

## A Terrible Idea – A Liquid Natural Gas Shipping Terminal at Warrenton, Oregon

A response to a US Army Corps of Engineers and Oregon Department of State Lands public notice of a permit Application (USACE No: NWP-2005-748 and ODSL Nos: 54374-RF, 54375-RF). Also sent to Oregon DEQ

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Why is the Oregon-LNG terminal proposal a really bad idea? Consider:

- (1) To get natural gas to send to Warrenton, it will be necessary to break it free from deep deposits across western North America by hydraulic fracturing. That damages the deep structure of the Earth across vast stretches of land. It pollutes the hundreds of thousands of gallons of water used to pressurize each well to break up deep shale deposits bearing only some gas. That water pollutes both surface waterways and ground water, in many cases with radioactive particulates. The wells only produce gas for a few years and are then abandoned.
- (2) That natural gas is all that North America will ever have. It cannot last forever, but it needs to stretch far, far into our future here in the U.S. It is essentially criminal to send vast quantities abroad, like the 9.6 million metric tons (9.6 Mt) approved by DOE for annual export through Warrenton. None of the profit from sale of that gas will stay in Oregon, or in the west for that matter. It will vanish into the accounts of Leucadia National, a New York holding company with total assets exceeding \$47.8 billion (the 2013 value).
- (3) Once exported the gas will be burned in Asia, with 9.6 Mt/year producing 27 Mt/year of carbon dioxide (CO<sub>2</sub>), the premier greenhouse gas. The U.S. is committed (in an agreement with China, among other places) to reduce its “carbon footprint” to 27% of our 2005 levels by 2025. That is a huge challenge, and we cannot reduce our CO<sub>2</sub> pollution by burning more fossil fuel, including fracked natural gas. It seems impossible that needs to be stated, but evidently it does. The notion of exporting *any* fossil fuel runs against our promises and our best interests.
- (4) Worse, we are already well above the 2005 CO<sub>2</sub> production levels. Honest calculation of our CO<sub>2</sub> production must include natural gas from the United States that is burned elsewhere. After all, Chinese (and other Asian) fuel consumption is the energetic basis for making a vast array of products we use; the U.S. doesn't manufacture its own toothbrushes! Much of the carbon Asia burns is burned for us.
- (5) As for greenhouse gases, the loss of methane (the main constituent of natural gas) into the atmosphere from Colorado fracking fields is about 4% of that captured and piped out (Pétron et al., 2012, *J. Geophys. Res.* 117: D04304). LNG terminals and ships also leak methane. Molecule-for-molecule methane is a more important greenhouse gas than CO<sub>2</sub>.

(6) The natural gas pipeline proposed from Woodland, Washington, will disturb habitats through 87 miles of the Oregon Coast Range, permanently reducing property values, and more importantly safety, across the full breadths of Columbia and Clatsop Counties. To cover the proposed 1,195 acres of right-of-way, the pipeline corridor must average 114 feet wide. That would be a scar across the largely forested (and thus inflammable) land wider than a four-lane freeway. It will be as visible from space as the Great Wall of China. Most of the 185 water bodies to be crossed will be significantly degraded as wildlife habitat and as agricultural resources. The notion that damage to streambeds and wetlands can be “restored” after “dry open trench” installation of pipeline (164 instances) is absurd.

(7) The pipeline would need to be installed in the face of a permit denial by the Clatsop County Commissioners, people elected in Clatsop County in part specifically to issue that denial. Possibly the west end of the pipe would need to be placed without a permit from the Warrenton City Commission, a permit which has not yet been sought (if wise, the Commission will deny a permit for the terminal itself). None of the owners of land on or adjacent to the pipeline will be adequately compensated for the so-called “ground disturbance.” None of this is acceptable just to profit non-resident and distant investors.

(8) The LNG terminal will destroy the *livability* of Warrenton. Truck traffic during construction of the terminal and installation of the pipe directly through town (there is no other route) will create initial disruption. Very large trucks hauling the valuable by-product propane and butane from the plant will continue to disrupt traffic for decades. The noise of construction, particularly the driving of piles into the unconsolidated Skipanon Peninsula to support the staggering mass of the plant and LNG storage tanks, will be at supra-industrial noise levels. Noise at low frequencies and sufficient to pose health risks at the northern edge of town will be emitted permanently, 24/7, by the compressors. The terminal and its seventeen-story (!) LNG storage tanks will become the principal view from the town, replacing the usually placid and beautiful scene of the lower Columbia River. The plant will be lighted all night, every night, casting a pall, probably of orange sodium lamps, through the whole vicinity, including the western sky seen from Astoria.

Plans for the plant show a sizeable rectangle labeled “flare systems.” Oregon LNG documents claim flaring will be extremely rare, but a substantial facility is provided for it. With a north wind the flare smoke will pollute the town. The risk of fire or methane suffocation from leaks at the plant will mean constant preparedness for evacuation. A recent accident blowing a small hole in an LNG storage facility in nearby Plymouth, Washington, required an evacuation to a two-mile radius. Anticipating the stress of rapid departure will cause many to move away permanently. This list could be extended, and it implies that Warrenton will become a ghost town. Not even workers at the plant (after the construction crews leave) will want to live in

the town. They would come to work, work, and then go home to Astoria or Seaside.

- (9) The LNG terminal will destroy the present *livelihood* of Warrenton. A very large part of Warrenton's economy is tourism, much of it from people with vacation homes and apartments. Collections of those are just across the Skipanon channel from the plant. Lively recreational fishing centers near river mile 10, just downstream from the proposed terminal. The interaction of this small-boat fishing with LNG carrier traffic (up to 300 trips per year in or out) will be complex. Concerns about the carriers and the plant as terrorist targets will involve special restrictions on all boating, on times of boat departure and return, perhaps even any access to the Skipanon River channel that would be less than 200 feet from the plant's west wall. All of this would degrade the boating and fishing experience enough that nobody will stay to play. All of the visitor interest in Lewis and Clark National Historical Park, Fort Stevens State Park and Sunset Beach will be diminished.
- (10) Transfer of LNG onto carriers for shipment to Asia is proposed to occur well offshore from the Skipanon Peninsula, adjacent to the Federal Navigation Channel (FNC). The ships will tie up at a dock on the end of a 2200 ft trestle with a roadway and pipeway from the storage tanks. The submerged bank at the location of the dock is proposed to be dredged from its present -20 to -30 ft depth (below MLLW) to -43 feet, the depth of the FNC. Some 1.2 million cubic yards of sediment, expected to be mostly fine sand, must be removed from a great, curving, underwater amphitheater to create a turning basin so that LNG carriers with drafts greater than 40 ft can approach and leave the dock. The basin will require maintenance dredging on a regular basis.
- (11) Experts on salmon ecology at NMFS and ODFW think making a turning basin will damage shallow foraging habitat for subyearling salmon. That is particularly likely for the most valued species, Chinook, which spends prolonged periods of early development in the shallow reaches of the Columbia estuary. The impacts of the new basin on young salmon migrating to sea (and adjusting to salinity right around river mile 11) or on adults returning to spawn up-river cannot be accurately anticipated. They are unlikely to be improvements. No "mitigation" by modifications of nearby marshes in Youngs Bay or elsewhere could compensate for these ecological damages.
- (12) The terminal is to be constructed on a stretch of coast established to be subject at long intervals to very energetic earthquakes ( $M_w \geq 8$ , energy estimates equivalent to Richter-scale numbers). Sudden slipping of the North American plate over the "subducting" Juan de Fuca plate at their junction offshore generates these quakes. According to precise dating of tsunami deposits and some Japanese tsunami records, the last major quake off Oregon was in 1700. The recurrence intervals for such quakes, also based on tsunami deposits and on turbidity deposits in continental-shelf channels, put us now

in the early window for the next megaquake. The research establishing these facts is as reliable as that explaining the mechanics of global warming.

When the quake occurs, and it will eventually, the damage could be comparable to the Tohoku subduction earthquake in Japan of November 2011. It will certainly be followed by a substantial tsunami. However, the quake itself is the greatest concern, and the existence of the terminal would add massively to the potential horror of quake damage to Warrenton. Any break in piping that releases either compressed natural gas (the pipeline will all be subject to dramatic accelerations and land shifts at faults) or LNG would result in suffocation and very likely fire. An LNG facility in Chiba on Tokyo Bay, far from the epicenter of the Tohoku quake, was damaged and caught fire in 2011. It took eleven days and cost six lives to extinguish that blaze.

The effects of a tsunami entering the Columbia on an LNG carrier at the Oregon LNG dock can be anticipated. Remember first that everyone will initially be engaged with the impacts of the earthquake. It will take them time to pick themselves up from the facility floors and orient themselves. Then they will be busy solving immediate problems. Attention to ship moorings will be uncertain. In other harbors tsunami arrival has lifted ships, which then generated massive buoyancy forces causing them to tear the bollards out of piers. At that point ships become free-floating in very powerful currents. Sequences of tsunami events can last 20 or more hours. Water washing in and out, in and out has devastated facilities like the Fukushima nuclear plant (with a reactor already cracked by the quake and mistakenly thought to be above the reach of tsunami). Tsunami could well devastate the Oregon LNG plant (which would be barely above higher high water), despite every design consideration to prevent it. Federal and state agencies cannot allow this compressor plant and terminal to be built at Warrenton. Warrenton will have plenty to deal with during a major earthquake and tsunami without it.

A substantial group of Warrenton and Astoria citizens, organized as Columbia Pacific Common Sense, strongly agree with all of my numbered points. They have been actively opposing LNG import and export terminals on the lower Columbia for over a decade. Their opposition will continue until Leucadia National takes its millions and goes back to New York. The time and effort expended by the USACE, the Coast Guard, FERC, Oregon DEQ, Oregon DSL, Oregon Department of Land Conservation and Development (ODLCD), much of that to assist Oregon LNG with its planning and even engineering (including brilliant work by FERC on miniscule but critical details) *should nevertheless be wasted*. Stop wasting public resources on this outrageous plan of greedy investors with no concern for peoples' lives, for the ecology of our region or for the well being of the only available, habitable planet.

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