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June 22, 2023

Ms. Rebecca Digiustino
Oregon Department of Environmental Quality
700 NE Multnomah Street, Suite 600
Portland Oregon 97232-4100

Subject: **Revised Focused Porewater Investigation Work Plan
Groundwater Source Control Evaluation
Former Gunderson LLC Facility
4350 NW Front Avenue, Portland, Oregon 97210**

Dear Ms. Digiustino,

The Greenbrier Companies (former Gunderson LLC (Gunderson)) is submitting the enclosed *Revised Porewater Investigation Work Plan* (Revised Work Plan) for the former Gunderson LLC Facility located at 4350 NW Front Avenue in Portland, Oregon (the Site). The work plan addresses comments and includes information requested in Oregon Department of Environmental Quality (DEQ) and US Environmental Protection Agency (USEPA) comments that were provided by DEQ in a May 23, 2023 letter. DEQ and USEPA comments are also listed below in *italics*, followed by Gunderson response.

DEQ COMMENTS

General Comments

1. *Although an increased number of transects would better refine the porewater discharge zone for Area 1, DEQ generally agrees with the location of the three discharge mapping transects for Area 1 and the proposal for collection of porewater sampling, based on the results of discharge mapping, using Trident probe equipment (and co-located sediment samples).*

Noted. The proposed porewater sampling transects are located offshore of the Site in the area of groundwater discharge mapped during the Portland Harbor RI. Two of the three transects are located in the offshore area where the highest concentrations of VOCs were detected in porewater during the RI.

2. *DEQ is aware that a supplementary pre-remedial design investigation is planned for late summer/fall 2023, roughly coinciding with the proposed porewater sampling work. DEQ will review and consider in-water data to the extent that may be relevant to source control decision making.*

Noted.

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3. *Discussion about quality assurance and quality control (QA/QC) is generally absent from the Work Plan. Please include information about how QA/QC will be tracked and maintained throughout the porewater investigation.*

QA/QC procedures are summarized in Appendix D.

4. *DEQ requests a seepage evaluation and porewater/sediment testing report be submitted as a stand-alone document, prior to the submission of a final source control evaluation document.*

Noted. The Revised Work Plan text has been updated to reflect that the porewater investigation results report will be submitted to DEQ.

5. *DEQ generally concurs with EPA's Primary Comment #8: monitoring well MW-74 has begun to show increasing total and dissolved zinc and copper concentration over the last several years. However, DEQ believes the current scope of work proposed for the porewater sampling event is sufficient based on current site conditions. If zinc concentrations continue to increase at MW-74, additional investigation in the area may be warranted as specified by EPA.*

In the interest of completing groundwater source control evaluation at the Site and progressing toward a source control decision, Gunderson is planning to collect porewater samples offshore of the MW-74 area for select metals (cadmium, copper, and zinc) as noted in the Revised Work Plan. The proposed sampling methods are consistent with those planned for the MW-82 area.

Specific Comments

6. *Section 5.3 Portland Harbor Remedial Investigation Porewater Assessment - The discussion of previous offshore porewater sampling of Area 1 in subsections of Section 5.3 and the inclusion of corresponding figures in Appendix C is appreciated. DEQ believes this section should be expanded to include specific discussion of sampling results off-shore of Area 1, including non-detects offshore of Lakeside, HVOC detections at GN4-A and GN-5A, and comparison of prior results to Portland Harbor screening values. To support this discussion, please include a table with the complete set of VOC sampling results illustrated in Figure C3.9-5 (Appendix A).*

Additional discussion regarding the results of porewater sampling conducted offshore of Area 1 during the Portland Harbor RI have been added to Section 5.3. The VOC sampling results that were available in the Portland Harbor Site Characterization and Risk Assessment (SCRA) dataset are included in Appendix C (Table C-1) for reference. Note that the data for the non-detect locations offshore of Lakeside could not be found in the SCRA.

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7. *Section 5.3.1 Procedures – There is no discussion of previous discharge mapping or sampling results offshore of MW-82, presumably because they are not available. Please confirm.*

Correct. No porewater sampling has been conducted offshore of MW-82 or new investigation area MW-74. This information has been added to the Revised Work Plan text.

8. *Section 6.1 Porewater Investigation Design and Figure 6 Investigation Areas-*

- *MW-82 Offshore Investigation - DEQ recommends at least two transects offshore of the MW-82 area to assess groundwater seepage and identify porewater sampling locations. A robust porewater discharge zone map is needed in order to select optimal porewater sample locations; a single transect will not adequately characterize the entire porewater discharge zone.*

An additional transect has been added offshore of MW-82. Two transects will also be completed offshore of well MW-74. The approximate transect locations for the MW-82 and MW-74 areas are shown on Figures 7 and 8, respectively.

- *As noted in General Comments above, DEQ generally agrees with the locations of the three transects offshore of Area 1. To illustrate transect locations relative to previous investigation results, DEQ requests a figure showing the transect locations superimposed on an enlarged version of Figure C3.9-5 of the Portland Harbor Final RI Report.*

As requested, Figure 9 of the Revised Work Plan shows the proposed transects offshore of Area 1 superimposed on the sampling locations as shown on Figure C3.9-5 of the Portland Harbor Final RI Report. Figure C3.9-5 is included in Appendix C of the Revised Work Plan.

9. *Section 6.1 Porewater Investigation Design – This section states that “bulk sediment sampling will be used to support evaluation of porewater discharge”. Please elaborate in this section or elsewhere in the Work Plan how bulk sediment sampling results will be used in conjunction with the porewater results.*

Additional information has been added to the Revised Work Plan. As noted in the text, the collocated sediment data will support the evaluation of the porewater data and will provide information regarding potential impact of sediment quality on the porewater sampling results and vice versa.

10. *Section 6.2.1.1 Water Elevation Evaluation – The stilling well is proposed to be attached to the Outfitting Dock; however, the location along the dock is not conveyed. Please identify the proposed location on Figure 6. Additionally, is there any opportunity for placement closer to the investigation area?*

As noted in the Revised Work Plan text, the only feasible location for deployment

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of a stilling well at the Site is the Outfitting Dock, located partially within the MW-74 investigation area. To minimize impacts to Site operations, the precise location for the stilling well will be decided in coordination with the property owner and operator (Oregon Green Manufacturing LLC) and will be located as far downstream as possible (i.e., as close to the Area 1 and MW-82 investigation areas as possible). Once determined, the precise location of the stilling well will be provided to DEQ via email.

11. *Section 6.2.1.2 Temperature and Conductivity Mapping – Please include additional details about the mapping procedure, including the number and location of the temperature and conductivity monitoring locations along the transects in both areas. Adding the proposed locations along the transect on Figure 6 would also be helpful.*

Additional information was added to the Revised Work Plan text regarding the mapping procedures and anticipated spacing of measurements. As noted in the Work Plan text, the maximum spacing between mapping locations will be approximately 50 feet, and a minimum of four mapping stations will be completed along each transect.

In Area 1, transect locations were also adjusted to overlap with the RI porewater sampling locations with the highest measured discharge rates and HVOC concentrations (Figure 9). As noted in Section 7.2.1.2, the precise locations of RI porewater sampling stations GN4A and GN5A (i.e., the samples that exhibited the highest measured HVOC concentrations) will be targeted for discharge mapping.

12. *Section 6.2.1.3 Sampling Location Selection – DEQ agrees to confer on sampling locations after completion of seepage mapping; however, DEQ requests that the Transition Zone Water Screening report and any relevant information used as basis for the sampling locations are also provided prior to or at the time of the request. Additionally, DEQ is unlikely to approve a single porewater sampling location for either offshore area. DEQ disagrees that one to three porewater samples will be sufficient coverage within each investigation area. Based on previous Area 1 investigation results, a minimum of three locations are expected to be necessary to confirm acceptable porewater concentrations in the GN4-A and GN5-A areas and confirm previous non-detects in the offshore area slightly downriver (GN3-A and GN2-A areas).*

The Revised Work Plan text has been revised to note that the discharge mapping, measurement data, and the proposed porewater sampling locations will be provided to DEQ in a technical memorandum or email for review. Because of the tight schedule for the mapping and sampling activities and to minimize any standby time, two separate tech memos may be provided to DEQ. For example, if mapping offshore of well MW-74 and well MW-82 is conducted first, a tech memo/email for these areas may initially be provided to DEQ for review, followed by a subsequent tech memo/email concerning Area 1 after mapping has been completed in that area. The comprehensive mapping data and results will also be

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included in the final report for the project.

The proposed number of sampling locations in the text has been revised. As noted in Section 7.2.1.3, a minimum of three sampling locations are planned offshore of Area 1 and approximately two sampling locations are planned offshore of well MW-74 and well MW-82. The text also notes that porewater samples will be collected at RI locations GN4A and GN5A areas as well as a downstream location within Area 1, provided discharge mapping results show groundwater discharge is occurring in these areas.

13. *Section 6.2.1.3 Sampling Location Selection – DEQ appreciates the inclusion of the results from the Portland Harbor Remedial Investigation /Feasibility Study (RI/FS) in the Work Plan. This information is helpful in illustrating both the groundwater seepage regime and the HVOC contaminant conditions offshore of the Area 1 during 2005-2007, which showed positive seepage rates and contaminant detections were confined to immediately offshore of the downriver-most portion of Area 1 (GN4-A and GN-5A locations). Given that detections were highest at the GN5-A location during the 2005 work, DEQ recommends collecting a porewater sample at or very near this location.*

Please see response to DEQ Comment 12.

14. *Section 6.2.2.1 MW-82 Area - Please clarify the statement of “up to five vials are attached to a frame which can be deployed into sediment at deployment depths of approximately 6 to 30 centimeters (cm) below the mudline”. How will the specific depth of deployment be determined? What factors would influence the number of vials to be deployed? Are multiple vials being collected for depth-discrete sampling or for obtaining adequate sample volume?*

Additional information has been added to the Revised Work Plan text regarding the passive samplers, deployment procedures, and processing and compositing procedures post-retrieval.

15. *Section 6.2.2.2 Area 1 - Please explain why collection of only shallow porewater samples (30 cm below the mudline) is sufficient. DEQ understands that the depth is consistent with the sampling depth used during the Portland Harbor investigation (presented in Section 5.3), but an explanation as to why this depth was initially chosen would be helpful.*

Additional rationale for the decision to target shallow porewater has been added to the Revised Work Plan text.

16. *Section 6.2.3 Surface Sediment Sampling – See Comment 10 about the number of porewater samples per area, which will impact the number and location of sediment samples. Please discuss methods that will be employed to collect sediment samples at the porewater sampling locations and the margin of error for returning to the sample location.*

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We assume that DEQ is referring to Comment 12 (see response above). Additional information has been provided in the Revised Work Plan text regarding the precision of the horizontal location recording for discharge mapping and the subsequent remobilization for porewater and sediment sampling and on sediment sampling procedures (Section 7.2 and Appendix D).

- 17. Table 1 Analytical Program, Quantification Limits and Cleanup Levels – The values listed in the “ROD Surface Water Cleanup Level” column appear to also include groundwater cleanup levels from the Portland Harbor Record of Decision (ROD) Table 17. Groundwater cleanup levels are more applicable to the porewater analytical results and, for the analytes listed on the table, the surface water cleanup level values are the same as the respective groundwater cleanup level values. Therefore, DEQ recommends changing the title of the cleanup level column to “ROD Groundwater Cleanup Level”.*

Table 1 has been revised as recommended.

- 18. Figure 4 Geologic Cross Section A-A’ and Figure 5 Geologic Cross Section B-B’ – DEQ appreciates the inclusion of the cross sections and requests the figures are updated to show well screen intervals and the depth at which the temperature and conductivity measurements will be collected. This update will help with visualizing the overall investigation and ease interpretation of the data.*

Well screen intervals and the depth of Trident discharge mapping have been added to the geologic cross section figures. Please note that in addition to the geologic cross section figures for Area 1 and MW-82 (Figures 4 and 5), a new Figure 6 was added for the geologic cross section in the MW-74 area.

EPA COMMENTS

Primary Comments

- 1. The first paragraph of Section 6.2.1.1 states that upland monitoring well and Willamette River water elevations will be recorded for at least 1 month prior to installation. A comprehensive record of monitoring well and river elevations are needed to document favorable hydraulic conditions are present throughout the porewater investigation. Revise the text to clarify that water level data will continue to be measured and recorded throughout the porewater investigation.*

The Revised Work Plan text has been revised as requested.

- 2. In Section 6.2.1.1, the first paragraph on page 13 states that pressure transducers will be installed in “one to two monitoring wells along the river within Area 1.” To determine whether this plan can be implemented and meet the study objectives, further details must be included. At minimum such details are (1) state which monitoring wells will potentially have transducers installed in them and (2) clarify the rational for installing transducers in the proposed monitoring wells in Area 1.*

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The Revised Work Plan text has been revised as requested and includes specific wells for transducer installation and why these wells were selected.

- 3. Section 6.2.1.1, last paragraph states that the period of maximum groundwater flux to the river is expected to occur in midsummer to late summer. Provide justification, which should include use of existing data to support identification of the period of maximum flux to the river. If the period of maximum flux is not targeted for the discharge mapping survey, there is potential to underestimate groundwater discharge locations and extent.*

The Revised Work Plan text has been revised as requested and includes evaluation of two year-long pressure transducer studies conducted at the Site in Area 1 and at well MW-82, respectively. It should also be noted that while groundwater discharge to the river generally occurs from summer to early fall the precise period of maximum groundwater flux to the river varies annually based on factors such as rainfall and releases from upstream reservoirs and will not be known until after the end of the groundwater discharge period.

- 4. Section 6.2.1.2 discusses the proposed transect locations for the discharge mapping survey. The proposed transects appear to be located sparsely, with a high potential for inadequate/incomplete discharge mapping. At least two transects should be targeted offshore of MW-82 to provide adequate spatial coverage.*

An additional transect was added offshore of MW-82 and two transects are proposed offshore of MW-74. The transects in Area 1 were placed to assess areas where discharge was mapped and porewater samples were collected during the Portland Harbor RI.

- 5. Because the work plan relies on successful implementation of samples collected by two different techniques (Trident Probes and SPs), Appendix D should include an SOP for the Trident Probes.*

The Trident SOP has been added to Appendix E of the Revised Work Plan.

- 6. Recent data from MW-74 show concentrations of dissolved cadmium, copper, and zinc are trending upward when compared to historical data. An additional area of investigation should be added in the vicinity of MW-74 including at least two additional transects to investigate the impacts to the river for cadmium, copper, and zinc (total and dissolved). Install a transducer in at least one upland monitoring well.*

See response to DEQ General Comment 5 regarding the additional investigation area near MW-74. Text was added to the Revised Work Plan to address well selection for transducers including one in the MW-74 area (Section 7.2.1.1).

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To Be Considered

1. *It would be helpful if the descriptions of Area 1 and 2 in Section 2.1 included information on land cover (including the riverbanks) as was included in the description of the Schnitzer ASD Yard.*

This information has been added to the Revised Work Plan text.

2. *The Schnitzer ASD Yard description provided under Section 2.1 should include a description or report reference for what is stored in the hazardous materials storage area and include confirmation that these hazardous materials are stored in accordance with applicable federal and state requirements.*

The requested information is not relevant to the scope of this Revised Work Plan. The hazardous waste materials storage area is self-contained, bermed, covered, maintained in accordance with federal and state regulations, and over 400 feet from the River.

3. *Confirm depth to groundwater ranges provided in Section 2.2.3. For example, the text states depth to groundwater at the Schnitzer ASD Yard is approximately 15 to 20 feet below ground surface. However, Section 2.0 notes ground surface elevations at the Site range from 36 to 42 feet, and Figure 3 shows groundwater elevations between 12 and 18 feet. It appears that the depth to groundwater in the ASD Yard area is greater than 15 to 20 feet below ground surface.*

The information as stated in the Revised Work Plan is correct. The ground surface elevation at the Schnitzer ASD yard is approximately 36 feet NAVD88.

4. *Footnote 4 in Section 4.2 (page 8) notes that no elevated metals have been detected in replacement well MW-93. However, Appendix A shows arsenic and manganese detections above screening criteria (i.e., PHSS cleanup levels) in MW-93. It would be helpful if the work plan defined "elevated" metal concentrations. This would help clarify why porewater investigation is only proposed for the MW-82 area.*

The footnote has been revised as noted.

5. *Section 6.2.2.1 first paragraph states that "PSDs such as SPs allow for more accurate quantification of porewater metals concentrations than direct sampling methods, as solids and colloidal material are not captured in the porewater sample volume." The first part of the sentence should be revised to correctly state that PSDs allow for more accurate quantification of "freely dissolved porewater metals concentrations." Other porewater sampling methods can still provide accurate porewater concentrations depending on the data use objectives.*

The Revised Work Plan text has been revised as noted.

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6. *Section 6.2.3 indicates that bulk sediment samples collected in the MW-82 area will be composite samples. It is unclear whether the proposed compositing is referring to compositing/homogenizing sediment across the entire sample depth of 30 cm or Gunderson is proposing compositing bulk sediment samples from multiple locations. Presumably, it is the former. If so, the text should be revised for clarification.*

The Work Plan text previously noted that the 0 to 30 cm sample would be mixed in a bowl and the resulting composite sample would be placed in laboratory supplied containers. Additional description has been provided for clarity in the Revised Work Plan text.

7. *In Section 7.3, it appears that the list of volatile compounds for the analysis of the sediment samples should be the same as the list of volatile compounds for the porewater. However, for the porewater list, 1,1-DCE appears, and for the sediment list, DCE appears instead of 1,1-DCE. Correct the DCE in the sediment list of compounds to 1,1-DCE as it appears in the porewater list.*

The sediment analyte list has been corrected as noted.

8. *In Section 7.3 and Table 1, the method for the grain size analysis is listed as ASTM D422. However, ASTM Method D422 has been replaced with ASTM Method D6913 for the coarse-size portion and D7928 for the fine-grained portion. Update the method reference for ASTM D422 to the correct method(s) in the text and table.*

The grain size methods have been modified as noted.

9. *In Footnote 2 included in Table 1, list which category of screening level was used or the hierarchy of selecting which category of criteria was selected (e.g., Oak Ridge National Laboratory's [Tier II SCV], EPA's 2004 NRWQC chronic.) from Table 3-1 in the Portland Harbor Joint Source Control Strategy (JSCS) Groundwater Screening Level Value (SLV) for Groundwater/Surface water/Stormwater (DEQ/EPA 2005) document.*

JSCS Table 3-1 provides the citations for the criteria listed. JSCS Table 3-1 notes that the highlighted values should be used for source control screening purposes. Table 1 lists the values that were highlighted in JSCS Table 3-1. Gunderson did not select which values to use.

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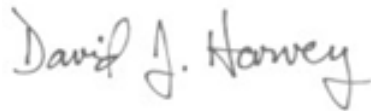
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Closing

Please contact us if you have any questions regarding this letter.

Sincerely,

A handwritten signature in black ink that reads "David J. Harvey". The signature is written in a cursive style with a large, looped 'D' and 'H'.

David J. Harvey
Senior Director EHS
The Greenbrier Companies

Copy (via email only):

Dan Hafley, DEQ
David Lacey, DEQ
Kirsten White, GeoEngineers Inc.
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