



Oregon

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February 12, 2019

Derek Vowels
Consultant, Supervisor, State and Federal Approvals
Jordan Cove LNG
111 SW 5th Ave., Suite 100
Portland, OR 97204

RE: DEQ review and Approval
Data Gap Investigation Report
Former Weyerhaeuser Containerboard Mill
North Bend, OR
ECSI 1083

Dear Mr. Vowels:

This letter provides our comments on GRI's *Data Gap Investigation Report, Former Weyerhaeuser Mill Site*, dated July 30, 2018, as well as some recommendations for future work at the site. The report includes the results of a comprehensive investigation of soil and groundwater conditions at multiple areas of concern across the former mill site. This included additional investigations at the mineral spirits release and the south "lowerator" areas, which were specified in DEQ's September 15, 2006 No Further Action letter for this site.

The report documented that elevated levels of petroleum hydrocarbons remain in soil beneath some areas of the site. This contamination is relatively deep, typically at least 8 feet below ground surface (bgs), and in some cases considerably deeper. The contamination is generally below depths that the occupational worker would be exposed (DEQ considers this 0-3 feet bgs). Construction workers and excavation workers could be exposed to the elevated levels of contamination in some areas.

DEQ identified some areas requiring further consideration in the GRI report. For example, GRI used some of DEQ's Risk Based Concentrations (RBCs) inappropriately. Most importantly, they incorrectly compared deep soil contamination with the occupational RBCs, and compared total chromium concentrations with the RBC for hexavalent chromium. Also, when background metals concentrations in soil exceed RBCs, we typically rely on the regional background concentrations as the cleanup action levels if they are greater than the RBC. Also, the RBC for diesel-range hydrocarbons was used as a surrogate screening level for a heavy range hydrocarbons, which typified most of the petroleum contamination at the site. It would have been more appropriate, and more representative, to calculate site-specific TPH RBCs at each of the discrete areas investigated for the heavy range hydrocarbons using TPH fraction data (see page 29 of DEQ's Risk-Based Decision Making for the Remediation of Contaminated Sites guidance [RBDM]). Additionally, polycyclic aromatic hydrocarbons (PAHs) were not, and should be evaluated as a chemical class per the November 2015 update to DEQ's RBDM guidance. DEQ's comments are detailed in comments summary (attached).

When we reviewed the data in light of the factors above, many of the risks identified by GRI (for example, direct contact to metals and TPH by occupational workers) fall away. TPH contamination remains in deep soils in some areas that could pose a risk to construction or excavation workers. However, it is unclear how likely it would be for such workers to come into contact with this contamination given it is very deep. Also, the risk from TPH was based on the comparison with the diesel RBC, which is likely a conservative surrogate for the actual hydrocarbons present. If the soil contamination were compared against a site specific RBC and a conceptual site model were refined, we feel it would provide you with a much better representation of where actual future risks to people are at your site. We recommend this approach before embarking on a cleanup plan meant to address unacceptable risks at the site. Based on our review of the data gap report, we feel that the former Containerboard Mill site is currently protective of human health, however, if deep soil excavation work were conducted in a few areas of the site workers could be exposed to elevated levels of petroleum contamination. These concentrations may exceed DEQ's acceptable risk levels. We recommend that if such deep excavation work is planned, that the contamination be further evaluated as described herein, and that a health and safety plan be prepared to limit worker exposures to the contamination and ensure that workers are aware of the potential presence of the contamination on the site.

DEQ's 2006 NFA letter also described Transite asbestos-containing material (ACM) remaining in the fill area on south Jordan Point. These materials were not further investigated as part of the data gap work. Please provide an updated assessment of the condition of the area containing the ACM. Particularly, provide details on ACM occurrence, including whether there is any on the ground surface, and the condition of the materials. This material will need to be properly managed in the near- and long-term to ensure it is properly contained. Or, it could be removed and placed in a landfill following appropriate asbestos handling requirements. If the material is to be left on-site, it would need to be properly capped. If left long-term, the repository would require long term engineering controls and a plan for long-term maintenance. Please provide me with this assessment, including details on the current status of the ACM area and your thoughts on near and long term management of the ACM by March 31, 2019.

Thank you for your continuing work to investigate and address contamination issues at the former containerboard mill site as part of your development project. Please contact me if you have any questions regarding this review or our recommendations or comments. I can be reached at (541) 687-7349 or by email at hanson.don@deq.state.or.us.

Sincerely,



Donald E. Hanson, RG
Project Manager

Attachment: DEQ Comments Summary, GRI Data Gap Report

ec: Mary Camarata, Oregon DEQ (w/ attachment)
Mike Kucinski, Manager, DEQ Cleanup Program (w/ attachment)
Claudia Davis, Manager, DEQ Air Quality Program (w/ attachment)
Mike Marshall/mmarshall@gri.com (w/ attachment)
Bruce Moore/bwmoore@pembina.com and Wes Hill/Wes.Hill@jordancovelng.com (w/ attachment)

cc: ECSI File 1083/COMM (w/ attachment)

**DEQ comments Summary, on GRI Data Gap Report dated 7/30/2018
Former Weyerhaeuser North Bend Containerboard Mill (ECSI 1083)**

General Comments:

1. Comparing soil data to the occupational RBC. Throughout the report soil contaminant data are compared against the occupational Risk Based Concentrations (RBCs), when in most of the cases, this is not appropriate due to the depth of the soil samples. Most of the soil samples collected for this investigation were collected from depths below 6 feet below ground surface (bgs) or so. The occupational exposure scenario considers contamination in the upper 100 cm (approx. 3 feet) of soil. It is probably appropriate to compare soil sample data from deeper than 3 feet with the construction worker and excavation worker RBCs.

If occupational scenario/RBCs were used to develop estimates of volumes of contaminated soil (above risk-based standards) from deeper than 3 feet bgs, then the volume estimates are probably high.

2. Chromium soil data and comparison to the Cr(IV) RBC. Throughout most of the report where soil was sampled for metals, chromium results were compared to the hexavalent chromium RBC. While this may be a very conservative way to evaluate the data, we don't think it is appropriate or necessary to do so. The total chromium data should be compared with the total chromium RBCs. If the RBC is higher than the regional background value, it should be used for risk-based decision-making. If the background concentration is higher than the RBC, it can be used for risk-based decision making in lieu of the RBC.
3. Evaluation of PAH data as a chemical class: In many areas, samples were analyzed for polynuclear aromatic hydrocarbons (PAHs). Individual PAH constituents were compared with their respective RBCs. This approach was indicated in DEQ's November 2015 update to the RBDM:

DEQ has clarified the definition of chemical classes to include such chemicals as polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), chlorinated dibenzo-p-dioxins and chlorinated dibenzofurans (dioxins/furans), chlordanes and total petroleum hydrocarbons (TPH). These chemical classes should be evaluated as a single hazardous substance for determining risk and potential hot spots. The acceptable cancer risk level for individual hazardous substances of one-in-one-million and non-cancer hazard quotient of one applies to each chemical class, and potential hot spot determinations will be made accordingly.

Carcinogenic PAHs should be evaluated as summed benzo[a]pyrene [BaP] equivalents. Dioxins/furans should be evaluated as the sum of 2,3,7,8-tetrachlorodibenzo-p-dioxin equivalents. PCBs should be evaluated as total PCBs, derived either from congeners or from aroclors. Similarly, total petroleum hydrocarbons and chlordanes should be evaluated as totals. This approach for evaluating chemical classes replaces Section 3.3.5 of DEQ's October 2010 Human Health Risk Assessment Guidance.

DEQ ran some calculations to compare some of the highest concentration samples from the site data reported by GRI as B(a)P equivalents. In most cases the B(a)P equivalents were also below

RBCs, however in a few the B(a)P equivalents did come into play. For example, for sample BP-119-8 they were 3.3 mg/Kg, which exceeds the occupational RBC. However, as mentioned in comment 1 above, the occupational scenario would not apply to a sample from 8 feet bgs.

4. Use of diesel RBC as surrogate for "oil" or "heavy oil". In hindsight, we feel it would have been preferable to use extractable petroleum hydrocarbons/volatile hydrocarbons (EPH/VPH) methods in discrete exploration areas where contaminant sources and the makeup of petroleum contamination is likely similar (de-barker and boiler/powerhouse areas for example). EPH/VPH testing would allow the calculation of contaminant-specific RBC for each area. Because there is no generic "oil" RBC, the diesel RBC is sometimes used as a surrogate for the oil range, and was done for this investigation. Using the EPH/VPH provides a better risk analysis, and could result in eliminating risk in some areas.

If a representative sample or samples from each area of concern were collected and analyzed for EPH/VPH in the future, site-specific RBCs could be calculated and used to compare against the data from this report.

5. Petroleum contamination at depth: In some areas of the site higher levels of petroleum contamination were confirmed. At the Lowerators and Boiler/Powerhouse areas, for example, where concentrations exceed construction worker RBCs by a significant margin.
6. Findings and Conclusions section: GRI concluded six general areas investigated had exceedances of RBCs or background metals concentrations. However considering that the occupational receptor pathway should only be used for shallow (3 feet or less, see comment 1 above), and that chromium should not be compared to the chromium VI RBC, then it appears that only four areas had exceedances of RBCs (the Chip Truck Hydraulic Lift Area[CT], the "Lowerators"[NL/SL], the Boiler and Powerhouse Area [BP], and the Debarker Area [DB]). These exceedances were petroleum at depth exceeding construction worker RBCs, which is appropriate. Again, if these areas had been evaluated using EPH/VPH methods per the RBDM Guidance, it is possible that would have resulted in lower risk, possibly acceptable risk levels.
7. Findings and Conclusions Section (Mitigation): The GRI report recommends mitigation in the areas where exceedances of RBCs exist if land use activities change. Given that most of the contamination at this site is deeper than typical construction worker activities, the current risk is very low. However, should there be significant earthwork and/or subsurface disturbances, extra care should be used in those areas and the contaminated soil should be properly managed and/or disposed in accordance with DEQ rules. And in fact, even if RBCs are not exceeded, any contaminated media should be managed in accordance with DEQ rules. Workers in areas of contamination should be provided with a health and safety plan to describe the levels of contamination, and ways to reduce or eliminate exposures during construction activities. These recommendations are consistent with the requirements of the 2006 No Further Action's requirements for the containerboard mill site.
8. Requirements of 2006 NFA Addressed:
 - a. The NFA recommended additional investigations in the vicinity of the south "Lowerator". The GRI investigation satisfies this recommendation and no additional investigations are recommended in this area at this time.
 - b. The 2006 NFA indicated that if petroleum contamination in the "Lowerator" areas are exposed in the future that the soils must be properly managed and/or disposed in

accordance with DEQ rules. This requirement remains unchanged. Additional information is known about the nature and extent of the contamination in this area.

- c. The NFA indicated that Transite siding in the fill area of Jordan Point should be properly managed and disposed of if ever excavated in the future. This area is discussed further below.

9. Asbestos Containing Material (ACM) on South Jordan Point:

- a. ACM needs to be properly managed to eliminate the chance for releases of ACM fibers that could result in human exposure.
- b. The ACM area should be re-surveyed to determine the current condition of the disposal area. This survey should include an assessment/description of any ACM on the ground surface, the condition of the ACM, and its prevalence.
- c. The survey should also describe how the ACM is currently contained and managed, including the condition of any soil cap, etc.
- d. The survey report should include the plans for the ACM area and how JCEP desires to manage this area in the near- and long-term to ensure that the ACM is secure.
- e. Options for management of the ACM include removal and placement in an appropriate landfill, and capping and managing the material in place. Capping in place would involve long-term engineering controls to maintain the capped repository.
- f. JCEP should therefore include an updated description of the current conditions of the area, and plans on how JCEP proposes to manage the ACM in the short-and long-term.