

Memorandum

To: Puget Sound Clean Cars Working Group **Date:** April 26, 2018

From: Ecology, Gradient, SAE

Subject: Puget Sound Clean Cars Working Group April 18, 2018 Web Meeting Minutes

Web Meeting Participants

- Working Group (WG): Ed Kolodziej, Gary Pollak, Keith Wilson, Michael Smith, Laurie Holmes, Dan Selke, Michael Smith
- Stakeholder Group (SG): Susan Hazen, Stacy Tatman, Thomas Tucker, Michelle Gaither.
- Operations Team (OT): Ken Zarker, Justine Asohmbom, Tom Lewandowski, Dave Mayfield, and Joel Cohen.

Agenda Items

Draft Report Sections- Dr. Tom Lewandowski presented slides summarizing the contents and key findings of draft report sections 1-4.

1. Introduction
 - a. Project background and scope are discussed in this section, along with information related to potential sources, frequency and volume of vehicle fluid leaks. Vehicle leak data are presented from the Puget Sound Toxics Loading Analysis (PSTLA), which identified and prioritized chemicals detected in stormwater in the Puget Sound region. Potential human health and environmental impacts of vehicle fluid leaks are also discussed.
2. Current Automotive Design and Maintenance Practices Related to Leaks
 - a. Design features currently used to prevent fluid leaks or provide warning of fluid leaks are discussed. Includes a discussion of voluntary standards for vehicle design used to measure durability, performance for seals and related parts. It is noted that leak sensors and warning lights are typically triggered only by significant fluid volume loss. Failure Mode and Effects Analysis (FMEA) is used to identify appropriate diagnostic methods for each failure mode...
 - b. Section 2 also discusses maintenance efforts carried out by professional repair facilities. This includes leak detection methods for handling brake fluids, and floor cleanup best management practices.
3. Approaches to Reduce Vehicle Leaks
 - a. In section 3 innovative and emerging technologies for reducing vehicle fluid leaks as well as reducing the impacts of vehicle fluid leaks are presented and discussed. Many technologies are early on in the research and design stage, while a few are commercially available (e.g. moisture-cure polyacrylate gaskets)

- b. Section 3 also presents innovative technology designed to reduce impacts of vehicle fluid leaks. Some examples are early on in the research and design stage (*e.g.* single cylinder engine for diesel vehicles), while others are commercially available (*e.g.* catch basin inserts to filter pollution out of stormwater before discharging to the sewer system).
4. Vehicle Fluid Composition and Safer Chemical Alternatives
- a. This section provides an overview of the chemical composition of vehicle fluids. A summary of chemicals commonly identified across dozens of vehicle fluid safety data sheets as well as chemicals listed on the Global Automotive Declarable Substance List (GADSL) is presented.
 - b. GADSL is a list of chemicals of concern for the automotive supply chain. If these chemicals are present in an automotive product they must be declared. Over 3200 chemical substances are listed, though GADSL does not comprehensively indicate all of the uses of listed substances in vehicles. Chemicals listed on GADSL were cross checked against EPA's CPCat database to identify those likely to be used in vehicle fluids (*e.g.* lubricants, hydraulic fluids, brake fluid, wiper fluid).
 - c. Chemicals identified from these efforts were then cross-checked against various databases of chemicals identified in stormwater samples. Only 4 chemicals found in the SDS review were also reported as being present in stormwater. Several limitations may explain the low number of chemicals identified on SDSs and detected in stormwater (*e.g.*, fluid degradation, analysis methods used). 15 chemicals found in GADSL were identified as possible automotive fluid components in CPCat and also reported as present in stormwater runoff.
 - d. Section 4 also discusses opportunities for substituting safer chemical alternatives across the various vehicle fluid types. Gradient conducted an initial search to see what information on alternatives is readily available, casting a wide net, and not conducting a comprehensive evaluation of alternatives.
 - i. Motor oil alternatives include synthetic base oils, polyalkylene glycols, vegetable oils, mahua oils, *etc.*. However it remains unclear whether alternative base oils will have similar weathering effects (increased levels of breakdown products or metal contaminants over time), and whether these alternatives confer advantage with regards to environmental and human health hazards.
 - e. State regulations in California and Texas aim to promote safer wiper fluid alternatives, specifically by limiting the amount of allowable methanol content.
 - f. Commercially available alternative transmission fluids include bio-based oils (high oleic vegetable oils offer biodegradable alternatives).
 - g. Available alternatives would need to be evaluated according to alternative assessment criteria (cost, performance, availability, hazard)
- Next Steps and Project Schedule
 - Dr. Lewandowski then presented next steps and a proposed timeline. The report draft will be distributed following the working group meeting, after which working group members are expected to review their assigned sections for accuracy and comprehensiveness, and identify additional sources/references worth seeking out. Working Group feedback on the draft report text is due back to the operations team by early May.
 - Progress Update

- A link to publically available project materials (meeting minutes, presentation slides, videos, newsletters, *etc.*) was presented.
- Gradient plans to distribute a poll for the next and final web meeting date, tentatively scheduled for June 2018.
- Additional Questions and Comments
 - Ken Zarker (Ecology) acknowledged the work conducted to date and that Ecology is looking forward to review the report. He also expressed appreciation for the creative approach to "connect the dots," identifying potential chemicals of concern. Justine Asohmbom (Ecology) seconded Ken's comments.
 - Laurie Holmes (MEMA) asked a question about a recent study by Ecology's environmental assessment program looking at a confined area within Thurston County, investigating sources of zinc and copper. Calculations on loadings were published in 2017. Follow up efforts include sampling stormwater within that defined area. Ken Zarker offered to set up a separate call to discuss that group's efforts.
 - Michael Smith submitted a comment that zinc is often included as an additive in engine oil, and Ed Kolodziej indicated zinc is often detected in stormwater samples. One possible reason why zinc compounds did not come out of the SDS review may be related to requirements for listing chemicals on SDS (a compound's inherent hazard and the % composition in the final formulation). Gradient offered to look further into this.
- Meeting Adjourned.

For any questions or comments, please contact Dave Mayfield (dmayfield@gradientcorp.com) or Joel Cohen (jcohen@gradientcorp.com).