STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47600, Olympia, WA 98504-7600 • 360-407-6000

December 1, 2023

Eric Rapp, Director Environmental Compliance
JELD-WEN, Inc
500 JELD-WEN Road
Craigsville, WV 26205

Re: Wood waste characterization at the Jeld Wen site:

Site Name: Jeld Wen
Site Address: 300 W Marine View Dr, Everett, Snohomish County, WA 98201-1030
Cleanup Site ID: 4402
Facility Site ID: 2757
Agreed Order No. DE 5095

Dear Eric Rapp:

This letter is a follow up to our Teams meeting on November 15, 2023. During that call, Ecology discussed our expectations for wood waste characterization at the Site. Since that call, Ecology's Jeld Wen team have met with our senior sediment experts and are providing additional feedback herein.

As discussed in our guidance[1], wood waste can result in negative impacts to benthic communities, including:

- The physical presence of wood waste, which prevents biota from thriving and recruiting in and on native, healthy substrate.
- Decreased dissolved oxygen due to microbial decomposition, which can create an unhealthy or toxic environment for biota.
- Decomposition by-products such as sulfides, ammonia, and phenols, which can cause or contribute to toxicity.

Ecology's authority under the Sediment Management Standards (Chapter 173-204 WAC) and the Model Toxics Control Act (RCW 70A.305) was affirmed by the Washington State Court of Appeals in *Port of Anacortes vs. Frontier Industries* (August 19, 2019).

[1] Wood Waste Cleanup, Identifying, Assessing, and Remediating Wood Waste in Marine and Freshwater Environments, Guidance for Implementing the Cleanup Provisions of the Sediment Management Standards, Chapter 173-204 WAC, September 2013., Publication No. 09-09-044

Wood waste is discussed in the Final Cleanup Action Plan (CAP) dated August 2023, Section 2.3.4 (Remediation Levels, Marine Sediment) and Section 3.5.4 (Marine Sediment Cleanup Action). This discussion includes the following statement:

> *The PDI work plan will follow a "weight of evidence approach" (Chapter 2 of the wood waste guidance) and may involve up to three levels of testing to confirm wood waste impacts.*

Total Volatile Solids (TVS) Data

As discussed during our November 15, 2023, call, the existing Total Volatile Solids data alone is insufficient to assess impacts of wood waste to sediment and the benthic community. Ecology notes that previous Total Volatile Solids results may be biased low due to:

1. The exclusion of wood waste greater than two inches from analytical samples, and
2. The limited sample depth due to refusal (Jeld-Wen's contractor could not advance the samplers to the target depth at many stations, and noted the presence of wood waste at some of these locations).

In order to validate any quantitative use of TVS results, a correlation analysis comparing TVS results with percent woody materials in sediment samples would be needed. However, because of the biases introduced via sampling methods, Ecology does not anticipate collection of additional TVS data would be of great value at this time.

Step 2 Wood Waste Characterization

Ecology is requesting sieving analysis of a significant number of sediment core samples to assess the percent wood waste by volume in sediments. This sampling is particularly important in the areas where MNR and Enhanced MNR are to be applied, since excavation/dredging and cover or capping would result in sediments covering wood waste, if present in those areas. Since Step 2 sampling locations may refine the boundaries of the remedial areas, some sieving data may be needed at locations that are currently within mapped excavation/dredging areas, but Step2 COC concentrations do not in fact trigger removal and capping. Wood waste sieving analysis is particularly important in shallow sediment samples, where it can have the greatest harm to benthic communities.

Our senior sediments experts have advised that wood waste characterization should also include total organic carbon (TOC), and TOC results greater than 3.5% should trigger bioassay analysis. Ecology notes that TOC results were discussed within the December 2021 Final RI/FS report:

> *TOC was measured in 99 samples, and ranged from 0.289% in sample 3SED6-B to 6.65% in sample 3SED3-A.*

Ecology did not find a tabulation of the TOC results within the RI/FS report, and we request that such a tabulation be included within the Step 2 work plans.

Our senior sediments experts have advised that any sediment samples with wood waste greater than 25% by volume should have bioassays performed (or wood waste cleanup done), and that application of any surrogate analyses to assess sediment toxicity must be based on site specific correlations with actual bioassay data. We have also been advised that other triggers for bioassay analysis should include sediment materials that are suspect based on observed characteristics or operational history.

In summary, assessing impacts from wood waste should be done using a thorough weight of evidence approach. This must include new analysis of the following from appropriate surface and core sample depths:

1. Percent wood waste by volume via sieving from both surface sediment and core increments.
2. Total Organic Carbon from both surface sediment and core increments.
3. Bioassays from surface sediment samples with $\geq$25% wood waste or $\geq$3.5% Total Organic Carbon.

In addition, the use of DGT passive samplers may be beneficial to the weight of evidence but will not replace the required sampling and analysis listed above.

Sampling locations should be comprehensive to determine nature and lateral/vertical extent of wood waste impacts, and particularly focused in areas where:

1. Surface sediment depths are shallowest, which can be determined using previous refusal depths.
2. Wood waste has been observed or operational history shows potential presence of wood waste.
3. COC concentrations are low and do not trigger removal or capping.
4. Monitored or Enhanced Natural Recovery areas are proposed.

Step 2 Test Pits

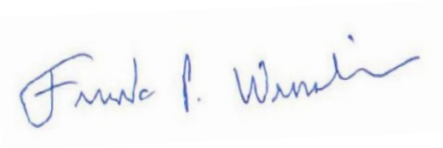
Our senior sediments experts also concurred with the importance of test pitting to assess the constructability impacts of large woody debris as well as to refine the Site conceptual model. Since log rafting took place throughout the area, the likelihood of encountering logs within the Site sediments is not insignificant. Tools such as ground penetrating radar (GPR) can also be used to map large woody materials.

Closing

As discussed during our call on November 15, 2023, Ecology is hopeful that a determination can be made that no significant quantities of wood waste are present at the Site.

We look forward to receipt of your Step 2 work plans, including a robust plan to characterize wood waste in sediments that includes the requirements stated above.

Sincerely,



Frank P. Winslow, LHG
Toxics Cleanup Program
Headquarters Cleanup Section

cc: Erik Gerking, Port of Everett
Nathan Soccorsy, Anchor QEA, LLC
Ron Woolworth, W&W Investments
Amy Hargrove, Ecology
Ryan Hardwick, Ecology
Josh Morman, Ecology
Susannah Edwards, Ecology