

Friends of Rocky Top

The following comments were submitted (copy & pasted) to the State Department of Ecology website on behalf of Carole DeGrave and Friends of Rocky Top (FORT), a CascadiaNOW! sponsored project, regarding the Agreed Order between Ecology and DTG/Anderson limited purpose landfill, 41 Rocky Top Road, Yakima, WA.

The background information on the DTG/Anderson site in the Agreed Order begins in 1997, yet disposal at Rocky Top is known to have occurred a decade earlier. To understand the scope of actual potential contamination threat from this location, the background section needs to be revised to reflect the site's complete disposal history.

Note: The Macquarie Asset Management purchase of all of DTG's assets, announced Dec. 1, 2022, requires acknowledgement in the AO and in all future documents. In these comments, for brevity and convenience, the term Anderson Site refers to all facilities and operations on Rocky Top owned and operated today by Macquarie/DTG.

Anderson Site History

A special property use permit was issued July 18, 1983, to Ron Anderson for surface mining permit (SPU-27-1983; Permit #675) for 10 acres, with expiration set for December 31, 2003.

A second special use permit was issued in 1987, allowing establishment of an asphalt plant and increasing the amount of material allowed to be mined (SPU-21-87; Permit #906).

In 1988, the Yakima Health District permitted disposal of demolition waste in the Anderson Site unlined surface mining pits located near the intersection of Summitview Rd and Rocky Top Road, as evidenced by multiple sources including:

a. Yakima County code enforcement officer complaints reporting demolition pit fires in July 1989 (see Swackhammer ERTS complaints),

b. Yakima County Planning Department approval of Anderson's Sanitary Landfill to Process Contaminated Soil (SPU-41-91), 4. Current Zoning and Use which states:

There are three quarries operated by the applicant in the vicinity, and two additional quarries operated by others to east across Summitview Road. The applicant's pit located at the northwest corner of Summitview and Rocky Top Roads is being refilled with waste materials from the demolition of buildings. A solid waste permit was issued by the Yakima Health District for this purpose.

And under 5. Project Description

Soil contaminated by petroleum products is brought to the site for treatment, where it is spread, aerated, and retested until it meets state clean-up standards for "problem wastes". The soils are then either used as a cover for the existing construction waste disposal pit on the site or crushed on site for use in making asphalt.

This site has been licensed since 1989 by the Washington State Dept. of Ecology. Originally DOE controlled operation of the site because the regulatory framework had not yet been established as to how to deal with this new activity. Now DOE is transferring control with respect to permitting the land use to the local jurisdiction, being Yakima County in this instance, and is also remanding control to the Yakima Health District with respect to monitoring the operation and issuing a solid waste permit. Accordingly, this permit is simply to replace the current regulatory framework.

Anderson Rock & Demolition Pits, Sanitary Landfill to Process Contaminated Soil
Yakima County Special Permit Use SPU-41-91, Zoning Adjustor's Decision, Sept. 12, 1991

As described above, the unlined demolition pits were originally "licensed" by Ecology and receiving waste in 1988, with permit authority transferred to Yakima Health District that year. In 1991, the demolition pits were permitted to be covered with remediated PCS.

What makes the unlined demolition pits a growing concern is the fact that material disposed was marginally regulated and routinely reported on fire, requiring dousing with water and their proximity to Cowiche Creek. Putting landfill fires out with water increases the potential to drive contaminants into the subsurface and groundwater resources. The burned material may have included tires, which along with roadway tire dust, can leach a toxic chemical; 6PPD-quinone. According to Ecology, tires release this toxin that ends up in roadway dust, and via water, can enter stormwater systems, drainage areas, groundwater, and sources that feed creeks and streams (see Attachment #1 Ecology news release, Saving Washington's salmon from toxic tire dust, January 25, 2023).

As regulator's are aware, no groundwater monitoring wells were ever required or established for the pits which are closer to Cowiche Creek than the LPL MTCA site or the PCS facility. In recent years the Yakama Nation have re-introduced salmon into this stretch of the river.

In 1991 the County approved Anderson's unlined Petroleum Contaminated Soil (PCS) remediation facility that accepted contaminated soils from all over the state, including Puget Sound and the Yakima Training Center (YTC). As Ecology recently disclosed in a letter to the Yakima Health District, this included 743 cubic yards of PFAS contaminated soil in 2004 for remediation and landfill use and/or disposal (see Attachment #2, Rivard letter to YHD, Jan 19, 2023).

Consequently, the unlined demolition pits at/near the current office, and the unlined PCS remediation site have never been included in the Anderson Site groundwater monitoring system, which started in 2006 with two wells completed in separate water bearing zones. A third monitoring well was completed in a separate, third water bearing zone in July 2022. Drilling was halted in a fourth monitoring well by DTG because of 'budget' concerns, ending the company's field investigation and further delaying their chances to provide a plan that meets the requirements of WAC 173-350-500.

Facility regulators and the public should be aware that it was at this same time - July 2022 - that DTG was negotiating its acquisition by Macquarie Asset Management for all of the company's assets, including a landfill on fire and emanating toxic fumes, that would shortly be forced into the Model Toxic Control Act cleanup program.

It should be recognized that five months prior the company claimed to Rivard and landfill regulators that it was "eager to develop a concrete action plan to work with Yakima Health to address the points in your February 11, 2022 letter" (see Attachment #3, John Martin email to James Rivard, re DTG Yakima LPL ♦ Virtual Review Meeting, February 15, 2022 9:40:18 AM and Attachment #4 James Rivard letter to Shawn Magee, YHD, re DTG LPL New Cell Development ♦ Hydrogeology Comments, February 11, 2022 letter).

Rivard's letter lays bare the wholly inadequate site characterization and groundwater interpretations, and that the existing monitoring network does not meet WAC 173-350-500 requirements, and recommends DTG conduct additional field work, including drilling multiple wells. While Martin committed to regulators that his company was eager to do just that, the reality is DTG was more committed to delay this work until now, Spring 2023, three months before a June 30, 2023 deadline to meet the regulator's concerns for landfill permit approval, per the YHD's letter to DTG outlining required tasks, and schedule for product development, March 24, 2022.

In July 2022 DTG ends their "concrete action plan" after drilling one well (50 feet) and stopping drilling of a second well due to budget implications. By not conducting the required field investigation DTG ignored regulator's timetable and requirements for field data it appears because of the potential revenue implications during negotiations with Macquarie. The company delayed drilling and field work until a timely and stern reprimand from the YHD (see Attachment #5, Steven Newchurch letter to John Martin, Additional Hydrogeologic Investigative Requirements for DTG LPL Permit Renewal and Southern Expansion, February 27, 2023).

The point is, the record is clear; it was 13 months after Martin told regulators the company was "eager to develop a concrete action plan" to address Ecology's list of hydrogeology concerns that the company actually provides regulators with a reasonable plan to do so that is only now being implemented.

The Anderson Site history of unlined, unmonitored disposal operations married with operational mismanagement and a 300% increase in disposal under DTG's three-year ownership that generated hundreds of complaints and confirmed multiple facility violations (see ERTS Anderson Site complaints record, and YHD Quarterly Inspection reports; 2020-2023) complicate regulator's ability to understand the web of contributing factors to detection of groundwater contamination at this location.

Consequently, the background information should be revised to include the contamination threat posed by the multiple permitted facilities because of their known, or suspected potential to contribute to Anderson Site groundwater contamination, including:

- 1) unlined & unmonitored petroleum contaminated soil (PCS) remediation site,
- 2) PFAS/PCS threat to groundwater not included,
- 3) unlined demolition waste pits (and subsequent fires),
- 4) unlined Material Recovery Facility (MRF) operating on unlined landfill working face,
- 5) disposal of gypsum and gypsum by-products, and
- 6) suspected disposal in the unlined surface mining area

Combined, these multiple factors (discussed individually below) suggest a broader, more

significant, and complicated threat to local drinking water supplies than represented in the limited scope of the initial MTCA investigation. An argument can be made that multiple unlined, overlapping disposal operations where remediated PCS is allowed for use and disposal throughout the facility raises complex and challenging questions for determining a specific source for detected contaminants.

How will regulators parse which facility and flow path detected sources of contamination originate? Is a detected contaminant the by-product of: a fire at one of the demolition pits that were doused with water?

Or from the MRF operating at the working face without a liner?

Or from the PFAS contaminated PCS soils from the Yakima Training Center disposed and spread around the site in 2004-06?

Or from other soils stored at the PCS site which may or may not have been contaminated, but which were moved to other parts of the facility in fall and winter of 2022/23?

Or maybe the contaminant's chemistry reflects the Elliot Bay seawall dredge spoils remediated and disposed, beginning in 2015? Would the detection be from the PCS site or the LPL MTCA footprint?

How can the public have confidence in the ability of this company or regulators to determine the source of detected contamination when there are many known potential sources that could be, either alone or combined, responsible for the detection?

As MTCA allows, the information generated during the investigation is added and if required, the scope can be reconsidered to reflect the new information and understanding of site conditions. While we understand why the initial MTCA footprint is limited, we think that the extent of contamination likely at this location makes it inevitable that regulators will be forced to require a broader investigation that includes all of these known potential sources of contamination, and expanding the MTCA footprint accordingly.

Comments on each contamination source that should be included in the MTCA investigation:

1) Unlined and unmonitored PCS site

The 1990-91 Anderson PCS permit application proposed three - or more - monitoring wells. While the County approval required three (3) groundwater monitoring wells, to date, facility regulators have not required any groundwater monitoring wells for this unlined facility that has been in operation for over 30 years.

2) PCS and PFAS threat to groundwater not included

It was recently reported that a U.S. EPA survey of 200 municipal solid waste (MSW) landfills found PFAS in the leachate of 95% of them. Landfills and material recovery facilities (MRFs) are known "passive receivers" of PFAS-containing items. DTG has transferred material to Rocky Top for many years, primarily from MRFs in Puget Sound. Building materials permitted for disposal at Rocky Top have likely contained PFAS. DTG ramped up acquisition of Puget Sound MRFs from late 2020 to early 2023 (15 companies, multiple locations, transfer vehicles, collection containers, etc.) that allowed them to substantially increase waste flow to Yakima in 2021 and 2022.

Consequently, it could be that PFAS contaminated materials and soils have been remediated, used and/or disposed on Rocky Top from demolition pits in the late 1980s, the permitted 1997

Demolition Waste landfill, and permitted LPLs in 2007 & 2015 (historical fill area).

This doesn't include the area YHD allowed DTG to fill just south of the historical fill, where DTG excavated the Vantage Interbed to gain airspace and eliminated the approved natural soil liner. This area has likely received over 500,000 cy of PFAS contaminated waste, covered by PCS soil that may or may not have been remediated.

Consequently, it is challenging to ascertain the PFAS threat and potential risk of future groundwater contamination at this location without new air and water quality data and continue technical review of site records. Why are PFAS called 'forever chemicals'? According to the Academy of Sciences:

Perfluoroalkyl and polyfluoroalkyl substances (PFAS) are a class of chemicals that includes more than 12,000 different compounds with various chemical properties. PFAS are commonly used in thousands of products, from nonstick cookware to firefighting foams and protective gear, because they have desirable chemical properties that impart oil and water repellency, friction reduction, and temperature resistance. PFAS as a class have a wide variety of distinct chemical properties and toxicities; for example, some PFAS can bioaccumulate and persist in the human body and the environment, while others transform relatively quickly. The PFAS that do transform, however, will become one or more other PFAS because the carbon-fluorine bond they contain does not break naturally. It is for this reason that PFAS are termed "forever chemicals."

Summary, National Academy of Sciences, 2022

Guidance on PFAS Exposure, Testing, and Clinical Follow-Up

3) Demolition Pits and recorded fires threat to groundwater not included

This long history of PCS and demolition, now construction waste that likely contain PFAS contaminated materials and soils remediated and used and/or disposed on Rocky Top at demolition pits in the late 1980s, in the permitted 1997 Demolition Waste landfill, and the permitted LPLs in 2007 & 2015 (including historical fill area).

Lastly, because the YHD allowed DTG to place waste south of the historical fill, where DTG excavated the Vantage Interbed to gain airspace and eliminated the YHD approved natural soil liner that protected groundwater from landfill leachate. This unlined area has likely received over 500,000 cy of material in 2022, including PFAS contaminated materials covered by PCS soil that may or may not have been remediated.

Consequently, it will be challenging for regulators to ascertain the source of the two identified contaminants (Polycyclic Aromatic Hydrocarbons and Benzene) and suspected PCS contamination without expanding the site investigation to account for the existing potential sources of contamination ◆ the demolition pits, PCS site and mining area.

4) MRF threat to groundwater not included

In addition, the background should include the permitted material recovery facility (MRF) operations because they were allowed to operate on the unlined landfill working face (not an impervious surface as standard) including in the MTCA area under investigation.

The MRF continues to operate on the unlined cell south of the historical cell, not an impervious surface, that constitutes an increased risk because DTG excavated portions of the approved natural soil layer (Vantage Interbed), likely creating more direct pathways for contamination to reach local groundwater (drinking water supply) and nearby Cowiche Creek.

5) Disposal of gypsum and gypsum by-products

In recent years, disposal of drywall and gypsum in landfills has been banned in Canada and municipalities across our nation due to the highly toxic hydrogen sulfide gas that is generated from the combination of drywall waste (gypsum), organic material, and a landfill's anerobic (air free) environment.

Shortly after acquiring the Anderson operations, DTG began importing significant volumes of "drywall backing paper" from Canada, reporting 19,394 cy in 2020, and 164,400 cy in 2021. Neighbors provided regulators with photos of this material spread like a blanket across the LPL in 2021. As DTG acknowledges, in 2021, YHD received odor complaints and observed visual vapor plumes emanating from fissures within the landfill. The amount of gypsum disposed at this facility is far greater than the Canada waste stream, as new information has recently surfaced drawing regulatory scrutiny in Puget Sound regarding DTG's MRF operations, including suspect gypsum recycling and likely disposal in Yakima. The new information comes from a DTG whistleblower and leading gypsum industry recycler.

6) Suspected disposal in the unlined surface mining area

In addition, suspected disposal in pre-dug holes in the mining area between 9:00 pm and 10:00 pm on April 15 & 16, 2020 was observed by multiple neighbors, and reported to facility regulators (see Cave ERTS complaint). This unexplained late night disposal deserves further investigation and should prevent the planned LPL expansion over the top of this suspected disposal area.

Comments on the Draft Cleanup Action Plan will be submitted separately by Joseph Stolle, PE GeoEngineers.

Saving Washington's salmon from toxic tire dust

We are taking action to reduce 6PPD-quinone, a chemical that is deadly to coho salmon



Coho salmon returning to rivers and streams often die before they can spawn. Photo by Roger Tabor, US Fish and Wildlife

For over 20 years, scientists faced a toxic mystery: coho salmon returning to urban streams and rivers in the Puget Sound region were dying before they could lay their eggs. The culprit was unknown, but it seemed linked to toxic chemicals running off our roads and

highways.

The fate of the salmon carries weight far beyond that single species. The endangered Southern Resident orca whales rely on salmon for food. Salmon are intertwined with the health and culture of Indigenous communities and are a key part of tribal treaty rights. Washington's economy and food supply depend on healthy salmon runs. Salmon are important to our well-being.

In 2020, a group of researchers finally [made a breakthrough](#) — they pinpointed a specific chemical as the killer: 6PPD-quinone, the last part pronounced "qui-KNOWN," a toxic chemical released from automotive tires that ends up in roadway dust and can run into streams. The chemical is created when 6PPD, a preservative that helps tires last longer, reacts with ozone in the atmosphere.

With a culprit identified, the hard work of reducing contamination from something as widespread as tire dust is now underway. Alongside tribal governments, interest groups, and federal, state, and local organizations, we have begun planning the most effective ways to reduce the amount of 6PPD-quinone going into the water.

Our agency is initially focusing on three key efforts to effectively reduce the threat of 6PPD-quinone to salmon:

- **Understanding the problem:** Developing scientific methods to measure 6PPD-quinone in the environment and identifying affected areas.
- **Reducing stormwater pollution:** Identifying stormwater-management approaches to capture and treat 6PPD-quinone and tire debris before it reaches streams, updating guidance for local governments to use, and acquiring more funding for stormwater-management grants.
- **Reducing sources of 6PPD:** Researching alternate chemical preservatives that could replace 6PPD in tires, and evaluating if these chemicals are actually safer.

Ongoing funding from the Legislature will help us expand our efforts to reduce the harmful impacts from this toxic tire-related chemical.

Using science to understand the problem



Chemist Joan Protasio explains the process for analyzing and measuring 6PPD-quinone in water samples to Gov. Jay Inslee.

We are expanding our laboratory and field-monitoring capacity to understand when, where, and how 6PPD-quinone ends up in the environment. In November 2022, we published [6PPD in Road Runoff: Assessment and Mitigation Strategies](#), which identifies watersheds in the state that are particularly vulnerable to 6PPD-quinone pollution. The report also summarizes research on actions to reduce the toxicity of 6PPD-quinone.

Our scientists are comparing and analyzing different methods to collect water samples from rivers and streams. We have already developed a laboratory method to analyze these water samples and measure 6PPD-quinone at around one part per trillion, which is like detecting an amount the size of a drop of water in 20 Olympic-sized swimming pools. We aim to establish a study to measure the presence of tire-wear particles and related pollutants like 6PPD-quinone in rivers, streams, and Puget Sound.

There are many questions we still need to answer before we fully understand the old and new challenges we face. The pollution from 6PPD-quinone and tire-wear particles is diffused, which means it comes from many sources and is spread by rainfall and melting snow. We are unsure whether 6PPD-quinone ends up in places other than freshwater and marine environments, such as in mud, plants, or animals — or how long it stays in different environments.

Finding answers to these questions will help us adapt our strategies and take further action to reduce its toxicity to coho salmon.

Reducing pollution in stormwater



Runoff from roads filtered by engineered soil mixes and plants reduces pollutants from entering stormwater infrastructure and receiving waters. We are identifying practices that reduce stormwater pollution and are testing their effectiveness to capture and prevent

stormwater from transporting 6PPD-quinone to surface waters (rivers, streams, and Puget Sound). Conducting science and engineering research on best management practices is essential so we can provide guidance to stormwater permit holders on how to manage tire-wear particles.

In June 2022, we published [Stormwater Treatment of Tire Contaminants — Best Management Practices Effectiveness](#), which presents emerging guidance on this challenge. The publication provides an overview of existing management practices and their anticipated effectiveness to prevent stormwater contamination, slow down and reduce the volume of runoff, and treat stormwater to remove toxicity. Some of the highlighted practices include:

- **Capturing tire debris:** Sweeping streets to prevent debris and chemicals from entering stormwater drainage systems and the waterbodies they drain to.

- **Detaining water:** Using stormwater ponds to hold large volumes of stormwater, which slows down runoff, encouraging rubber particles to settle, or using infiltration areas that let water soak into the ground to prevent runoff to surface waters.
- **Using physical and chemical treatment processes:** Filtering runoff through the soil or grasses in engineered channels before it enters surface waters to reduce the concentration of pollutants.

We recently published [Focus Sheet: Best Management Practices for 6PPD-q](#), which summarizes the studies we have already conducted on these practices. We will continue researching the relative effectiveness of these management practices and will meet with local governments, tribes, interest groups, and community members to incorporate management practices into our stormwater guidance, permits, and funding programs. We will issue more protective stormwater guidance in 2024 to help local governments manage stormwater practices and permits.

Lastly, in 2022, we increased our [Municipal Stormwater Capacity grant program](#) funding. With this increase in funding, we hope to better support the work local governments are doing to implement stormwater permits.

Reducing sources of 6PPD pollution



The chemical 6PPD is used as a rubber stabilizer that prevents tires from breaking down while driving and helps them last longer. Photo from pexels.com.

Automotive tires are the primary source of 6PPD and 6PPD-quinone. Our long-term goal is to prevent tires from releasing these toxic chemicals. However, 6PPD

is an important ingredient for tire manufacturers: the chemical stops tires from breaking down quickly and helps them last much longer, which keeps passengers safe and minimizes the number of tires in landfills.

Without an effective replacement, 6PPD cannot be removed from tires without significant consequences. We are working hard to find an alternative that provides the same level of tire performance as 6PPD, but that isn't highly toxic in our environment.

In November 2021, we published [a hazard assessment](#) of 6PPD and nine possible alternatives. We are continuing that work to identify a potential alternative and to prioritize steps the state and industry should take to reduce the source of 6PPD pollution.

Solving a pollution problem that is happening every day, on every roadway, from millions upon millions of motor vehicles, requires coordination across state and federal regulatory agencies, tribal governments, industry, research universities and institutions, and interest groups.

We established a forum for these groups to work together to expedite sharing research and new ideas. We are funding research at academic institutions to learn more about 6PPD replacement chemicals and their toxic impact on salmon and other aquatic species. We are also coordinating with tire and chemical manufacturers to better understand 6PPD so that we can make knowledgeable decisions on finding a chemical to replace 6PPD in tires.

Controlling the source of pollution is the most effective way to prevent 6PPD-quinone from entering the environment; however, it will take many years to develop tires that don't contain 6PPD and never release 6PPD-quinone into the environment.

In the meantime, we will continue monitoring 6PPD-quinone in the environment and will provide guidance and funding to treat stormwater before it enters waterways. Our goal is to lessen the toxic effects of 6PPD-quinone until we can find a safer replacement.

Continuous collaboration

The threat of 6PPD-quinone is an urgent problem that needs dynamic solutions and innovative partnerships. We are developing solutions with partners throughout the state and the nation.

From leading workshops to find safer alternatives, to coordinating with local governments to implement stormwater management practices, to working with researchers to develop a statewide monitoring program — our work includes partners from tribal governments, local governments, state agencies, federal agencies, academic institutions, and industrial organizations.

Solving the mystery behind coho deaths was only the start of a long and difficult process. But if we can succeed, the rewards will be great. Protecting the salmon, restoring the water quality of streams in communities overburdened by pollution, and preserving Washington's environment, as well as our state's cultural and recreational values, are all goals worth fighting for.

Tire anti-degradant (6PPD) and 6PPD-quinone



6PPD stands for the chemical 6 p-phenylenediamine. It's a chemical that prevents automotive tires from degrading (i.e. breaking down) and helps them last longer. When 6PPD is exposed to air, it reacts with ozone to create **6PPD-quinone**, pronounced like "qui-KNOWN," and also referred to as **6PPD-q**. 6PPD-q is lethal to coho salmon and can contaminate water systems.

We work with tribal governments, local governments, state agencies, federal agencies, academic institutions, and industrial organizations to reduce the pollution and sources of 6PPD-q released from tires in Washington.

I want to...

- Read our blog about protecting salmon from 6PPD-q
- Read the initial hazard assessment of 6PPD and 6PPD-q
- Read about best management practices for 6PPD-q

What are the impacts of 6PPD-q?

Driving causes tires to release dust and small particles because of friction on the road. These particles contain 6PPD-q, which then washes into stormwater, and, in turn, can spread to rivers, streams, and Puget Sound. Since 6PPD-q was only recently discovered, we are still learning about this chemical and its impacts on wildlife.

6PPD-q can end up in freshwater or marine environments harming wildlife. Green infrastructure can help remove toxic chemicals like 6PPD-q from stormwater.

Taking action to protect salmon

We're initially focusing on three key efforts to effectively reduce the threat of 6PPD-q to salmon:

- **Understand the problem:** Develop scientific methods to measure 6PPD-q in the environment and identify affected areas.
- **Reduce stormwater pollution:** Identify stormwater-management approaches to treat 6PPD-q and tire debris before it reaches streams, update guidance for local governments to use, and increase funding for stormwater infrastructure.
- **Reduce sources of 6PPD:** Research alternate chemical preservatives that could replace 6PPD in tires, and evaluate if these chemicals are actually safer.



STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

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January 19, 2023

Yakima Health District
ATTN: Shawn Magee
Environmental Health Director
1210 Ahtanum Ridge Drive
Union Gap, WA 98903

DTG Yakima Limited Purpose Landfill – PFAS Recommendations

Dear Shawn,

Ecology staff in our solid waste management division has recently learned that soils removed from the Yakima Training Center's (YTC) former Fire Training Facility were brought to the former Anderson Landfill (now DTG) for petroleum contamination treatment and disposal in 2004. As you may be aware, YTC's Fire Training Facility was a shallow unlined pit that was periodically filled with old fuel and set on fire so that fire crews at the YTC could practice fighting fires with aqueous film forming foam (AFFF). Prior to 2004, soil and groundwater at the YTC site was determined to be contaminated with petroleum-related compounds and cleanup was initiated. One of the selected remedies was to excavate the contaminated soil and remove it from the site. Approximately 743 cubic yards of the excavated soils were taken to Anderson Landfill for treatment at the petroleum contaminated soils (PCS) treatment site and disposal in the landfill.

In 2004, at the time of excavation of the YTC Fire Training Facility, the toxic characteristics of the ingredients of AFFF were not understood by YTC, the Yakima Health District (YHD), or Ecology. AFFF contains per- and poly-flouroalkyl substances (PFAS) which are now understood to be toxic at very low concentrations and extremely persistent in the environment. At the time of disposal of the Fire Training Facility soils, analytical methods were not available to identify and quantify PFAS in soil, and regulators were not aware that these compounds were as persistent or as toxic as they are now understood to be.

The PCS removed from the YTC site, were transported to the Anderson Landfill for treatment at the PCS site and disposal in the landfill. This material likely contained elevated concentrations of PFAS. Because the existing landfill and the PCS treatment site are unlined, there is a risk of migration of PFAS into groundwater. Ecology recommends that the sampling and analysis plan for routine monitoring at the landfill be amended to include analysis for PFAS. Ecology also recommends soil grid sampling of the PCS pad area and installation of monitoring wells around the PCS treatment area and development of a sampling and analysis plan for the site which should include soil sampling to determine if PFAS is present. Ecology recommends this work gets completed within 1 year time.

There have been some indications from DTG that they do not intend accept additional PCS for treatment at the PCS treatment facility. Ecology recommends monitoring well installation and soil sampling at the PCS treatment facility even if the facility will be closed to ensure that the site is not contaminated with PFAS or petroleum products. If the facility will remain open, Ecology also recommends that additional design features (e.g. an impermeable working surface, lined stormwater ponds, etc.) be required by YHD to ensure human health and the environment are protected during future operations. Either way more work is needed at the PCS site to decommission and monitor for the long-term, or prepare for future use with adequate environmental compliance controls.

Ecology has developed recommended groundwater cleanup levels for six PFAS compounds: PFOA, PFOS, PFNA, PFHxS, PFBS, HFPO-DA. The recommended cleanup levels and the basis for those levels are outlined in the attached document: *DRAFT Guidance for Investigating and Remediation PFAS Contamination in Washington State*. While the recommended groundwater cleanup levels and the guidance document are draft, they are still enforceable under the Model Toxics Control Act (MTCA) because the underlying toxicology information for these compounds meets the criteria required by MTCA. Therefore, it is within YHD's regulatory authority to require sampling and analysis for PFAS to ensure protection of human health and the environment.

Attached is some related documentation for YHD's records related to the YTC material.

Ecology appreciates the opportunity to work through the issues outlined above with YHD. For any concerns or questions feel free to contact me at (509) 731-5163 or via email at james.rivard@ecy.wa.gov.

Yakima Health District
Shawn Magee
DTG Yakima Limited Purpose Landfill – PFAS Recommendations
Page 3 of 3

Sincerely,

James Rivard (Signed Digitally)

James Rivard
Regional Manager
Solid Waste Management Program
Washington State Department of Ecology
Central Regional Office

Attachments:

- (1) DRAFT Guidance for Investigating and Remediation PFAS Contamination in Washington State
- (2) Some ECY related YTC related Information

CC: Steven Newchurch, YHD
Luke LeMond, Ecology
Cole Provence, Ecology
Sage Park, Ecology
Ecology Records

From: John Martin <john@dtgrecycle.com>
Sent time: 02/15/2022 09:40:18 AM
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Subject: RE: DTG Yakima LPL - Virtual Review Meeting
DTG_Logo_15b8125f-a68a-4df8-8a18-487c6b89b740.png 058_sm_fb_b4c5bf88-e415-4f62-8f86-6308c9fe4a38.png 058_sm_in_e5fb2776-
Attachments: 0c46-4412-a144-562ec71bfa8c.png SocialLink_Instagram_32x32_153ee435-b87a-481f-bc0e-46417254bb81.png dtg_sweeper_signature-
600x150-300_b9fa682e-e80c-49fb-892f-e536be80fd56.png

CAUTION : This email originated from outside of this organization. Please exercise caution with links and attachments.

James,

Let's keep this Friday's meeting to discuss hydrogeology. You are correct in assuming that we will have some ideas to present, and we would like to get them in front of you as soon as possible. We are eager to develop a concrete action plan to work with Yakima Health to address the points in your February 11, 2022, letter.

If you don't mind and to expedite our response, please copy me on your upcoming comment letter to Yakima Health District.

Thanks,

John

From: Rivard, James (ECY) <JRIV461@ECY.WA.GOV>
Sent: Tuesday, February 15, 2022 9:04 AM
To: John Martin <john@dtgrecycle.com>; Ian Sutton <ISutton@parametrix.com>; shawn.magee@co.yakima.wa.us
Cc: ted.silvestri@co.yakima.wa.us; Grieves, Kimberly <ksar461@ECY.WA.GOV>; LeMond, Luke (ECY) <llem461@ECY.WA.GOV>; Arnie Sugar <asugar@hwageo.com>; Dwight Miller <DMiller@parametrix.com>; Rounds, Megan (ECY) <MROU461@ECY.WA.GOV>
Subject: RE: DTG Yakima LPL - Virtual Review Meeting

Yeah no problem. It appears I glanced at schedules a little too quickly. Myself and Luke will be able to attend for sure on Friday. The February 11th letter was mostly about hydrogeology. So we can discuss that in a narrow scope, if you want to present a few concepts, but there may be no decision on Friday as time might be needed to consider and evaluate. Then meet back up again next week.

We are working on some additional comments regarding facility operations and engineering. Those may come later this week. So between staff schedules, additional comments coming later in the week, and the likelihood of needing to meet more than once...

What would you rather do: 1) Proceed with meeting on Friday, 2) Waiting until the next batch of comments comes to meet next week?

Either way, I think we will have to meet next week. So below is a Doodle Poll to help with scheduling.

https://doodle.com/poll/zq5rr4sbt2ytncqz?utm_source=poll&utm_medium=link

Thanks,

From: John Martin <john@dtgrecycle.com>
Sent: Monday, February 14, 2022 3:34 PM
To: Rivard, James (ECY) <JRIV461@ECY.WA.GOV>; Ian Sutton <ISutton@parametrix.com>; shawn.magee@co.yakima.wa.us
Cc: ted.silvestri@co.yakima.wa.us; Grieves, Kimberly <ksar461@ECY.WA.GOV>; LeMond, Luke (ECY) <llem461@ECY.WA.GOV>; Arnie Sugar <asugar@hwageo.com>; Dwight Miller <DMiller@parametrix.com>; Rounds, Megan (ECY) <MROU461@ECY.WA.GOV>
Subject: RE: DTG Yakima LPL - Virtual Review Meeting

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James,

Thank you for your quick response. Friday at 3:30pm would work well for us.

-John



John Martin

Associate General Counsel

Desk 425.523.8385 | Cell 425.408.2186

john@dtgrecycle.com

P.O. Box 14203 Mill Creek, WA 98082

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From: Rivard, James (ECY) <JRIV461@ECY.WA.GOV>

Sent: Monday, February 14, 2022 3:05 PM

To: Ian Sutton <ISutton@parametrix.com>; shawn.magee@co.yakima.wa.us

Cc: ted.silvestri@co.yakima.wa.us; Grieves, Kimberly <ksar461@ECY.WA.GOV>; LeMond, Luke (ECY) <llem461@ECY.WA.GOV>; John Martin <john@dtgrecycle.com>; Arnie Sugar <asugar@hwageo.com>; Dwight Miller <DMiller@parametrix.com>; Rounds, Megan (ECY) <MROU461@ECY.WA.GOV>

Subject: RE: DTG Yakima LPL - Virtual Review Meeting

I can be available.

Overlaying other Ecology's employees schedules.

Looks like these are available (sorry that they are late in the day)

Thursday (potentially 4 PM), after 4:30 PM all clear

Friday any time after 3:30 PM

From: Ian Sutton <ISutton@parametrix.com>

Sent: Monday, February 14, 2022 2:48 PM

To: shawn.magee@co.yakima.wa.us; Rivard, James (ECY) <JRIV461@ECY.WA.GOV>

Cc: ted.silvestri@co.yakima.wa.us; Grieves, Kimberly <ksar461@ECY.WA.GOV>; LeMond, Luke (ECY) <llem461@ECY.WA.GOV>; John Martin <jmartin@dtgrecycle.com>; Arnie Sugar <asugar@hwageo.com>; Dwight Miller <DMiller@parametrix.com>

Subject: DTG Yakima LPL - Virtual Review Meeting

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Hello, Shawn and James.

After receipt of the letter from Ecology dated February 11, 2022 for the DTG Yakima Limited Purpose Landfill New Cell Development – Hydrogeology Comments, we would like to schedule a virtual meeting to review and discuss the comments.

I've CC'd those that may want to attend a virtual meeting. Would Thursday or Friday afternoon work for the call? We'll have some proposed responses prepared for the meeting and will expect to be able to fine tune those at the meeting to satisfy your

needs and provide DTG a path forward for continued operation of the facility.

Please let me know if a meeting is possible and your potential availability.

Best regards,
Ian

Parametrix

ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

Ian Sutton, PE
Senior Engineer
[206-394-3712](tel:206-394-3712) | direct
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STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

1250 W. Alder Street • Union Gap, WA 98903-0009 • (509) 575-2490
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

February 11, 2022

Yakima Health District
ATTN: Shawn Magee
Environmental Health Director
1210 Ahtanum Ridge Drive
Union Gap, WA 98903

RE: DTG Yakima Limited Purpose Landfill New Cell Development – Hydrogeology Comments

Dear Shawn,

The facility is regulated under Washington Administrative Code (WAC) 173-350, which establishes minimum functional standards that the Yakima Health District (YHD) must enforce to ensure compliance with a limited purpose landfill (LPL). After DTG Recycle (DTG) approached the Washington State Department of Ecology (Ecology) and YHD late last year with news that DTG expected to begin filling a new landfill cell in January, Ecology raised concern that a review could take some time and recommended discussions about the new cell as soon as possible. Since that time, Ecology has been conducting additional review of the available information related to the facility. Our comments from this review will come in the form of two letters. This letter addressing Hydrogeology and a second letter addressing Facility Operations and Engineering. We are taking this approach to get comments out as timely as possible.

The technical assistance provided below is based on the known information available to Ecology at the time of this writing. If there is additional documentation that DTG or the YHD can provide, it may help better inform Ecology. Upon review of any additional information, new technical assistance in the future may follow.

Background

The DTG-Anderson Limited Purpose Landfill is located on the north slope of Cowiche Mountain west of Yakima, WA in Yakima County. The landfill is regulated under WAC 173-350 and operates under the jurisdiction of YHD under permit HSW2019-00020. The facility also includes a Petroleum Contaminated Soils (PCS) Treatment Facility and a Material Recovery Facility (MRF) that also operates under the jurisdiction of YHD permits HSW2020-00001 and HSW2020-00003, respectively. This landfill does not have a bottom liner and includes two groundwater monitoring wells along the northern boundary of the facility.

DTG Anderson Limited Purposed Landfill New Cell Development Permit Application

After a significant amount of additional review of facility documentation and WAC 173-350, Ecology finds that the hydrogeologic characterization of the site, and the resulting groundwater monitoring network, fails to meet the requirements of WAC 173-350-500. This conclusion is based on review of:

- 2007 Geotechnical and Hydrogeologic Investigation Report (HWA 2007).
- The second submittal of the same report HWA 2007 report with no changes (HWA 2015).
- Review of data collected at the facility to date.
- Publicly available geologic information in the site vicinity.
- Correspondence letters:
 - *RE: Anderson Limited Purpose Landfill, Petroleum Contaminated Soils Site and Material Recovery Facility Application*, Washington State Department of Ecology, January 23, 2020.
 - *RE: DTG Yakima/Anderson Limited Purpose Landfill and Petroleum Contaminated Soil Site Application*, Washington State Department of Ecology, April 30, 2020.
 - *Review of DTG Limited Purpose Landfill permit application and the DTG Petroleum Contaminated Soil Remediation Facility permit application, both received on March 30, 2020*, Yakima Health District, May 18, 2020.

Ecology recommends additional work to gather more information regarding geologic and hydrogeologic characteristics under the existing and proposed new cell, and design a groundwater monitoring network, which meets the requirements of WAC 173-350-500.

Specifically, groundwater monitoring and site characterization required by WAC 173-350-500(2) includes a detailed list of items required for landfill site characterization. The requirements include investigation of faults, joints and fractures, unstable slopes and subsidence areas, a site specific borehole program, a site-specific flow path analysis, a well survey, site water balance calculation, and conceptual monitoring network design. Many of these items received cursory investigation in the 2007 and 2015 applications, but in many ways left more questions than answers. While we understand that addressing the items identified in this letter may seem like a burden for DTG and may impact the landfill's operation, the recommendations described below are intended to ensure compliance with the requirements of WAC 173-350, and to protect human health and the environment.

Hydrogeology

Per WAC 173-350-500, the groundwater monitoring network must have enough wells to yield representative samples and sufficient data to interpret groundwater flow paths during each sampling event. ***It does not appear, from the information that Ecology has on file, that the existing monitoring network is satisfactory to meet these regulatory requirements.***

The existing monitoring network is comprised of two monitoring wells along the northern boundary of the facility. These wells are presumed to be downgradient based on a potentiometric surface map provided as Figure 11 in HWA 2007. The potentiometric surface contour lines in this map were generated from data that spans 20 years and does not meet minimum quality control standards. This potentiometric surface contradicts the surface generated from concurrently collected water level data presented in Figure 10 of HWA 2007. Concurrently collected data indicates groundwater flow is toward the south in Figure 10, while Figure 11 indicates flow to the north. To date, no additional potentiometric surface maps or groundwater flow directions have been provided.

Groundwater data collected at the facility since 2006 indicates that groundwater elevation in MW-3 is consistently over 100 feet higher than the groundwater elevation in MW-2. Groundwater elevation in MW-3 also appears to exhibit much more short-term variability than MW-2. Water quality in these two monitoring wells is also distinct. Geologic cross section B-B' provided in HWA 2007 may indicate a significant discrepancy in the location of the Vantage Interbed at these two wells that was not explored. Thus, the available data suggests that these two wells may not be screened in the same aquifer and/or an unmapped geologic structure is present between them. In addition, no groundwater was encountered at Borehole BH-1 in spite of the fact that it was advanced considerably deeper than the boreholes for MW-2 and MW-3. HWA 2007 and HWA 2015 state that groundwater beneath the southern portion of the facility *“may discharge to another deeper aquifer, or flow to the west, and eventually north”*. HWA

2007 and HWA 2015 also state that “a flow boundary or discharge area likely exists somewhere between MW-2 and BH-1, possibly related to the thrust fault running under Cowiche Mountain”. Ecology can find no evidence that any attempt has been made to gather any additional information.

Review of USGS Wiley City 7.5' Quadrangle by Ecology indicates the presence of a “spring” or seep on the south side of Cowiche Mountain directly south of the facility, suggesting groundwater is present south of the facility and flowing to the south. Ecology acknowledges that the seep noted in this map may originate in a different aquifer, but the presence of seeps on the south side of the ridge could contradict the presumed groundwater flow direction. Ecology recommends that YHD work with DTG to further explore the hydrogeology at the site to ensure an adequate and complete site conceptual hydrogeologic model for the facility.

Since the design of the monitoring network must be based on accurate determination of groundwater flow direction, the existing monitoring network does not provide enough information to satisfy the regulatory requirements of WAC 173-350-500(3) Groundwater Monitoring –System Design.

Ecology recommends additional borings and monitoring well installation, and possibly the use of geophysical methods to investigate the presence or absence of potential geologic structures under the facility that may be causing this data gap.

Well Setbacks

Per WAC 173-350-400(3)(b), waste must be more than 1,000 ft from water supply wells. This facility has waste approximately 400 ft from a domestic well (denoted as Barnes '03 in HWA 2007). Based on the presumed groundwater flow direction in HWA 2007 and HWA 2015, the existing monitoring network appears to be inadequate for detection of groundwater contamination before it enters the Barnes '03 well. Ecology understands that the facility may have obtained a variance from this requirement for the current cell. However, at this time Ecology cannot support or recommend to YHD and DTG a variance for purposes of landfill expansion.

Ecology recommends an update to the landfill vicinity well survey for the proposed expansion cell to satisfy the requirement per WAC 173-350-500(2)(d). In addition, Ecology recommends installing a groundwater monitoring well between the facility and the Barnes '03 well on DTG's property and including it in the quarterly monitoring program to provide early notice of groundwater contamination to the user of Barnes '03.

Aquifer Characteristics

The aquifer performance test (APT) documented in HWA 2007 and HWA 2015, does not appear to have been conducted in a manner to yield enough meaningful information about the characteristics of the aquifer. Based on the saturated thickness of the aquifer being pumped, the appropriate monitoring well distance from the pumped well is expected to be in the range of 10 to 100 meters. The monitored wells during the test were more than 300 meters from the pumped well. In addition, the pumping duration may have been too short for drawdown to propagate to the monitoring wells. The design of the APT combined with the limited geologic information collected from lithologic logs at the site, appears to have resulted in poor quality APT data that sheds very little light on the hydrogeologic parameters of the aquifer, which makes estimates of groundwater velocity somewhat unreliable. Calculation of groundwater flow rate is required by WAC 173-350-500(2)(c) subsequent to significant additional exploratory drilling and site characterization.

Ecology recommends that at least one additional APT is conducted to properly estimate the hydraulic characteristics of aquifer(s) at the facility once additional monitoring wells are installed or the existence of a flow boundary is confirmed.

Groundwater Recharge

HWA 2007 and HWA 2015 discuss regional groundwater recharge from published sources but do little to evaluate recharge potential in the immediate vicinity of the site. The reports state that there is evidence that leakage from the Tieton Canal caused enough recharge to significantly raise water levels in nearby wells, suggesting a greater recharge potential than HWA 2007 and HWA 2015 acknowledge. While the arid climate in the area can greatly limit recharge, the presence of faults and/or fractures in the area can provide preferential flow paths that may greatly accelerate recharge.

Ecology recommends additional evidence be collected to provide more site-specific information related to recharge potential.

Faults and Geologic Structure

The hydrogeologic information outlined above suggests complex geology beneath the site as suggested by both HWA 2007 and HWA 2015. Geologic information in the area also suggest complex geology, including faults beneath the facility.

Geologic cross section C-C' provided in HWA 2007 and HWA 2015 fails to correlate the Vantage Interbed that was recorded in the drilling logs in BH-1, MW-2, and MW-3. The location of this unit corresponds to the lower limit of the first water-bearing unit encountered at the site and is

crucial to understand the hydrogeology of the site. In addition, no data has been collected at depth beneath the proposed or existing footprint of the waste. Again, Ecology recommends additional exploration at the site to create a conceptual site model that meets the requirements of WAC 173-350-500. Please note that the proposed and existing cells should be depicted on any cross sections that transect the cell locations.

HWA 2007 and HWA 2015 note the presence of a thrust fault with a surface expression on the southern face of Cowiche Mountain and likely present under the facility. The Vantage Interbed occurs along the southern edge of the LPL with a northerly dip of approximately 7 degrees. Two windows of the Vantage Interbed have also been mapped outcropping down the slope north of the site, suggesting additional faulting in the immediate area. The Grande Ronde Basalt outcrops at the top of Cowiche Mountain with a reported dip to the north of approximately 7 degrees, but windows of the Grande Ronde basalt also outcrop at the bottom of the northern slope of the mountain, with the younger Frenchman Springs Member of the Wanapum Basalt Formation in between. The recorded elevation offset in the Vantage Interbed occurrence between MW-2 and MW-3 and the corresponding 150 ft potentiometric surface difference between the two wells also suggests significant geologic structure in the area that has not been identified or described. Review of aerial photography and LiDAR datasets by Ecology indicate the presence of a linear feature resembling a scarp on the northern edge of Cowiche Mountain that could be further evidence of faulting. The thrust fault on the south side of Cowiche Mountain has been previously mapped as an inactive fault, but data from the Pacific Northwest Seismic Network indicate a number of low magnitude shallow earthquakes have been recorded since 1977 along this fault, suggesting it is active. Geomorphology off the southeastern end of Cowiche Mountain appears indicative of mass wasting events, further suggesting complex geology in the immediate vicinity of the site that has not been adequately characterized with relation to landfill activity and groundwater occurrence and flow patterns. HWA 2007 and HWA 2015 both acknowledged the possibility of additional unmapped faults at the site that have the potential to influence groundwater flow patterns. The available information for the site indicates that there may be significant poorly described faults and/or folds at the site and groundwater flow direction has not been determined. The presence of faults and/or fractures beneath the facility may provide preferential flow-paths from the surface to groundwater or between aquifers.

Based on these findings, Ecology has concluded that the existing site conceptual hydrogeologic model and groundwater monitoring network may be inadequate to ensure protection of human health and the environment. Again, for these reasons, significant additional site characterization is recommended to ensure compliance with the requirements of WAC 173-350-500. Any drilling program should include the use of X-Ray Fluorescence (XRF) analysis to

differentiate basalt formations and provide more definitive information related to faulting and folding. Ecology recommends additional investigation at the site to fully characterize the geology and hydrogeology in order to ensure regulatory compliance and to protect human health and the environment.

Petroleum Contaminated Soils

This facility includes a petroleum contaminated soil (PCS) treatment facility. PCS is stockpiled at the site and spread over ground for treatment. The facility is unlined. The existing Groundwater Sample and Analysis Plan dated March 21, 2007 and prepared by HWA Geosciences, Inc. includes no petroleum constituents. WAC 173-350-500(4)(i) requires inclusion of any other pertinent constituents based on the site specific waste profile. Ecology is concerned that the current groundwater sampling and analysis plan does not include PCS related constituents.

Ecology recommends the facility groundwater sampling and analysis plan include gasoline, diesel, and oil petroleum hydrocarbon analysis and volatile organic compounds (VOCs) via EPA Method 8260 SIM to meet the WAC 173-200 Groundwater Quality Criteria.

Electronic Data Submittal

WAC 173-350-500(5)(d) requires that all groundwater monitoring data be submitted in an electronic form compatible with Ecology's database. To date, Ecology has not received groundwater monitoring data in electronic form.

Ecology recommends that the facility's Sampling and Analysis Plan be updated to meet this requirement.

Liner Design

YHD has recently asked for clarification from Ecology regarding the need for a liner in the new cell versus using the alternative liner design used in the existing cell as is currently planned. Because of the uncertainties associated with the hydrogeologic conditions at the facility, Ecology cannot recommend an alternative liner for the new cell at this time. Significant additional information is needed for DTG to provide reasonable assurance that an alternative liner will be protective of human health and the environment.

Conclusion

Based on Ecology's review of the available information, the HWA 2007 and 2015 reports have never satisfied the requirements WAC 173-350-500(2), 173-350-500(3), 173-350-500(4), or 173-

Yakima Health District

Shawn Magee

DTG Yakima Limited Purpose Landfill New Cell Development – Hydrogeology Comments

Page 8 of 8

350-500(5). Ecology recommends that YHD and DTG work together to address the deficiencies outlined above to bring the facility into compliance with WAC 173-350-500.

Ecology appreciates the opportunity to work through the issues outlined above with YHD. For technical related questions contact Luke Lemond, Regional Hydrogeologist at (509) 379-3961 or via email at luke.lemond@ecy.wa.gov.

Sincerely,

James Rivard (Signed Digitally During COVID-19 Telework Mandate)

Regional Manager

Solid Waste Management Program

Central Regional Office

CC: Ted Silvestri, YHD

Brandon Comfort, YHD

Luke Lemond, Ecology

Kimberly Greives, Ecology

Megan Rounds, Ecology

Ecology Records



February 27, 2023

John Martin
DTG Limited Purpose Landfill
P.O. Box 14203
Mill Creek, WA 98082

RE: Additional Hydrogeologic Investigative Requirements for DTG Limited Purpose Landfill Permit Renewal and Southern Expansion (YHD Permit: HSW2019-00020).

Dear John Martin,

Since 2021, DTG has indicated that the facility is ready and prepared to expand to a new phase at the DTG Limited Purpose Landfill (LPL). Yakima Health District (YHD) and Washington Department of Ecology (DOE) conducted a facility review which revealed a lack of hydrogeologic data to properly conceptualize and characterize the groundwater flow direction and extent of for the shallow and deep aquifers located beneath the facility's footprint. The review concluded that the hydrogeological data for the facility was insufficient for both the current LPL footprint and the proposed southern expansion.

PREVIOUS PROPOSALS

DTG has submitted two proposed hydrogeologic work plans to YHD and DOE to characterize the groundwater flow under the extent of the LPL footprint and the southern expansion area of approximately 80 acres.

The first proposal, dated January 4, 2023, included only one additional well on the northern boundary of the LPL footprint to be drilled into the deep aquifer. An up-gradient/background well was not proposed, and instead, DTG proposed using an already drilled water supply well, Bertheas '95, as the only background/up-gradient well which would be conformed to compliance standard. This proposal was found to be insufficient by YHD and DOE.

The second proposal, dated February 9, 2023, proposed three additional wells on the northern boundary of the LPL. The well locations proposed were two (a cluster) on the northern boundary for shallow and deep aquifer characterization, and a well on the northeast boundary for deep aquifer characterization. Two other wells were mentioned and included in the proposal; however, these wells will be dependent on the MTCA Agreed Order (AO). YHD will not consider these wells for this proposal as they are not confirmed to be drilled nor address the absence of data in the southern LPL expansion area. An upgradient/background well was not proposed to be drilled, and again, Bertheas '95 was included to act as the only up-gradient or background monitoring well. This proposal was found to be insufficient by YHD and DOE.

ADDITIONAL MONITORING WELLS

The second proposal has included additional wells that will assist in the hydrogeologic investigation at DTG LPL. However, there are still two areas that have no data to support the groundwater flow depictions in this proposal. A well south of the southern expansion area is required to achieve a proper background/up-gradient monitoring well. No data has been collected in the southern expansion area and therefore, the assumptions made on groundwater flow beneath this area are too great. Please propose a new well location south of the southern expansion area to assist in groundwater flow conceptualization and background water quality. YHD highly recommends constructing Bertheas '95 well to a compliance well, as proposed in the February 9, 2023, plan, in addition to a new well to assist in background water quality assessment and groundwater flow characterization.

A well on the northwest boundary of the LPL is required to ensure the groundwater monitoring network encompasses all areas of the facility. Similarly, to the southern area, there is no data on the west property boundary for groundwater besides BH-1 that was abandoned before reaching groundwater. Therefore, the groundwater flow direction on the western boundary is based only on assumption and not data. Please propose a new well location on the western boundary to assist in groundwater flow conceptualization and characterization.

Based upon the data provided following the installation of new monitoring wells, YHD, with technical assistance from DOE, reserves the right to require additional work to ensure this facility is compliant with WAC 173-350-500 and to protect human health and the environment. A limited purpose landfill cannot be approved to operate if there is inadequate groundwater monitoring given the closest neighbor well to waste is 400 feet. YHD must approve a plan to be implemented that justifies and supports expanding the LPL to the South is not a human health or environmental threat.

SUMMARY

At a minimum, the following wells must be installed to support the southern LPL expansion:

- 1) MW-5S per DTG proposal dated February 9, 2023.
- 2) MW-8D per DTG proposal dated February 9, 2023.
- 3) MW-9D per DTG proposal dated February 9, 2023.
- 4) An additional well south of the southern LPL expansion area.
- 5) An additional well on the west boundary of the LPL.

DTG has had ample time and numerous calls to bring forth a plan that meets the requirements of WAC 173-350-500. **If there is not an adequate plan and timeline approved before June 30, 2023, the DTG LPL solid waste permit will not be renewed until the requirements for approval into the southern expansion area are met. Please provide an updated plan and timeline for review that support the installation of the wells stated above within fourteen (14) days of certified receipt of this letter.** YHD highly recommends submitting documents as soon as possible to alleviate timing issues with the permit renewal of the DTG LPL.

Thank you for continuing to work with YHD on these matters to ensure compliance. If you have any questions, please contact steven.newchurch@co.yakima.wa.us or (509) 249-6504.

Sincerely,



Steven Newchurch
Environmental Health Specialist

cc: Washington State Department of Ecology