10 minutes, and it is very doubtful that in 10 minutes the ship could be unmoored, tied to the tugboats and moved to the middle of the moorage slip. But perhaps more to the point, tugboat crewmen with healthy survival instincts may not stick around to find out if Jordan Cove's plan will work.

"If I were a tugboat operator, and a subduction zone earthquake started, I would be doing what everybody else will be doing, and that is running for high ground. The last thing you want to do is get on a boat in a tsunami zone, and your chances of that working out are not good."

Chris Goldfinger, the marine earthquake scientist who led OSU's Cascadia Subduction Zone research that found in 2012 that the southern coast of Oregon was overdue for a massive earthquake-tsunami. Goldfinger was in Japan when the 2011 Tohoku earthquake-tsunami struck that country's northeastern coast.

PDF page 366 of Jordan Cove's May 9 rebuttal to DSL carried an entirely different scenario, in the form of a 'simulation' that assumed an earthquake 15 miles offshore, generating a tsunami arriving 3 hours later; but this contradicted everything known about local offshore geology.

In earlier communications to the County and state agencies I have also disproved claims by Jordan Cove spokesmen that all 30 Japanese LNG import terminals survived the 2011 Tohoku quake-tsunami, without a scratch. I did the same to a their claim that an LNG carrier moored at the Arun LNG terminal in Indonesia survived one of the disastrous tsunamis that have struck that part of the world in recent years. In truth, Arun had not been affected.

When asked about this puzzle, one U.S. Coast Guard official confessed that **there is no plan:** → → →

"I'm very skeptical that anything can be done in a near-shore tsunami to protect the tanker," said Randy Clark, a security specialist with the U.S. Coast Guard. "There simply isn't enough time. . . . There are no real regulations. There is no requirement to mitigate this risk."

A search of Jordan Cove's most recent Draft EIS revealed that this time it did not repeat its claim, quoted on the previous page, about unmooring the ship and controlling it with three tugboats, but it didn't replace it with another plan either.

"Jordan Cove LNG terminal at Coos Bay designed for Cascadia quake, tsunami though hazards remain", *The Oregonian/Oregon Live*, June 26, 2014.

Nevertheless, Jordan Cove asserts (on page 45/46 of its May 9 rebuttal to DSL, or PDF page 51/52):

The project adequately protects against tsunami and earthquake safety hazards.

... Applicants discuss how the Project has minimized potential harm from tsunami and earthquake risks in DEIS Sections 4.1.4 (page 4-40) and 4.13, (Pages 4-734 to 4-740); and the LNG Terminal is designed to protect against tsunami inundation, flooding and sea level rise, hurricanes and storm surge, and seismic events to provide safety and protection to facility staff and the general public.

While Jordan Cove's claims that the terminal's storage tanks and other facilities have been raised far enough above tsunami level may be true, they still fail to address the prospect of LNG carriers being thrown onto land and breached during the tsunami. Moreover, the parts of this year's Draft EIS cited above by Jordan Cove amount to no more than a list of all the government agencies that have some authority over this project, and the procedures they may use; there is not a word about how loaded tankers will be handled during the tsunami. I can only conclude that *if* Jordan Cove has an experience-based 'plan' for that prospect, it is a deep secret; but everything suggests that the company has no plan at all.

(6) Despite plausible scenarios for *terrorist* attacks and almost 17,000 potential victims, Jordan Cove fails to address those dangers too.



In January of this year it was reported that the chief of Jordan Cove's new, company-owned sheriff's department asserted that Coos Bay is "not an attractive target" for terrorists. To put this into perspective, he also said that he did not expect Coos Bay to be attacked by Somali pirates.¹¹⁾ With his second statement I can agree, for geographical reasons; traveling more than 10,000 miles in a 16-foot skiff sounds too onerous.

Regardless of the piratical menace, my answer to the sheriff's target assessment of Coos Bay is: **IT DEPENDS**. As Coos Bay is today, terrorists would not waste their evil schemes on it. But they could change their minds if Coos Bay were enhanced by a new attraction that could cause a lot of collateral damage. But the name of that new attraction must not be spoken, because the sheriff deputy's employer, Jordan Cove's terminal, is already being sited in violation of all of the LNG industry's key safety rules, as detailed earlier. And, those violations could be very helpful to ambitious terrorists.

¹¹⁾ "The reality is, in Coos Bay, Oregon, we're not an attractive target", KCBY, January 2, 2009.

On 9/11, box cutters were the only weapons used to kill 3,000 people, a casualty number that dwarfs all subsequent terrorist attacks since. But it demonstrated the terrorists' method: use simple means to exploit big vulnerabilities, and inflict many unexpected deaths.

If Jordan Cove is built, it's not unrealistic to think the equivalent of 9/11 could be inflicted on Coos Bay. By JC's own admission in its 2015 EIS, 16,922 living targets will be inside the 'Hazard Zones' surrounding the terminal and the long narrow channel through which its LNG tankers must sail.¹²⁾ If terrorists cause LNG spills from the terminal or from a tanker, they can cause huge fires, 15 times hotter than any gasoline fire. If they kill only a quarter of the 17,000 people living in the Hazard Zones, their results will exceed 9/11's.

And here are six ways of doing it:

SCENARIO 1: Even if the new sheriff in town is in self-protective denial, the possibility of an attack on the terminal, or more likely on a loaded LNG tanker, by a small boat loaded with explosives (see page 7), must be the main reason why the Coast Guard has mandated exclusion zones and armed escorts around the ships. LNG fire experts Havens and Venart warn that a hole blown into one tank of an LNG carrier can cause a fire so hot that the foamed insulation around all the ship's other tanks melts, so the LNG inside those will turn into gas much too fast for the pressure control system. A chain-reaction of bursting tanks leads to the loss of the entire ship – not to mention the lives of the folks in the three Hazard Zones.

While Scenario 1 seems possible, law enforcement's concentration on waterborne threats may cause the terrorists to favor other scenarios, to preserve the element of surprise:

SCENARIO 2: While a loaded LNG tanker is departing, a small plane takes off from the Tenmile airstrip. Pretending to North Bend's control tower to be in distress but loaded with explosives, it overshoots the airport runway and hits the ship. LNG pours out, causing a pool fire that kills thousands in the Hazard Zones, along with the crews on the still-moving ship, the Coast Guard vessels and the sheriff's boats. That's because inside Hazard Zone 1, within 500 meters, or 1/3 mile, from the fire, nobody is expected to survive.



At a public meeting at the Port office last December I inquired if the LNG tankers' security escort would have any anti-aircraft missiles, and was told no. But time may not allow their use, anyway.

¹²⁾ This number is mentioned in Jordan Cove's FEIS of 2015, page 4-1031 (= p.1381 in the 7891-page pdf).

SCENARIO 3: Terrorists take over a home on a bluff, with a nice view of the bay. They attack the passing tanker with rocket-propelled grenades or similar ordnance.

SCENARIO 4: Before the loaded LNG tanker departs, frogmen have attached a couple of limpet mines, set to blow when it reaches the bay's narrowest part, at Empire. That this is very feasible was shown last month, when it was done to 4 empty oil tankers in the middle east. The nearby picture shows the results. An official report concluded that the mines had been expertly placed, most likely by Iranian divers, so as not to sink the ships but to issue a warning.¹³⁾



SCENARIO 5: Terrorists attack the LNG terminal itself, using 50 cal hunting rifles with bullets of depleted uranium, whose extreme hardness enables it to easily go through a tank – a military tank. They could shoot holes into gas tanks or pipes, hoping that the fire will spread to other parts of the terminal. (Besides natural gas the terminal will store tens of thousands of gallons of other gases, all flammable or explosive or poisonous, in steel tanks.)

SCENARIO 6: Drones remotely controlled from the dunes drop hydrochloric acid on the terminal's gas lines and gas storage. Hydrochloric acid eats through steel in no time. The FAA's electronic countermeasures to drone flights could be evaded by resorting to visual guidance technology.

Jordan Cove has not responded to these concerns, except for regurgitating a very old 'security assessment':

3.32. Navigation Route Security Concerns

The security assessment conducted in association with this Waterway Suitability Assessment demonstrates the lower security risk. Typically, terrorists would be targeting high population areas or targets that would create disastrous consequences. Given the very low population density and the remote nature of the proposed terminal, both may be possible but are not probable.

This is found on Jordan Cove's May 9 rebuttal to DSL, on PDF page 208, which is the same as page 142 of a document published they in 2007 or earlier. Besides being old, Jordan Cove's document is also contradictory. While asserting that terrorists target 'high population areas', seeking to 'create disastrous consequences', it insinuates that they will not try that in Coos Bay due to its 'very low population density'. But, in its Final EIS of 2015, Jordan Cove acknowledged that 16,922 people reside within the three Hazard

¹³⁾ "United Arab Emirates, Norway, Saudi Arabia brief UN Security Council on high degree of sophistication behind Fujairah attacks." *Joint Press Statement of United Arab Emirates, Kingdom of Norway, & Kingdom of Saudi Arabia – New York, 6 June 2019.*

Zones (which they call 'Zones of Concern') that surround the terminal and the long narrow channel through which its LNG tankers must sail. That number of potential burn victims is unlikely to have diminished but, for reasons I don't know, Jordan Cove's Draft EIS published this March makes no mention of it, nor does it cite a different number. Previously the Zones *have* been acknowledged by Jordan Cove and the U.S. Coast Guard, however.¹⁴⁾

We already know that if terrorists breach a loaded LNG tanker, the spilled LNG can cause a fire 15 times hotter than any petroleum fire. The terrorists' use of explosives would have provided ignition. Moreover, LNG fire experts say that most or all of a loaded LNG carrier's tanks could be breached soon after such an attack, in a sort of chain effect, because the huge temperature differences and the melting of the polystyrene insulation around the ship's tanks would cause them to burst. According to Jerry Havens and James Venart, both well known, very serious LNG fire scientists, this could lead to the loss of the entire ship. And that's without considering what such a fire, moving down the bay, would do to our population. If it killed only a quarter of the almost 17,000 people inside the Hazard Zones, the terrorists' achievements would exceed those of 9/11, when slightly fewer than 3,000 were killed.

"I cannot conceive of any vital disaster happening to this vessel. Modern shipbuilding has gone beyond that."
Edward J. Smith,
Captain of the White
Star Line's Titanic

To summarize this part: Jordan Cove continues to denigrate, obfuscate and ignore serious public safety concerns. Jordan Cove is simply not a responsible enterprise.

(7) Even aside from his failure to disclose an ex parte communication, Commissioner Sweet is incurably biased in favor of Jordan Cove

To the uninitiated it can be very hard to discover reasons why our politicians continue to coddle the irresponsible Canadian gas speculators, and point 7 in LUBA's recent response to the County Commissioners only reveals the tip of the iceberg:

7. Failure by Commissioner Sweet to Disclose Substance of *Ex Parte* Communication – Commissioner Sweet failed to disclose the substance of any *ex parte communication* that occurred at a 2014 community luncheon presentation by Applicant about aspects of the Project, OSCC, Or LUBA at 371-372 (McCaffree first assignment of error).

There is far more than this one undisclosed incident to substantiate Commissioner Sweet's inability to be a dispassionate, neutral arbiter. In fact, he has long been such a diehard cheerleader for Jordan Cove that he ought to recuse himself. In the past he has been heard to make statements expressing "complete confidence in Jordan Cove", and feigning ignorance of any pollution caused by the terminal. When asked once if it was

¹⁴⁾ The 16,922 number is mentioned in Jordan Cove's FEIS of 2015, page 4-1031 (= p.1381 in the 7891-page pdf). The Zones are confirmed in several Coast Guard NVICs (Navigation and Vessel Inspection Circulars). PDF page 984 of Jordan Cove's Draft EIS of March 2019 contains the Coast Guard descriptions of the Hazard Zones, which JORDAN COVE prefers to call 'Zones of Concern'.

really such a good idea for the County to depend on Jordan Cove's money, he replied:

"We have to be dependent. Without Jordan Cove, Coos County will shrivel up and rot!"¹⁵⁾

"In general, corruption tends to exist whenever governments have favors to extend, or something to sell."
Alan Greenspan, *chief of the Federal Reserve (1987-2006)*

Last September, when Jordan Cove representative Taylor traveled to Colorado to make his pitch for Jordan Cove buying a little bit of Colorado gas (cited on page 5 of this letter), Commissioner Sweet went with him, either at the taxpayers' expense or at Jordan Cove's. This was at about the same time when Jordan Cove donated \$50,000 to Sweet's reelection campaign, for a small rural County an outlandish amount. I might add to this my understanding that if after an election a candidate has not spent all of his campaign funds, he is pretty much free to do with those what he wants. Assuming that is correct, then excessive donations could double as bribes. But that is assuming that Sweet needs bribing, and his position in favor of Jordan Cove has been so blatant that the company seems to own him already.

One reason for that ownership may be that for more than 10 years already the County has been receiving \$25,000 a month from Jordan Cove, under a so-called "**Interruptible Transportation Purchase Agreement**", officially a 'lease' of our underused 12-inch County-owned gas supply pipeline. The originally alleged purpose was that Jordan Cove could use that line's excess capacity to send out the natural gas from the LNG *import* terminal that was first proposed in 2005, but that idea was officially abandoned in 2012. Still, Jordan Cove has continued the payments, even though the County pipeline is unlikely ever to be used for bringing gas to the hoped-for LNG *export* plant, because that one will be fed by the hoped-for, much bigger 36" pipeline. But the "**Interruptible Transportation Purchase Agreement**" continues in force, so the County is still getting **\$300,000 a year** from Jordan Cove for – essentially – nothing, except the County Commissioners' keen awareness of who can pay the piper. At the signing of the "Interruptible Transportation Purchase Agreement", Jordan Cove gave the County a \$200,000 bonus, and promised another **\$200,000 bonus** "... **if and when Construction is Commenced** on an LNG facility within the boundaries of Coos County, Oregon." Perhaps that clause's Copious Capitalization was designed to impress the County Commissioners, but the money must have impressed them a great deal more.

Well before Sweet's 2018 reelection, Jordan Cove's determination to **OWN** Coos Bay had become obvious. During the May 2017 election we voted on a local ballot measure that might have hampered Jordan Cove's plans somewhat – if it had passed. I figured that it had no chance because it was too complicated, droning on about 'fossil fuels' and the civil rights of 'natural ecosystems', a tough sell in a rural County. But Jordan Cove spent more than \$580,000 fighting it, for our area an even more sensational amount. On October 9, 2018, I lodged a complaint with the Federal Elections Commission, alleging violations of Section 319 of the Federal Election Campaign Act of 1071 (2 U.S.C.441e), covering "**Contributions and Donations by Foreign Nationals**." Jordan

¹⁵⁾ "Sweet: "There is no Plan B" – the county will "just shrivel up and rot". MGX's blog, January 11, 2015.

Cove qualifies as such because it is 100% Canadian, originally owned by Veresen of Calgary, Alberta, and more recently by Pembina, a pipeline company also headquartered in Calgary. Moreover all of the handful of corporate entities operating as "Jordan Cove" are registered as "foreign" with the Oregon Secretary of State's office. As far as I know the case is still under investigation.

If it would be convenient for you, I will be glad to email a PDF copy of this letter.

Should you want any copies of documents cited herein, please let me know.

Sincerely,

A handwritten signature in black ink, appearing to read "Wim G. de Vriend". The signature is written in a cursive, somewhat stylized script.

Wim G. de Vriend