State of Oregon
Department of Environmental Quality Memorandum

Date: May 11, 2022

To: Environmental Quality Commission

From: Richard Whitman, Director

Subject: Item L: Director's Report (Informational)
May 19-20, 2022, EQC Meeting

1. Director's Office

1.1 Diversity, Equity and Inclusion

DEQ is working with its consultants Engage to Change to conduct an organizational assessment of DEI at the agency. The assessment will provide an overview of DEI challenges and opportunities at DEQ. The DEI Council is overseeing the organizational assessment and has kicked off the process with a series of listening sessions with staff from our affinity groups. The DEI Council is also pleased to announce Jamila Thompson has been hired as the new DEI Analyst for DEQ. Along with the DEI coordinator, DEQ now has two full-time staff devoted to DEI work. Together, our DEI coordinator and DEI analyst will work on strategic organizational projects, including an inclusive work process framework as a resource for managers, project leads and staff across DEQ to make the shift towards a more inclusive and collaborative approach to working.

1.2 Environmental Justice

DEQ is working with the Governor's Office and the Environmental Justice Task Force to help the transition to the new structure (and new name – Environmental Justice Council) and responsibilities approved by the Oregon Legislature in HB 4077 (2022). These responsibilities include leading the development of an analytical tool that will assist communities and state agencies understand existing and historic environmental burdens, as a means of collaborating to avoid and reverse those burdens in future efforts. The Council will lead the work to engage communities in the development of this tool, with technical support from DEQ's Environmental Justice Work Group, the Oregon Health Authority, and other organizations. DEQ will be recruiting in the near future for three staff members to assist in this and other environmental justice work.

1.3 Internal Audit

I'm sad to report that DEQ's Internal Audit lead – Valerie Wicklund – has resigned. The agency will soon begin recruiting for a replacement. In the meantime, we are exploring options to contract for some audit functions as a temporary measure.

1.4 Strategic Planning

DEQ has restarted its work to develop a new strategic plan. This effort will involve working collaboratively with staff and agency leadership, including the commission, to define the key elements of the agency's mission, goals, and strategies. DEQ's project team, along with our consultants, Engage to Change and Berry Dunn, have been working to prepare for the initial meetings of the strategic planning steering committee. We have a strong mix of expertise to support both the process and the outcome - an inclusive, nimble strategic plan that will guide DEQ's work for the coming years.

The plan ultimately will support our employees, those whom we serve, and the state as a whole. During the first few meetings, the strategic planning steering committee, working with our consultants, will further define how the committee will consult with important voices inside and outside of DEQ.

All of the steering committee's work will be available to staff, and the project team will regularly update the commission and the public via the DEQ Digest and the regular Director's Report. A draft of the plan will be discussed with the commission later this year, and the commission will be asked to approve the final plan.

2. Air Quality

2.1 Cleaner Air Oregon

DEQ and the Oregon Health Authority (OHA) are collaborating on formation of a new Air Toxics Science Advisory Committee (ATSAC). In the Air Toxics Alignment Rules adopted in November 2021, DEQ rescoped ATSAC to provide input on future updates to air contaminant toxicity reference values (TRVs). ATSAC will advise DEQ on the development of TRVs to be recommended to the EQC for use in the state's toxic air contaminant program. ATSAC will provide scientific input on inhalation toxicity reference values that will inform DEQ, OHA, rules advisory committees, and the EQC. DEQ and OHA are currently in the process of recruiting ATSAC nominees and will submit a list for EQC approval in July.

2.2 Advanced Clean Cars II

DEQ is beginning work on a proposed rule that would have Oregon adopt the Advanced Clean Cars (ACC) II program. ACC-II is being developed by the California Air Resources Board (CARB) in collaboration with other states (including Oregon) under authority granted by Congress in the federal Clean Air Act. Oregon adopted ACC-I rules ten years ago, along with 17 other states. These rules are designed both to reduce smog-causing pollutants as well as greenhouse gas emissions. The ACC-I rules set requirements for manufacturers of light-duty

vehicles (for minimum requirements for Low Emission (LEV) and Zero Emission (ZEV) vehicles through the 2025 model year. The ACC-II rules would extend this program out for the 2026 through 2035 model years.

CARB is finalizing the program over the next couple of months. The proposed rules include significant provisions for credits for actions to accelerate adoption of clean light-duty vehicles, along with requirements for manufacturers in terms of what low and zero-emission vehicles are made available for purchase. The program does not mandate what vehicles people may drive.

DEQ will present an information item about this proposal at the July 2022 EQC meeting. DEQ plans to hold stakeholder and advisory committee meetings this summer, with proposed rules going out for public comment in September 2022. The EQC will be asked to consider the rules for adoption at the November EQC meeting to ensure requirements can apply to the 2026 model year vehicles.

2.3 Smoke Grants – Senate Bill 762 (2021)

The 2021 Oregon Legislature passed comprehensive legislation to help communities recover from past wildfires and to be better prepared for future wildfires. One portion of the legislation directs DEQ to administer a grant program to help communities prepare for wildfire smoke, including projects related to Community Response Plan development and implementation, smoke mitigation, and alternatives to slash burning. The program also includes funding for tribal nations to prepare for wildfire smoke. DEQ awarded funding to 20 recipients with projects being conducted in 22 counties. Ongoing updates on this work are available at https://www.oregon.gov/deq/aq/Pages/Smoke-Resources.aspx.

2.4 Wildfire and Ozone Season Preparations

Wildfire season is quickly approaching as is the time of year when ozone levels tend to be higher. DEQ has been preparing systems to inform the public regarding air quality conditions so that people and families will have information to help them protect their health.

DEQ's wildfire smoke team has updated the internal protocol for scheduling stakeholder calls and issuing air quality advisories. Meetings are planned with external partners in late May, to review the protocol and refine processes. The DEQ Lab has been working to deploy additional monitors that DEQ received funding for through SB 762 (2021) and is seeking stakeholder feedback on site selection. DEQ also participated in Governor Brown’s annual briefing on wildfire preparation, which included updates from Oregon Department of Forestry, Oregon State Fire Marshall, Oregon Military Department, Oregon Emergency Management and OHA.

DEQ has brought online its seasonal ozone monitors and has reviewed procedures for ozone advisory calls. DEQ is also reviewing additional forecasting techniques and modeling resources to better predict ozone trends.

2.5 Building Awareness

Staff from Air Quality, in collaboration with Lichens CitiSci and the U.S. Forest Service, have developed a pilot air quality curriculum for Outdoor School in Oregon titled, "Air Quality Matters". The curriculum enhances students understanding about the impacts of air quality on human health, ecological health, and climate change. The classroom activities connect directly to the outdoor school experience through lichen and air quality monitoring studies. This collaborative team will gather feedback from this pilot to expand the curriculum to other schools and apply for grant funding. The curriculum will create longitudinal data for the schools to use for STEM activities and inspire careers in science and policy.

2.6 Commute Option Rulemaking Update

DEQ is working with other state agencies to implement projects to reduce greenhouse gas (GHG) emissions from the transportation sector. One of those projects is developing rules for a statewide employer-based commute option program. We know from our experience implementing Employee Commute Options in the Portland metropolitan area for the past 20 years, that employer-based commute option programs bring multiple benefits to air quality, workers, and employers. Commute options using transit, biking, and telecommuting in the Portland metro area have kept more than 30,000 metric tons of GHGs, hundreds of tons of ozone precursor pollutants, and tens of tons of toxic air contaminants out of the air each year. We also know that transportation emissions are likely to disproportionately affect communities of color, lower income households and other vulnerable populations living near roadways. In addition to developing commute option rules applicable outside the Portland region, this rulemaking will include revisions to strengthen the current Employee Commute Option rules in Division 242 (Rules Applicable to the Portland Area).

DEQ has convened a rules advisory committee (RAC) that will meet between May and August of 2022. The RAC is comprised of nearly 30 people affiliated with employers, local government planning departments, economic development districts, social justice advocacy organizations, academia, metropolitan planning organizations and transportation management agencies. DEQ has initiated contracts to compensate organizations sending representatives that would not otherwise be able to participate because of financial barriers. DEQ expects the RAC will bring a wide range of perspectives, lived experience, technical expertise, and community knowledge. When the RAC has concluded its work to help DEQ with proposed rules, DEQ will the proposals for public comment, and will hold a public hearing in the fall of 2022. We expect to bring proposed rules to the EQC early in 2023. Staff will present a more detailed informational item on this rulemaking at the July EQC meeting.

2.7 Air Quality Permitting Updates Rulemaking

DEQ is in the midst of developing proposed rule changes for commission consideration to strengthen Oregon's air quality permitting program, including aspects to streamline processes and increase regulatory certainty for permittees. The proposed changes would allow DEQ to protect air quality with more efficient and effective permitting, allowing DEQ to focus resources on priority areas including environmental justice.

The proposed rules would affect businesses that are permitted through the Air Contaminant Discharge Permit (ACDP) program (approximately 2,400 businesses). These are businesses that are not required to obtain federal Title V Operating Permits (approximately 100 businesses) because they are not "major" sources of air pollutants. Major sources emit more than 100 tons/year of regulated air pollutants or 25 tons of hazardous air pollutants. Some of the proposed rules would also affect Title V permittees.

A RAC was formed with 12 members from industry, environmental groups, and public health. The RAC met five times between December of 2021 and May of 2022. Draft proposed rules and the draft fiscal impact statement were shared with the RAC on March 15, 2022, giving them over a month to review the documents and provide feedback and suggestion before the drafts were finalized for purposes of public comment. Public notice will begin in late May, and last for six weeks. A public hearing will be held in July. DEQ expects that the proposed rules will be presented to the EQC for its consideration in November 2022.

3. Land Quality

3.1 Hazardous Waste and Underground Storage Tanks Program – 2021 Hazardous Waste Rulemaking Implementation

The EQC approved adoption of eight federal rules for the Hazardous Waste Program in November of 2021, and these rules went into effect on January 1, 2022. The Hazardous Waste rules team is presently engaged in outreach to permittees and implementation of the newly adopted rules. The team has provided several trainings, both internally and externally, created training materials available on the web, and published 11 fact sheets. Work continues with translation of fact sheets into Spanish, Chinese, Russian, and Vietnamese and updates to program documents, including the Small Quantity Generator Handbook, existing fact sheets, and inspection checklists.

3.2 Materials Management Program – Plastic Pollution and Recycling Modernization

DEQ's Materials Management program is filling new staff positions and seeking diverse stakeholder perspectives on policy proposals to help implement the Plastic Pollution and Recycling Modernization Act (SB 582).

The Truth in Labeling Task Force is studying and evaluating misleading or confusing claims regarding the recyclability of products made on a product or packaging. The task force began meeting in January 2022 and will submit a report to the legislature by June 1, 2022. The task force consists of 15 members appointed by the Governor, plus two non-voting members of the Legislature appointed by the Senate President and Speaker of the House.

The first meeting of the Oregon Recycling System Advisory Council Meeting is May 11, 2022. The Recycling Council will advise Oregon DEQ and Producer Responsibility Organizations (PROs) on key recycling system elements, including the uniform statewide collection list, PRO program plans, and more. The council consists of 17 members appointed by the Governor, plus

two non-voting members of the Legislature appointed by the Senate President and Speaker of the House.

To prepare for an upcoming rulemaking, DEQ has begun research and planning for several technical projects including evaluating materials for possible inclusion in statewide recycling lists. In consultation with a Technical Workgroup, DEQ is evaluating economic and environmental impacts of several potential future recycling scenarios. These current research efforts will continue through the spring and summer. DEQ plans to develop and share draft rule concepts with a RAC this fall and will also consult with the Recycling Council later this year.

The project team plans to update the EQC about Plastic Pollution and Recycling Modernization Act implementation at a commission meeting this summer.

4. Water Quality

4.1 Clean Water State Revolving Fund (CWSRF) Advisory Committee to Inform Bipartisan Infrastructure Law Implementation

In November 2021, President Biden signed the Bipartisan Infrastructure Law (BIL) that provides an infusion of funding for wastewater infrastructure projects for the next five years. These funds will come directly to CWSRFs nationwide as supplemental capitalization grants. As explained in EPA guidance, a key priority of the BIL is to ensure that disadvantaged communities are prioritized for this historic investment in water infrastructure. Disadvantaged communities include those with environmental justice concerns that are often low-income individuals, communities of color, and those at risk of experiencing disproportionately high exposure to pollution – whether in air, land, or water.

To implement the BIL, the DEQ CWSRF loan program is developing a standing advisory committee to both provide general programmatic advice and function as a rulemaking advisory committee. The advisory committee will provide input on prioritizing funding for communities that have not historically fully accessed CWSRF loan funds, are most in need of improved infrastructure, have historic environmental and health burdens, are economically disadvantaged, and often lack capacity for project development and implementation and face challenges in long-term operations. The rulemaking will review principal forgiveness, application scoring, and affordability criteria for opportunities to add environmental justice metrics. Beyond the rulemaking, the advisory committee will be a resource to provide advice and insight into targeting and distributing funding with an emphasis on prioritizing funding for disadvantaged communities, capturing that input as appropriate into program documents, such as the Intended Use Plan or other policy documents.

4.2 Annual Report on 2021 Columbia River Total Dissolved Gas/Spill for Fish Passage

The annual report on Total Dissolved Gas levels at the U.S. Army Corps mainstem Columbia dams is attached to this Director’s Report. The TDG annual report is required as a condition of the commission’s waiver of the TDG standard for these facilities.

5. Eastern Region

5.1 Lower Umatilla Basin Groundwater Management Area (Northern Morrow and Umatilla Counties)

Lamb Weston Hermiston Facility
DEQ issued a pre-enforcement notice to Lamb Weston after finding its potato processing facility in Hermiston over-applied nitrogen-containing wastewater to farmland in two areas in the Lower Umatilla Basin Groundwater Management Area (LUBGWMA).

A pre-enforcement notice is the first step in DEQ's enforcement process. After issuing the notice, DEQ permit staff referred the violations to DEQ's Office of Compliance and Enforcement for formal enforcement action. Formal enforcement action may include a fine and an order that may require Lamb Weston to clean up the contamination and alter its practices to prevent ongoing and future contamination. Several Oregon news outlets reported on these violations, including Oregon Capital Chronicle, OPB, and East Oregonian and La Grande Observer.

Port of Morrow – Wastewater Permit Modification Public Comment Period
DEQ is requesting public comment on a water quality permit modification for the Port of Morrow. The permit allows the port to collect, treat and reuse industrial wastewater from food processors, storage facilities and data centers in its industrial park outside Boardman.

This permit modification proposes significant changes to ensure the port's operations do not adversely affect groundwater. Changes include requirements for the port to reduce its nitrogen application during the non-growing season, additional wastewater treatment and monitoring, and assessment and cleanup of groundwater contamination from current operations. Comments are due Friday, May 20 at 5 p.m. Several Oregon news outlets reported on the permit modification comment period, including Oregon Capital Chronicle, East Oregonian, Oregonian/OregonLive.

DEQ issued the port a $1.3 million fine in January 2022 for exceeding the winter irrigation limits and failing to monitor crop nitrogen uptake for several years. The port has appealed the penalty.

5.2 Chemical Waste Management (CWM) Proposed Hazardous Waste Permit Renewal (Gilliam County)

DEQ received a hazardous waste permit renewal application from CWM on May 2. CWM hosted a public information meeting on April 13, prior to submitting its application. DEQ permit staff attended the meeting, along with two Gilliam County commissioners, the county planning director, the mayor of Arlington, and several Waste Management employees. The event details were published in the local Arlington paper, on DEQ's website, and were sent to subscribers of DEQ's hazardous waste and CWM mailing email/text subscription lists.

DEQ posted the CWM application online for public review and will evaluate it for completeness. Within 60 days of receiving the application, DEQ must determine whether the application is complete or if CWM must submit additional information.

If DEQ determines the application is complete, DEQ will begin drafting a permit renewal. DEQ will make the draft permit available for public review and will host a public hearing to accept verbal and written comments on the conditions of the draft permit. DEQ will review and respond to all comments received by the comment deadline and may revise the draft permit based on comments.

6. Northwestern Region

6.1. Zenith Energy Terminals

The Oregon Court of Appeals has affirmed the decision of the Oregon Land Use Board of Appeals, upholding the City of Portland's denial of a land use compatibility statement for Zenith (but requiring the city to better explain in findings its reasoning). Unless the case is appealed, the next step would be for the city to adopt supplemental findings and issue a new decision.

6.2 Port of Astoria, Astoria

In early April, DEQ signed a consent judgment with the Port of Astoria, McCall Oil and Chemical Corporation and ExxonMobil, which will allow the parties to move into remedial design for Area of Concern 4. This is a big step for this project and the *Daily Astorian* covered it, with interviews from the Port Director and DEQ Project Manager.

6.3 Metro 2030 Regional Waste Plan

In December 2019, DEQ approved Metro's 2030 Regional Waste Plan: Equity, Health, and the Environment. Metro prepared this solid waste reduction plan update and prepared a regional solid waste management plan. Metro has incorporated the waste reduction plan into the regional waste management plan. The Metro plan will help the three-county area move towards the waste recovery goal of 64 percent and ensure that local jurisdictions implement specific waste reduction programs, waste prevention programs, and reduce greenhouse gases. DEQ also supports Metro's focus on equity as the foundation of the plan and their commitment to reducing the environmental and health impacts of product manufacturing and use. This aligns well with our Materials Management in Oregon: 2050 Vision and Framework for Action. Metro has also provided a periodic report, as required, on the progress to-date of Metro and local government implementation efforts. A link to the Metro progress report follows: https://www.oregonmetro.gov/sites/default/files/2022/01/21/Regional-waste-plan-progress-report-Jan-2022.pdf

7. Western Region

7.1 J.H. Baxter Plant in Eugene

DEQ is requiring J.H. Baxter & Company, owner of a wood treatment facility in Eugene, to collect additional soil samples in nearby residential yards to determine if contaminants from the company's plant have accumulated in the neighborhood beyond specific sites already identified. Due to the time needed to obtain access agreements with property owners and sampling

sequencing, this is expected to take place between September and November 2022. DEQ has formed a technical team that includes the Lane Regional Air Protection Agency, the Oregon Health Authority, Oregon State University, and the City of Eugene. The technical team will investigate the sources and extent of the contamination and any potential health risks to the community. When the soil sampling analysis is complete, DEQ will share the results with the residents whose yards were sampled. DEQ will inform residents if sampling results indicate the need for soil cleanup. There will also be a public meeting to share the investigation results and any follow-up actions with the general public.

Work to refine sampling plans for further testing near the plant site in collaboration with EPA is nearly complete, with obtaining right of access agreements the next step in the process. This sampling will also refine the urgent cleanup areas around residences with elevated dioxin concentrations. Once there is better definition of the areas to be cleaned, the actual cleanup activity will commence, likely in mid- to late-June.

7.2 Trainsong Park

DEQ continues to work with the City of Eugene and EPA to plan further investigation around Trainsong Park. Trainsong Park was initially sampled as part of a background sample for the J.H. Baxter cleanup. The sampling identified unexpectedly high concentrations of dioxins in two areas in the park. The next phase of sampling is expected in the next several weeks, and after rights of access agreements are obtained, we anticipate some sampling in the neighborhood adjacent to the park as well. The source of this contamination is not known but is not believed to be associated with the J.H. Baxter site.

7.3 Riverbend Landfill

On Jan. 27, 2022, Riverbend Landfill submitted a Landfill Closure Permit Renewal application. DEQ plans to go out for public comment period on this application in late May, with a public hearing in late June. The permit requires final closure 8 years from permit issuance. Final closure means that the facility is no longer accepting waste and closure construction (landfill capping) has been completed. Under a closure permit, however, the landfill can continue to accept additional waste. Beyond specific closure dates, there are not major differences between an active/operating permit and a closure permit. Further, a closure permit would not necessarily prevent the owner from applying for a future landfill expansion.

7.4 401 Water Quality Certification on the Rogue River

Jetboats operating on the Rogue River have historically used prop wash or jet wash to clear channels through gravel bars that would otherwise create obstacles or hazardous conditions for boaters. The U.S. Army Corps of Engineers (USACE) is proposing to extend their 404 permit for this activity. A similar application for the Upper Rogue from an operator in the Grants Pass area received close to 1,000 comments before the application was withdrawn.

7.5 Coos Bay Office Move

DEQ's Coos Bay office is moving on Monday, May 16, 2022. Our new location is 465 Elrod Avenue in Coos Bay, eight blocks south and two blocks west of our previous location. The new office will be professionally appointed and will be cost-competitive with the prior location. The office will be closed to the public for the move on May 13 and 16, 2022.

7.6 Fire Recovery Projects in Santiam and McKenzie Basins

DEQ staff continue to work closely with local, state, and federal partners to help identify wastewater solutions in the Santiam Canyon and McKenzie fire-impacted communities of Mill City, Detroit, Gates, Idanha, and Blue River. Staff have approved permits for a number of small projects, and the largest and most complicated areas are still underway. Oregon Solutions is engaged in the Blue River project, helping bring the community together to explore key areas of focus as that community rebuilds.

Marion and Lane Counties have been allocated ARPA funding to assist with community wastewater and water infrastructure. Large-scale wastewater projects are difficult to implement in these areas due to geography, soils, and regulatory restrictions.

State of Oregon
Department of Environmental Quality Memorandum

Date: May 11, 2022

To: Environmental Quality Commission

From: Jennifer Wigal, Water Quality Administrator

Subject: Annual Report on 2021 Columbia River Total Dissolved Gas and Spill for Fish Passage

Annual Report and Update
This is an informational summary about the total dissolved gas (TDG) levels and biological monitoring results during the 2021 fish passage spill season at the lower four Columbia River dams. The Environmental Quality Commission (EQC) requires an annual report from the U.S. Army Corps of Engineers (USACE) to DEQ as a condition in the February 2020 TDG water quality standard modification order. DEQ received the 2021 TDG report from USACE on January 31, 2022. The dams included in the TDG modification and addressed as part of the report are Bonneville, The Dalles, John Day and McNary federal hydropower dams. This informational summary also includes comparative summary data for the 2015-2021 spill seasons.

Background
In February 2020, the EQC approved a waiver to the statewide TDG standard of 110 percent atmospheric pressure for the four lower Columbia River dams (Oregon Administrative Rules (OAR) 340-041-0031(2)). The purpose of the TDG waiver is to benefit the passage of out-migrating Endangered Species Act listed anadromous salmonids past McNary, John Day, The Dalles, and Bonneville federal hydropower dams while protecting other beneficial uses of the Columbia River. The TDG waiver is in effect for the 2020-2024 spill seasons during the fish passage period of April 10 to August 31.

The 2020 TDG waiver order approved by the EQC was required to allow for the operation and maintenance of the Columbia River System[1] as described in the National Oceanic and Atmospheric Administration Fisheries' (NOAA) 2019 Biological Opinion under Section 7(b) of the Endangered Species Act and the 2019-2021 Spill Operation Agreement signed by the states of Oregon and Washington, the Nez Perce Tribe, Bonneville Power Administration, USACE, and the U.S. Bureau of Reclamation. The 2019-2021 Spill Operation agreement balances power generation and increased voluntary spill to benefit the passage of out-migrating juvenile salmonids. Fish exposed to high levels of TDG can suffer from gas bubble trauma (GBT), which increases their susceptibility to predation and causes mortality in severe cases. Although spilling water over the dams' spillway structures increases TDG levels, spill improves survivorship of

[1] Referred to previously as the "Federal Columba River Power System" or "FCRPS."

out-migrating anadromous salmonids. DEQ recommended, and the EQC adopted[2], the TDG waiver order after finding that a failure to act (i.e., maintaining the statewide standard of 110 percent TDG) would result in greater harm to in-river migrating, the modified standard provides a reasonable balance of impairment risks due to elevated TDG levels to resident and migrating aquatic communities when compared to other options, and there are sufficient water quality and biological monitoring data to determine compliance with standards and that aquatic communities are being protected.

The 2020 waiver order allows TDG concentrations up to 125 percent of atmospheric pressure in the dams' tailraces during spring spill, April 1 through June 15, and 120 percent of atmospheric pressure during summer spill, June 16 through August 31. The 2020 TDG waiver order is the first time the EQC has allowed greater than 120 percent TDG since the 1995 adoption of OAR 340-041-0104(3), which permits the Commission to approve TDG standard waivers for fish passage in the Columbia River. The waiver specifies using the average of the 12 highest hourly TDG measurements in a calendar day to determine exceedances of 125 percent TDG in the spring and 120 percent TDG in the summer. For an additional measure of safety, the average of the two highest hourly TDG measurements in a calendar day determines instantaneous exceedances of 127 percent TDG in the spring and 125 percent TDG in the summer.

The 2020 and 2021 spring spill seasons were the first occurrences of allowing greater than 120 percent TDG. In 2020, TDG levels rarely exceeded the applicable criteria and biological monitoring indicated low levels of GBT in juvenile salmonids and no exceedances of the biological benchmarks, indicating low impacts of GBT to out-migrating fish. In 2021, USACE targeted its spring spill levels up to the 125 percent "gas cap," which refers to Oregon and Washington's modified TDG water quality standards. USACE targeted spill levels according to these "flex spill" amounts for at least 16 hours daily to increase juvenile salmonid passage via spill and reduce powerhouse passage. During the remaining daily eight hours for the spring season and for 24 hours per day during summer spill season, USACE targeted "performance standard spill," which refers to lower spill levels intended to meet NOAA's performance standard testing described in the 2008 Federal Columbia River Power System Biological Opinion.

2021 Results

In water year 2021, Columbia River flows at The Dalles Dam were 82 percent of the average from 1981-2010, lower than in 2020 when flows were 90 percent of average. Due to low runoff volumes between April and August 2021, there were no gauge days[3] of flows above the 7Q10[4] when the TDG standard does not apply due to forced spill[5] resulting from high flow conditions.

[2] As required under OAR 340-041-0104(3)(a-d).

[3] A gauge day is a calendar day at a dam during the spring or summer spill period specified in the TDG water quality standard modification. The total gauge days are 612, or 153 days multiplied by four, which is the number of days the modified standard is in effect multiplied by the number of compliance locations. There are 304 spring gauge days and 308 summer gauge days.

[4] The average peak flow for seven consecutive days that has a recurrence interval of 10 years, or a 10 percent probability of being equaled or exceeded in any given year.

[5] Forced spill occurs when there is more water than can be temporarily stored behind the dam or pass through the turbines, and as a result, water must be released through the spillway. Causes of force spill include either lack of

Columbia River flows were not sufficiently high to spill up to the 125 percent daily TDG gas cap and there were no instances of spill above the 125 percent TDG spill cap due to forced spill.

Exceedance rates and the number of days affected by malfunctioning monitoring gauges decreased from annual rates from 2015-2020 (Table 1). During spring spill in 2021, there were no exceedances of either the 12-hour or 2-hour TDG limits. There was a total of seven 12-hour exceedances in Summer 2021. Six exceedances were due to uncertainties associated with TDG modeling, such as weather forecasting – one exceedance occurred at the John Day forebay and five occurred at the Bonneville Dam forebay. One 12-hour exceedance was due to a data quality event caused by an equipment failure at The Dalles that prohibited TDG from being evaluated in the dam's tailrace for a day. The 2-hour TDG limit of 125 percent was not exceeded during summer 2021.

Table 1. Summary of streamflow and TDG exceedances on the mainstem Columbia River from McNary Dam to Bonneville Dam, 2015-2021

	Stream Flow		**Total Dissolved Gas Exceedances**[6]		
Year	Annual Stream	Number of Gauge	Exceedances of	Exceedances of	Malfunctioning Monitoring

load, or lack of turbine spill, but forced spill may also occur as a result of reservoir management for flood risk, passing debris, or other operational or maintenance activities required to manage dam facilities for safety and authorized project uses.

[6] Exceedance occurrences include days affected by malfunctioning or damaged monitoring gauges for which USACE did not report data.

	Flow (percent of average[7])	Days[8] When Flows are Above 7Q10[9]	12-Hour Limit[10]		2-Hour Limit[11]		Gauges Resulting in Missing or Erroneous Data
			Number of Gauge Days	Percent of Total Gauge Days	Number of Gauge Days	Percent of Total Gauge Days	
2015	86%	0	77	13%	--	--	51
2016	95%	0	13	2.1%	--	--	0
2017	128%	24	277	45%	--	--	7
2018	104%	74	101	17%	55	9.0%	58
2019	89%	0	78	13%	23	3.8%	19
2020 Spring	90%	0	10	3.3%	3	1%	0
2020 Summer		0	8	2.6%	5	1.6%	5
2021 Spring	82%	0	0	0%	0	0%	0
2021 Summer		0	7	2.3%	0	0%	1

The Fish Passage Center (FPC) coordinated biological monitoring of juvenile salmon and steelhead and for non-salmonids for GBT at Bonneville and McNary Dams during the fish passage spill period. The 2021 spill season was the first year that non-salmonids were monitored for GBT in the tailraces of McNary and Bonneville Dams with the goal of collecting a minimum of 50 and a target of 100 fish per sampling day to evaluate against the biological action criteria.

The TDG waiver states that the fish passage spill program must be halted if the following biological action criteria thresholds are exceeded for either juvenile salmonids or non-salmonid fish species (during spring spill only) when minimum sample sizes are met:

i.) more than 15 percent of fish examined show signs of GBT in non-paired fins, or

ii.) more than five percent of fish examined have signs of severe GBT, defined as having over more than 25 percent of their non-paired fin surface area occluded by gas bubbles.

[7] Compared to average flows at The Dalles Dam from 1981-2010.

[8] A gauge day is a calendar day at a dam during the spring or summer spill period specified in the TDG water quality standard modification. Total spring and summer gauge days are 612, or 153 days multiplied by 4, which is the number of days the modified standard is in effect multiplied by the number of compliance locations. There are 304 spring season gauge days and 308 summer season gauge days.

[9] Average peak flow for seven consecutive days that has a recurrence interval of 10 years, or a 10 percent probability of being equaled or exceeded in any given year.

[10] The 12-hour limit for spring 2020 and 2021 is 125 percent TDG. For 2021 summer and the preceding years, the 12-hour limit is 120 percent TDG.

[11] The 2-hour limit for spring 2020 and 2021 is 127 percent TDG. For 2021 summer and the preceding years, the 2-hour limit is 125 percent TDG.

Juvenile Salmonid Biological Monitoring:

In 2021, 5,300 juvenile salmonids were examined for GBT signs. In total, 14 individuals, or 0.3 percent, displayed signs of GBT. Only one juvenile salmonid examined had over 25 percent of their fin surface area affected. During spring spill, 0.4 percent of examined individuals showed signs of GBT; <0.1 percent of examined fish showed signs of GBT during summer spill. There were no exceedances of the biological action criteria in the sampled juvenile salmonids. Overall, the 2021 juvenile salmonid GBT monitoring shows similar levels of GBT observed during the 2020 spill season, when 28 individuals, or 0.4 percent of the 6,395 juvenile salmonids collected, exhibited GBT with no observations of greater than 25 percent affected surface area (Table 2).

Salmonid GBT sampling occurred twice a week at McNary and Bonneville Dams through the spring spill season, but was reduced and/or discontinued prior to the end of the fish passage season due to environmental conditions. At McNary Dam, FPC reduced sampling frequency to once-per-week on July 6, due to elevated water temperatures. FPC reduced sampling because the GBT monitoring process increases stress experienced by sampled juveniles due to higher-than-normal stream temperatures. The combination of these conditions can result in a considerable increase in mortality for juveniles that are not able to recover from anesthetization required for GBT evaluation. After August 5, salmonid GBT monitoring was discontinued at McNary Dam due to decreasing fish numbers, continued high water temperatures, and TDG concentrations below 110 percent. At Bonneville Dam, salmonid GBT monitoring began on April 10, and was discontinued after July 25, due to high water temperatures, decreasing fish numbers, and generally low TDG concentrations. The target sample size of 100 salmonids was met in 25 out of 29 sampling days at McNary Dam and 25 out of 30 sampling days at Bonneville. The minimum sample size of 50 fish was exceeded in all but two sampling days at McNary and all but four sampling days at Bonneville. When considered collectively, the minimum sample size requirement of 50 salmonids per week, per zone, was met each week in the Mid-Columbia Zone except the first week (April 4 – 10) [12,13].

Although salmonid GBT monitoring halted before the spill season concluded, less invasive condition monitoring of juveniles occurred throughout the spill season at McNary, John Day and Bonneville dams. The 2008 Federal Columbia River Power System Biological Opinion requires USACE to conduct condition monitoring, a type of biological monitoring, to identify injuries that may indicate dam passage issues.

Non-Salmonid Biological Monitoring:

During the 2021 spring spill season, 1,997 non-salmonid fish were examined for GBT. A total of 13 non-salmonid fish species were sampled. Three species comprised approximately 94 percent of the collected fish: sculpin (59 percent), three-spined stickleback (18 percent) and northern pikeminnow (18 percent). In total, 29 fish, or 1.5 percent, showed signs of GBT. Except for two three-spined sticklebacks and two peamouths sampled below Bonneville Dam, sculpin were the only species sampled that showed signs of GBT. Only two individuals, or 0.1

[12] The Mid-Columbia Zone extent includes the mainstem Columbia River from McNary pool to Bonneville Dam.
[13] The first partial week (April 4 – 10) did not meet minimum fish numbers because spill started on Saturday, April 10 and salmonid sampling occurred only below Bonneville Dam, with just three salmonids caught and examined.

percent of the sampled population, had gas bubbles that covered more than 25 percent of their non-paired fin surface-area (Table 2).

USGS conducted the primary GBT monitoring of native non-salmonids once weekly below McNary and Bonneville Dams from April 12 – June 17. The sample size minimum of 50 fish was met in each of the 10 weekly samples at both McNary and Bonneville Dams; the target size of 100 non-salmonid fish was hit in four of the 10 weekly samples below McNary and seven of the 10 weekly samples below Bonneville. In addition to the USGS sampling efforts, two feasibility efforts for monitoring GBT in non-salmonids were conducted by the Oregon Department of Fish and Wildlife, the Washington Department of Fish and Wildlife, and the Pacific Marine Fisheries Commission below Bonneville via boat electrofishing[14] and below John Day Dams via angling[15]. None of the weekly samples conducted as part of the feasibility studies met the minimum fish sample size requirements. When considered collectively, however, the minimum sample size requirement of 50 non-salmonid fish per zone was met every full week sampling occurred. All collected fish were examined for GBT according to the criteria and protocol established for the regional smolt monitoring program, the same criteria and protocol used to evaluate GBT in juvenile salmonids.

The 2020 TDG waiver order requires monitoring of non-salmonids for GBT through the summer spill season beginning in 2021. However, no GBT monitoring of non-salmonids occurred in summer 2021 due to an oversight and prioritization of other work. DEQ is working with USACE to ensure non-salmonid GBT monitoring is conducted through summer spill in 2022. DEQ provided conditional approval to the 2022 GBT monitoring plans submitted to DEQ for review by USACE on March 15, 2022. The approval is conditioned upon receiving, and approving, an addendum prior to the start of summer spill that details how summer GBT monitoring for non-salmonids will be implemented in 2022.

Risks to Fish

There was low level occurrence of GBT in both juvenile salmonids and non-salmonid fish species and no exceedances of the biological benchmarks in 2021. Biological monitoring results indicate a low GBT risk to out-migrating juvenile salmonids or non-salmonid fish species when USACE conducts spill in accordance with the spring 125 percent TDG and summer 120 percent TDG standard modification. DEQ will continue to work with USACE to assist with compliance with the TDG modified standard and improve monitoring data accuracy and completeness during the 2022 fish passage spill season.

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[14] Over three sample dates from May 19 – 28, a total of 63 non-salmonids were examined. In total four individuals, or 6 percent showed signs of GBT.

[15] Over three sample dates from June 2 – 16, a total of 23 non-salmonids were examined. No individuals showed signs of GBT.

Table 2. Seven-year summary of biological monitoring data for gas bubble trauma reported by the USACE for fish passage spill operations under the 2020 EQC order allowing modifications to the total dissolved gas standard for Bonneville, The Dalles, John Day, and McNary federal hydropower dams on the mainstem Columbia River.

	Salmonids					Non-Salmonids[16]				
	Number of Juvenile Salmonids	Juvenile Salmonids Showing Signs of Gas Bubble Trauma		Juvenile Salmonids with Gas Bubbles Covering Over 25 Percent Surface Area		Number of Non-Salmonids	Non-Salmonids Showing Signs of Gas Bubble Trauma		Non-Salmonids with Gas Bubbles Covering Over 25 Percent Surface Area	
Year	Examined[17]	Number	Percent	Number	Percent	Examined	Number	Percent	Number	Percent
2015	4,573	6	<0.1%	0	0%	-	-	-	-	-
2016	5,533	6	<0.1%	0	0%	-	-	-	-	-
2017	6,424	76	1.2%	2	< 0.1%	-	-	-	-	-
2018	6,074	61	1.0%	0	0%	-	-	-	-	-
2019	5,483	18	0.3%	0	0%	-	-	-	-	-
2020 Spring	3,662	25	0.7%	0	0%	15	0	0%	0	0%
2020 Summer	2,733	3	0.1%	0	0%	-	-	-	-	-
2021 Spring	3,398	13	0.4%	1	<0.1%	1,997	29	1.5%	2	0.1%
2021 Summer	1,902	1	<0.1%	0	0%	-	-	-	-	-

Note: In 2020 and 2021, two biological action criteria apply for juvenile salmonids during spring and summer spill seasons and for native non-salmonid fish species during spring spill season only: if more than 15 percent of examined fish show signs of GBT in non-paired fins, and if more than five percent of fish show signs of GBT that occlude more than 25 percent of their non-paired fin surface area.

[16] Targeted monitoring of non-salmonid fish for GBT did not occur from 2015-2019. In 2020, a pilot study was conducted to monitor for GBT in non-salmonid fish collected from fish bypass systems in dam forebays. During spring spill in 2021, non-salmonid fish were primarily collected for GBT monitoring in dam tailraces via beach seining and electrofishing.

[17] Variability in annual number of examined juvenile salmonids is related to decreasing numbers of juveniles near the end of seasonal passage, which affects ability to obtain target sample sizes, and variable timing of monitoring cessation due to increasing stream temperatures affecting ability of examined salmonids to recover from anesthetization. Both causes of variable annual sampling are related to stream flow.