STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
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June 28, 2017

Mr. Gil Insley
Clariant Corporation
4000 Monroe Rd
Charlotte, NC 28205

Re: Further Action at the following Site:

- **Site Name:** Chemtrade Performance Chemicals US LLC
- **Site Address:** 404 Hendrickson Dr., Kalama, WA. 98625
- **Cleanup Site No.:** 1784
- **Facility/Site No.:** 24634187
- **VCP Project No.:** SW0492

Dear Mr. Insley:

The Washington State Department of Ecology (Ecology) received your request for an opinion on your independent cleanup of the Chemtrade Performance Chemicals US LLC facility (Site). This letter provides our opinion. We are providing this opinion under the authority of the Model Toxics Control Act (MTCA), Chapter 70.105D RCW.

Issue Presented and Opinion

Is further remedial action necessary to clean up contamination at the Site?

YES. Ecology has determined that further remedial action is necessary to clean up contamination at the Site.

This opinion is based on an analysis of whether the remedial action meets the substantive requirements of MTCA, Chapter 70.105D RCW, and its implementing regulations, Chapter 173-340 WAC (collectively "substantive requirements of MTCA"). The analysis is provided below.

Description of the Site

This opinion applies only to the Site described below. The Site is defined by the nature and extent of contamination associated with the following release:

- Zinc and Cadmium into the Soil, Ground Water, Surface Water, and Sediment.

Please note a parcel of real property can be affected by multiple sites. At this time, we have no information that the parcel(s) associated with this Site are affected by other sites.

Basis for the Opinion

This opinion is based on the information contained in the following documents:

1. CDM, *Phase I and 2 Environmental Site Assessment* Clariant Corporation Chemical Plant, November 19, 2002.
2. CDM, *Angle Boring Groundwater Analytical Results*, Former Clariant Plant, July 21, 2003.
3. CDM, *Contaminant Delineation*, Former Clariant Corporation Chemical Plant, March 3, 2004.
4. CDM, *Soil Excavation Summary Report* Former Clariant Corporation Chemical Plant, March 3, 2004.
5. CDM, *Winter 2004 Quarter Groundwater Monitoring*, Former Clariant Corporation Chemical Plant, March 24, 2004.
6. Washington State Department of Ecology, *To: Mr. Ronald Walton, Clariant Corporation, From: Mr. Charles Cline, Further action letter pursuant to RCW 70.105D.030(1)(i)*, June 1, 2004.
7. CDM, *Spring 2004 – 2nd Quarter Groundwater Monitoring*, Former Clariant Corporation Chemical Plant, July 9, 2004.
8. CDM, *VCP #SW0492 Evaluation of the Cadmium Plume*, Former Clariant Plant, August 17, 2004.
9. CDM, *Summer 2004 – 3rd Quarter Groundwater Monitoring*, Former Clariant Corporation Chemical Plant, October 18, 2004.
10. CDM, *Fall 2004 – 4th Quarter Groundwater Monitoring*, Former Clariant Corporation Chemical Plant, December 3, 2004.
11. CDM, *Winter 2005 – 5th Quarter Groundwater Monitoring*, Former Clariant Corporation Chemical Plant, April 14, 2005.

12. CDM, *Spring/Summer 2005-6th and 7th Quarters Groundwater Monitoring*, Former Clariant Corporation Chemical Plant, September 14, 2005.
13. CDM, *Screening Level Ecological Risk Assessment,* Former Clariant Corporation Chemical Plant, November 30, 2005.
14. CDM, *Site Conceptual Model for Zinc and Cadmium in Groundwater* at the Former Clariant Corporation Chemical Plant, November 30, 2005.
15. CDM, *Fall 2005 – 8th Quarter Groundwater Monitoring,* Former Clariant Corporation Chemical Plant, January 3, 2006.
16. Washington State Department of Ecology, *Re: Further Action Determination under WAC 173-340-515(5) for the following Hazardous Waste Site: Former Clariant Corporation Chemical Plant,* March 9, 2006.
17. CDM, *Summer 2006 Groundwater Monitoring*, Former Clariant Corporation Chemical Plant, September 29, 2006.
18. CDM, *Piezometer Installation and Groundwater Sampling Report* – February 2007, Former Clariant Corporation Chemical Plant, April 12, 2007.
19. CDM, *Feasibility Study*, Former Clariant Corporation Chemical Plant, October 10, 2008.
20. Washington State Department of Ecology, *Re: Opinion on Proposed Cleanup of the following Site: Former Clariant Corporation Chemical Plant (aka Chemtrade Performance Chemicals US LLC),* November 10, 2008.
21. Hart & Hickman, *Remedial Action Report*, Former Clariant Corporation Facility, January 19, 2011.
22. Hart & Hickman, *Post-Injection Monitoring Report & RAWP Addendum*, July 5, 2011.
23. Hart & Hickman, *Pilot Test Plan, Former Clariant Corporation Facility*, September 9, 2011.
24. Hart & Hickman, *Pilot Test Report*, Former Clariant Corporation Facility, October 31, 2011.
25. Hart & Hickman, *Additional Remedial Action & Performance Monitoring Report*, Former Clariant Corporation Facility, October 16, 2012.
26. Hart & Hickman, *Geochemical Evaluation Summary & 2013 Remedial Action Work* Plan, Former Clariant Corporation Facility, March 25, 2013.

27. Hart & Hickman, *Pilot Scale Injection Report*, Former Clariant Corporation Facility, May 22, 2014.
28. Hart & Hickman, *Sediment and Sediment Pore Water Sampling Report*, Former Clariant Corporation Facility, September 30, 2015.
29. Washington State Department of Ecology, *Re; Further Action at the following Site: Chemtrade Performance Chemicals US LLC*, February 9, 2017.
30. Hart & Hickman, *From Scott Drury and Steven C. Hart, LG, Attention Mr. Adam Harris, LHG, Re: Response to Opinion, Chemtrade Performance Chemicals US LLC,* May 31, 2017.
31. Hart & Hickman, *Seep Study Work Plan Chemtrade Performance Chemicals US LLC Site,* May 31, 2017.
32. Hart & Hickman, *Soil Sampling Work Plan, Chemtrade Performance Chemicals US LLC Site,* May 31, 2017.

These documents are kept in the Central Files of the Southwest Regional Office of Ecology (SWRO) for review by appointment only. You can make an appointment by calling the SWRO resource contact at 360.407.6365. This opinion is void if any of the information contained in these documents is materially false or misleading.

This letter responds to a request for opinion on a seep study work plan, and a soil sampling work plan. Comments on the proposed seep study and proposed soil study are provided. A request was also made to provide technical assistance on approaches to potential cleanup levels and points of compliance for the Site. Ecology is responding separately to the request for technical assistance.

Analysis of the Cleanup

Ecology has concluded that **further remedial action** is necessary to clean up contamination at the Site. That conclusion is based on the following analysis:

1. Characterization of the Site.

Site characterization is described in Ecology's February 9, 2017 letter. In that letter, Ecology requested a work plan for conducting a seep study at the Site. Ecology also requested updating the site conceptual model by evaluating the manufacturing facility as an ongoing source of contamination. The two submitted work plans directly address these requests, and we appreciate their submittal. This opinion reviews and provides comments on the two submitted work plans.

The proposed work will address current data gaps in the ongoing site remedial investigation. The information may be sufficient to complete the remedial investigation. The work will support completing a feasibility study with remedial alternatives that meet the minimum requirements of MTCA. As discussed in both work plans, the selected remedial alternative for this Site may include institutional controls managed by an environmental covenant. Remedial alternatives will be evaluated in the feasibility study.

The seep study is needed for the remedial investigation to determine if there is a completed pathway for remaining groundwater contamination at the Site to enter adjacent Columbia River sediment or surface water, and the potential magnitude of the impact. Evaluation of the manufacturing facility as an ongoing source of soil contamination is needed to address whether additional contamination has been released to the environment in the time since remedial investigation was last conducted in this area of the Site. In parallel with these two studies, Ecology recommends continuing to address the comments provided in our February 9, 2017 opinion letter.

Seep Study Comments:

1. **Proposed lateral extents of seep study:** Lateral extents of the seep study are proposed from location PZ14 in the north of the Site, to location PZ15 in the south. Based on the plan view isocontour maps provided for this review, and based on the cadmium and zinc sample results reported to Ecology's Electronic Information Management database (EIM), locations PZ14 and PZ15 appear appropriate as lateral extents for the seep study. If zinc or cadmium seeps are detected in sediment or porewater near locations PZ14 or PZ15, additional lateral investigation may be warranted with the goal of adequately characterizing and evaluating contamination extents.
2. **Proposed vertical extents of seep study:** Proposed vertical extents are not clearly described in the work plan. Ecology expects that detectable seeps will be evaluated throughout the proposed lateral extents of the study. The lowest elevation of the upper bounds of the study should be at the approximate lateral surface projection of groundwater elevations measured in monitoring wells near the Columbia River. Data should be collected to the lowest elevation reasonably achievable. If this study results in determining that seeps are likely below low tidal water levels, additional subaqueous sediment investigation may be necessary.

3. **Tide and river stage:** Please conduct the seep study in conjunction with negative tidal elevations, during hydrographically low Columbia River stages. Please base your deployment schedule on the nearby tidal stations, including the station at St. Helens, Oregon. Please report actual river stage elevations at St. Helens, Oregon for the sampling periods.

   Daytime negative tidal elevations are predicted at the Site for July 20 through July 29, 2017, for August 6-10, 2017 and for August 18-25, 2017. Daytime negative tidal elevations are also predicted from September 16-21, 2017. Any of these dates are acceptable to Ecology to carry out the seep study, unless unusually high river stages or rain impact the ability to obtain adequate data results. In that event, please postpone data collection. Please reserve September 16-21, 2017 as a backup dates for the study, in case field deployment needs to be postponed due to unusual weather or river stages. Field observations and data collection should be conducted when approaching lowest tidal elevations. Field data collection may require several tidal cycles.

4. **Contingency Plan – Incremental Sampling Methodology:** Ecology appreciates that the cost for a conductivity study is substantial, and that no conductivity study has therefore been proposed. In the submitted work plan, if potentially high hyporheic exchange areas are not identified by visual observations and/or the sediment survey as proposed, H&H proposes to collect pore water and sediment samples from a line of 22 pushpoint samplers installed at a spacing of approximately 40 feet along the portion of the shore line between PZ14 and PZ15.

   In the contingency where detection of seeps is limited due to field conditions in one or more areas of the Site, as described above, Ecology prefers evaluating sediments and porewater in those specific areas using incremental sampling methodology, by establishing decision units, and conducting composite sampling of sediment and porewater from each established decision unit. Please use incremental sampling methods for areas of the Site where visual observations and/or the sediment survey as proposed are not effective.

   Ecology's goal for this study is to determine the maximum contamination loading in surface water and sediment at the Site at the locations of preferential pathways. Incremental sampling methodology for the seep study is only appropriate in the contingency that targeted discrete methods are not possible due to field conditions, especially due to the presence of significant armoring along the shoreline.

Decision units may be established prior to deployment or in the field. However, please develop a Quality Assurance Protocol Plan or similar document prior to deployment, anticipating the contingency. The proposed spacing of the 22 discrete pushpoint sampling locations appears adequate as centroids of decision units for this effort, although larger decision units may be appropriate farther from known groundwater contamination sources. For each decision unit established, please use available incremental sampling method guidance to direct collection and reporting of sufficient discrete samples, with sufficient coverage to obtain robust and defensible composite porewater and sediment samples representative of the decision unit.

Composite porewater and sediment samples obtained from each decision unit should be analyzed, and average concentration reported for each decision unit. For incremental sampling methodology, sample collection using pushpoint samplers may not be the most efficient method for collecting material for composite sampling. For incremental sampling, other sampling methods may be acceptable.

5. **Notification:** Please notify Ecology of the dates and times for seep study deployment. Due to the many field variables inherent in a study of this type, it is valuable for Ecology to deploy staff to evaluate the study as it is carried out.

6. **Detection Limits:** Please ensure detection limits are used sufficient to resolve contaminant concentrations to below natural background concentrations in soil, sediment and water.

7. **Reporting:** With the goal of determining locations and concentrations of maximum loading to the environment, please include reporting of the latitude and longitude of sample locations, the locations and geographic extents of seeps detected, pictures of the seeps, and concentrations of sediment and porewater obtained from the locations of seeps. Please also report river stage elevations at Saint Helens Oregon for the times of sample collection, observations at the Site, and height of groundwater in monitoring wells.

   If, due to field conditions, the contingency plan is implemented and average concentrations are obtained from decision units using incremental sampling methodology, please report the decision unit extents, individual locations where composited samples were obtained for each composite sample, and the analytical results obtained.

Soil Study Comments:

8. **Soil study locations and depths:** Twenty two locations are proposed for additional soil investigation. Composite samples are proposed to be obtained from 0-3 feet bgs, and from 3-6 feet below ground surface (bgs) and analyzed for cadmium and zinc using EPA Method 6010. Proposed sampling locations and composite intervals appear adequate to detect whether additional contamination has entered the environment as a result of ongoing manufacturing processes. If contamination is detected, additional remedial investigation may be needed.

   Pit Area and rusting floor drains: Please ensure that samples are collected from below the make tank room[1], if that area is the same area as the "Pit" area, discussed by Ecology in our February 9, 2017 letter. One of Ecology's goals is to obtain contaminant concentration information from below the floor of the pit area of the manufacturing plant. Also, as discussed in the work plan, please ensure that samples are collected from areas below rusted floor drains within manufacturing process areas.

9. **Reporting:** Please add reporting for pH levels in soil samples.

10. **Groundwater - contingency plan:** Please include a contingency for groundwater sampling and analysis, should groundwater be encountered in the soil borings.

11. **Results:** If results of this study detect additional contamination at levels that could impact the determination of a Site remedial alternative that meets the minimum requirements of MTCA, additional delineation of the detected contamination may be necessary for the remedial investigation.

2. **Establishment of cleanup standards:**

Ecology is separately providing requested technical assistance on setting cleanup levels and points of compliance for the Site. As detailed in Ecology's February 9, 2017 letter, additional remedial investigation and reporting is needed at the Site before establishing cleanup levels and points of compliance.

3. **Selection of cleanup action.**

Ecology has determined the cleanup action you selected for the Site, excavation of contaminated soils and pilot scale remedial injections, does not meet the substantive requirements of MTCA.

[1] Figure 4, Proposed Sample Locations, May 12, 2017.

As detailed in Ecology's February 9, 2017 letter, a feasibility study for the Site is needed that provides remedial alternatives meeting minimum threshold requirements. As discussed in both work plans, that feasibility study may demonstrate that additional remedial action is disproportionately costly at the Site compared to the benefit to be obtained by additional remedial action.

4. Cleanup.

Ecology has determined the cleanup you performed does not meet cleanup standards for the Site.

Limitations of the Opinion

1. Opinion does not settle liability with the state.

Liable persons are strictly liable, jointly and severally, for all remedial action costs and for all natural resource damages resulting from the release or releases of hazardous substances at the Site. This opinion **does not**:

- Resolve or alter a person's liability to the state.
- Protect liable persons from contribution claims by third parties.

To settle liability with the state and obtain protection from contribution claims, a person must enter into a consent decree with Ecology under RCW 70.105D.040(4).

2. Opinion does not constitute a determination of substantial equivalence.

To recover remedial action costs from other liable persons under MTCA, one must demonstrate that the action is the substantial equivalent of an Ecology-conducted or Ecology-supervised action. This opinion does not determine whether the action you performed is substantially equivalent. Courts make that determination. *See* RCW 70.105D.080 and WAC 173-340-545.

3. State is immune from liability.

The state, Ecology, and its officers and employees are immune from all liability, and no cause of action of any nature may arise from any act or omission in providing this opinion. *See* RCW 70.105D.030(1)(i).

Contact Information

Thank you for choosing to clean up the Site under the Voluntary Cleanup Program (VCP). After you have addressed our concerns, you may request another review of your cleanup. Please do not hesitate to request additional services as your cleanup progresses. We look forward to working with you.

For more information about the VCP and the cleanup process, please visit our web site: www.ecy.wa.gov/programs/tcp/vcp/vcpmain.htm. If you have any questions about this opinion, please contact me by phone at (360) 407-6528 or e-mail at adam.harris@ecy.wa.gov.

Sincerely,

Adam Harris, LHG
SWRO Toxics Cleanup Program

By Certified Mail: [91 7199 9991 7037 0291 6203]

AH: kb

cc: Scott Drury, Hart & Hickman
Nicholas Acklam, Ecology
Matthew Alexander, Ecology