



Public Comments

Meeting: Wednesday, December 20, 2023

Submittal: Written comments received at planning@cityoftacoma.org
by 12:00 noon on the meeting day

Subjects: Comments are addressing the following Discussion Item(s) on the agenda:

F1 – One Tacoma Plan Update

F2 – South Tacoma Groundwater Protection District Code Update

**No. of
Comments:** Six



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From: [Esther Day](#)
To: [Planning](#)
Cc: [City Clerk's Office](#)
Subject: Tacoma Comprehensive Plan
Date: Wednesday, December 20, 2023 10:41:28 AM
Attachments: [Copy of U.S. District Judge ecy-epa ruling.pdf](#)

Dear Planning Commission,

I am keenly aware that the State Dept of Ecology was sued by a group of citizens and they won. Why, because they had been deferring science to local government.

U.S. District Judge Marsha Pechman gave Ecology specific instructions to update their science and also told them that the GMA has no standing insofar as allowing the State to defer SCIENCE to local government.

As such, it was found that the State Dept of Ecology/EPA had not updated their science since 2006.

That said, I would like you to CITE YOUR SOURCE for the Tacoma Critical Areas and Climate Change: Best Available Science and Practices (June 2023 report) that will serve most of the requirements to cover five types of critical areas defined in RCW.36.70A, wetlands, critical aquifer recharge areas (CARAs), fish and wildlife habitat conservation areas (FWHCA), frequently flooded areas, and geologic hazard areas.

Sincerely,
Esther Day

<https://www.pugetsoundinstitute.org/2021/12/ecology-epa-now-under-the-gun-to-adopt-new-water-quality-criteria-for-aquatic-creatures/>

The University of Washington Puget Sound Institute provides analysis, research and communication to inform and connect the science of ecosystem protection.

Ecology, EPA now under the gun to adopt new water quality criteria for aquatic creatures

by Christopher Dunagan (<https://www.pugetsoundinstitute.org/author/christopher-dunagan/>)

December 31, 2021

Long delays in updating state water-quality standards to protect orcas, fish and other aquatic species appear to have finally caught up with the Washington Department of Ecology and its federal counterpart, the Environmental Protection Agency.

In a court ruling this week, **U.S. District Judge Marsha Pechman of Seattle found that Ecology has “abdicated its duties” to update certain water-quality standards, as required by the federal Clean Water Act.** Meanwhile, she said, **EPA has failed to meet its legal oversight obligations to ensure that adequate water-quality standards are protective of aquatic creatures.**

The lawsuit, brought by Northwest Environmental Advocates, followed a petition filed by the group in 2013 seeking to get EPA to revise Washington’s water quality standards for aquatic species. **The petition followed years of delay by the state.** The standards, including numeric aquatic life criteria, place limits on toxic chemicals found in the state’s waterways. It took four years, but **EPA eventually denied the petition, refusing to make a determination about whether or not the state’s existing water quality standards were consistent with the Clean Water Act.**

In its denial and later court pleadings, EPA stressed its desire to support Ecology’s efforts to update aquatic life criteria. **Ecology** had discussed the update and even proposed it as part of the agency’s **2015-2020 strategic plan, but the work was never started.** EPA admitted that **Washington’s aquatic life criteria had not been updated for most chemicals since 1992, even though formal reviews and updates are required every three years, noted Judge Pechman in her ruling.**

The judge’s order, (<https://www.pugetsoundinstitute.org/wp-content/uploads/2021/12/Order.pdf>) issued Wednesday, requires EPA to determine **within 180 days if the state’s current water quality standards are consistent with the Clean Water Act** or if they need to be revised. If they are determined to be inadequate, the act itself requires EPA to promptly promulgate new regulations — unless the state adopts acceptable standards in the meantime.

Ecology officials acknowledge that the agency has been slow to adopt new aquatic life criteria. *In fact, the required three-year “triennial review” has not been conducted since 2010.* Ecology currently is going through a new triennial review, and the agency’s draft work plan lists the update to aquatic life criteria as a priority over the next four years.

“We have not conducted a triennial review since 2010 because we were in continual rulemaking efforts for the water quality standards,” states the introduction to the draft work plan (PDF 494 kb).

(<https://fortress.wa.gov/ecy/ezshare/wq/standards/2021TriennialReviewDraftPlan.pdf>)

No doubt Ecology dedicated a lot of time and effort to other water-quality rules the past decade. Much public attention — including a legislative battle — was focused on human exposures to toxic chemicals, as Ecology worked through the long development of new human health criteria. The discussions largely revolved around fish-consumption rates for people who eat a lot of fish, along with what was considered an allowable cancer risk.

In a controversial move after Ecology completed its work, **EPA refused to accept some of the state’s human health criteria, imposing stronger restrictions than Ecology proposed.** The criteria were **later reversed by President Trump’s EPA.** Even today, the issue is not yet resolved, with a revised rule in the works from EPA in the midst of a lawsuit. (See Ecology’s timeline (<https://ecology.wa.gov/Water-Shorelines/Water-quality/Water-quality-standards/Updates-to-the-standards>) along with other background. (<https://ecology.wa.gov/Regulations-Permits/Laws-rules-rulemaking/Closed-rulemaking/WAC-173-201A-Overview>)) I have been following these issues since their inception in 2010, including a 2015 article in the Kitsap Sun (<https://archive.kitsapsun.com/news/local/feds-watch-closely-as-state-updates-water-quality-standards-ep-978184867-354869921.html>) newspaper.

Some of the rule-making that Ecology says contributed to delays:

- * Recreational use criteria (<https://ecology.wa.gov/Regulations-Permits/Laws-rules-rulemaking/Closed-rulemaking/WAC-173-201A-Aug17>)
- * Total dissolved gas (<https://ecology.wa.gov/Regulations-Permits/Laws-rules-rulemaking/Closed-rulemaking/WAC173-201A-revisions>)
- * Salmon spawning habitat, and (<https://ecology.wa.gov/Regulations-Permits/Laws-rules-rulemaking/Rulemaking/WAC173-201A-Salmon-spawning-habitat>)
- * Chelan River use attainability analysis (<https://ecology.wa.gov/Regulations-Permits/Laws-rules-rulemaking/Rulemaking/WAC173-201A-Chelan-CAA>)

Since EPA is in charge of enforcing the provisions of the Clean Water Act, Judge Pechman focused her attention on EPA’s failure to take charge of the situation, other than to encourage Ecology to get moving on the aquatic life criteria:

“The CWA (Clean Water Act) operates on a principle of cooperative federalism where states take the lead in setting WQS (water quality standards) with the goal of eliminating pollutant discharge into navigable waters to protect and enhance human and aquatic life,” the judge wrote in her order (PDF 228 kb). (<https://www.pugetsoundinstitute.org/wp-content/uploads/2021/12/Order.pdf>) “States must create WQS specific to aquatic life and review them every three years to determine whether new or revised standards are necessary.

“But while states play a lead role in setting WQS, EPA serves as a backstop,” she continued. “Not only does EPA have to review state-adopted WQS, but it must also ‘promptly prepare and publish’ new WQS for a state ‘in any case where the administrator determines that a revised or new standard is necessary to meet the requirements of this chapter.’...”

“So while EPA wanted to **‘work in partnership to efficiently and effectively allocate resources to address pollution and accelerate state adoption of new and revised criteria,’** **nothing in the record showed that Washington was a willing partner.** And certainly nothing in the record supports EPA’s belief that inaction would be an efficient or effective way of ensuring adequate WQS or complying with the goals and requirements of the CWA.”

The judge calls out specific criteria that EPA has recommended for updates, based on scientific studies, including aquatic life criteria for **ammonia and copper**. She did not accept EPA’s excuse that Ecology may have higher priorities or that EPA lacks the resources to undertake the rulemaking.

“This wait-and-see approach appears particularly ill-conceived in light of EPA’s recognition that **copper pollution has an ‘adverse impact on salmonids,’** whose health impacts ‘critically important and endangered species throughout the Pacific Northwest,’” she stated.

Pechman noted that **the letter denying the petition for rule-making contains no explanation about how EPA was “marshaling its limited resources to protect Washington’s waters or why simply waiting for Washington to act would be reasonable to meet the CWA’s goals. This undermines EPA’s position.”**

The judge also rejected EPA’s argument that the update to Washington’s human health criteria — a related set of standards — would protect aquatic life. She cited EPA’s own recommendations for **copper**, which are 1,200 micrograms per liter for humans but a maximum of 4.8 micrograms per liter for aquatic life. *Under those recommendations, what is considered safe for humans is 250 times higher than what is considered safe for protecting salmon from acute toxicity. (Chronic levels are considered even lower for aquatic life.)*

Further, the judge points out, EPA should not assume that its national recommendations would be adequate for the unique species of Washington state — “such as **Puget Sound’s Southern Resident Orcas who are some of the most contaminated marine mammals in the world** due to bioaccumulation through the food stock, particularly through Chinook salmon.”

The judge ordered EPA to make a determination on the adequacy of the state’s aquatic life criteria within 180 days, but she agreed to allow additional time if EPA can provide “specific, detailed explanations of why additional time is necessary and what tasks remain to be performed.”

How that will mesh with Ecology’s time schedule is yet to be seen. Most relevant staffers with Ecology as well as EPA were out this week for the holiday. I will invite them to contribute comments, concerns and additional context when they return.

Ecology’s draft work plan covering the next four years does not lay out a specific timetable for adopting aquatic life criteria. The agency has taken comments on four possible approaches to adopting new water quality standards:

- * Option 1: Stagger three rule-making by group (metals, organics, non-priority)
- * Option 2: Stagger two rule-making by group (all metals, all organics)
- * Option 3: Rule-makings for different groups of chemicals based on highest priority
- * Option 4: Review and update all necessary criteria in one rule-making

In bringing its lawsuit, Northwest Environmental Advocates said Washington state has revised aquatic life criteria for some toxic chemicals since 1992, but many remain less protective than EPA's recommended levels. For 14 chemicals, Washington has no aquatic life criteria at all, whereas EPA has established maximum levels in freshwater to avoid acute or chronic toxicity, according to NWEA. In saltwater, Washington has no criteria for 11 chemicals for which EPA provides recommended standards, the group says.

Under the Endangered Species Act, the U.S. Fish and Wildlife Service and NOAA's National Marine Fisheries Service have reviewed the adequacy of aquatic life criteria for the states of California, Oregon and Idaho. (USFWS covers freshwater species, while NMFS covers saltwater species.) For a number of chemicals, the agencies have found that criteria adopted by the states and approved by EPA are likely to jeopardize the continued existence of a threatened or endangered species, the so-called "jeopardy" finding.

To show that Washington's standards are outdated, **NWEA listed more than two dozen chemicals for which the state uses numeric criteria that are either higher or close to the levels found to be in violation of the Endangered Species Act.**

"Levels of these and other toxic pollutants are among the reasons that EPA has long been concerned about the health of one of Washington's most important waterbodies, Puget Sound," states the legal complaint (PDF 490 kb).

(<https://www.pugetsoundinstitute.org/wp-content/uploads/2021/12/Order.pdf>) "EPA features the toxic contamination of Southern Resident killer whales, Pacific herring and harbor seals in Puget Sound on its website as evidence of its ongoing concerns about toxic pollution of Washington's waters."

- * Water quality (<https://www.pugetsoundinstitute.org/category/blog-topics/water-quality/>)
- * Water quality (<https://www.pugetsoundinstitute.org/tag/water-quality/>)
- * Environmental Protection Agency (<https://www.pugetsoundinstitute.org/tag/environmental-protection-agency/>)
- * Northwest Environmental Advocates (<https://www.pugetsoundinstitute.org/tag/northwest-environmental-advocates/>)
- * Department of Ecology (<https://www.pugetsoundinstitute.org/tag/department-of-ecology/>)
- * Aquatic life criteria (<https://www.pugetsoundinstitute.org/tag/aquatic-life-criteria/>)
- * Environmental lawsuit (<https://www.pugetsoundinstitute.org/tag/environmental-lawsuit/>)

From: [Michelle Mood](#)
To: [Planning](#)
Cc: [Timothy Smith](#); [Heidi S.](#); [Cathie Raine](#); [Janeen Provazek](#); [Stacy Oaks](#)
Subject: Comments - Planning Commission Agenda Dec 20, 2023
Date: Monday, December 18, 2023 2:51:43 PM
Attachments: [Planning Commission Comments Dec 20 2023 meeting.docx](#)

Attached are comments for the December 20, 2023 meeting. Thank you for your patience in considering my comments.

Dr. Michelle S. Mood (she, her, hers)

(c) 740-233-6333

3719 S. Gunnison St

Tacoma, WA 98409

Thank you for taking the time to read my comments. Due to my long haul covid, it is very unlikely that I will be able to zoom into the meeting. I have comments on the One Tacoma Comprehensive Plan, the South Tacoma Groundwater Protection Plan, a few maps, and a long Appendix. I hope you can take the time to take a look.

Comments: One Tacoma Comprehensive Plan updates.

The One Tacoma Comprehensive Plan is a lot of work but then it doesn't seem to be followed. In 2022 I looked at it carefully and listed all the requirements for the Planning and Development Services Department to follow regarding the environment, and the PDS is not following it. See the Appendix attached to my comments listing some of the actions, goals, and policies required.

So are we just doing this because it's Washington law to update it? Are we using it for anything? How much do we spend on a document that is ignored? One Tacoma requires PDS to promote clean and green industrial development. When has that happened yet? The City rejected the Neighborhood Council proposal for a South Tacoma Economic Green Zone (STEGZ) before Bridge Industrial bought the BNSF land, with the STEGZ muscled out of the way even as PDS knew that Bridge Industrial was angling to buy the property the STNC wanted for the STEGZ. Why do all this work if it doesn't get translated into action by the city?

There are two books and sixteen chapters of the One Tacoma Comprehensive Plan. That's a lot of work. But does anyone follow it?

As you know, this really has not been a priority recently. How is One Tacoma really shaping our city today? Is this just all wasted effort? What needs to happen to make all this hard work actually lead to change? What role do you have to play in this?

In a recent Planning Commission meeting, you were wonderful and strongly urged the PDS to repair relationships with residents who are feeling unnecessarily cut out from inclusion in big decision making processes after the Bridge Industrial project was under way from pre-planning stages to permit submission for a full 15 months before the 975 residents plus the South Tacoma Neighborhood Council (only) was notified the property had been sold and had a plan for the megawarehouse. I really appreciate that. My property shares a boundary with the planned Bridge Industrial megawarehouse and I still don't understand why we didn't rate to get an Environmental Impact Statement and a Health Impact Assessment (but somehow Home in Tacoma gets a HIA!?). We need more inclusion before we can believe the city has our interests at heart.

And yet I see today the planning for the One Tacoma Comprehensive Plan, the focus of which for 2024 includes a focus on SUSTAINABILITY, but no community groups involved in environmental sustainability are included in the discussions, EQUITY and anti-racist system transformation, but no inclusion of organizations of overburdened communities, who will know far better than the privileged city staffers what systems are still racist, and PUBLIC HEALTH, with an emphasis on the most vulnerable and overburdened communities – but will these three really be front and center? Or will OPPORTUNITY become overemphasized, with the expansion of development and business goals? The goal of COMMUNICATIONS AND ENGAGEMENT requires that plans and policies are developed WITH the community – that comes AFTER the city has had their say first. The City staff are involved at first and from the start. Isn't that backwards? Seriously, we don't need more lip service to inclusion. We need more inclusion. Are we really going to be included to the point that we help shape policy and shape the vision? Please uplift our voices and the voices of those already organized and ready to give input – but are being bypassed. It shows a bit of cowardice to just meet with random citizens instead of Neighborhood Councils and nonprofits working for equity and sustainability already.

I notice in the plan that, much to my dismay, the Land Use Map, the key tool to control residents' lived environment, pollution load, and green space, has a miniscule section in this plan (Section C.3). This is the place to zero in on. This is the place where the City Council has the key role in constraining development decisions taken by staffers in the PDS. There are more actionables already in the section on Historic Preservation (C13) than on Land Use Map!

We have a long way to go to bring our city up to contemporary standards. Looking at the report prepared (by "ESA") in June 2023 for the city of Tacoma, "Tacoma Critical Areas and Climate Change: Best Available Science and Practices," I discovered that Tacoma and Peirce County are not among the areas that have adopted any of the Washington Department of Fish and Wildlife riparian or Washington State Department of Ecology wetlands guidance in their Critical Areas Ordinances! The updates to the Comprehensive Plan need this included – a 72 page report filled with excellent information should not be sidelined during this review of the One Tacoma Comprehensive Plan.

Incredibly, in Table 1 (in section 2.4 Aquifer Recharge Areas of the "Tacoma Critical Areas and Climate Change" report), Tacoma lags way behind Peirce County in protection. Under "General Requirements for Review Procedures" to protect aquifer recharge, Tacoma has precisely zero requirements. This shows a huge gap you could drive a 2.5 million square foot warehouse through – which is exactly what has happened on 150 acres of grassland and wetlands above the South Tacoma aquifer next to my property. The City must quickly draft and pass ordinances to protect our aquifer recharge. And of course the One Tacoma plan should hit this home hard. Please refer to that document in order to massively update the Critical Areas aspects in line with all the work shown in ESA's report!

Comments on the South Tacoma Groundwater Protection District Code Update

The status quo of the STGPD covering so much of the Tacoma land has apparently only been seen as an intractable part of development. The STGPD covers one-fifth of the land of Tacoma. Now what's on the table today is a plan, according to the agenda, is that the City is contemplating moving the specifics of the STGPD code to a different section of the city code. The STGPD absolutely should not be placed in any other part of the Tacoma Municipal Code – that would serve to remove its oversight function. It is the primary overlay for all actions in the district and should be kept in that form. This is the only way it will retain sufficient power to guide development.

All property within the district must comply with the mandates of the STGPD. If in any case this code conflicts with regulations of the underlying zoning district, the STGPD must control decision and outcomes. Any other relationship will make the STGPD toothless.

For similar reasons, the code must be updated to regulate development and shifts in surfaces from permeable to impervious. This is imperative. Looking at the report prepared (by "ESA") in June 2023 for the city of Tacoma, "Tacoma Critical Areas and Climate Change: Best Available Science and Practices," Tacoma again is shockingly behind other areas, lacking a policy on impervious surfaces (according to section 2.4.3). Similarly, Climate Change is not even referred to in the Best Available Science reports for Tacoma. Much needs to change.

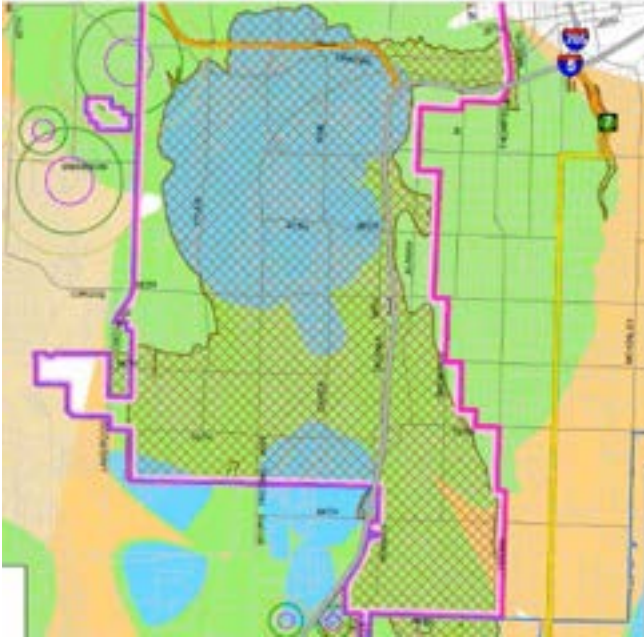
For some reason the PDS is not sharing the full maps available in their presentation to you. I've included a bit of it below. Looking at the map of the full STGPD compared to the one included in your meeting materials, it looks like the boundaries of the STGPD will be reduced and limited to certain boundaries much smaller than the original STGPD. It looks like it's being cut down to just the Manufacturing Industrial Center, that's Nalley Vally, the West Mall Area, and the Mixed Use Center.

If so, that would be a disaster. It would mean that only a few property owners would be accountable to the STGPD code restrictions.

In my map segment below (first map), there is a subset of the STGPD that is critical for infiltration of water down into the three aquifers that underlie Tacoma. That's the hashtagged part in this map. That section is critical to the health of the aquifer.

If the plan is to reduce the STGPD to what is seen in the second map below (from your meeting materials), no residential area will be included anymore, and some of the most critical recharge area will not be protected. This seems to be going backwards in terms of visionary actions for sustainability.

One can connect the dots about whose interests this serves.



City of Tacoma | Planning and Development Services
South Tacoma Groundwater Protection District (STGPD)



Protecting our water is a community responsibility. It's not fun, but it's critical. If I spill some gasoline in my driveway filling my gas mower, the part that doesn't evaporate will trickle into the groundwater within 12 months inside the hashtagged area. Next door to me and across the street from me are two auto repair shops run out of private homes. Think about that. We surely want the STGPD code to apply.

See this screenshot from google maps – you can see the multiple cars and trucks in my neighbors to the north and west. This kind of activity would not be covered by the STGPD code if the area gets reduced and cuts out the residential areas. Note the greenery to the right – that is the hill down to the Critical Areas Biodiversity Corridor and four wetlands and a stream on the land Bridge Industrial built. The activity at the top of the hill needs to continue to be subject to the STGPD code. Do not let this get scaled back.



Any reduction in the region of the Groundwater Protection District is a step in the wrong direction. We've had these strict codes in place to try to protect and maintain the quality of water as close to natural for a very long time. There is no urgency in the world that would require us to quickly update code without careful thought and research nor to remove protections or reduce protected areas. We cannot undermine in any way the current level of protection. If we no longer have "strict performance standards which eliminate or reduce threats to the critical natural resource, the water, in order for the city to maintain groundwater resources as reasonably as possible to their natural condition of purity."

If we change that in any way, how are we going to meet our One Tacoma Comprehensive 2024 focus on SUSTAINABILITY and EQUITY and PUBLIC HEALTH?

And most importantly of all, the STGPD should not be placed in any other part of the Tacoma Municipal Code – that would serve to remove its oversight function. It is the primary overlay for all actions in the district and should be kept in that form.

Thank you for your patience in reading my comments on today's agenda.

Michelle S. Mood
3719 S. Gunnison St
Tacoma, WA 98409

APPENDIX A: ONE TACOMA

Existing goals and policies that seem to be ignored anyway

In the Environmental Chapter we find that the goals and policies include:

GOAL EN–1 Ensure that Tacoma’s built and natural environments function in complementary ways and are resilient to climate change and natural hazards.

GOAL EN–3 Ensure that all Tacomans have access to clean air and water, can experience nature in their daily lives and benefit from development that is designed to lessen the impacts of natural hazards and environmental contamination and degradation, now and in the future

*Policy EN–1.1 Recognize the multiple benefits of the City’s ecosystem services, including economic impacts, **pollutant reduction potential, carbon sequestration** and the reduction of stormwater runoff.*

*Policy EN–1.2 **Promote equitable, safe and well-designed physical and visual access to nature** while also protecting high value natural resources, fish and wildlife.*

*Policy EN–1.3 **Consider the impacts of climate change** and the risks to the city’s environmental assets in all phases of planning, programming and investing.*

*Policy EN–1.5 Protect the quantity, quality and function of **high value environmental assets** identified in the City’s natural resource inventories, including: a. Rivers, lakes, **streams and associated riparian uplands** b.*

*Floodplains c. Riparian corridors d. **Wetlands and buffers** e. **Groundwater** f. **Trees and urban forests** j. **Habitat complexes and corridors** ...when planning for growth.*

*Policy EN–1.7 Consider Tacoma’s **environmental assets as important resources** and components of the City’s infrastructure.*

*Policy EN–1.12 Coordinate plans and investments with other jurisdictions, air and water quality regulators, watershed councils, soil conservation organizations and community organizations and groups to maximize the benefits and cost-effectiveness of **watershed environmental efforts** and investments.*

*Policy EN–1.13 Coordinate transportation and **stormwater** system planning in areas with unimproved or substandard rights of way to improve water quality, prevent localized flooding, enhance pedestrian safety and neighborhood livability.*

*Policy EN–1.17 Assess and periodically review the **best available science for managing critical areas** and natural resources*

*Policy EN–1.18 **Evaluate climate data and consider climate risks** in the development of regulations, plans and programs.*

*Policy EN–1.19 Evaluate **trends in watershed and environmental health** using current and historical data and information to guide improvements in the effectiveness of City plans, regulations and infrastructure investments.*

*Policy EN–1.20 Maintain an up-to-date inventory of **environmental assets***

*Policy EN–1.23 Assess and reassess Tacoma’s **tree canopy** coverage on a regular basis so as to be able to track the potential implications on environmental health*

*Policy EN–1.25 Develop management plans for each of the City’s **watersheds**.*

Policy EN–1.26 Maintain, implement and periodically update a climate action plan and GHS inventory,

*Policy EN–1.27 Assess the risks and potential impacts on both City government operations and on the community due to **climate change, with regard to social equity**.*

*Policy EN–1.28 **Incorporate climate change considerations into City operational plans**.*

*Policy EN–1.29 **Protect processes and functions of Tacoma’s environmental assets (wetlands, streams, lakes) in anticipation of climate change impacts**.*

*GOAL EN–3 **Ensure that all Tacomans have access to clean air and water, can experience nature in their daily lives** and benefit from development that is designed to **lessen** the impacts of ... environmental contamination and degradation, now and in the future.*

*Policy EN-3.1 Ensure that the City achieves **no-net-loss of ecological functions** over time.*

*Policy EN-3.2 **Evaluate the potential adverse impacts of proposed development on Tacoma's environmental assets, their functions and the ecosystem services they provide.***

*Policy EN-3.3 **Require that developments avoid and minimize adverse impacts, to the maximum extent feasible, to existing natural resources, critical areas and shorelines through site design prior to providing mitigation to compensate for project impacts.***

*Policy EN-3.5 **Discourage development** on lands where such development would pose hazards to life, property or infrastructure, or **where important ecological functions or environmental quality would be adversely affected:***

*a. Floodways and 100-year floodplains c. **Wetlands** d. **Streams** e. Fish and wildlife habitat conservation areas f.*

Aquifer recharge areas

*Policy EN-3.6 **Limit impervious surfaces within open Space Corridors, shorelines and designated critical areas to reduce impacts on hydrologic function, air and water quality, habitat connectivity and tree canopy.***

*Policy EN-3.7 **Encourage site planning and construction techniques that avoid and minimize adverse impacts to environmental assets.***

*Policy EN-3.10 **Minimize and manage ambient light levels** to protect the integrity of ecological systems and public health without compromising public safety.*

*Policy EN-3.12 **Avoid locating new sensitive uses in proximity to sources of pollution** (e.g., Interstate-5, Interstate-705, State Route-509, State Route-16, State-Route 7, truck routes, rail yards) and vice versa. Where such uses are located in proximity to sources of air pollution, use building design, construction and technology to mitigate the negative effects of air pollution on indoor air quality.*

*Policy EN-3.22 **Protect and preserve the quantity and quality of Tacoma's groundwater supply.***

*Policy EN-3.23 **Encourage infiltration of stormwater to promote aquifer recharge and assure continuous and adequate groundwater supply.***

*Policy EN-3.28 **Protect the quality of groundwater used for public water supplies to ensure adequate sources of potable water for Tacoma and the region. Ensure that the level of protection provided corresponds with the potential for contaminating the municipal water supply aquifer.***

*Policy EN-4.9 **Ensure that plans and investments are consistent with, and advance, efforts to improve watershed hydrology by achieving more natural flow patterns in rivers, streams, floodplains, wetlands and groundwater aquifers. Minimize impacts from development and encourage restoration of degraded hydrologic functions, where practicable***

I also want to draw your attention to two additional points in the One Tacoma Comprehensive Plan. One point is about "low impact development" which "strives to mimic pre-disturbance hydrologic processes by emphasizing conservation, use of on-site natural features, site planning, and distributed stormwater practices that are integrated into a project design. Low impact development best management practices emphasize pre-disturbance hydrologic process of infiltration, filtration, storage, evaporation and transpiration. Common low impact development best management practices include: bioretention, rain gardens, permeable pavements, minimal excavation foundations, dispersion, soil quality, vegetated roofs and rainwater harvesting."

From: [Cathie Raine](#)
To: [Planning](#)
Subject: STGPD Updates (12/20/23 Meeting)
Date: Wednesday, December 20, 2023 11:42:43 AM

Dear Planning Commissioners:

I have concerns with the approaches used and types of updates being proposed by the Planners/Planning and Development Services(PDS) Dept with the STGPD updates...that include:

1. The boundaries with the STGPD appear to be 'shrinking' and the proposed 'protection' area focus is primarily with the Industrial zones in Tacoma. Why are these areas the only areas of concern? Would the other areas within the STGPD not be affected with potential pollutants entering into the groundwater? Is this proposed change mainly due to potentially harmful/polluting development projects being considered by the Planners in the near future? With the 'Home in Tacoma' planning project, more mixing of businesses in with residential areas is planned. There could be even MORE of a concern with maintaining water quality with the mixing of different business projects in with housing areas. We need to continue with the STGPD without a shrinking of the area of concern. In fact, with the planned annexation of the Manitou area on April 1st 2024, the STGPD may actually need to expand to cover that new area of Tacoma.

2. Limitations on the amount of pavement and construction may be needed within the STGPD especially in the near future due to the planned construction of the Bridge Industrial Company's 2.5 million sq ft 'warehouse'(fulfillment center) project in South Tacoma...directly over the Aquifer. The amount of loss of permeable surface area over this aquifer would greatly adversely impact both the quantity of water and likely quality of water in the aquifer. Adding more impermeable surfaces within this STGPD would further limit our back-up drinking water supply that we may likely rely on in the future...especially with the predictions of substantial population growth anticipated in the future.

3.The STGPD updates need to continue to be an 'overlay' with zoning plans ...and, not tucked away/meshed together within other PDS Dept updates. The protection of the aquifer is needed now more than ever..given the City's plan for the mega-warehouse to be removing so much permeable surface area from the groundwater situation!

4. Potential delays anticipated with the use of an Health Impact Assessment for these STGPD updates. Why would an HIA be needed? What criteria is being used to determine HIA use? Is the HIA proposal being used as a delay tactic. Is the Director of the PDS Dept the person that makes this decision alone..per his discretion?

Please help us preserve the quality/quantity of our 'drinking water'.

Respectfully submitted,
Cathie (Raine) Urwin
South Tacoma resident

From: [Tim Smith](#)
To: matthewgmartenson@gmail.com; asstele@msn.com; jordanrash.tacoma@gmail.com; TPCDorner@gmail.com; bsanthuff@gmail.com; sandeshtpc@gmail.com; robb.krehbiel@gmail.com; brettmarlo18@gmail.com; chris.tacoma@gmail.com
Cc: [Planning](#)
Subject: Comments for 20 DEC 23 Planning Commission Meeting
Date: Tuesday, December 19, 2023 1:57:27 PM
Attachments: [PC 20 DEC my comments.docx](#)
Importance: High

Commissioners,

I submit these comments for your consideration regarding the Comprehensive Plan and South Tacoma Groundwater Protection Code update Work Plan. These are sent directly to you because of continued issues with City mailing lists, requests through the firewall, and an exacerbated feeling of distrust with City Staff. I appreciate your highlighting rebuilding of trust with the staff and the residents however we continue to widen that communications gap rather than close and repair trust and communications.

For example, one part of the agenda is the work plan for the Comprehensive Plan update - a massive and vital undertaking. I have worked on City issues for over 20 years, and it was just Sunday that I discovered a new Contracting Approval Board which approved the contract you are being briefed on but as of now 19 DEC 23 at 1500 CST that contract has not been approved by the Council. This should have been sent much sooner for review but it only went out on Friday afternoon.

As someone partly responsible for the resident led legislative STGPD update, clearly, I as well as the STGPD that proposed this should have been provided at least some, courtesy, early notification and copy of what is a significant expansion of the work plan. Nothing in this expansion is new to us - much is what we proposed 2 years ago- finally. Just giving we residents that have spent 1,000s of free hours analyzing, considering, and reviewing this vital codified protective water law should get some credit and consideration. That is trust-building. That is good government. That is good staff work.

This is what we need right now in this continuing climate emergency. Because of an outdated code we had no defense against a major out of state business to place major impervious surfaces - 100 +acres over our primary Critical Aquifer Recharge Area without any independent scientific hydrogeological analysis. We have done no actual analysis of the health impacts to an already marginalized sacrifice zone which has been subject to decades of brutal environmental racism - and few deliberate mitigations.

Lakewood water District over the southern portion of this same general aquifer recharge area is having to do major remediation and very expensive cleansing systems to drink the water. We are blessed with the Green River second source and now additional water availability with the loss of a major industrial customer, more than ever we should be protecting this resource. There are many, many parts of the USA that would like to have a similar resource. There are multiple municipalities dealing with contaminated water supplies.

What are we doing?

Why should we be so flippant and uncaring. If we don't know the best science, we should protect our water vigorously until we do know. We have a long way to go to bring our city up to contemporary standards. Looking the report prepared (by "ESA") in June 2023 for the city of Tacoma, "Tacoma Critical Areas and Climate Change: Best Available Science and Practices," it is filled with excellent information should not be sidelined during this review of the One Tacoma Comprehensive Plan or the STGPD. (Attached)

Table 1 (in section 2.4 Aquifer Recharge Areas of the "Tacoma Critical Areas and Climate Change" report) shows that Tacoma lags way behind Peirce County in protection. Under "General Requirements for Review Procedures" to protect aquifer recharge, Tacoma has precisely zero requirements - the SWMM is a manual and focuses on stormwater but key analysis and protections for aquifer recharge needs to be codified. This shows a huge gap you could drive a 2.5 million square foot warehouse through – which is exactly what has happened on 150 acres of grassland and wetlands above the South Tacoma.

Likewise weak oversight, the lack of adequate recharge protections, and an attitude of permissiveness for planning staff and dismissiveness to residents input allowed a metal recycling company to be allowed to locate on top of the aquifer recharge area and nearly immediately to be out of compliance with STGPD permitted activities resulting in possible contamination of the aquifer which is still being monitored for compliance.

You are getting primary guidance from staff planners. Please implore them to include us as well. Please continue to communicate with the residents. I attached some additional specific points. I would also implore you to watch the video clip below where the Tacoma City Council IPS Committe solicited some input from the original proponents of this legislative review. There is much more to say.

In 1988 some great residents and City staff created something that was relatively new at the time the STGPD. Part of this impetus was from the EPA and the ROD regarding the various Superfund Sites established in South Tacoma. Thos Superfund Sites still exist and will remain under cleanup and mitigation for years.

Don't overlook the absolute priority and criticality of updating this legacy protective system for our most precious natural resource.

Water is Life

Timothy Smith

Video:

Brief overview of STGPD -- six-minute audio presentation to IPS (prior to moratorium passage) and discussion.

(Start at the 1hr, 34 min / 45 second mark, timestamp 1:34:45)

https://cityoftacoma.granicus.com/player/clip/5747?view_id=2&redirect=true&h=b71ffcddb2434b6a9f2d4357a95e19c1

Key points for the Planning Commission regarding the new STGPD Work Plan
20 DEC 23

- The policy of the City of Tacoma is to establish strict performance standards which will reduce or eliminate threats to this critical natural resource in order that the City of Tacoma might maintain its groundwater resources within the South Tacoma Channel as near as reasonably possible to their natural condition of purity. The intent of this overlay district is to provide supplemental development regulations in the area so designated to permanently protect this supplemental source of Tacoma's water supply. In the event of conflict with the regulations of the underlying zoning district and STGPD code, the provisions of this overlay code shall control decisions.
- The district boundaries need to be expanded to include the newly annexed Manitou area and NOT decreased as hinted at in this updated work plan.
- Impervious surface limitations are vital to protecting the aquifer recharge capabilities and should match or exceed those of Pierce County in all areas of the STGPD Overlay.
- The code should stand as a distinct overlay and not be moved or placed subordinate to some other section of the code such as the Critical Area. There is more to the surface protection zone than just the Critical Aquifer Recharge Area. We have been opposed to code relocation from the beginning. The STGPD is the primary OVERLAY for this area and should not be placed in any other part of the TMC as this will further diminish its oversight function.
- The Wellhead Protection Plan has demonstrated there are over 4,000 potential contamination sources in the STGPD. The TPCHD only monitors about 2,000. Other agencies have monitoring roles (i.e. DOA – Dept of Agriculture/DOE – Dept of Ecology) and they should be involved in this update.
- Provisions and methods should be established in the pre-application permit approval process to screen ALL applications for potential health impacts to the aquifer using established Health Impact Assessment methodologies with review by the Tacoma Pierce County Health Department as part of their STGPD oversight role. We need to prevent contamination and assess threatening developments before they are approved and vested to identify key mitigation and compensation measures.
- We have strongly suggested the combined planning efforts over 2 years ago to maximize the synergy of stovepipe organizational efforts and fuse available staff and limited resources. We wanted the establishment of a Critical Areas Review Team with both internal and external SMEs and community-based participants and a volunteer resident level committee to assist in the review and public engagement. Many of the members from the 2016 group which review the STGPD last time are still available and may desire to assist again.

FINAL

TACOMA CRITICAL AREAS AND CLIMATE
CHANGE: BEST AVAILABLE SCIENCE AND
PRACTICES

Prepared for
City of Tacoma

June 2023



FINAL

TACOMA CRITICAL AREAS AND CLIMATE CHANGE: BEST AVAILABLE SCIENCE AND PRACTICES

Prepared for
City of Tacoma

June 2023

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Atlanta	Palm Beach County	San Diego
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Orlando	Sacramento	Thousand Oaks

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CHAPTER 1

Climate Change and Critical Areas in Tacoma

Critical areas defined in Chapter 13.01 of the Tacoma Municipal Code (City of Tacoma 2023) include wetlands, streams, fish and wildlife habitat conservation areas, frequently flooded areas, geologically hazardous areas, and aquifer recharge areas. These areas provide critical ecosystem functions and services, including flood and erosion control, groundwater recharge, fish and wildlife habitat, water and air purification, cultural resources, and recreation. These natural habitats may help to buffer the impacts of climate change in the city, including warmer air and stream temperatures, more extreme winter storms and flood events, sediment loading of waterways, rising sea levels, and lower summer streamflows. This section summarizes key concerns related to climate change and critical areas in Tacoma.

1.1 Wetlands

- Wetlands supplied by surface water may experience more frequent drying as summers become warmer and snowpack is depleted more rapidly in spring (WSDOE 2023; CIG n.d.). This may cause shifts in species assemblages and increase the risk of habitat conversion and/or habitat loss and degradation for aquatic, avian, and terrestrial species that rely on wetlands for habitat (WDFW 2015). Wetlands supplied by groundwater are expected to be less vulnerable to climate change (City of Tacoma ESD 2016), though increased groundwater demand for agricultural, commercial, or residential uses may stress naturally available water supplies.
- Increases in winter precipitation may have positive effects on wetlands by creating additional side channel habitat; however, heavy rainfall may also diminish the ability of soils and vegetation to effectively store water and attenuate floods and erosion (WDFW 2015).
- Estuarine and freshwater wetlands are found along Tacoma's shoreline, many of which are within the boundaries of the port (Port of Tacoma n.d.). As sea levels rise, these low-lying areas are highly susceptible to inundation. Coastal freshwater wetlands are likely to experience shifts in plant dominance towards more salt-tolerant species. Estuarine wetlands will likely be unable to migrate inland as sea levels rise as they are backed by developed areas.
- Wetlands are carbon sinks and changes to their viability due to drying induced by higher temperatures and drought may result in that carbon being released to the atmosphere (Salimi et al. 2021). As sea level rise, wetlands can also drown, releasing carbon back into the system (Thorne et al. 2018).

1.2 Streams

- Warming stream temperatures will affect species that require cool waters such as salmonids by inhibiting their migration and breeding patterns (Mantua et al. 2010).

Within city limits, streams and rivers that provide habitat for salmon include the Puyallup River, Leach Creek, Swan Creek, Chambers Creek, and Joe's Creek (Pierce County n.d.).

- Streamflows are anticipated to decrease during summer months as the snowpack reserve melts. For streams that traverse developed areas, culverts, or other infrastructure, decreased flows may exacerbate the effects of these barriers on fish species movement. Heavy rainfall will exacerbate polluted runoff from impervious surfaces, particularly if municipal stormwater systems and/or green infrastructure cannot adequately handle increased flow rates (USEPA n.d.). Pre-spawn mortality of coho salmon has been attributed to polluted urban stormwater runoff that decreases dissolved oxygen levels (Mauger et al. 2015).
- Wildfires upstream could contribute to increased sedimentation of waterways due to post-fire erosion and flooding (Raoulison et al. 2023).
- As drought and extreme heat events co-occur, terrestrial plant species in riparian habitats will face greater stress and mortality, and may be unable to provide shade to streams and rivers (Raymond et al. 2014; USFS n.d.).
- Increased drought conditions will also likely reduce water availability in riparian habitats, which will impact seedling germination rates and tree survival (WDFW 2015).

1.3 Fish and Wildlife Habitat Conservation Areas

- Shifting seasonal patterns such as an earlier incidence of spring conditions and a longer, warmer, and drier summer period will likely create timing mismatches between the availability of food sources and life cycle events such as reproduction and migration (Snover et al. 2013).
- The National Audubon Society identified 122 bird species in Pierce County inclusive of migratory species that are susceptible to climate change impacts by late-century (Audubon 2019). Contributing factors include shifting seasonal conditions causing disruptions to migration patterns and prey availability, and loss of habitat due to conversion, mortality, and inundation from sea level rise. Rising sea levels may result in the loss of nearshore habitat in areas with hard shoreline armoring such as seawalls or bulkheads as is the case for the majority of shoreline within and immediately surrounding Tacoma (City of Tacoma ESD 2016; Puget Sound Nearshore Ecosystem Restoration Project [PSNERP] n.d.).
- Increased peak streamflows may scour streambeds and salmon redds, affecting egg survival (Tohver et al. 2014).
- Some plant species may experience increased heat and drought stress and subsequent infestation by pests and pathogens (Raymond et al. 2014).

1.4 Frequently Flooded Areas

- Flood risk is expected to increase in Tacoma. Some flood protection infrastructure is aging and may not be adequate to accommodate increased streamflows. Smaller urban

creeks are also expected to experience more frequent flooding (City of Tacoma ESD 2016).

- Components of the stormwater system that are already experiencing capacity challenges will be more likely to flood during larger, more intense precipitation events (City of Tacoma ESD 2016).
- Sea level rise will increase the extent, depth, and duration of flooding, making it more difficult for rivers to drain to Puget Sound (Mauger et al. 2015). Sea level rise will permanently inundate some low-lying areas with the extent and depth of inundation depending on shoreline characteristics such as elevation, drainage pathways, and the presence of armoring or other flood protection structures (Mauger et al. 2015). These impacts will be exacerbated by storm surge and king tides.

1.5 Geologically Hazardous Areas

- Shifting precipitation patterns are likely to increase the occurrence of landslides and accelerate erosion (Mauger and Vogel 2020), particularly in areas that are susceptible to geological hazards. Areas of moderate and high potential geological hazard are concentrated along Tacoma's shorelines, Puget Creek, Buckley Gulch, Garfield Gulch, Swan Creek, in Chambers Creek Canyon, and East of the Interstate-5/WA-7 interchange (City of Tacoma GIS n.d.; City of Tacoma ESD 2016). Ruston Way and Marine View Drive have also been identified as being at increased landslide risk (City of Tacoma ESD 2016).
- Drier conditions and soils are likely to increase landslide risk by widening gaps in rocks and soils (Mauger et al. 2015).
- Increased streamflow may cause more aggressive channelization of waterways and increase bank instability (Mauger et al. 2015).
- Declines in vegetative cover along streambanks may contribute to higher erosion risk (Raymond et al. 2014).
- Coastal bluffs and areas that are subject to tidal influence will likely experience greater rates of erosion with sea level rise (Huppert et al. 2009; Mauger et al. 2015).

1.6 Aquifer Recharge Areas

- Coastal aquifers may become more susceptible to saltwater intrusion due to sea level rise (Huppert et al. 2009).
- Because Tacoma relies on a series of groundwater wells to supplement surface water sources during periods of peak demand reduced summer flows and droughts will likely prompt increased groundwater withdrawals (City of Tacoma ESD 2016).
- More intense precipitation events anticipated with climate change may create operational difficulties for drinking water systems including damage, loss of power, and the intrusion of pollutants into wells and distribution systems (Siemann and Whitely Binder 2017).

- Reduced summer streamflows are expected to diminish the function of floodplain areas, including the recharge of groundwater aquifers (Siemann and Whitely Binder 2017).
- Snowpack and snowmelt play an important role in groundwater recharge in Pierce County. Reductions in snowpack and more rapid melting of snow may decrease groundwater recharge and cause increased variability in groundwater supplies in the county (Pitz 2016).

CHAPTER 2

Critical Areas Ordinances

There are numerous opportunities for the City of Tacoma to integrate up-to-date science on both effective critical areas management strategies and how climate change will affect these areas and their management. This section presents findings from a rapid literature review (and interviews where possible) to document efforts undertaken by other Washington municipalities to integrate emerging state guidance on riparian and wetland management, water supply and storage considerations (particularly with respect to aquifer recharge areas), climate-informed updates to municipalities' critical areas policies, and nearshore, stream, and riparian buffer considerations in light of climate change.

2.1 Benchmarking

In 2020, the Washington Department of Fish and Wildlife (WDFW) released series of new guidance documents (Quinn et al. 2020; Rentz et al. 2020), detailing the Best Available Science (BAS) and management recommendations for riparian ecosystems in the State of Washington. In 2022, the Washington State Department of Ecology (WSDOE) released *Wetland Guidance for Critical Area Ordinance (CAO) Updates: Western and Eastern Washington*. Each of these documents are intended to help guide jurisdictions in making scientifically sound decisions as they update their CAOs.

To identify jurisdictions that have implemented some or all the guidance from the documents above, a benchmarking review was completed. For the benchmarking process, CAOs were reviewed for the following 39 jurisdictions:

Anacortes	Everett	Olympia
Arlington	Federal Way	Pierce County
Bainbridge Island	Friday Harbor	Port Orchard
Bellevue	Gig Harbor	Redmond
Bellingham	Island County	Renton
Benton County	Issaquah	San Juan County
Bremerton	Jefferson County	Seattle
Burien	King County	Skagit County
Cheney	Kittitas County	Snohomish County
Clallam County	Langley	Spokane (City)
Clark County	Lynnwood	Spokane County
Cle Elum	Mason County	Thurston County
Edmonds	Mount Vernon	Whatcom County

Notably, the 2022 WSDOE guidance is in part a synthesis that builds from a wetland identification methodology first published in 2014 and a 2021 report on mitigation strategies including compensatory mitigation, among other previously released documents. This means that many of the jurisdictions reviewed that had updated the wetlands section of their CAOs after 2014 were partially in agreement with the new guidance; these jurisdictions were omitted from the list of adopters discussed below.

For jurisdictions where no public-facing updates were found, an email was sent to local staff members inquiring about ongoing update processes that may not yet be publicly available. Of jurisdictions that replied, only **Issaquah** indicated that an update to the CAO is in progress while **Snohomish County** reported that it had begun a BAS process. All other respondents reported that they had not yet begun the update process, with most indicating that the CAO update would begin after completing Comprehensive Plan updates.

2.2 Adopters of New Wetland and Riparian Guidance

Through the benchmarking process, only **four** jurisdictions were identified with public-facing updates to CAOs that adopt any of the WDFW riparian or WSDOE wetlands guidance. **Anacortes** updated its stream buffer standards to accommodate the new WDFW guidance after appearing before a Growth Management Hearing Board. **Clark County** has fully adopted the WSDOE guidance and substantial parts of the WDFW guidance. **Benton County** adopted stream buffers that appear to be in concurrence with the 2020 WDFW guidance, though in a way that departs from Anacortes and Clark County. **Issaquah** updated its CAO in conjunction with a broader update to development codes; the city anticipates making further revisions through the coming years to include elements of the WSDOE guidance.

A fifth jurisdiction, **Cle Elum**, passed an update that included the 2020 WDFW guidance through its planning commission before it was abandoned by the City Council in early 2021.

2.2.1.1 Anacortes

An assignment of error was brought by an advocacy organization that held that the City of Anacortes failed to uphold both the GMA and its Comprehensive Plan regarding critical area buffers (specifically stream buffers). The Growth Management Hearing Board found that the city departed from BAS as established in Rentz et al. (2020) by permitting buffers of 50-feet for all streams. As a result, Anacortes was required to update its riparian buffer ordinances to reflect a BAS approach, electing to utilize 200-year Site Potential Tree Height as an indicator of appropriate buffer width (and the approach suggested in Rentz et al. 2020). Ordinance 4025 amended the code as such and can be viewed [here](#).

2.2.1.2 Clark County

Rick Mraz, Wetlands Policy Lead with WSDOE, conferred in a phone interview that Clark County was the first jurisdiction he had seen to update its CAO and adopt the WSDOE guidance “whole cloth.” Upon inspection of the adopted ordinance ([here](#)), it also appears that the WDFW riparian guidance has been adopted as well, utilizing the Riparian Management Zone (RMZ) model.

2.2.1.3 Benton County

Located on the Columbia Plateau, the geography and landscape of Benton County differs substantially from Tacoma and Western Washington. The adopted updates to the riparian buffers in the County’s CAO appear to follow the WDFW guidance and represent a different approach to riparian area buffers. The [link](#) shows both a redline update and the comment/response matrix provided by the County. Of note are the comments of Elizabeth Torrey on page 13, requesting no changes to the proposed language on behalf of WDFW, seemingly indicating support for the chosen approach.

2.2.1.4 Issaquah

In June 2023, the Issaquah City Council adopted an updated CAO as a component of a larger development code update. This project has been ongoing since 2018, with work on the CAO beginning in 2021 and finishing in June 2023. Given the timeline, the 2022 WSDOE guidance was not incorporated, though further amendments are likely given upcoming land use code and comprehensive plan updates. As Issaquah is a heavily developed jurisdiction and the 2022 WSDOE guidance builds from the 2014 wetland identification tables previously released by WSDOE, the city anticipates few substantial changes.

Issaquah initially perceived the guidance from WDFW as being most applicable at the county scale and for larger landowners. Follow-up conversations with WDFW confirmed that the 200-year Site Potential Tree Height standard for RMZs is in fact intended to be implemented in developed areas as well, which prompted planners in Issaquah to explore what such a regulation would look like if implemented. Soil studies on shorelines of the state within Issaquah determined that the appropriate buffer under such a standard would be 175-200 feet, which in many cases in the old downtown area have already been fully built out. As implementing this standard would have created “hundreds of, if not a thousand” non-conforming sites, Issaquah contracted with The Watershed Company to prepare a BAS report to find a defensible alternative. Issaquah elected to implement a 150-foot buffer for primary shorelines, representing a 50-foot increase over the previous regulation.

Having completed a public engagement process for the CAO update, Issaquah reported minimal community pushback on its chosen ordinance, citing an engaged group of residents and advocacy organizations who regularly push the City to “do more” with regards to environmental regulation.

2.2.1.5 Cle Elum

Cle Elum drafted updates to its CAO before the WDFW guidance was released. Following the guidance release, Cle Elum received a request from Elizabeth Torrey on behalf of WDFW to incorporate the riparian buffers guidance. Responding to the request, the recommended amendments were updated and presented to the Planning Commission. Elizabeth Torrey, also a Cle Elum planning commissioner, recused herself on account of having submitted the request on behalf of WDFW.

Following further discussion at a second Planning Commission meeting, amendments that incorporated Site Potential Tree Height as the determinant for buffer widths along a local creek were passed. The amended ordinances appeared before Cle Elum’s City Council for a first reading. At the following Council meeting (5/24/21), several councilmembers expressed concern over the ordinances, citing a desire for legal analysis by the City Attorney, requesting “accurate” maps, stating that previously properties abutting the creek had not been regulated because there was no buffer, and voicing concerns

over whether the ordinance would “affect the citizens.” At the next meeting (6/14/21), the Mayor reported that the City would be conducting an internal review of the BAS and a report would be sent back to the Planning Commission before returning to City Council. At present, the city’s CAO remains unchanged from its 2010 state

2.3 Gap Analysis and Emerging Updates

In addition to email inquiries, a review of any gap analyses and BAS reports was completed for the above jurisdictions to check for adoption of either the WDFW or WSDOE guidance. From this pool, two gap analysis reports were found: Langley and Pierce County. Both reports reference the WDFW guidance on riparian areas; neither reference the WSDOE wetlands guidance.

2.4 Aquifer Recharge Areas

2.4.1 Tacoma and Pierce County Comparison

Aquifer recharge areas’ definitions and protection standards according to Pierce County and City of Tacoma (Table 1):

TABLE 1. COMPARISON OF AQUIFER RECHARGE DEFINITIONS AND PROTECTION STANDARDS BETWEEN THE CITY OF TACOMA AND PIERCE COUNTY

	Pierce County	City of Tacoma
<i>Definition</i>	Land areas where the prevailing geologic conditions allow infiltration rates which create a high potential for contamination of groundwater resources or contribute to the replenishment of groundwater. (19D.170.030)	Areas that, due to the presence of certain soils, geology, and surface water act to recharge groundwater by percolation. (13.01.110.A)
<i>Classification</i>	<ol style="list-style-type: none"> The boundaries of the two highest DRASTIC zones that are rated 180 and above on the DRASTIC index range, as identified in Map of Groundwater Pollution Potential, Pierce County, Washington, National Water Well Association, U.S. Environmental Protection Agency; and The Clover/Chambers Creek Aquifer Basin boundary as identified in the Clover/Chambers Creek Basin Groundwater Management Program. (18E.50.030) 	<p>The following criteria should be considered in designating areas with critical recharging effects: A. Availability of adequate information on the location and extent of the aquifer; B. Vulnerability of the aquifer to contamination that would create a significant public health hazard. When determining vulnerability, depth of groundwater, macro and micro permeability of soils, soil types, presence of a potential source of contamination and other relevant factors should be considered; and C. The extent to which the aquifer is an essential source of drinking water. (13.11.810)</p>
<i>General Requirements for Review Procedures</i>	<ol style="list-style-type: none"> The Pierce County Critical Areas Atlas-Aquifer Recharge and Wellhead Protection Area Map provides an indication of where aquifer recharge and wellhead protection areas are located within the County. The Department will complete a review of the Aquifer Recharge Area Map for any development proposal to determine whether the proposed project area for a regulated activity falls within an aquifer recharge or wellhead protection area. When the Department’s maps or sources indicate that the proposed project area for a regulated activity is located within an aquifer recharge or wellhead protection area, the 	N/A

	Pierce County	City of Tacoma
	<p>Department shall require aquifer recharge and wellhead protection area review as set forth in this Chapter.</p> <p>4. Any regulated activity located within an aquifer recharge or wellhead protection area shall comply with the standards set forth in PCC 18E.50.040.</p> <p>5. Any hazardous uses, as defined in PCC 18E.50.040, shall require the submittal of a hydrogeologic assessment, as set forth in PCC 18E.50.030 B. below.</p> <p>6. The Department may waive some of the critical area protective measure provisions contained in PCC 18E.10.080. (18E.50.040)</p>	
<i>Protection Standards</i>	<p><i>General.</i> All regulated activities that are not exempt, prohibited, or otherwise excluded in the following standards under the provisions of this Chapter shall ensure sufficient groundwater recharge. In order to achieve sufficient groundwater recharge the applicant shall either comply with the impervious surface limitations set forth in Table 18E.50.040-A or demonstrate that the volume of water infiltrated at the proposed project area will be the same or greater amount for post-development as the pre-development volume.</p>	<p>Standards for development in aquifer recharge areas shall be in accordance with the provisions in Chapter 13.09, South Tacoma Groundwater Protection District, of the TMC and other local, state, and federal regulations.</p>

SOURCE: Pierce County CAO, City of Tacoma CAO

2.4.2 Water Supply Considerations

2.4.2.1 Pierce County

Current Pierce County regulations in aquifer recharge areas focus mostly on identification and classification, reducing contamination risks by limiting high-risk activities. To further guide and inform their CAO update, the County is implementing the current 2021 WSDOE Critical Aquifer Recharge Area (CARA) Guidance (WSDOE 2021a), which recommends the following steps to characterize and protect aquifer recharge areas:

- Identify where groundwater resources are located.
- Analyze the susceptibility of the natural setting where groundwater occurs.
- Inventory existing potential sources of groundwater contamination.
- Classify the relative vulnerability of groundwater to contamination events.
- Designate areas that are most at risk to contamination events.
- Protect by minimizing activities and conditions that pose contamination risks.
- Ensure that contamination prevention plans and best management practices implemented and followed, including application of BMPs in the Pierce County Stormwater Management and 10 Site Development Manual for new developments in aquifer recharge areas. Review BMPs for infiltration designs with water quality treatment in the Chambers/Clover Creek watershed because of high infiltration rates and high-water table conditions. Stormwater control usually affects the vadose zone

and seasonal water tables with low risk to deeper water supply aquifers. Some exceptions are those glacial outwash plains with extensive deposits of coarse gravels near the surface.

- Manage groundwater withdrawals and recharge impacts to:
 - Maintain availability for drinking water sources.
 - Maintain stream base flow from groundwater to support in-stream flows, especially for salmon-bearing streams

2.4.3 Impervious Surface Standards

Examples of impervious surface standards from other municipalities that the City of Tacoma could review, modify, and adopt were identified for the City of Sammamish and King and Pierce counties.

2.4.3.1 City of Sammamish

The Sammamish Unified Development Code (21.03.020) implements best management practices for critical areas to implement the goals of the GMA, State Environmental Policy Act (SEPA), and the City of Sammamish Comprehensive Plan:

- New single-family home construction or modifications or additions to existing single-family homes on existing legal lots that will result in a total site impervious surface of more than 2,000 square feet shall provide a drainage design, using the following sequential measures, which appear in order of preference: Infiltration of all site runoff shall be required to the maximum extent technically feasible in existing soil conditions, consistent with the infiltration system design requirements of the King County Surface Water Design Manual (KC SWDM).
- Groundwater Quantity Protection Standards. For developments in all CARA classes, the applicant shall provide surface water infiltration as follows:
 - a. Seventy-five percent of on-site stormwater volume generated from the proposed development shall be infiltrated; provided, that a lesser standard may apply or on-site infiltration may be waived when:
 - i. The applicant demonstrates that infiltration is not a reasonable alternative due to site-specific soil and/or geologic conditions;
 - ii. It is determined that increased saturation of soils would result in an increased risk to existing facilities and/or adjacent properties;
 - iii. Infiltration would result in significant unavoidable impacts to other critical areas or result in an excessive loss of native vegetation; or
 - iv. The applicant proposes an addition of no more than 700 square feet of total new impervious surface compared cumulatively to 2005 levels.

2.4.3.2 King County

King County’s SWDM requires flow control BMPs to reduce runoff volumes and increase groundwater recharge by mitigating hydrologic impacts from new and existing impervious surfaces. Mitigating these impacts through flow control can help prevent the loss of vegetation diversity and habitat quality; disruption of spawning, egg hatching, and migration; and algal scour and washout of organic matter. Flow control BMPs the County aims to implement include, but are not limited to, the conservation and use of native vegetated surfaces, bioretention, permeable pavements, and reduction of development footprint.

King County Code (K.C.C. 9.04.050) requires flow control BMPs abide by the following standards:

- Proposed projects that would result in two thousand square feet or more of new plus replaced impervious surface or seven thousand square feet or more of land disturbing activity shall provide flow control BMPs that use processes such as infiltration, dispersion, storage, evaporation, transpiration, forest retention and reduced impervious surface footprint to mimic pre-developed hydrology and minimize stormwater runoff generated by new impervious surface, new pervious surface, replaced impervious surface and any existing impervious surface added on or after January 8, 2001, as specified in the [SWDM]. Flow control BMPs shall be applied to manage stormwater runoff from the aforementioned surfaces to the maximum extent feasible using lists of flow control BMPs specific to the project location, size and impervious coverage; or as required to demonstrate that developed discharge durations from the surfaces match pre-developed durations for those surfaces for the range of predeveloped discharge rates from eight percent of the two-year peak flow to fifty percent of the two-year peak flow as specified in the [SWDM].

2.4.3.3 Pierce County

Pierce County factors in impervious surface limitations within CARAs to achieve sufficient groundwater recharge (Table 2):

TABLE 2. IMPERVIOUS SURFACE LIMITATIONS - PIERCE COUNTY.

Comprehensive Plan Land Use Designation	Maximum Impervious Surface Coverage (%)
Urban Land Use Designations	
Employment Center	60%
Major Urban Center	75%
Activity Center	50%
Community Center	50%
Neighborhood Center	50%
Mixed Use District	75%
High Density Residential District	50%
High Density Single Family	50%
Moderate Density Single Family	35%
Public Institution	60%
Urban Military Land	Not Applicable
Master Planned Community	20%
Employment Based Planned Community	20%
Rural Land Use Designations	
Essential Public Facility Rural Airport North	PUD
Essential Public Facility Rural Airport South	PUD
Rural Activity Center	60%

Rural Neighborhood Center	50%
Gateway Community	50%
Rural Separator	10%
Rural Sensitive Resource	10%
Rural Farm	10%
Rural 10	10%
Rural 20	10%
Rural 40	10%
Reserve 5	10%
Master Planned Resort	10%
Rural Military Land	Not Applicable
Natural Resource Land Designations	
Designated Forest Land	Not Applicable
Agricultural Resource Land	Not Applicable

NOTES: (1)The maximum impervious surface coverage is calculated for the total amount of impervious surface per each individual site. The percentage for maximum total impervious surface per lot or site may be exceeded if the applicant can demonstrate that the effective impervious surface on the site is less than or equal to what is allowed for the total impervious surface.

SOURCE: Pierce County Critical Aquifer Recharge Areas

2.5 Climate Change-Informed Updates

2.5.1 BAS Reviews

As a component of the benchmarking process, BAS Reports and CAOs for the 39 jurisdictions listed in Section 2.1 were reviewed for the integration of climate change. **Bellingham, Cle Elum, Jefferson County, Kittitas County, Langley, and Pierce County** were the only jurisdictions to have climate change references within their BAS reports. Of these six, the majority referred to climate change as something to monitor, further study, or otherwise keep in mind, but did not include suggestions on management or regulatory activities to address climate change impacts.

Pierce County and Langley each included exploration of potential management actions that could support the mitigation of climate change impacts across each required section of the CAOs. These strategies (The Watershed Company 2022, 2023) are listed below. Some of these recommendations appear in the draft CAO update available on the City of Langley website ([link](#)). Many of these strategies align with those already implemented to protect critical areas and serve the purpose of reducing stress on critical areas so they are more capable of withstanding climate change (e.g., maintaining water storage capacity, maintaining vegetation to buffer runoff, etc.). Starred (*) strategies in Sections 2.5.1.1-2.5.1.5 are more targeted towards being responsive to climate change.

2.5.1.1 Critical Aquifer Recharge Areas Climate Strategies

- Review regulatory requirements for reclaimed water use and temporary dewatering during construction to ensure adequate protections are in place.
- Promote and incentivize low impact development, specifically infiltration of clean runoff to support aquifer recharge.

- Balance growth and development with preservation and restoration of open spaces and native vegetation tracts.
- Manage stormwater to maintain groundwater recharge in CARAs. Utilize 20-year planning horizon to manage supply and demand given climate trends and projections.*
- Adaptive management of stormwater has the potential to better mimic natural systems and mitigate for some of the functions lost elsewhere in the landscape due to changes in surface and groundwater inputs.* For example, the use of roadside bioswales may be expanded. Stormwater treatment capacity may be increased as needed to protect water quality and manage water quantity.
- Planning for increased flooding can reduce the likelihood of contaminated runoff events.*
- Preserve open space and concentrate urban development away from CARAs.
- Continue to protect CARAs by maintaining updated CARA maps and classifications.
- Continue to modify public outreach efforts to educate residents about best practices in CARAs and promote water conservation and water use efficiency programs.*

2.5.1.2 Fish and Wildlife Habitat Conservation Areas Climate Strategies

- Promote retention of significant trees and maintain tree replacement requirements.
- Encourage and incentivize enhancement and restoration of native forest patches throughout the jurisdiction, particularly where connectivity to one or more FWHCAs is demonstrated. Both voluntary and required restoration planting should be paired with monitoring and maintenance that allows for dry season irrigation and adaptive management.
- A broader native plant species palette in regulated FWHCAs could be allowed to increase resilience of plant communities considering climate stressors as new scientific recommendations on native plant tolerances are published.*
- Manage stormwater infrastructure to avoid and minimize discharges of untreated runoff to streams.
- Encourage the use of local nursery plant stock grown under current conditions to increase resilience of plant communities considering climate stressors.*
- Update and maintain regulations for habitats and species of local importance. This may include adding mapping resources to help identify the locations of potential habitats and species requiring protection and management.
- Prioritize protection of streams and riparian corridors to reduce the stresses of climate change on native fish species and anadromous fish, such as Chinook salmon.*

2.5.1.3 Frequently Flooded Areas Climate Strategies

- Establish a comprehensive flood hazard management plan (CFHMP) to support stormwater management, salmonid habitat, and streamflow planning.

- Encourage and incentivize floodplain restoration actions to restore floodplain connectivity to streams and wetlands.
- Utilize the FEMA Climate Resiliency approach to support flood hazard management planning and follow grant funding opportunities.

2.5.1.4 Geologically Hazardous Areas Climate Strategies

- Review and address landslide and erosion hazards to roads and infrastructure.
- Encourage or require climate-informed design for development and infrastructure in or near geologic hazard areas.*
- Require appropriate surface and ground water management practices for development near coastal bluffs.
- Encourage retreat and increased setbacks for bluff top development.*
- Encourage utilization of soft shore protection strategies.
- Identify and prioritize geologic hazards within the jurisdiction, then update mapping as needed using current practices like LiDAR and GIS database tools.
- Keep in communication with the Governor's office to ensure the jurisdiction is included in statewide collaborative efforts to manage geologic hazard areas.

2.5.1.5 Wetlands Climate Strategies

- Continue to encourage and incentivize direct wetland impact avoidance to maintain existing carbon storage.*
- Continue to regulate wetland buffers to encourage and require width retention/limitations and enhancement with native vegetation. Both voluntary and required restoration planting should be paired with monitoring and maintenance that allows for dry season irrigation and adaptive management.
- Manage stormwater infrastructure to avoid and minimize discharges of untreated runoff to wetlands.
- A broader native plant species palette in regulated wetlands and wetland buffers could be allowed to increase resilience of plant communities considering climate stressors as new scientific recommendations on native plant tolerances are published.*
- Apply increased protections to bog wetlands and associated buffers to prevent stormwater impacts that could change pH and alter sensitive plant communities.
- Consider adding low impact development or stormwater management requirements to buffer requirements if the jurisdiction does not do so already.
- Encourage use of native plant stock grown under local conditions to increase resilience under climate stressors.*

2.5.2 Wetlands and Drought

Despite expected impacts to wetlands due to climate change, background research and an interview with Ecology staff revealed no implemented planning efforts related to adapting buffer or other regulations in anticipation of drought impacts on wetlands. In Tacoma, it is more likely that forested buffers around wetlands will be affected by drought and extreme heat events.

The draft update to the CAO for the City of Langley incorporates some of the climate change-related guidance found above that was provided to the City by The Watershed Company, though revisions to the draft ordinances appear to be ongoing and no evidence was found that the current (or any) version had been presented to Langley City Council for review.

2.6 Buffer Management

2.6.1 Nearshore and Marine Buffers and Sea Level Rise

2.6.1.1 WSDOE Current Guidance

As the rate of sea level rise will vary greatly across coastal regions of Washington State WSDOE does not provide specific recommended buffer widths in terms of feet or meter lengths for jurisdictions in its current guidance. Instead, WSDOE provides general guidance and recommendations about the ways in which planners and land managers can integrate sea level rise planning into Shoreline Master Programs (SMPs) and land use policies (WSDOE 2017):

- As sea levels rise, so too will the ordinary high water mark (OHWM), which is the basis for determining shoreline jurisdictions. In response, jurisdictions may use sea level rise projections to update the OHWM on planning documents and in regulations.
- High resolution geospatial data of coastal areas has been used in several urban jurisdictions to help identify low-lying areas and to see flooding impacts and different levels of sea level rise. This information can be used by managers to estimate suitable buffer distances based on local topography and risk factors. Similarly, this information can be used to inform future siting requirements for flood control infrastructure, storm drainage facilities, and pump stations.
- In highly urbanized settings, WSDOE recommends jurisdictions use sea level rise projections to establish a setback in order to accommodate future dikes or seawalls that will likely be required to protect existing infrastructure as sea levels rise.

WSDOE recommends that jurisdictions and planners plan for sea level rise by developing sufficient buffers and setback distances. The SMP Handbook includes resources for planners to help make decisions about how and to what degree sea level rise should be incorporated into SMPs. Some of the information included in this handbook comes from the Washington Coastal Resilience Project, which included the development of updated and more accurate sea level rise estimates. WSDOE will be updating SMP guidance to require jurisdictions to address the effects of sea level rise and storm severity in the next few years.

Below are examples of how different jurisdictions have incorporated sea level rise projections into planning and land use policy decisions related to buffers.

2.6.1.2 King County

In 2020, King County established a sea level rise risk area on Vashon and Maury Island during its Comprehensive Plan update. This area extends inland from the edge of the existing 100-year floodplain, and uses sea level rise projections and existing topography to define the risk area. There is not standard buffer width; instead, the width varies depending on local topography and hazards. Under these regulations, new homes built within the risk area are also required to be built three-feet above the 100-year base flood elevation and comply with a number of other floodplain regulations related to home construction. King County selected the three-foot elevation requirement based upon the best available science for sea level rise projections. Additionally, as the buffer area is tied to the FEMA-mapped floodplain, the sea level rise risk area automatically adjusts as FEMA completes floodplain mapping updates.

2.6.1.3 San Juan County

The San Juan County Code requires buffers be of sufficient width to “avoid the need for new protective structural shoreline stabilization and flood protection measures” for the useable life of a structure (assumed to be 75 years) (WSDOE 2021).

2.6.1.4 City of Burien

The City of Burien’s SMP includes a policy that directs the City to incorporate updated sea level rise projections in order to update buffer distances and locations as well as other planning decisions.

2.6.1.5 Island County

Island County requires sea level rise projections to be considered during site-specific development in order to create appropriate buffer distances to minimize potential flood risk.

2.6.1.6 City of Edmonds

Edmonds requires the city to evaluate new scientific information related to sea level rise as it becomes available and to update development standards as appropriate.

2.6.1.7 Mason County

When a geotechnical report or assessment is required for proposed structures in Mason County, those reports must address sea level rise. The plans must show the current OHWM and demonstrate that no shoreline stabilization structures will be needed to protect the structure over the course of its anticipated life.

2.6.2 Stream and Riparian Buffers and Climate Change

Riparian buffers provide storage capacity during severe flood events, filter pollutants from stormwater before it reaches streams and rivers, and provide critical habitat. Managing riparian buffers to maximize these benefits is essential in helping jurisdictions adjust to climate change. Several resources exist for resource managers to consider when developing regulations related to riparian buffers.

Past studies have examined recommended buffer widths for riparian areas. In order to be most effective, buffers should extend along all streams including intermittent and ephemeral channels. Buffers as narrow as 4.6 m (15 ft) have proven effective in the short term, although wider buffers provide greater sediment control, especially on steeper slopes. However, long-term studies suggest the need for much wider buffers; 30 m (100 ft) buffers are sufficiently wide to trap sediments under most circumstances, although buffers should be extended for steeper slopes. An absolute minimum width would be 9 m (30 ft). To maintain aquatic habitat, the literature indicates that 10-30 m (35-100 ft) native forested riparian buffers should be preserved or restored along all streams. While narrow buffers offer considerable habitat benefits to many species, protecting diverse terrestrial riparian wildlife communities may require some buffers of at least 100 meters (300 feet) depending on local wildlife conditions. To provide optimal habitat, native forest vegetation should be maintained or restored in all buffers, regardless of size (Wenger 1999).

Although forested buffers provide extensive benefits, both grass and forest buffers can reduce levels of nutrients and sediments from surface runoff and reduce levels of nitrates from subsurface flows. Higher rates of denitrification are often observed in forested buffers, and researchers attribute this to the greater availability of organic carbon and interactions that occur between the forest vegetation and the soil environment. Grass buffers are more quickly established, and in terms of sediment removal, may offer greater stem density to decrease the velocity of water flow and provide greater surface area for sediments to be deposited. Forested buffers, though, offer the advantage that the woody debris and stems may offer greater resistance and are not as easily inundated, especially during heavy floods (Klapproth 1999).

Buffers also provide important benefits in terms of pollutant control. Buffers are short-term sinks for phosphorus, but over the long term their effectiveness is limited. In many cases phosphorus is attached to sediment or organic matter, so buffers sufficiently wide to control sediment should also provide adequate short-term phosphorus control. However, long-term management of phosphorus requires effective on-site management of its sources. Buffers can provide very good control of nitrogen, include nitrate. The widths necessary for reducing nitrate concentrations vary based on local hydrology, soil factors, slope, and other variables. In most cases 30 m (100 ft) buffers should provide good control, and 15 m (50 ft) buffers should be sufficient under many conditions. It is especially important to preserve wetlands, which are sites of high denitrification activity (Wenger 1999).

2.6.2.1 Local Recommendations

In 2023, WDFW developed the RMZ Checklist for CAOs. This tool is intended to be used to determine whether or not existing CAOs contain the most up-to-date and accurate information based upon goals in the GMA and the most recent BAS resources (including Quinn et al. 2020 and Rentz et al. 2020). The document outlines 22 riparian management recommendations, and asks managers whether or not they are included in the CAOs, and how they are or are not addressed. Some information includes:

- Questions about the methodologies used to determine riparian buffers: site-potential tree height, extent of native riparian vegetation, or minimum pollution removal distance.
- Information about the relationship between riparian zones and channel migration zones.
- Inclusion of riverine wetland within buffer areas.

- Mitigation requirements to ensure no net loss of riparian ecological functions.

Specifically, this document also asks planners if their CAO includes language to bolster climate resilience by increasing habitat connectivity, planning for a wider range of streamflows, and increasing stream shading (WDFW 2023).

Snohomish County considers variable buffer widths to allow for greater flexibility in meeting habitat and water quality goals, while reducing impacts to useable lands (Snohomish County 2006). Buffer widths are related to the wetland and riparian functions that need protecting from the upland activities from which a wetland or riparian area is being buffered. Establishing variable buffer widths requires a heightened level of analysis to determine ecosystem functions, and the best decisions to make based on the location of riparian and wetland areas.

In the 2005 Snohomish River Basin Salmon Conservation Plan, buffers of 150 feet were recommended along all salmon bearing streams and rivers. Analyses conducted by the King County Snoqualmie Fish, Farm, Flood Initiative noted the potential for the displacement of hundreds or even thousands of acres of agricultural land in the uniform 150-foot buffer recommendation was implemented. In response, **King County** led an effort to determine priority functions and recommendations for riparian buffer areas in order to more specifically target implementation of the 150-foot buffers as opposed to a one-size-fits-all approach. Although this exercise was targeted specifically on the Snoqualmie River Basin, the results are broadly applicable (Kubo et al. 2019). Findings were grouped into six categories:

Water Quality Control (minimum buffer width: 10-328 ft, minimum buffer length 984-4920 ft):

- Low-gradient areas have higher removal efficacies of suspended solids, nutrients, and pesticides, compared to higher-gradient areas.
- Soils with higher clay content have greater potential for nutrient and pesticide removal.
- Woody vegetation including shrubs and trees have higher removal efficacies of nutrients and pesticides compared to grasses.
- Long and continuous buffers have greater nutrient and pesticide uptake compared to fragmented buffers; narrower buffers that are long and continuous are more effective than wide-fragmented buffers.
- Straightened watercourses require wider, longer, and more continuous riparian buffers to compensate for lost capacity in aquatic in-stream processes.

Water Temperature (minimum buffer width: 5-225 ft, minimum buffer length 328-8202 ft):

- Small and medium watercourses are most susceptible to temperature fluctuations and provide the greatest potential for shading benefits among watercourse sizes.
- Riparian vegetation height and density significantly influence watercourse shading.
- Riparian buffer length accounts for a majority of temperature variation (the longer the buffer length, the greater the shading benefit).

- Narrow-dense riparian buffers are most effective for shading on east-west oriented watercourses.
- Wider-taller buffer widths are needed for shading on north-south oriented watercourses.
- Straightened channels may only require dense and overhanging buffers at relatively narrow widths to provide shade benefits.
- Larger waterways require tall, dense, and wide riparian buffers to shade waterbodies.

Riparian Corridor/Buffer Microclimate (minimum buffer width: 50-328 ft, minimum buffer length: N/A):

- Riparian buffer width, length, and continuity helps protect and maintain microclimate presence from surrounding landscape climate conditions.
- Riparian areas closer to watercourses protect stream center microclimate and riparian areas further from watercourses protect off stream microclimate.
- The ability of microclimate conditions to buffer water temperatures decreases with increasing watercourse width.

Large Wood Recruitment/Retention (minimum buffer width: 13-213 ft, minimum buffer length: N/A):

- Primary wood input among mainstem and large watercourses comes from bank erosion.
- Areas of channel migration require wide buffers to provide continual wood sources.
- Large channels require relatively larger wood (i.e., tall and wide) to remain stable and influence channel and habitat forming processes.
- Coniferous trees provide long-term habitat benefits and deciduous trees provide short-term benefits.
- Armoring shifts wood input drivers from erosion-based to windthrow (trees tipped during large storm events) and tree mortality; large wood source distance from windthrow and mortality is based on max tree height (potential fall distance).
- Size of habitat-forming wood is relatively smaller in small and medium watercourses.
- Small and medium watercourses receive a greater proportion of wood inputs from shorter source distances (closer to watercourses).
- Hardwoods generally contribute more large wood in smaller channels.
- Primary wood inputs among high-gradient watercourses comes from debris flows, landslides, and windthrow (greater source distances than bank erosion).
- High-gradient tributaries contribute to instream wood that is transported downstream.

Erosion and Bank Stability (minimum buffer width: 10-164 ft, minimum buffer length: N/A):

- Trees and shrubs provide the greatest bank stabilization for large watercourses.

- Trees are more effective than shrubs or grasses on steep banks.
- Maximum root strength and depth can be achieved at around ½ site potential tree height.
- Grass and shrubs may be suitable vegetation for small and medium watercourses that have relatively less-steep banks.
- Small and medium channelized watercourses may require trees, rather than grass or shrubs due to related bank steepness.
- Bank erosion commonly occurs on the outside of river bends; outside bends with riparian vegetation can significantly decrease erosion during storm events.
- The denser vegetation is along outside bends, the more effective riparian vegetation is at reducing erosion impacts.

Invertebrate Prey and Leaf-litter Debris Input (minimum buffer width: 10-246 ft, minimum buffer length 164-1969 ft):

- Relative contribution and role of litter and detrital inputs tends to decrease from small streams to large streams.
- Riparian corridor length and continuity may be the primary drivers of macroinvertebrate structure and diversity.
- Percentage of tree coverage in a riparian corridor is positively related to stream invertebrate community structure and diversity.
- Deciduous trees provide seasonal pulse inputs and conifer trees provide year-round inputs.

These findings, in conjunction with spatial data tools and other information, can similarly help the City of Tacoma identify areas in which to prioritize for riparian buffer establishment.

2.6.3 Buffer Restoration and Site Development Standards and Criteria

A review of buffer design and development documents revealed two distinct threads of inquiry: buffer design standards for agricultural lands (Emmingham et al. 2005; Kallestad et al. 2009; Kubo et al. 2019), and buffer design standards for urban areas, particularly with a focus on homeowners (WWCD n.d.; TDADF 2015; KCDNRP n.d.). Aside from these documents, Rentz et al. (2020) provides a list of suggested restoration practices, some of which may be applicable on the scale of an individual urban landowner. None of these documents are regulatory in nature, and largely suggest similar themes deemed important for the function of buffers, such as the use of native plants in appropriate microclimates, co-benefits for property owners who plant native riparian buffers, and overviews of buffer functions. For the purposes of this section, the focus is primarily on buffer design standards for urban areas.

Chapter 4 of the Management Recommendations included in the 2020 Riparian Ecosystems Guidance from WDFW includes a series of restoration actions that has been included below (Rentz et al. 2020).

- Improve quality of vegetation for both aquatic and terrestrial wildlife by removing invasive species wherever present. Further, to avoid the likely return of invasive species, cleared areas should be replaced with native riparian vegetation: specifically, native vegetation that provides needed ecosystem functions as described in Volume 1 and throughout this document (e.g., shade, large wood, pollution removal).
- Where riparian areas already possess some native vegetation, enhance them with a greater mixture of native plants that provide necessary habitat components (forage, cover, breeding, roosting, etc.) for a diversity of species and multiple riparian functions (e.g., streambank stability, wood recruitment, organic litter input, and pollutant removal). The specific mix of vegetation will vary by ecoregion and local needs, but likely includes conifers, grasses, and herbaceous plants.
- Increase off-channel habitat and improve natural flow regimes by removing dikes or levees and restoring access to and within the floodplain.
- In areas of incised channels, reintroduce beaver or construct beaver dam surrogates to store sediments, raise streambed elevation, raise water table elevation, and restore riparian vegetation.
- Remove reed canary grass, which can greatly inhibit channel morphology and aquatic species movement.
- Through proper consultation with WDFW and tribal biologists, increase the presence of large wood in streams and rivers to improve habitat for salmon, resident fish species, and aquatic amphibians.
- Increase connectivity through removal of non-fish passing culverts. If replacement culverts are needed, ensure they are adequately sized and climate-change-resilient; see WDFW’s online resource on Incorporating Climate Change into the Design of Water Crossing Structures (Wilhere et al. 2016).
- Reduce soil erosion by increasing vegetation complexity and density, excluding (or substantially minimizing) soil compacting activities, and implementing upland soil management techniques where applicable.

The **Walla Walla Conservation District** (WWCD) has developed the Creating Urban Riparian Buffers (CURB) program with the intent of improving water quality and wildlife habitat in streams that flow through Walla Walla and College Place. In their guidance document titled *Do-It-Yourself Riparian Buffer Guide for Homeowners*, WWCD lays out a decision pathway for property owners, supporting the identification of challenges such as noxious weeds, erosion, and sediment accumulation before guiding property owners through the likely resolutions to these challenges. The guide includes design recommendations and a plant list comprised of appropriate native species (WWCD n.d.).

King County Department of Natural Resources and Parks published a brochure guiding property owners through the benefits and planning requirements of installing a native plant buffer. This includes a suggested site plan, plant lists for each microclimate expected in a riparian area, a seasonally indexed planting and design guide, and an overview of required permits for work performed in the stream buffer (KCDNRP n.d.).

2.6.4 Plant Lists for Western Washington Riparian Buffers

Tables 3 and 4 present recommended riparian buffer plant lists from KCDNRP and the Riparian Buffers for Western Washington Agriculture (Kallestad et al. 2009). Table 3 includes consideration of species and associated climate-related concerns.

TABLE 3. KCDNRP RIPARIAN PLANT LIST AND CLIMATE CHANGE-RELATED CONCERNS

Planting Site	Plant Species	Example Climate Change-Related Concerns	
Wet, Saturated conditions	<ul style="list-style-type: none"> • Oregon ash • Pacific crabapple • Sitka spruce • Black cottonwood • Red-osier dogwood 	<ul style="list-style-type: none"> • Lady fern • Rushes • Bulrushes • Arrowhead • Bur-reed • Cattail 	<ul style="list-style-type: none"> • Oregon ash – low drought tolerance, susceptible to emerald ash borer • Pacific crabapple – moderate drought tolerance, high flood tolerance • Sitka spruce – low drought tolerance • Black cottonwood – low drought tolerance
Moist or inundated slopes	<ul style="list-style-type: none"> • Pacific ninebark • Swamp rose • Salmonberry • Snowberry • False lily-of-the-valley • Sedges 	<ul style="list-style-type: none"> • Red alder • Shore pine • Cascara • Native willows • Western red cedar • Twinberry 	<ul style="list-style-type: none"> • Shore pine – high drought tolerance • Cascara – moderate drought tolerance • Western red cedar – low-moderate drought tolerance; largely pest- and disease-resistant • Red alder – moderate drought tolerance
Dry, upland slopes	<ul style="list-style-type: none"> • Baldhip and Nootka roses • Thimbleberry • Elderberry • Sword fern • Douglas fir 	<ul style="list-style-type: none"> • Vine maple • Bigleaf maple • Serviceberry • Black hawthorn • Salal • Oceanspray 	<ul style="list-style-type: none"> • Douglas fir – moderate-high drought tolerance; susceptible to beetle infestations in warming conditions • Bigleaf maple – moderate drought tolerance; low-moderate tolerance of warming temperatures • Black hawthorn – moderate drought tolerance, high flood tolerance • Vine maple – low-moderate drought tolerance

SOURCE: KCDNRP n.d.

TABLE 4. WESTERN WASHINGTON AGRICULTURE PLANT LIST (KALLESTAD ET AL. 2009).

Planting Site	Trees and shrubs	Understory
Streamside	<ul style="list-style-type: none"> • <i>Salix scouleriana</i> (Scouler’s widow) • <i>Salix sitchensis</i> (Sitka willow) • <i>Salix lasiandra</i> (Pacific willow) • <i>Cornus cerulea</i> (Red-osier dogwood) • <i>Alnus rubra</i> (Red alder) • <i>Thuja plicata</i> (Western red cedar) • <i>Picea sitchensis</i> (Sitka spruce) • <i>Rubus spectabilis</i> (Salmonberry) • <i>Ribes lacustre</i> (Prickly currant) • <i>Spirea douglasii</i> (Spirea hardhack) 	<ul style="list-style-type: none"> • <i>Oxalis oregano</i> (Wood sorrel) • <i>Polystichum munitum</i> (Sword fern) • <i>Athyrium filix-femina</i> (Lady fern)

Upslope	<ul style="list-style-type: none"> • <i>Pseudotsuga menziesii</i> (Douglas fir) • <i>Tsuga heterophylla</i> (Western hemlock) • <i>Populus trichocarpa</i> (Black cottonwood) • <i>Acer macrophyllum</i> (Bigleaf maple) • <i>Fraxinus latifolia</i> (Oregon ash) • <i>Acer douglasii</i> (Douglas maple) • <i>Symphoricarpos albus</i> (Snowberry) • <i>Rosa spp.</i> (Wild rose) 	
SOURCE: Kallestad et al. 2009		

2.6.5 Buffer Maintenance Standards and Criteria

No Washington-specific sources of buffer maintenance recommendations were located, though some of the management activities from Rentz et al. (2020) could be construed as such. A nationwide search for buffer maintenance guidance resulted in the identification of three resources in addition to the maintenance suggestions included above.

Created by the Tennessee Department of Agriculture Division of Forestry (TDADF), the *Tennessee Urban Riparian Buffer Handbook: A Practical Guide to Establishing Healthy Streamside Buffers* is intended to support property owners, local governments, and community groups in advancing the creation of riparian buffers. The guide includes a scoresheet for identifying sites in need of buffer enhancement, suggestions related to buffer landscape design including access and scenic considerations, and several example site plans for a variety of land use types including residential, parkland, and commercial properties. The document provides a local native plant list, as well as suggestions related to the number of plants to be included in a buffer of a given size (TDADF 2015):

- Inform your neighbors to assuage concerns that may arise around the appearance of property neglect.
- Avoid mowing in a planted buffer. Where mowing is required such as along footpaths, do not mow lower than 4-6 inches.
- Periodic removal (2x a year) of volunteer nonnative invasive species is recommended.
- For buffers installed on properties maintained by landscaping crews, the use of fences and no-mow signage during the first several years of buffer establishment may be necessary. Fences may also be an opportunity to mount signage or other resources explaining to the broader public the benefits of riparian buffers.

In Harrisonburg, Virginia, the *Stream Buffer Maintenance Handbook for Newly Established Buffers* gives guidance related to riparian buffers on private residential properties as well as on lands where the public may be allowed. They indicate that the first 3-5 years after planting a buffer are the most important maintenance period and suggest the following activities (City of Harrisonburg 2011):

- If used, maintain tree shelters to support the establishment of trees and prevent grazing.

- Utilize hand pulling or limited pesticides to abate weed growth, limiting mowing to target weed species during appropriate seasons during years one and two, taking care to avoid nesting periods.
- Replant and reseed the buffer as needed throughout the first few years to replace plants and trees that have died.
- Inspect the buffer annually, and after major storms. Ensure that any dead or damaged plants are replaced in a timely manner.
- No-mow zones, signage, and fencing are also recommended as options to support the establishment of a riparian buffer.

In a 1999 review of forest riparian buffer design and management, appropriate maintenance activities are identified, of which the following may be applicable for an urban riparian buffer (Klapproth 1999):

- Landowners should inspect the buffer on a regular basis, watching for bank erosion and washouts, weed problems, wildlife damage, and insect and disease problems.
- Mulching and landscape fabrics may be used to avoid the establishment of weeds.
- Once a stand of trees has become established, periodic thinning and harvest of select trees can help to maintain vigorous growth and maximize nutrient uptake.
- At maturity, selective harvest of trees is recommended to sustain this growth and to remove nutrients sequestered in tree stems and branches.
- Where warm season grasses are used in a buffer design, they may require particular attention while establishing as they will be vulnerable to competition from weeds while they establish root networks.
- In some cases, a berm of sediment may develop along the edge of a buffer. This should be removed if and when it reaches six inches in height and the area around it should be regraded and reseeded.

2.6.6 Regulations Requiring Bulkhead Removal

Across all jurisdictions whose SMPs were reviewed in the process of creating this document, no active SMP was found to have a standard or regulation requiring the removal of bulkheads. The **City of Issaquah** may become the sole exception, as their current draft SMP has provisions that would require the removal of structural bulkheads upon (re)development unless an appropriate geotechnical report prepared by the applicant finds that such a structure would be required to retain use of the property. In such a case, it would be required that the design of the shoreline armor be such that it accounts for likely negative ecological impacts of shoreline armor and seeks to address them. Elsewhere, the draft SMP restricts the construction of new bulkheads where one is not currently in place.

An interview with planning staff in Issaquah conferred that WSDOE staff who are currently reviewing the document seemed “hesitant” about some of the language being used in the draft SMP related to bulkhead removal. This is likely owing to the fine line that must be walked when disallowing structural armoring such as bulkheads so that a taking does not occur. The draft is expected to be returned to Issaquah in July 2023 and should be monitored to determine if WSDOE is supportive of restrictions on shoreline armoring at this level.

2.6.7 Lessons Learned for Tacoma

The **City of Issaquah** uses the percentage of a buffer comprising nonnative invasive species as the standard for requiring enhancement of the buffer upon site (re)development. When a buffer area consists of more than 50% nonnative invasive vegetation, enhancement will be required. It was suggested during an interview that the reason they can require such a standard is because of engaged citizens and advocacy groups who often push the City to “do more” with regards to environmental protection. It was reported that many developers have willingly enhanced buffers to win community support for projects, highlighting the importance of strong public engagement in advancing environmental protections and associated regulations.

CHAPTER 3 Shoreline Master Programs

This section reviews if and how sea level rise has been integrated into Washington municipalities’ Shoreline Master Programs, where and how soft shore stabilization techniques have been encouraged and/or used in place of hard armoring, and climate adaptation case study summaries from other port cities in the United States and Canada.

3.1 Sea Level Rise Integration into Shoreline Master Programs

3.1.1 Summary

Addressing sea level rise in Shoreline Master Programs (SMPs) is not currently required, though guidance for doing so electively is included in Appendix A of WSDOE’s SMP Handbook (WSDOE 2017). With the passage of House Bill 1181 – *Improving the state’s response to climate change by updating the state’s planning framework* – in the 2023 legislative session, WSDOE has been directed to update SMP guidance to require programs to address the effects of sea level rise and storm severity on “people, property, and shoreline natural resources and the environment.” While the law goes into effect on July 23, 2023, these requirements are unlikely to apply immediately (Andrews 2023).

The general approach to incorporating sea level rise into SMPs in jurisdictions that have done so to date includes:

1. *Acknowledging sea level rise as a problem/monitoring objective either in the Comprehensive Plan or a SMP*: Because there is not yet an enforceable mandate to plan for sea level rise, this step is important to provide grounds for regulatory controls related to sea level rise. These policies can also guide internal discussion though they lack the quantified and enforceable requirements updated regulations provide.
2. *Performing a localized sea level rise vulnerability or risk assessment and/or electing to utilize models developed by the Washington Coastal Resilience Project (Miller et al. 2018) to evaluate local sea level rise risks*: Because most sea level rise projections are presented probabilistically (as a percent chance of occurring between 0.1–99%), determining which emission scenario(s) to use and overall risk tolerance is an important part of this step for individual jurisdictions. RCP 8.5 is a high-emissions scenario in which greenhouse gas emissions continue unabated while RCP 4.5 assumes more stringent global enforcement of emissions reductions. High-likelihood projections reflect lower rates of sea level rise and may be easily exceeded while low-likelihood projections reflect higher rates of sea level rise that are within the realm of possibility but are less likely to occur. Mid-range projections (between 17–83%) under the RCP 8.5 scenario typically address the average concerns and risk tolerance of many jurisdictions to evaluate risk under the most likely conditions to occur by a given timeframe (e.g., 2050, 2080, 2100, etc.). For example, a project to redesign Owen Beach at Point Defiance Park adopted a 17% probability of 2.5 feet of inundation

by 2090 under a high emissions scenario (RCP 8.5) along with around 3.6 ft of storm surge as their scenario (Faghin n.d.). The associated sea level rise rates were then incorporated into the project design to ensure park structures and facilities remained functional through their anticipated lifespans. Guidance on how to choose appropriate sea level rise projections is included in Appendix A of the SMP Handbook.

3. *Developing and adopting regulations and requirements based on local vulnerabilities.* Several examples are included below from different cities and counties in Washington.

Most jurisdictions addressing sea level rise are somewhere between steps one and two, with a select few (e.g., **Olympia**, **Langley**, **Bellingham**) moving forward in some capacity based on modelling available to them. Other jurisdictions are in the process of or waiting to begin modelling (e.g., **Grays Harbor**) and have created some policy-level guidance in their SMPs to support the adoption of regulatory provisions later. Some jurisdictions have added small regulatory allowances or restrictions to address some component of sea level rise (e.g., building elevation in **Pierce County**, anticipation of bluff erosion in **San Juan County**) without fully addressing sea level rise challenges across the board.

Topics addressed in cataloged SMPs:

- Bluff erosion
- [Dis]allowance of hard-structure shoreline armoring/protection
- Changes in recreational access to beaches or intertidal zones
- Decrease in nearshore habitat
- Accommodation of shoreline migration
- Elevation of existing structures (and the intersection of those activities with height limits)
- Shifting shoreline jurisdiction boundaries
- Stormwater outfalls
- Implications for restoration projects/mitigation activities
- Siting of new roadways, railways, or other public facilities

Challenges to adoption of sea level rise regulations in SMPs were collected by the WSDOE in the report titled: *Lessons Learned from Local Governments Incorporating Sea Level Rise in Shoreline Master Programs* (WSDOE 2021). These included:

- Pressure for residential development in areas vulnerable to sea level rise.
- Existing development in vulnerable areas where it is difficult or impossible to relocate (e.g., railroads and wastewater treatment sites).

- Concerns over regulations affecting private property.
- Uncertainty regarding legal liability stemming from action (or inaction) on sea level rise.
- Potential legal risks and liabilities when sharing sea level rise data and information.
- Insufficient capacity to take on mandatory planning work, leaving little staff time available for the development of voluntary initiatives such as sea level rise regulations.
- Disconnect between long-range planners and those who implement SMPs resulting in unclear guidance related to sea level rise policies where regulations are not in place.
- Uncertainty around future conditions requiring decisions about risk tolerance.

3.1.2 Implementation Examples

3.1.2.1 King County

In King County, the sea level rise risk areas is defined as three feet above the base flood elevation identified in the 2020 Flood Insurance Rate Map for the adjacent coastal high hazard area flood zone and only applies to Vashon-Maury Island. Reference to the sea level rise protection zone and risk area appear in regulations regarding steep slopes, groundwater wells, and shoreline stabilization. Steep slopes and groundwater wells within sea level rise areas are subject to additional regulatory requirements while new development or redevelopment on the island triggers the suggestion that structures be setback further than the recommended amount by the developer (Title 21A).

21A.24 Critical Areas

- Steep slope hazard areas: “For new structures and substantial improvements to existing structures on sites where any portion of the steep slope hazard area extends into the coastal high hazard area or sea level rise risk area: a) The critical area report shall include an assessment of current and future risks of sea level rise conditions anticipated to occur over the next fifty years and a recommended buffer; b) If a critical area report is not submitted to the department, the minimum buffer shall be seventy-five feet.”
- Critical aquifer recharge areas on Vashon-Maury Island: “All new groundwater wells within a sea level rise risk area shall include a surface seal that prevents risks of saltwater contamination caused by sea level rise conditions anticipated to occur over the next fifty years; and [t]he owner of a new well located within the sea level rise risk area shall test the well for chloride levels using testing protocols approved by the Washington State Department of Health. The owner shall report the results of the test to Seattle-King County Department of Public Health and to the Department of Natural Resources and Parks. If the test results indicate saltwater intrusion is likely to occur, the Department of Natural Resources and Parks, in consultation with Seattle-King County Department of Public Health, shall recommend appropriate measures in addition to the minimum requirements of this title to prevent saltwater intrusion.”

21A.25 Shorelines

- Shoreline stabilization: “The department shall provide a notice to an applicant for new development or redevelopment located within the shoreline jurisdiction on Vashon and Maury

Island that the development may be impacted by sea level rise and recommend that the applicant voluntarily consider setting the development back further than required by this title to allow for future sea level rise.”

3.1.2.2 Bellingham

The Bellingham SMP includes recognition that as sea level rise projections become adopted by the scientific community, they can be applied to planning efforts and development standards in Bellingham (Title 22). For the purposes of determining OHWM and other jurisdictional boundaries, the likely impacts of sea level rise are acknowledged and addressed by a requirement that such boundaries be determined by field investigations and a survey or engineered drawings.

22.03.010 Shoreline jurisdiction

- “Natural or restored shoreline ecosystems and processes that occur over time, such as channel migration or sea level rise, have the potential to alter the point of beginning (OHWM, outer extent of a floodway, floodplain or channel migration zone) from which the extent of shoreline jurisdiction is measured.”

22.03.030 Shoreline environment designations

- “*Setbacks and Buffers*. Development within shoreline reaches designated as shoreline residential shall be set back from the field-determined OHWM (approximately elevation 314 feet above sea level) of the shoreline.”

3.1.2.3 San Juan County

San Juan County requires that on all non-bedrock shorelines, new structures must evaluate the potential impacts of sea level rise over the life of the structure (defined as 75 years) and demonstrate that the proposed buffer will be sufficient to avoid the need for new protective structural shoreline stabilization and flood protection measures for that period. No citation was given for the 75-year building life and the SMP update precedes the release of the Miller et al. (2018) projections.

3.1.2.4 Jefferson County

Jefferson County’s SMP includes a policy that “encourages” all shoreline use and development to address potential impacts of climate change and sea level rise (Title 18):

18.25.180 Shoreline use

- “Encourage all shoreline use and development to address potential adverse impacts of global climate change and sea level rise.”

3.1.2.5 Burien

Burien has a goal to monitor sea level rise and adjust development standards accordingly (Title 20):

20.20.045 Flood prevention and minimization element

- “Monitor sea level rise and accordingly adjust development standards and building setbacks to minimize flooding potential.”

3.1.2.6 Olympia

The mention of sea level rise impacts in Olympia’s SMP largely references the 2019 Sea Level Rise Response Plan developed for the downtown area:

SMP goals and policies

- “The City should...develop plans to address the impacts of sea level rise in collaboration with impacted property owners, the community and the [WSDOE]. These plans should include at minimum flood prevention approaches, shoreline environment impact considerations and financing approaches. The City should amend the [SMP]and other policy and regulatory tools in the future as necessary to implement these plans.”
- “The City should collaborate with private property owners, business owners and citizens in the implementation of the [SMP]to explore creative ways to reduce ecological impacts and mitigate for impacts from sea level rise when new development or redevelopment is proposed. This objective may best be accomplished by developing flexible approaches to shoreline development where the total environmental benefit is enhanced through such measures.”
- “Residential development, including the division of land and the construction of residential units, should be designed and located with consideration of sea level rise projections and so that shoreline armoring and flood hazard measures will not be necessary to protect land or structures.”
- “New development requiring structural shoreline armoring should not be allowed. Shoreline use and development should be located and designed in a manner so that structural stabilization measures are not likely to become necessary in the future, including a consideration of sea level rise.”

18.20.837 Fill water-ward of the OHWM

- “Construction of protective berms or other structures to prevent the inundation of water resulting from sea level rise shall be allowed subject to all other provisions of this [SMP]and the mitigation sequencing process when there are no other feasible options to protect existing development.”

3.1.2.7 Pierce County

Pierce County has updated its SMP to allow for structural raising of legally established single-family residences and nonconforming structures to protect the structures from sea level rise in accordance with the height limits established elsewhere in the County Code (Title 18):

18s.10.055C Residential structures

- “Structurally raising the floor elevation of an existing legally established single-family residence, which is necessary to protect the structure from flooding due to sea level rise, shall be allowed in accordance with the height limits set forth in PCC 18S.30.060, Scenic Protection and Compatibility.”

3.1.2.8 Langley

The Langley SMP includes many provisions related to sea level rise that rely on the 2021 City of Langley Sea Level Rise Assessment:

4.2 Shoreline use

- “The City should continue to develop information about the impacts of sea level rise on the shoreline and other affected properties; the City should develop adaptation plans to address the impacts of sea level rise in collaboration with impacted property owners, the community and the [WSDOE]. These plans should include at minimum flood prevention approaches, shoreline environment impact considerations and financing approaches. The City should amend the [SMP] and other policy and regulatory tools in the future as necessary to implement these adaptation plans.”
- “During scheduled SMP updates, the City shall assess whether the anticipated sea level rise projections used in the SMP remain relevant or revisions are necessary to adjust for more up to date research.”
- “Applicants for development in the shoreline plan area shall be provided with information on sea level rise.”
- “Applicants for development in Langley’s West and Center reaches shall be encouraged to voluntarily consider increasing setbacks to allow for future sea level rise.”
- “A condition of approval for any application, including an exemption letter, shall be required to record a notice on title to identify the potential threat associated with sea level rise and shall hold the City harmless.”
- “Geotechnical reports in support of variances proposing development or redevelopment within 65 feet of a bluff must contain erosion projections for 75 years based in part on sea level rise.”

4.4 Flood hazard management

- “When reviewing projects that could be affected by sea level rise adjust development standards such as building setbacks or elevation as necessary to minimize potential damage from flooding.”

4.5 Public access

- “Public access sites shall be designed to accommodate for the level of expected sea- level rise in 2100. Consideration of sea level rise projections ...may be used.”

5.1 Shoreline stabilization

- “Partial modification of stabilization measures (e.g., fill, construction of protective berms) within the shoreline jurisdiction shall be allowed in response to increases in sea level, subject to all other provisions of the SMP.”
- “The size of the shoreline stabilization structures shall be the minimum necessary to protect the primary use or structure. Consideration of sea level rise projections ... may be used to determine the minimum necessary size of shoreline stabilization structures.”
- “The size of the bulkhead shall be the minimum necessary to protect the primary use or structure. Consideration of sea level rise projections ... may be used to determine the minimum necessary size of shoreline stabilization structures.”

6.10 Utilities

- “Upgrades and replacement of utilities and other public infrastructure shall be located outside of areas that may be impacted by the expected sea-level rise in 2100. If infeasible, such development shall be designed and constructed to adapt to the level of expected sea level rise feet in 2100. Consideration of sea level rise projections ”

3.1.2.9 Ocean Shores

Ocean Shores requires that structures be set back from steep slopes and shorelines vulnerable to erosion so that structural improvements are not required to protect such structures for the expected life of the structure, including anticipated impacts from sea level rise. No expected structure life or sea level rise projection is given in the SMP.

5.14 Residential development

- “Set back residential development and accessory structures and uses from steep slopes and shorelines vulnerable to erosion so that structural improvements are not required to protect such structures for the expected life of the structure and considering sea level rise, increased storm intensity, and changes to coastal erosion and sediment supply.”

3.1.2.10 Port Angeles

The Port Angeles SMP requires geotechnical reports for projects requiring variances within 65 feet of a bluff, which include 75 years of anticipated sea level rise impacts utilizing best available science.

5. Critical areas (geologically hazardous areas)

- “Proposals requiring a variance for development within 65 feet of the top of a marine bluff as outlined above shall be required to submit a geotechnical engineering report, prepared in accordance with the requirements of this SMP. The geotechnical engineering report shall: include coastal erosion rates over at least 75 years, based in part on anticipated sea level rise and storm frequency”

3.1.2.11 South Bend

In South Bend, new structural stabilization is prohibited except when a geotechnical report identifies the need to protect existing primary structures from impacts borne in part of sea level rise or natural processes. Existing armoring may be replaced only under similar circumstances:

5.7 Shoreline stabilization

- “New structural shoreline stabilization measures shall not be allowed except when necessity is demonstrated...to protect existing primary structures [and] there is conclusive evidence, documented by a geotechnical analysis that the structure is in danger from shoreline erosion caused by tidal action, currents, waves, or sea level rise. Normal sloughing, erosion of steep bluffs, or shoreline erosion itself, without a scientific or geotechnical analysis, is not demonstrated need. The geotechnical analysis should evaluate on-site drainage issues and address drainage problems away from the shoreline edge before considering structural shoreline stabilization.”

- “A property owner may replace an existing shoreline stabilization structure with a similar structure if there is a demonstrated need to protect primary uses or structures from erosion caused by currents, tidal action, waves, or sea level rise. Replacement may occur in accordance with the following provisions:
 - The design, location, size, and construction of the replacement structure results in no net loss of shoreline ecological functions;
 - Replacement walls or bulkheads do not encroach waterward of the OHWM or existing structure unless the residence was occupied before January 1, 1992 and there is significant safety or environmental concern. In such cases, the replacement structure shall abut the existing shoreline stabilization structure;
 - Where a net loss of shoreline ecological functions associated with critical saltwater habitats would occur by leaving the existing structure, remove it as part of the replacement measure; and
 - Replacement of structural stabilization measures with nonstructural ones that restore shoreline ecological functions may locate waterward of the OHWM.”

3.1.2.12 University Place

University Place allows fill to be placed waterward of the OHWM to create protective berms or other structures in response to sea level rise (Chapter 18):

18.35 Shoreline modifications

- “Fill should be allowed to accommodate berms or other structures to prevent flooding caused by sea level rise when other flood prevention methods or alternatives are not feasible and in accordance with UPMC 18.25.030.”
- “Fill waterward of the OHWM shall be authorized for the following purposes only, with due consideration given to specific site conditions and only as part of an approved use or development...Construction of protective berms or other structures to prevent the inundation of water resulting from sea level rise when consistent with the flood hazard reduction provisions in UPMC 18.25.030.”

3.1.2.13 Clallam County

Clallam County requires the consideration of sea level rise impacts in the location and design of roadways and other infrastructure, designing shoreline stabilization, and as a rationale for establishing buffers. Its SMP does not quantify sea level rise risks (Title 35).

35.05 SMP goals

- “To increase public awareness of sea level rise projections, and tsunami hazard areas and evacuation route maps in coastal areas.”
- “To inform citizens and property owners about information on potential climate change and sea level rise impacts...”

35.15 Transportation policies

- “The location and design of new transportation uses/developments including replacement of existing roads and other infrastructure should take into account implications of sea level rise and other climate change effects.”

35.30 Shoreline buffers and vegetation conservation

- “Buffers should be established and maintained along all marine and freshwater shoreline water bodies to protect people and property from risks associated with flooding, bank erosion, channel migration, bluff recession, landslides, storm surges, sea level rise, tsunamis and other hazards.”

3.2 Soft Shore Stabilization Examples in Washington

3.2.1 Alternatives to Bulkheads

WSDOE’s SMP guidelines encourage the use of soft shore stabilization techniques over hard armoring (e.g., bulkheads, seawalls) to provide protection while limiting erosion and habitat degradation. Engineered soft shore designs are characterized by the use of natural features such as drift logs, vegetated berms, beach nourishment, and large rocks to mimic naturally occurring ecological processes while still providing protection to landward resources and structures. WSDOE maintains a database of soft shoreline projects [here](#).

Some examples of soft shoreline projects include:

- **Sunlight Shores, Whidbey Island:** An old bulkhead comprising concrete, creosote-soaked wood pilings, and boulders was replaced with a natural shoreline, returning beach access to residents and protecting upland property from erosion risks and sea level rise.
- **Powell Property, Bainbridge Island:** A residential property whose beach was bordered by concrete bulkheads, rock walls, and creosote-treated wood pilings deployed a soft-shore design that incorporated native plants and now provides habitat for a number of marine species including Chinook salmon.
- **Seahurst Park, Burien:** In partnership with the U.S. Army Corps of Engineers, the City of Burien restored the shoreline within the boundaries of Seahurst Park through the removal of hard shoreline armor, riparian habitat enhancement, and the relocation of park facilities. To remedy the observed drop in beach level due to unreplaced sediment since the construction of hard armor, the new beach was nourished by the addition of gravels.
- **Edgewater Beach, Olympia:** In partnership with the South Puget Sound Salmon Enhancement Group, a private property owner on Edgewater Beach removed ~800 feet of armoring from the base of a feeder bluff, allowing the sediment supply from the feeder bluff to enter the system and restore beaches that had been deprived of sediment supply.

3.2.2 Site Identification

Several organizations including the Puget Sound Partnership and WDFW have been involved in projects facilitating the removal of hard shoreline armoring in Puget Sound. Of projects completed to date and reviewed in the development of this summary, recreational and residential land uses appear to be most

accommodating to armor removal projects, largely due to the flexibility inherent in sites developed for these uses. In all cases however, site-specific characteristics are most important in determining suitability for armor removal and all guidance reviewed encourages a site-by-site approach to designing projects.

While no decision support tools were identified to aid in the selection of sites, several criteria emerged as being important to the overall function of the nearshore ecosystem in Puget Sound. Examples of this include ensuring the function of feeder bluffs to enable adequate sediment supply, expanding or extending sites that already support habitat to further redevelop ecological function, or utilizing drift cells or other geological markers to identify sites that substantially limit ecological function or who may contribute substantially if restored.

Released in 2014, the WDFW Marine Shore Design Guidelines set out to establish the characteristics that support different shoreline armoring designs on a given site including the identification of sites where hard armor is the only viable solution (Johannessen et al. 2014; Figure 1).

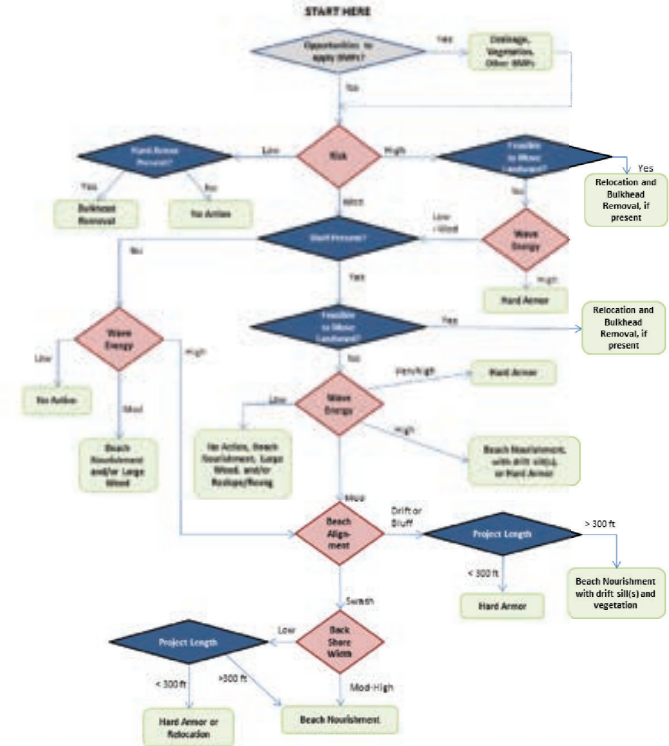


Figure 5-11. Decision tree for identifying appropriate design techniques for a given site. Read top to bottom. Refer to site and coastal processes assessment data, Table 3-4 for risk, Tables 5-6 for wave energy, and 5-7 for backshore width categories.

SOURCE: Johannessen et al. 2014

Figure 1
WDFW Marine Shoreline Design Guidelines Shore
Armor Decision Tree

Similarly, the Seattle Green Shoreline Decision Tree (City of Seattle n.d.) was designed for Lake Washington. The graphic is included here as an alternative presentation method to the decision tree presented in Johannessen et al. (2014), which could be further modified to address site or sub-area specific conditions along Tacoma’s shorelines (Figure 2).



SOURCE: City of Seattle n.d.

Figure 2
Seattle Green Shoreline Decision Tree

3.2.3 Standards, Criteria, and Definitions

3.2.3.1 Shoreline Management Act

The Shoreline Management Act requires that hard armoring approaches such as bulkheads be viewed as a last resort option when all other designs have been deemed infeasible (Carman et al. 2010). In cases where hard armoring is unavoidable, it is suggested that jurisdictions search for opportunities to minimize and mitigate the site-specific and cumulative impacts of that project (EnviroVision et al. 2010). One

example is the design of the Elliott Bay seawall in Seattle, which includes light-penetrating sidewalks, riparian zones, and an underwater habitat bench to create a shallow water corridor for migrating salmon (Dunagan 2020). It is recommended that guidance products and technical assistance be provided to contractors and homebuyers regarding the benefits of soft shore techniques in terms of expense, complexity, long term resilience, and ecosystem function (Dethier et al. 2017) to further support the removal of hard shoreline armoring.

Two examples of SMPs that are noteworthy for the way they handle soft shore stabilization projects are Island County and Whatcom County.

Island County

Island County allows for the modification of shoreline buffers and setback requirements to encourage shoreline restoration projects:

- “If a property owner removes existing structural shoreline stabilization and replaces it with natural soft shore stabilization in accordance with Army Corps of Engineers and National Marine Fisheries Service standards for shoreline restoration, the standard shoreline buffer (or setback in the Canal Communities) may be reduced by a distance equal to the distance that the [OHWM] is moved toward the principal structure on the site following removal of the structural stabilization, up to fifty percent (50%) of the required buffer width.”

Island County also has a host of requirements related to the conservation of shoreline vegetation including the requirement that native plants typical of the area be used in restoration projects, protecting existing native vegetation and natural features such as stumps and drift logs, and pruning restrictions, among others.

Whatcom County

In addition to requirements stating that non-structural shore protection measures should be pursued, Whatcom County establishes a hierarchy for stabilization designs:

- “Structural shoreline stabilization measures should only be used when more natural, flexible, nonstructural methods such as vegetative stabilization, beach nourishment and bioengineering have been determined infeasible. Alternatives for shoreline stabilization should be based on the following hierarchy of preference: a. No action (allow the shoreline to retreat naturally), increase building setbacks, and relocate structures. b. Flexible defense works constructed of natural materials including soft shore protection, bioengineering, including beach nourishment, protective berms, or vegetative stabilization. c. Rigid works constructed of artificial materials such as riprap or concrete.”

Construction setbacks have been noted as the most effective tools for shoreline protection (Barnard 2010).

3.2.3.2 Guidance

The Puget Sound Nearshore Ecological Restoration Program (PSNERP) partnered with WDFW to release *Management Measures for Protecting and Restoring the Puget Sound Nearshore* (Clancy et al. 2009). This document provides a menu of management options for restoring ecological function to the nearshore environment in Puget Sound. It includes 21 management measures, including armor removal and modification, beach nourishment, large wood placement, and revegetation. Each of these management

measures is described in detail, including performance measures that could be monitored once a project is implemented. Table 5 is taken from the document and describes each of the management measures. Each measure is explored in further detail within the document.

TABLE 5. PSNERP MANAGEMENT MEASURES FOR PROTECTING AND RESTORING THE PUGET SOUND NEARSHORE.

No.	Management Measure	Description
1	Armor Removal or Modification	Removal, modification, or relocation of coastal erosion protection structures such as rock revetments, bulkheads, and concrete walls on bluff-backed beaches, barrier beaches, and other shorelines.
2	Beach Nourishment	The intentional placement of sand and/or gravel on the upper portion of a beach where historic supplies have been eliminated or reduced.
3	Berm or Dike Removal or Modification	Removal or modification of berms, dikes and other structures to restore tidal inundation to a site that was historically connected to tidal waters. Includes dike/berm breaching and complete dike/berm removal.
4	Channel Rehabilitation or Creation	Restoration or creation of canals in a restored tidal wetland to change water flow, provide habitat, and improve ecosystem function.
5	Contaminant Removal and Remediation	Removal or remediation of unnatural or natural substances (i.e. heavy metals, organic compounds) harmful to the integrity or resilience of the nearshore. Pollution control, which is a source control measure, is a different measure.
6	Debris Removal	The removal of solid waste (including wood waste), debris, and derelict or otherwise abandoned items from the nearshore.
7	Groin Removal or Modification	Removal or modification of groins and similar nearshore structures built on bluff-backed beaches or barrier beaches in Puget Sound.
8	Habitat Protection Policy or Regulations	The long-term protection of habitats (and associated species) and habitat-forming processes through zoning, development regulations, incentive programs and other means.
9	Hydraulic Modification	Modification of hydraulic conditions when existing conditions are not conducive to sustaining a more comprehensive restoration project. Hydraulic modification involves removing or modifying culverts and tide gates or creating other engineered openings in dikes, road fills, and causeways to influence salt marsh and lagoon habitat. This measure is used in managed tidal systems (as opposed to naturally maintained systems).

10	Invasive Species Control	Eradication and control of nonnative invasive plants or animals occupying a restoration site and control measures to prevent introduction of such species after construction is complete.
11	Large Wood Placement	Installation of large, unmilled wood (large tree trunks with root wads, sometimes referred to as large woody debris) within the backshore or otherwise in contact with water to increase aquatic productivity and habitat complexity.
12	Overwater Structure Removal or Modification	Removal or modification of overwater structures such as piers, floats and docks to reduce shading and restore wave regimes.
13	Physical Exclusion	Installation of exclusionary devices (fences, barriers, mooring buoys, or other devices) to direct or exclude human and/or animal use of a restoration site.
14	Pollution Control	Prevention, interception, collection, and/or treatment actions designed to prevent entry of pollutants into the nearshore ecosystem.
15	Property Acquisition and Conservation	Transfer of land ownership or development rights to a conservation interest to protect and conserve resources, enable restoration or increase restoration effectiveness.
16	Public Education and Involvement	Activities intended to increase public awareness of nearshore processes and threats, build support for and volunteer participation in restoration and protection efforts, and promote stewardship and responsible use of nearshore resources.
17	Revegetation	Site preparation, planting, and maintenance to manipulate soils and vascular plant populations to supplement the natural development of native vegetation.
18	Species Habitat Enhancement	Installation or creation of habitat features (sometimes specific structures) for the benefit of native species in the nearshore.
19	Reintroduction of Native Animals	Reestablishment of native animal species at a site where they existed or as replacement for lost habitat elsewhere.
20	Substrate Modification	The placement of materials to facilitate establishment of desired habitat features and improve ecosystem functions, structures, or processes.
21	Topography Restoration	Dredging, excavation, and/or filling to remove or add layers of surface material so that beaches, banks, tidal wetlands, or mudflats can be created.

NOTES: Management measures are listed in alphabetical order. No hierarchy or priority order should be inferred. See individual management measure chapters within the document for complete definitions.

SOURCE: Ciancy et al. 2009

The guidance document links management measures and associated performance measures to each other, suggesting likely pairings and outcomes, grouping measures by the geomorphic landforms in which they are most likely to be effective, and exploring the anticipated impacts of climate change on nearshore ecological processes. Tacoma could use these tools to develop location-specific guidance related to shoreline armoring and ecological restoration projects based on underlying geomorphology. When combined with decision trees as seen in the WDFW guidance or Seattle’s Green Shorelines program, these tools could form the basis of a set of regulations for shoreline development with an eye to climate resilience and ecological function.

3.2.4 Lessons Learned for Tacoma

3.2.4.1 Sea Level Rise

Integrating sea level rise projections into SMPs has presented a challenge for many shoreline jurisdictions in Washington to date. Limited guidance for voluntary adoption of sea level rise regulations currently exists and jurisdictions have noted a number of challenges that complicate the adoption of new regulations related to sea level rise. However, House Bill 1181’s directive for WSDOE to update SMP guidance to include sea level rise should address many of the challenges associated with uncertainty around appropriate language. The City of Tacoma may want to consider participating in the development of guidelines as part of the city’s SMP update.

3.2.4.2 Soft shorelines

The decision trees in Figures 1 and 2 represent the best tools found to visualize and prioritize the roles of different shoreline stabilization techniques in different areas. Each of these decision trees note allowances for hard armoring in certain cases. Given the city’s ongoing sea level rise adaptation project, these decision trees could be modified for use in prioritizing different approaches that are suitable to specific shoreline segments and their geomorphological characteristics. For example, Whatcom County includes an explicit desired hierarchy of shoreline stabilization techniques within their SMP, listing them as follows:

1. No action to allow the shoreline to retreat naturally, and building setbacks and/or relocation;
2. Soft shore defenses (e.g., bioengineering, beach nourishment, protective berms, or vegetative stabilization)
3. Hard armoring only in cases “where it is necessary to retain the use of a site but requires consideration of the full suite of alternative actions before arriving at such a determination.”

A series of supportive documents (Johannessen et al. 2014; Clancy et al. 2009) identify which shoreline management practices may be appropriate for an individual site and stress both the importance of site-specific design and the reality that in some cases hard armoring may be essential to protect a structure, at least in the near term. Minimal code language was found requiring certain techniques or strategies.

3.3 Port City Case Studies and Examples

This section includes background research and summaries of climate adaptation policies and projects that have been planned for and/or implemented in port cities, including those in Bellingham, Vancouver (BC), San Diego, San Francisco, Miami, and New York.

3.3.1 Bellingham

The City of Bellingham uses its SMP (City of Bellingham 2023) to regulate development along its shorelines. The SMP was updated in 2013 and the 2021 update is underway. The 2013 SMP does not include regulatory or policy language specific to strategies related to climate change. The update will include a sea level rise vulnerability assessment framework (Romanenko 2021).

The City of Bellingham and Coastal Geologic Services developed a prioritization tool to identify protection and restoration strategies and priority actions within in the WRIA 1 estuarine and marine nearshore environment (City of Bellingham n.d.-a). The tool resulted in the identification of top- and high-ranking restoration and enhancement priorities. For the City of Bellingham, the following priorities were identified (MacLennan et al. 2013):

- 3-year restoration priority:
 - Modify existing structure under railroad crossing to open up tide channel and remove toppled revetment rock from intertidal at Post Point Lagoon shore, up-drift of surf smelt spawning.
- 3-year enhancement priorities:
 - Remove debris and regrade to create intertidal and possibly salt marsh with eelgrass habitats at the Cornwall Avenue Landfill.
 - Remove fill and debris and modify elevations to provide estuarine and riparian vegetation, mudflat, and marsh along the east shore of Padden Creek.

The WRIA 1 prioritization identified coarse-scale priorities then added specificity through a fine-scale analysis. The coarse-scale assessment evaluated the presence of or proximity to important ecological communities (e.g., forage fish spawning and eelgrass) relevant to juvenile salmonids as well as the level of degradation of the shoreline from human modifications. The fine-scale assessment identified specific opportunities to protect, restore, or enhance habitats. These two steps led to a portfolio of prioritized actions to improve marine nearshore conditions.

The City has made investments in the shoreline via projects such as:

- City of Bellingham Boulevard Park Shoreline Improvements – In 2013, Bellingham Parks and Recreation made improvements at Boulevard Park including removing concrete rubble along the shoreline, creating sand and gravel beaches and rock revetments. Portions of the existing lawn were converted to a gravel and sand beach (City of Bellingham n.d.-b).
- Boulevard Park Shoreline and Public Access Enhancement – The project includes rebuilding and enhancing two beaches in the park. The project focuses on beach nourishment, increasing dry beach backshore area, removal of riprap in the intertidal zone, and removal of failing rock revetments. The eastern beach will have a new rock revetment installed further inland. As a result, an eroding trail will be moved further inland, and utilities and a storm drain trench will be relocated within the park. The western beach will have a small revetment and rockery installed and invasive blackberry bushes removed (City of Bellingham n.d.-c).

- Little Squalicum Estuary Project – The project will restore 4.85 total acres of coastal habitat including a 2.4-acre estuary and will remove a fish passage barrier at the mouth of Little Squalicum Creek just two miles east of the Nooksack River Delta (City of Bellingham n.d.-d).
- Post Point Lagoon – Post Point Lagoon is one of seven pocket estuaries in Bellingham Bay. Restoration work in 2008 included “placing large woody debris within and around the lagoon; removing fill from the shoreline, increasing shoreline length by 18% and saltmarsh area by 70%; re-establishing a native marine riparian buffer along the shoreline; protecting native vegetation and habitat elements by restricting access to sections of the upland, shoreline and intertidal zones; and installing educational signs” (City of Bellingham n.d.-e).

3.3.2 Vancouver, British Columbia, Canada

The City of Vancouver, British Columbia, has undergone many different planning initiatives related to climate change, including the 2012 Climate Change Adaptation Strategy, which was updated in 2018 (City of Vancouver 2019), and the Coastal Flood Risk Assessment Program (CFRA) (City of Vancouver 2018), a multi-phase process to determine the risk, consequences, and vulnerability of Vancouver to future sea level rise and storm surge scenarios, including the following recommendations in the third and final phase of the CFRA:

- By-laws, regulations, and policies be developed to guide the design of coastal flood protection infrastructure, to ensure that it meets a consistent performance standard and is adaptable over time
- City launch a sea level rise design challenge to advance solutions for the most flood-vulnerable areas

In 2018, the City published the Fraser River Foreshore Coastal Adaptation Plan (CAP) (City of Vancouver 2018-a). The CAP is a multi-year undertaking to determine the risk, consequences, vulnerability, and adaptation opportunities of Vancouver to future sea level rise. Included were design attributes to be employed across adaptation approaches, particularly to design with and for nature:

- Restore, rehabilitate or create new foreshore habitat areas where practical
- Address overland flooding hazards by prioritizing green infrastructure solutions for stormwater retention, detention, and infiltration.
- Where feasible allow for river channel migration or expansion to accommodate additional flows (riverine, freshet flooding hazard)
- Work with the natural water dynamics
- Utilize Green Shores techniques for resist approaches
- Flood wall with habitat features
- River channel migration
- Expanded riparian areas
- Remove seawalls and barriers and restore foreshore habitat

The 2022 Vancouver Plan (City of Vancouver 2022), the long-range land use plan to guide growth and change over next 30 years, includes the following direction and policies related to climate change adaptation:

- Direction 3.3 Climate Change Adaptation
 - Policy 3.3.1 Advance natural climate solutions that buffer impacts of climate change, sequester carbon (capture, secure and store carbon from the atmosphere), and improve biodiversity.
- Direction 10.2: Manage Water on Boulevards, Sidewalks, and Streets
 - Policy 10.2.1 Reallocate parts of the public right-of way (e.g., streets and sidewalk areas) to expand the breadth and scale of nature based assets such as green rainwater infrastructure.
 - Policy 10.2.2 Develop a city-wide blue green network of connected park-like streets that manage rainwater, support climate adaptation and biodiversity, and create public space opportunities.
 - Policy 10.2.3 Restore, maintain, and maximize the use of existing natural creeks, streams, and drainage assets.

The City led a collaborative design challenge to rethink the future of the False Creek shoreline called Sea2City Design Challenge (City of Vancouver 2022-a). The project brought together two multi-disciplinary design teams, City staff, local coastal adaptation experts and First Nation representatives, knowledge keepers, and designers from Musqueam, Squamish, and Tsleil-Waututh over a 12-month period to reimagine key sites along Vancouver’s False Creek shoreline. One early recommendation from the Sea2City Design Challenge is for Vancouver to change the language of coastal planning to reflect the gradual transition to the softer, more interconnected shorelines the vision speaks to. Outcomes of the Sea2City Design Challenge include the following concepts and pilot projects:

- Re-wilding False Creek
 - The designs incorporate the natural topography of the sites and imagines a future where flood new development sits higher and closer to the boundary of the floodplain. This approach helps restore the natural shoreline to buffer new development while helping improve False Creek water quality and rainwater management. The team imagines a shoreline that creates room for False Creek to safely host more common coastal flood events in the future and expand public access to the shoreline.
- South Shore Pilot Projects
 - In Olympic Village, a forested berm tests how tree and plant species will adapt to changing temperatures, including red cedars, yellow cedars, and sequoias. The berm also serves to raise the elevation at the site and acts as an anchor for the gradual transition of the area.
 - In Stamps Landing, a habitat bench will provide an oasis for people and nature in Leg-in-Boot Square. The habitat bench will demonstrate a soft shores approach to temporary flood protection in an urban setting in the near-term. As sea levels rise, the habitat bench will decay and evolve from an upland, to intertidal, to subtidal feature.



SOURCE: City of Vancouver 2022-a

Figure 3
Stamps Landing Habitat Bench Design

- In terms of adaptive design, the North Shore team recognized that there is uncertainty around the impacts and timing of climate change, and that part of planning for adaptation is to remain open and flexible to timelines that can change significantly as new information is included. Adapting according to shoreline zones that follow the gradient of the shoreline and focusing development above a flood construction level (FCL) of 5.6m is a major consideration for the north shoreline.

The City's Northeast False Creek Plan (NEFC Plan) (City of Vancouver 2018-b) sets the long-term vision for the last remaining piece of large undeveloped land in the downtown along False Creek, and includes the following policies for climate change adaptation and flood protections:

- 11.2.2 Ensure all elements of Northeast False Creek are designed with the latest sea level rise projections in mind. A continuous line of flood protection built to the City's Building By-law

requirements and in accordance with direction from City staff will extend across the site, designed such that it could be raised an additional meter in the future.

- 11.2.3 Any flood management infrastructure put in place to serve as flood defense (e.g., seawall) will be built to the appropriate structural standards to meet Provincial requirements.
- 11.2.4 Design the flood management infrastructure to enhance the public realm, to be a great place for people to walk and bike and to improve the shoreline habitats by incorporating a naturalized approach, supporting the biodiversity and habitat policies of the plan.
- 11.2.5 Ensure no residential levels or critical infrastructure will be placed below the Flood Construction Level. Buildings in the designated floodplain are encouraged to consider additional flood defense design approaches to ensure resilience through the life of the building.
- 11.2.6 Provide a generous tree canopy where possible within Northeast False Creek. A diversity of tree species is encouraged for resiliency.
- 11.2.7 Landscapes should be designed to be drought tolerant and resilient to climate variability. Irrigation needs should be minimized or eliminated.

The City has made some direct investments in climate change adaptation. The Still Creek Enhancement project aims to rehabilitate and enhance Still Creek to create a more naturalized creek corridor, including 10- and 50-year actions for creek enhancement with acquisition of land. Implementing actions will maintain the natural drainage asset, reduce flood risk, and increase biodiversity, aquatic habitat health and sequestration (Still Creek Enhancement 2023).

The City is undergoing a Climate Emergency Action Plan 2020-2025 (City of Vancouver 2020) that includes six large-scale actions (referred to as Big Moves) for Vancouver to reduce carbon pollution by 50%. Big Move 6: Natural Climate Solutions focuses on restored forests and coasts (City of Vancouver 2021). Recently, construction has begun on the Tatlow and Volunteer Park stream restoration project in support of Big Move 6 (Vancouver Board of Parks and Recreation 2020). The Vancouver Park Board is restoring a small segment of a historical stream in Volunteer and Tatlow parks originally known as 'First Creek.' The project's design goals are to improve accessible shoreline access, increase native plantings and biodiversity, create habitat for bird and pollinator species, and restore riparian shoreline.

3.3.3 San Diego

The City of San Diego uses the California Coastal Act, passed in 1976 by the State Legislature, to regulate coastal development (California Coastal Commission 2023). The Coastal Act guides land use planning along the coast of California.

Article 8 specifies: "The commission shall take into account the effects of sea level rise in coastal resources planning and management policies and activities in order to identify, assess, and, to the extent feasible, avoid and mitigate the adverse effects of sea level rise."

Article 4 does not explicitly address climate change, but includes policy language about construction that alters natural shoreline processes:

- 30235. Revetments, breakwaters, groins, harbor channels, seawalls, cliff retaining walls, and other such construction that alters natural shoreline processes shall be permitted when required to serve coastal-dependent uses or to protect existing structures or public beaches in danger from erosion and when designed to eliminate or mitigate adverse impacts on local shoreline sand supply. Existing marine structures causing water stagnation contributing to pollution problems and fishkills should be phased out or upgraded where feasible.

Beyond that, the municipal code does not detail climate change-specific policies or regulations. The City conducted a Sea Level Rise Vulnerability Assessment in 2019 (City of San Diego 2019) and presented key findings from the assessment of exposure, sensitivity, and adaptive capacity of critical built, natural, and cultural assets to coastal hazards. The results will inform the identification of adaptation measures to protect critical City assets and services. Additionally, this assessment will inform a broader City-wide multi-hazard vulnerability assessment, which includes analysis for vulnerability to additional climate hazards such as precipitation driven flooding, extreme heat, and wildfires. It is anticipated the vulnerability assessment and related mapping would be updated approximately every ten years, or as necessary to address significant changes in climate change hazard projections.

Asset-owning City departments were consulted to identify which built, natural, and cultural assets owned and/or managed by the City could be considered critical. The selection criteria were:

- If the asset/resource (or its function) is necessary for continuity of important City operations;
- If the asset/resource (or its function) is a key driver in the City's economy;
- If loss of the asset/resource would present equity issues;
- If the asset/resource is critical to safeguarding biological diversity and other environmental considerations

The City selected specific scenarios to be considered in the vulnerability assessment based on the best available climate science. The selected scenarios and corresponding sources included best available localized modeling from the Coastal Storm Modeling System (CoSMoS) for coastal erosion in the area, covering shoreline and cliff retreat under a Medium-High Risk Aversion Scenario of sea level rise by 2100 and various options for coastal armoring or retreat.

In 2021, City Council adopted the City's first-ever climate adaptation and resilience plan, Climate Resilient SD Plan (City of San Diego 2021). The plan includes the following policies:

TNE-5: "Manage the coastline as a social, economic, and environmental resource for current and future generations,"

- For city-owned properties and leaseholds, consider rolling easements to establish a development boundary that moves inward as sea level rises along the shoreline. Establish the easements as needed to allow for natural migration of shoreline and avoid shoreline armoring.
- Update the Coastal Erosion Assessment regularly to identify current conditions of coastline bluffs, beaches, access stairs, ramps, outfalls, seawalls or other related infrastructure. The Coastal Erosion Assessment should be updated every five years to evaluate the status of coastline erosion or shoreline change.
- Utilize adaptive pathways for coastline planning. Adaptive pathways are a sequence of adaptation strategies over time that consider uncertainty and future risk. An adaptive pathways approach should include completion of an economic analysis to evaluate efficiency and effectiveness of adaptation strategies over time. Adaptive pathways should consider: a) Prioritization of nature-based solutions and natural shoreline protection methods to protect areas subject to coastal flooding. b) Consideration of resilience or relocation options for areas highly vulnerable to coastal erosion and/or coastal flooding. c) Consideration of less intensive uses for City assets, such as transition from vehicle based facilities to bike based facilities.

Policy TNE-3: "Prioritize the implementation of nature-based climate change solutions wherever feasible"

- Implement nature-based shoreline protection methods to protect areas subject to coastal flooding. Develop a coastal resilience master plan that would identify locations for implementation of nature-based solutions to mitigate coastal flooding and erosion, improve coastal resiliency, protect habitat, and increase recreational opportunities for residents and visitors. Nature-based shoreline protection could include beach nourishment, living shorelines, dune restoration, native plantings, habitat restoration, waterfront/floodable parks, kelp farms or oyster reefs.

While the City has not yet made many direct investments in adapting shorelines to prepare for climate change, the City is currently working on numerous plans to address this. A Coastal Resilience Master Plan, estimated to be complete in 2025, will identify specific resilience and conservation needs along the coastline and develop a portfolio of nature-based solutions to promote resilience, protect critical coastal habitats, and support coastal access (City of San Diego 2023). The plan will engage the public; analyze 10 sites based on feasibility, risk, and benefits; develop nature-based solutions for six of the most feasible locations; and select a pilot project. An Environmental Impact Report that analyzes the environmental effects of nature-based solutions to address climate change along the coast will also be prepared.

3.3.4 San Francisco

The guiding policy document for the City & County of San Francisco is the General Plan, which includes the Local Coastal Program (LCP) adopted by the City Planning Commission and the Board of Supervisors and certified by the California Coastal Commission on April 26, 1984 (San Francisco Planning 2023). The LCP is a policy and regulatory document required by the California Coastal Act that establishes land use, development, natural resource protection, coastal access, and public recreation policies for San Francisco's Coastal Zone.

The LCP Amendment is an update to the 1986 Western Shoreline Area Plan that will specifically address sea level rise and coastal erosion concerns along the area. The Western Shoreline Area Plan (San Francisco Planning 2023-a) includes objectives, policies, and implementation measures for Ocean Beach and Coastal Hazards such as:

POLICY 12.1

- As the shoreline retreats due to erosion and sea level rise, incrementally remove shoreline protection devices, rubble that has fallen onto the beach, roadway surfaces, and concrete barriers south of Sloat Boulevard.
- Import sand to restore the beach and construct dunes. Stabilize dunes with vegetation, beach grass straw punch, brushwood fencing, or other non-structural methods.

POLICY 12.2

- Adaptation measures that preserve, enhance, or restore the sandy beach, dunes, and natural and scenic resources such as beach nourishment, dune restoration, and managed retreat shall be preferred over new or expanded shoreline protection devices.

POLICY 12.5

Shoreline protection devices shall be avoided and only implemented where less environmentally damaging alternatives are not feasible. Shoreline protection devices such as rock revetments and seawalls shall be permitted only where necessary to protect existing critical infrastructure and existing development from a substantial risk of loss or major damage due to erosion and only where less environmentally damaging alternatives such as beach nourishment, dune restoration and managed retreat are determined to be infeasible. New or expanded shoreline protection

devices should not be permitted solely to protect parking, restrooms, or pedestrian or bicycle facilities.

The City of San Francisco has begun the process of adjusting a variety of policies to address sea level rise. A floodplain management ordinance was adopted in 2008, and the *Guidance for Incorporating Sea Level Rise into Capital Planning in San Francisco: Assessing Vulnerability and Risk to Support Adaptation* was issued in 2014. The City of San Francisco has completed other planning efforts related to climate change, including: 2016 Sea Level Rise Action Plan, 2020 Sea Level Rise Vulnerability and Consequences Assessment, and 2020 Hazards and Climate Resilience Plan.

San Francisco Planning completed the Islais Creek Adaptation Strategy, which assessed future climate risks and identified a range of potential adaptation strategies for the Islais Creek shoreline (San Francisco Planning 2021). Where feasible, the strategy suggested nature-based and living shoreline adaptation strategies to provide flood protection while increasing parks and habitat areas, including:

- Removing aging waterfront structures in favor of living shoreline features that restore a natural edge condition and create passive recreation opportunities
- Consider expanding open space in opportunity areas that could be developed as public/private partnership
- Maintain existing wetland areas and consider regrading areas where they could migrate over time
- Introduce green streets and street-level green infrastructure to reduce localized urban flood risk, reduce peak flows, increase biodiversity and enhance neighborhood character

The Islais Creek Adaptation Strategy also developed the following Toolkit Strategies:



Direct investments and projects are mostly being led by other entities, such as Port of San Francisco, San Francisco Bay Restoration Authority, San Francisco Recreation & Parks, and others.

3.3.5 Miami

Miami’s zoning code establishes standards and procedures for new development or redevelopment in the City including Appendix B - Waterfront Design Guidelines (City of Miami n.d.):

- Walkways along a natural shoreline or rip rap shoreline may be set back from the edge of the shoreline and meander within the waterfront setback area.
- Properties with natural shorelines must provide flood protection... via berm, wall, or similar elements to protect rights of way and adjacent properties from flooding. Flood barriers may be setback from the shoreline if the natural area may safely accommodate flooding.

The Miami Forever Climate Ready is a strategy to reduce the increasing risk of flood, flood, heat, and storm impacts over next 40 years (City of Miami 2023-a). The Miami Forever Climate Ready Plan (City of Miami 2022) established Goal 3, “Protect and enhance our waterfront,” with the following objectives:

- Objective 3.1: Reduce the severity, duration, and impact of coastal and riverine flooding on shorelines and surrounding communities.
- Objective 3.2: Update and implement waterfront design standards.
- Objective 3.3: Accelerate investment in features along the waterfront.
 - Update city policy to ensure design scopes for city-owned waterfront and drainage projects prioritize and integrate green infrastructure solutions such as living shorelines and bioswales to improve coastal protection, drainage, and water quality, and enhance natural systems.
 - Continue installation of tidal valves at City outfalls to reduce high-tide flooding through storm drains.
 - Implement changes to City seawall standards considering sea level rise projections through 2060 and designing for adaptability over time. Inform and engage key stakeholders prior to introducing the new standards.
 - Develop and build upon landscaping and vegetation standards that require native plantings for city swales and along waterfront areas that are more resilient to salt water, hurricanes, and extreme weather events.

3.3.6 New York, NY

In March 2021, the City Council passed Local Law 41, which involves the development of a new resilience scoring system for public projects. By 2026, all City projects must meet a stringent set of requirements that will certify their preparedness for extreme weather threats (City of New York Mayor’s Office of Climate and Environmental Justice 2022). One of the suggested features includes integration with naturally resilient shoreline features.

The New York City Waterfront Revitalization Program (WRP) (City of New York 2016) is the City’s principal Coastal Zone Management tool. The WRP establishes the City’s policies for development in the Coastal Zone, a geography defined by legislation that includes the floodplain, as well as other areas that have some relationship with the waterfront. City, state, or federal discretionary actions within NYC’s Coastal Zone must be reviewed for consistency with the WRP. This includes zoning changes, infrastructure projects, and funding. Revisions to the WRP approved in 2016 require that all projects take sea level rise projections into consideration. Within the plan, the following policies relate to climate change:

- Avoid fragmentation of natural ecological communities and maintain corridors to facilitate the free exchange of biological resources within and among these communities. Protect those sites which have been identified as key to maintaining habitat connections within ecological systems.

- Protect non-invasive plants from excessive loss or disturbance, and encourage greater quantity and diversity of non-invasive plants to the extent practicable. Select plants that are resilient to current and future changes in climate.
- Prevent the net loss of wetlands by: (1) avoiding the draining of, placement of fill in, or excavation of wetlands; (2) minimizing adverse impacts resulting from unavoidable draining, fill, excavation or other activities; or (3) providing mitigation for any adverse impacts which may remain after all appropriate and practicable minimization measures have been taken. These are presented in order of descending preference with (1) being the most effective and preferred option
- Maintain or create resilient vegetative buffers between wetlands and nearby uses to protect the wetland's character, quality, values, and functions. Buffers should be designed and maintained to preserve hydrologic balance within the wetland and between the wetland and surrounding upland area. The adequacy of the buffer width and composition is determined by: (1) the potential for adverse effects associated with the proposed or existing use; (2) the nature and importance of the wetland and its benefits to the ecological complex; (3) the direction and flow of surface water between a use and the wetland; and (4) the necessity to achieve and maintain a high filtration efficiency or surface runoff as determined by vegetative cover type, soil characteristics, and slope of land. In all cases, the buffer must not be less than that required by state law. If site constraints do not allow sufficient buffer width, consider other management measures or design alternatives to preserve or achieve hydrologic balance.

CHAPTER 4

Climate-Informed Review of Comprehensive Plan and SMP Policies

This section reviews existing Comprehensive Plan and SMP policies that are responsive to climate change, identifies potential modifications to those policies to make them more responsive, and additional climate adaptation strategies for consideration.

4.1.1 Environment + Watershed Health

4.1.1.1 GOAL EN-1 Ensure that Tacoma's built and natural environments function in complementary ways and are resilient to climate change and natural hazards.

Policy EN-1.4 Maintain self-sustaining populations of native plants, native resident and migratory fish and wildlife species, including at-risk species and beneficial organisms such as pollinators.

- Can be used as justification for larger-than-minimum buffers to ensure adequate space for species life cycles

Policy EN-1.5 Protect the quantity, quality and function of high value environmental assets identified in the City's natural resource inventories, including: a. Rivers, lakes, streams and associated riparian uplands b. Floodplains c. Riparian corridors d. Wetlands and buffers e. Groundwater f. Trees and urban forests g. Bays, estuaries and marshes h. Shorelines i. Native and other vegetation species and communities that provide habitat value j. Habitat complexes and corridors, rare and declining habitats such as wetlands, native oak and habitats that support special-status or at-risk plant and wildlife species k. Other natural resources as identified.

- Restore floodplains and connectivity to improve the resilience of streams and rivers and reduce flood risk.
- Reconnect floodplains to increase water retention and storage by removing hard armoring (Loos and Shader 2016).

Policy EN-1.9 Develop hazard mitigation plans that reduce exposure of Tacoma citizens to future disasters or hazards (e.g., flooding, earthquakes, winds).

- Could add more specifics related to climate change: sea level rise, extreme heat, drought, etc.

Policy EN-1.17 Assess and periodically review the best available science for managing critical areas and natural resources and utilize the development of plans and regulations while also taking into consideration Tacoma's obligation to meet urban-level densities under the GMA.

- No change.

Policy EN-1.18 Evaluate climate data and consider climate risks in the development of regulations, plans and programs.

- No change.

Policy EN-1.19 Evaluate trends in watershed and environmental health using current and historical data and information to guide improvements in the effectiveness of City plans, regulations and infrastructure investments.

- Could be expanded to include climate projections to evaluate the suitability of current investments and regulatory standards in light of a changing climate.

Policy EN-1.25 Develop management plans for each of the City's watersheds. Evaluate the current conditions of the watersheds in Tacoma and use the findings to inform decisions about future land use, stormwater planning and urban forest and open space management.

- Improve and expand urban forest management to maximize or conserve carbon storage.

4.1.1.2 GOAL EN-2 Protect people, property and the environment in areas of natural hazards.

Policy EN-2.5 Promote soil stability by retaining vegetation in erosion prone areas.

- No change.

Policy EN-2.7 Establish setbacks around the perimeter of site-specific landslide hazard areas to avoid the potential to undermine these areas, cause erosion and sedimentation problems to downstream or downhill land uses and avoid the risk to human life and safety. Establish broader setbacks in areas at risk for mass wasting.

- Review required buffers and setbacks for steep slopes and shorelines vulnerable to erosion exacerbated by climate change, and establish new minimums, if necessary, so that improvements are not required to protect such structures during their expected life.

4.1.1.3 GOAL EN-3 Ensure that all Tacomans have access to clean air and water, can experience nature in their daily lives and benefit from development that is designed to lessen the impacts of natural hazards and environmental contamination and degradation, now and in the future.

Policy EN-3.1 Ensure that the City achieves no-net-loss of ecological functions over time.

- Ensure no net loss of ecosystem composition, structure, and functions, especially in Priority Habitats and Critical Areas, and strive for net ecological gain to enhance climate resilience.

Policy EN-3.5 Discourage development on lands where such development would pose hazards to life, property or infrastructure, or where important ecological functions or environmental quality would be

adversely affected: a. Floodways and 100-year floodplains b. Geologic hazard areas c. Wetlands d. Streams e. Fish and wildlife habitat conservation areas f. Aquifer recharge areas g. Shorelines.

- Consider climate stressors when determining allowed activities and uses within wetlands and Fish and Wildlife Habitat Conservation Areas (FWHCAs), and ensure regulations maintain habitat integrity and function.
- Coordinate all programs that can affect fish and wildlife habitat to optimize the ability of local policies, rules, and management activities to protect habitats, and look for gaps or inefficient practices that could impede climate resilience.
- Require open space set-asides (such as parks) for new development.

Policy EN-3.6 Limit impervious surfaces within open Space Corridors, shorelines and designated critical areas to reduce impacts on hydrologic function, air and water quality, habitat connectivity and tree canopy.

- Expand reasoning for impervious surface standard for public and private development/redevelopment
- Identify opportunities to expand habitat protection and improve habitat quality and connectivity to foster climate resilience using conservation area designations, buffers, and open space corridors.

Policy EN-3.19 Protect and retain wetlands, rivers, streams and lakes through use of best management practices, managing and treating stormwater runoff, protecting adjacent native vegetation, removing invasive plant species and limiting the use of fertilizers/pesticides or other chemicals.

- Protect and restore wetlands and corridors between wetlands to provide biological and hydrological connectivity that fosters resilience to climate impacts.

4.1.1.4 GOAL EN-4 Achieve the greatest possible gain in environmental health City-wide over the next 25 years through proactive planning, investment and stewardship.

Policy EN-4.2 Encourage landscaping designed to complement local wildlife and native or climate adapted vegetation and help offset the loss of wildlife habitat areas resulting from past development practices.

- Could prioritize native and/or climate-resilient landscaping (e.g., drought tolerance, pest tolerance, etc.)

Policy EN-4.6 Enhance native vegetation along wetlands, rivers, streams and lakes. The City may require new planting of native vegetation and/or removal of non-native species to restore ecological functions of riparian buffers where such activities will enhance the corridor's function.

- Protect and restore riparian vegetation to reduce erosion, provide shade, and support other functions that improve the resilience of streams to climate change.

- Choose native drought- and pest-resistant trees, shrubs, and grasses in restoration efforts to support climate resilience.
- Restore and maintain critical areas and open space areas to maximize the climate resilience benefits they provide.

Policy EN-4.14 Ensure that plans and investments are consistent with and advance efforts to improve the diversity, quantity and quality, of fish and wildlife habitat and Open Space Corridors, especially rare and declining habitat types and habitats that support at-risk plant and animal species and communities.

- No change.

Policy EN-4.15 Ensure that plans and investments are consistent with and advance efforts to prevent the spread of invasive plants, and support efforts to reduce the impacts of invasive animals and insects.

- Could include potential range expansion of non-native and invasive species with climate change

Policy EN-4.21 Reconnect shorelines and upland areas and water courses through habitat conservation and restoration efforts, property acquisition and/or easements.

- Could emphasize sea level rise connection to easing the transition between coastal and inland/upland areas

Policy EN-4.26 Utilize the City's TDR Program to conserve valuable city and regional assets, and continue to develop and enhance the program. Lands meeting the City's criteria for conservation that are located within the designated Open Space Corridors, and lands achieving other open space goals of this Plan, are appropriate "sending areas" for the transfer of development rights to other locations in the City, county and region.

- Could be expanded to explicitly include critical areas

4.1.1.5 GOAL EN-5 Plan at a watershed scale to restore and protect natural resources that contribute to watershed health.

Policy EN-5.2 Improve protections to watershed processes by tailoring zoning and subdivision regulations, sensitive area protections, clearing and grading limitations and stormwater mitigation requirements that are appropriate for each watershed based on the findings of the watershed based analysis, the community's vision for population and job growth and the requirements of the Growth Management Act.

- Connect to climate change adaptation planning in Pierce County and adjacent cities

4.1.2 Design + Development

4.1.2.1 GOAL DD-5 Ensure long-term resilience in the design of buildings, streets and open spaces, including the ability to adjust

to changing demographics, climate, and economy, and withstand and recover from natural disasters.

Policy DD-5.9 Integrate natural and green infrastructure, such as street trees, native landscaping, green spaces, green roofs, gardens, and vegetated stormwater management systems, into centers and corridors.

- Connect to potential impervious surface standard and importance for promoting flood attenuation and groundwater recharge

4.1.2.2 GOAL DD-7 Support sustainable and resource efficient development and redevelopment.

Policy DD-7.5 Encourage site and building designs that make efficient use of water and manage stormwater as a resource.

- Connect to potential impervious surface standard and importance for promoting flood attenuation and groundwater recharge

4.1.2.3 GOAL DD-11 Protect people, property and the environment from environmental hazards.

Policy DD-11.1 Evaluate slope and soil characteristics, including liquefaction potential, landslide hazards, and other geologic hazards.

- Expand to include sea level rise and flooding

Policy DD-11.2 Limit development in or near areas prone to natural hazards where practicable, using the most current hazard and climate change-related information and maps.

- No change

Policy DD-11.3 Encourage development approaches that will enhance the ability of people, wildlife, natural systems, and property to withstand and recover from a natural disaster or other major disturbance.

- Explicitly mention climate change and/or climate-exacerbated hazards

4.1.2.4 GOAL DD-12 Integrate and harmonize development with the natural environment.

Policy DD-12.1 Ensure that new building and site development practices promote environmental health and ecosystem services, such as pollutant reduction, carbon sequestration, air cooling, water filtration, or reduction of stormwater runoff.

- Connect to services provided by critical areas

Policy DD-12.2 Encourage flexibility in the division of land, the siting and design of buildings, and other improvements to reduce the impact of development on environmentally sensitive areas, maintain natural landforms, retain native vegetation, protect specimen trees, and preserve open space.

- Expand to include explicit mention of soft shore stabilization techniques
- Incorporate sea-level rise information, along with tsunami hazard mapping, into critical area delineation for siting critical infrastructure, land-use planning, and emergency management.

4.1.3 Public Facilities + Services

4.1.3.1 GOAL PFS–1 Provide public facilities and services necessary to support existing and new development envisioned in the Urban Form Element.

Policy PFS–1.3 Coordinate and cooperate with federal, state, regional, and local jurisdictions, private industry, businesses, and citizens in the planning, siting, design, and development of facilities serving and affecting the community.

- Connect to importance of creating standards and projects that cross jurisdictional boundaries related to habitat connectivity and corridors, groundwater recharge, flood control, and other projects related to ecosystem services

4.1.3.2 GOAL PFS–4 Provide public facilities that address past deficiencies, particularly those in underserved areas, meet the needs of growth, and enhance the quality of life through acceptable levels of service and priorities.

Policy PFS–4.3 Use the following levels of service to assist in determining the need for public facilities, and as a management tool for monitoring the sufficiency of the facilities:

- Modify habitat/open space standards to explicitly support increased/enhanced buffer standards

4.1.3.3 GOAL PFS–7 Design, locate and provide public facilities with features and characteristics that support the environment, energy efficiency, aesthetics, technological innovation, cost-effectiveness, livability, sustainability, and equity.

Policy PFS–7.1 Design natural infrastructure into projects whenever feasible to mimic ecological processes and minimize the need for built infrastructure.

- Emphasize importance of soft/natural infrastructure in climate adaptation

Policy PFS–7.10 Promote water reuse and water conservation opportunities that diminish impacts on water, wastewater, and surface water systems.

- Connect to groundwater recharge

4.1.4 Shoreline Master Program

4.1.4.1 GOAL 1: To preserve and develop shorelines in a manner that allows for an orderly balance of uses.

Policy 5. Balance the location, design, and management of shoreline uses throughout the city to prevent a net loss of shoreline ecological functions and processes over time.

- Prevention of net loss will require allowing for inland migration of shoreline habitats as sea levels rise, a potential challenge on some sites that may require the development of new area for shoreline function as sites are lost.

Policy 6. Encourage shoreline uses and development that enhance shoreline ecological functions and/or processes or employ innovative features that further the purposes of this Program.

- No change, soft shore armor designs may be considered under this policy.

4.1.4.2 GOAL 3: To conserve shoreline resources and important shoreline features, and protect shoreline ecological functions and the processes that sustain them to the maximum extent practicable.

Policy 3. Acquire or otherwise protect a maximum amount of prime habitat for conservation purposes.

- Could be expanded to specifically include inland acquisitions to accommodate migrating habitats.

4.1.4.3 GOAL 4: To re-establish, rehabilitate and/or otherwise improve impaired shoreline ecological functions and/or processes through voluntary and incentive-based public and private programs and actions that are consistent with the Shoreline Master Program Restoration Plan and other approved restoration plans.

Policy 2. Over time the City will strive to reduce the total amount of shoreline armoring and restore natural shoreline functions.

- Supports the development of regulations that restrict or disallow hard shoreline armoring.

Policy 5. Encourage and facilitate voluntary, cooperative restoration and enhancement programs between local, state, and federal public agencies, tribes, non-profit organizations, and landowners to address shorelines with impaired ecological functions and/or processes.

- This policy could be expanded to include the address of habitat migration needs through barrier removal and land acquisition/conservation.

4.1.4.4 GOAL 6: Protect and enhance shoreline features of archaeological, historic, and cultural value or significance and to preserve these features for the public benefit through

coordination and consultation with the appropriate local, state and federal authorities, including affected Indian tribes.

Policy 3. Collaborate on cultural resource management issues with the appropriate tribal, state, federal and local governments and entities.

- Access to harvest sites along shorelines will be impacted with SLR, as will the prevalence of culturally relevant species.

4.2 Additional climate mitigation and adaptation strategies related to critical areas

The following potential mitigation and adaptation strategies are sourced from the Washington Department of Commerce Model Climate Element [Menu of Measures](#):

- Protect, enhance, and restore ecosystems in order to meet tribal treaty rights and conserve culturally important consumptive and non-consumptive resources including foods, medicinal plants, and materials that could be adversely impacted by climate change.
- Establish or work with partners to establish a native plant nursery and seed bank to support long-term restoration and carbon sequestration efforts.
- Implement actions identified in restoration and salmon recovery plans to improve climate resilience of streams and watersheds.
- Increase the climate resilience of native fish species and aquatic ecosystems by reducing the threat of aquatic invasive species (e.g., fish, plants, invertebrates, etc.).
- Take early action to eliminate or control non-native invasive insect species that take advantage of climate change, especially where invasives threaten native species or ecosystem function.
- Use an integrated approach to prevent the spread and establishment of invasive plant species and enhance the climate resilience of native plant communities.
- Take inventory of and protect climate refugia and habitat connectivity needs for species under stress from climate change.
- Identify, protect and restore submerged aquatic vegetation (eelgrass, kelp, etc.) that provide aquatic habitat, "blue" carbon storage, and other ecosystem services.
- Ensure no net loss of ecosystem composition, structure, and functions, especially in Priority Habitats and Critical Areas, and strive for net ecological gain to enhance climate resilience.
- Restore and maintain critical areas and open space areas to maximize the climate resilience benefits they provide.

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From: [Tim Smith](#)
To: matthewgmartenson@gmail.com; asstele@msn.com; jordanrash.tacoma@gmail.com; TPCDorner@gmail.com; bsanthuff@gmail.com; sandeshtpc@gmail.com; robb.krehbiel@gmail.com; brettmarlo18@gmail.com; chris.tacoma@gmail.com
Cc: [Planning](#)
Subject: Part II: Comments for 20 DEC 23 Planning Commission Meeting
Date: Wednesday, December 20, 2023 6:57:16 AM
Attachments: [image.png](#)
[Outlook-cpttiing.png](#)
[Outlook-rj23ncpb.png](#)
[Outlook-duivl40k.png](#)
[Att C CAPO Tech Memo.pdf](#)
[10_Aquifer.pdf](#)
[Bridge Industrial AO 21612 FINAL 2023 12 19 \(1\).pdf](#)
[WAR311285-2023-12-19-CoverageAOltr \(1\).pdf](#)
[WAR311285-ResponsetoCommentsSummary \(1\).pdf](#)
Importance: High

Good morning. After I submitted comments, yesterday, the WA State Dept of Ecology issued a Construction Stormwater Permit for the Bridge Industrial Project which highlight why the STGPD Code needs updating, why the Critical Area ordinance needs reinforcement, and highlight why my comments about keeping the STGPD as a stand-alone zoning overlay must be heeded.

DOE and the City of Tacoma do not truly understand the hydrogeological sensitivity of this construction site. The area is a very specific Critical Aquifer Recharge Area. The water table is roughly 15-20 feet below the surface and is the primary CARA for the South Tacoma Well Field. The area is a key part of Tacoma's well head protection plan.

The City of Tacoma in its Critical Area Permit did not analyze the CARA separately from the other critical areas - as required by WA State law. Although this CADO/CAPO permit along with the MDNS was appealed to the Hearing Examiner, during the appeal hearing the attorneys challenging the determinations failed to adequately address this oversight and thus the MDNS is flawed and incomplete.

So, when DOE finished up this permit after the appeal hearing they saw that no issues were raised and focused on just addressing stormwater runoff as they did not have any visibility on the CARA. They have placed very specific controls in their robust Administrative Order, however, I truly do not think they understand the 150-acre location, the quantity of water involved, and the underlying aquifer vulnerability. Their AO strive to protect "waterbodies of the state" - Flett Creek but overlooks another waterbody - the sole-source drinking water aquifer.

During Phase I construction, they are directing that ALL water be stopped from running into Flett Creek and that all water be directly infiltrated into the ground. Although testing is required, this is not an immediate process with instant results. The requirement to remove the top foot of soil may very well expose currently unknown contamination and the direct, untreated infiltration creates a direct pathway for 10s of thousands of gallons of rainwater. I have no idea how they will store all this water! They mention using Baker tanks, but they will need hundreds of them at 21,000 gallons a piece.



Actual pre-treatment of the water does not begin until Phase II.

So frustrating to have DOE willing to protect surface waters but not understanding that just below the surface is a dynamic and very complicated triple layer, sole-source aquifer for not only Tacoma but also Lakewood and Pierce County. We can't just believe that we put a cork in the 60" pipe which leads off this site to Flett Creek and allow all the dewatering and rainwater to just infiltrate potential contaminants into a drinking water aquifer and everything will be okay. This is madness.

Attached is the existing understanding and city map of both the South Tacoma Groundwater Protection District and embedded wellhead protection plan and critical aquifer recharge area. The construction area encompasses much of the blue cross-hatched area in the upper right middle of the map. I have also included the flawed City of Tacoma CAPO permit and the new DOE Stormwater permit.

Vr,

Tim Smith





City of Tacoma
 Planning and Development Services
 Technical Memorandum

February 13, 2023

To: Shirley Schultz, Principal Planner

From: Karla Kluge, Senior Environmental Specialist

**Subject: BNSF Warehouse Development
 SEPA and Critical Area Development Permit LU21-0125
 5024 South Madison, Parcel No's. 0220241001, 0220131120, 0220131131,
 0220134004, 022134011, 0220134800, 278010090, 2783010110, 2783011011,
 374000086**

Project Description

The Applicant has applied for a Critical Area Development Permit for industrial redevelopment on the subject property to include three double-loaded buildings, one single-loaded building, and associated infrastructure including several parking areas, truck courts, and stormwater infrastructure for water quality treatment. Several critical areas are located on site including wetlands, a stream, Fish and Wildlife Habitat Conservation Areas (Biodiversity Areas) and floodplains. The project was carefully designed by the applicant to avoid and minimize impacts to critical areas to the greatest extent feasible by utilizing all developable upland areas onsite and undergoing multiple variations in site design, including narrowing building widths and redesigning parking and stormwater infrastructure to minimize impacts to the critical area buffers to the greatest extent feasible.

No direct impacts to the identified wetlands or FWHCA (Biodiversity Areas) are proposed from the industrial development except for impacts to the existing Wetland B associated with enlarging the wetland for wetland creation work. Due to the large building footprints required for industrial development, and the need to provide ample parking for employee cars, semi-trucks, and trailers, and to provide safe and efficient access throughout the site, complete avoidance of the onsite critical areas is not possible. Due to required frontage improvements and road widening of South Madison Street to meet current road standards and provide safe site access, approximately 1,101 linear feet of Stream Z must be relocated/shifted slightly westward along its alignment adjacent to proposed Building D. No changes in site design would result in avoidance or less impacts to Stream Z, as any industrial project consistent with the site zoning would also require road improvements resulting in similar impacts.

Wetland and stream buffer averaging is proposed along the eastern portions of the buffers associated with Wetlands A and B and Stream Z, resulting in a net gain of buffer area for Wetland A (18,301 square feet), Wetland B (23,902 square feet), and Stream Z (141,781 square feet). Buffer averaging will decrease the buffers up to the allowable 25 percent down to 112.5 feet, and in one area, an additional 230 square feet of additional indirect impacts to Wetland B are necessary and unavoidable to maintain adequate parking and safe site access. With recent site design changes and additional buffer averaging area, the indirect impact area was recently further reduced from 22,614 square feet to 230 square feet. An additional 143,383 square feet of temporary buffer impacts are necessary for slope grading as part of the full buffer restoration,

and 600 square feet of permanent buffer impacts for a stormwater trench. In addition, the project will require the addition of two new bottomless crossings to provide safe site access from South Madison Street to proposed Building D on the southwest portion of the site. These bottomless crossings will result in minor, temporary construction impacts to Stream Z.

Sixty-eight Garry oaks were identified on the project site. The proposed development will result in the removal of 1 Garry Oak tree rather than seven trees that were originally proposed. Modifications within Madison Street improvements will allow retention and preservation of the other 6 trees located along that accessway. The applicant stated that the 6 trees and one tree within the development footprint do not meet the criteria described under the WA Department of Fish and Wildlife "Management Recommendations for Washington's Priority Habitats, Oregon White Oak Woodlands", January 1998 for a woodland or stand. However, recent best available science identified for urban areas from the WA Department Fish and Wildlife indicate preservation of even single large trees offer an important habitat area for urban animals, even where the Oak tree does not support the associated threatened Washington Western Gray Squirrel.

Lastly, the project proposes to develop within portions of the 100-year floodplain areas onsite; the project will provide the necessary floodplain compensation areas to result in no net loss of base flood storage capacity. All appropriate best management practices (BMPs) and temporary erosion and sediment control (TESC) measures will be implemented throughout the course of construction to minimize construction impacts.

The applicant describes the proposed relocation to a portion of Stream Z will ensure 1:1 ratio for no net loss of stream length. To offset the 230 square feet of permanent indirect impacts to Wetland B following buffer averaging, 11,789 square feet of wetland creation is proposed in excess of the required 3:1 mitigation ratio. An additional 600 feet of buffer within Wetland B will be impacted by a stormwater feature. Given the substantial 23,902-square-foot net gain in buffer area for Wetland B, the 600 square feet of permanent buffer impacts are de minimis. The existing conditions of the wetland and stream buffers onsite are severely degraded due to prior clearing and grading activities, dominance of non-native invasive vegetation, and the presence of trash and debris associated with homeless encampments. As such, in addition to the wetland creation and stream buffer creation actions, buffer restoration is proposed within the entire onsite buffer areas (upland buffer and flood compensation areas) adjacent to the proposed development (700,052 square feet) to increase ecological functions onsite. Buffer restoration activities will consist of pulling back and re-sloping the banks of Stream Z above the OHWM and outside of any wetland areas, removing existing fill material, non-native invasive species, trash, and debris, and replanting with a native plant palette. The proposed mitigation actions, along with the new stormwater infrastructure, including infiltration, will ensure no adverse impacts to the FWHCA and will result in a net gain in ecological functions when compared to the existing degraded conditions of the onsite critical areas proposed to be impacted.

The site encompasses 22 parcels of land, most of which are zoned "M-2" Heavy Industrial; 2 parcels are zoned "T" transitional Districts. The site is also located within the South Tacoma Groundwater Protection District. Primary truck and auto access to the site is proposed via a new road running to the northeast and connecting to South 35th Street. Auto access is also proposed from South 56th Street at Madison Street and Burlington Way.

Vegetation onsite primarily consists of non-native invasive species including scotch broom (*Cystus scoparius*), butterfly bush (*Buddleja davidii*), Himalayan blackberry (*Rubus armeniacus*), annual ryegrass (*Lolium perenne multiflorum*), and reed canarygrass (*Phalaris arundinacea*).

Additionally, a forested patch spans the western boundary of the subject property dominated by Douglas fir (*Pseudotsuga menziesii*), Pacific madrone (*Arbutus menziesii*), red alder (*Alnus rubra*) and black cottonwood (*Populus balsamifera*), with an understory composed of beaked hazelnut (*Corylus cornuta*), Oregon grape (*Mahonia nervosa*), non-native invasive English holly (*Ilex aquifolium*), non-native invasive Himalayan blackberry, swordfern (*Polystichum munitum*), non-native invasive reed canarygrass, and trailing blackberry (*Rubus ursinus*).

Documents provided by the applicant

- Revised Joint Aquatic Resources Permit Application form
- SEPA checklist, Prepared May 25, 2021, revised December 10, 2021, and August 8, 2022
- *Wetland and Fish and Wildlife Habitat Assessment Report, BNSF Report*, Revised November 2022, Soundview Consultants
- *Wetland Delineation Report, Part 2, BNSF Property*, July 17, 2007, Barghausen Consulting Engineers
- *Mitigation Plan, BNSF Tacoma*, Revised November 2022, Soundview Consultants
- *Tree Retention Plan, 8/5/2022*, Soundview Consultants
- *Technical Memorandum*, November 29, 2022, Soundview Consultants
- *Biological Evaluation*, May 2021, Soundview Consultants
- *Geotechnical Report, BNSF Railway Industrial, Tacoma, WA, Terra Associates Inc., May 19, 2021*
- *Hydrogeological Assessment, BNSF Railway Industrial, Terra Associates Inc., March 30, 2022*
- Stormwater Site Plan, December 10th, 2021, Benjamin Eldridge
- Lighting Impacts, The Lighting Group (TLG), 3/2/2022
- FEMA Map Exhibit – Floodplains
- Various Floodplain studies
- *Amendment to operations and Maintenance Plan south Tacoma Field Site, soil Management Plan for Property Development*, March 24, 2022, TRC
- *Bridge Point Tacoma, Updated Transportation Impact Analysis*, December 10, 2021, TENW
- *Inadvertent Discovery Plan*, Department of Ecology form

Wetland Delineation and Stream Identification

Four wetland areas (Wetland A, Wetland B, Wetland C and Wetland D), a stream and a Biodiversity Area/Corridor were identified within the project area. The identified wetlands and stream are situated within a mapped Biodiversity Area and Biodiversity Corridor on the western portion of the subject property. In addition, portions of the subject site are mapped within the FEMA 100-year floodplain.

A previous Wetland and Stream Delineation Report was conducted by Grette Associates in July 2007. The Grette wetland delineation identified three wetlands (Wetland A, B/Z, and C) and one excavated stream corridor on the subject property. The stream corridor flows north to south through the western portion of the subject property and was identified as a historic headwaters for Flett Creek. All wetlands were found to be located adjacent to the identified stream corridor. Wetlands were classified per 2004 Washington State Wetlands Rating System for Western Washington— Washington Department of Ecology (WSDOE). The previously proposed project

was approved through the City of Tacoma SEPA Determination of Nonsignificance and Permit Decision (WET2007-10000099831, MLU2007-40000099830, and SEP2007-40000099829) on December 19, 2008.

Given the age of the delineation, a new delineation was required. Additionally, the wetland ratings system has been updated, and several changes to the local code have occurred since the original 2007 delineation. The following wetland ratings have been updated according to the current 2014 Washington Department of Ecology Wetland Rating Manual.

The updated wetland rating, characterization and wetland delineation was verified during site visits in July and October. I conducted a site visit to the project site on July 2nd, 2021, with Environmental Services Staff to view the general boundaries based upon the previous wetland delineation and compare the current wetland boundaries and characterization from site visits that I have conducted over the years. A site visit was also conducted on November 8, 2022, with Soundview consultants and City staff to review the wetland boundaries and identified biodiversity areas. I have reviewed the consultant report and concur with the wetland delineation, wetland category, functional assessments and general description of the wetlands and buffer areas provided in the report and data sheets.

Wetland A is approximately 30,080 square feet in size onsite and is located on the northwest portion of the subject property associated with Stream Z. Hydrology for Wetland A is provided by a seasonally high water table, direct precipitation, surface runoff from adjacent uplands, overbank flooding from Stream Z, and hydrologic flows within the channel of Stream Z. Wetland vegetation is dominated by Pacific willow (*Salix lasiandra*), non-native invasive Himalayan blackberry, hardhack (*Spiraea douglasii*), broad leaf cattail (*Typha latifolia*), and non-native invasive reed canarygrass. Portions of Wetland A are located entirely within the OHW of Stream Z. Wetland A is a Palustrine Forested/Scrub-Shrub/Emergent, Temporarily Flooded, Seasonally Flooded (PFO/SS/EMAC) wetland. Wetland A is considered a Category III riverine wetland with a habitat score of 5 points and a required 75-foot buffer.

Wetland B is approximately 123,270 square feet in size onsite and is located on the west central portion of the subject property associated with Stream Z, approximately 1,200 feet south of Wetland A. The majority of Wetland B is located within the OHW of Stream Z; however, a fringe extends to the east, above the OHW of Stream Z. Hydrology for Wetland B is provided by a seasonally high-water table, direct precipitation, surface runoff from adjacent uplands, overbank flooding from Stream Z, and hydrologic flows within the channel of Stream Z. Wetland vegetation is dominated by red alder, hardhack, and twinberry honeysuckle (*Lonicera involucrata*). Wetland B is a Palustrine Forested/Scrub-Shrub, Temporarily Flooded, Seasonally Flooded (PFO/SSAC) wetland. Wetland B is considered a Category II riverine wetland with a habitat score of 6 points and a required 150-foot buffer.

Wetland C is approximately 28,380 square feet in size onsite and is located on the southwestern portion of the subject property adjacent to Stream Z, approximately 365 feet south of Wetland B. Hydrology for Wetland C is provided by a seasonally high water table, direct precipitation, overbank flooding from Stream Z, and hydrologic flows within the channel of Stream Z. Wetland vegetation is dominated by black cottonwood, Scouler's willow (*Salix scouleriana*), Sitka willow (*Salix sitchensis*), non-native invasive blackberry, and hardhack. Wetland C is a Palustrine Forested/ScrubShrub, Temporarily Flooded, Seasonally Flooded (PFO/SSAC) wetland. Wetland C is considered a Category III riverine wetland with a habitat score of 6 points and a required 75-foot buffer.

Wetland D is approximately 2,500 square feet in size onsite and is located in the southwest portion of the subject property adjacent to Stream Z. Hydrology for Wetland D is provided by a seasonally high water table, direct precipitation, and overbank flooding from Stream Z. Wetland hydrology consists of unidirectional flow from Wetland C to the north via a culvert under an access road, where it enters Wetland D. Wetland vegetation is dominated by black cottonwood saplings, hardhack, non-native invasive Himalayan blackberry, and reed canarygrass. Wetland D is a Palustrine Scrub-Shrub/Emergent, Seasonally Flooded (PSS/EMC) wetland. Wetland D is considered a Category III riverine wetland with a habitat score of 4 points and a required 75-foot buffer.

Stream Z flows south through the length of the property and continue offsite to the south. The approximate length of Stream Z through the property is 6,360 linear feet. Stream Z originates from a stormwater outlet northwest of the site. The channel varies from 10 to 20 feet in width with a defined channel and steep banks as it travels south and through the wetlands. Lack of maintenance and blockages result in the channel terminating in the southern portion of the site within Wetland D. Stream buffer vegetation along the eastern side of the channel is dominated by black cottonwood, red alder, various willows, hardhack, Himalayan blackberry, and reed canary grass. The western side vegetation is dominated by Douglas Fir, beaked hazelnut, Oregon grape, and Himalayan blackberry.

The Ns2 Stream corridor is reportedly in an area known as the Old Tacoma Swamp. This area historically served as part of the headwaters for Flett Creek, and the stream extends from near the northwest corner of the site to Madison Street at the south end of the site. The surrounding land to the east of the stream was filled and the corridor excavated to allow stormwater drainage to be collected and conveyed offsite through the City's stormwater management system through a well-defined channel. A culvert under a road crossing near the mid-point of the western portion of the corridor appears to be undersized and blocked by debris, which creates upstream flooding. A culvert under another crossing near the south center of the subject property was observed during a later site visit and appeared to be partially blocked.

The southern portion of Stream Z is straightened and maintained as a ditch (Ditch Z) and appears artificial and intentionally excavated with vertical banks and little evidence of scour. Ditch Z appears to function as ephemeral drainage rather than a stream and is found to be dry even when the upper portions of Stream Z area flowing. However, upstream and downstream areas of Ditch Z meet stream criteria and it directly connects or is an extension of the same channel and is thus, considered part of Stream Z.

No salmonid presence is modeled or documented within the stream. In addition, DNR does not map this section of Flett Creek nor does EPA Waters Data inventory. As such, the channel is likely a Type Ns2 stream (waters not connected to a Type S, F, or Np water). A Type Ns2 determination was previously approved by the City of Tacoma through a SEPA Determination of Nonsignificance (SEP2007-40000099829) and Permit Decision (WET2007-10000099831 and MLU2007-40000099830) on December 19, 2008.

Fish and Wildlife Habitat Conservation Areas (Biodiversity Areas and Garry Oaks)

The western portion of the subject site is mapped as Biodiversity Area/Corridor under the city of Tacoma's DART map. The area west of Stream Z consists of an undeveloped forest area dominated by Douglas Fir, Pacific madrone, red alder, and black cottonwood with an understory of beaked hazelnut, Oregon grape, non-native English Holly, Himalayan blackberry, sword fern, reed canarygrass and trailing blackberry. The forested area is heavily degraded with non-native

invasive species, homeless encampments and associate trash and debris. Much of the area east of Stream Z is entirely cleared and graded with fill material and heavily degraded with homeless encampments and associated trash and debris. Thus, most of the mapped area to the east does not provide high functioning habitat to be considered a Biodiversity Habitat or Corridor.

One area along the western portion of the site was identified as a Biodiversity Area. The recognized biodiversity area is approximately 486,831 square feet in size and consists of a large, forested patch along the western slope onsite and a small forested patch on the eastern edge of Wetland B, including the entirety of Wetland B. Vegetation in this area is dominated primarily by a diverse assemblage of native species including a canopy of Douglas fir, Pacific madrone, red alder and black cottonwood, with a sub-canopy composed of beaked hazelnut and Oregon grape, and herbaceous understory of western sword fern and trailing blackberry. Overall, the biodiversity area contains less than 50 percent non-native invasive species in sparse patches of namely Himalayan blackberry. Despite the dominance of native vegetation containing multiple canopy layers, the forested area is degraded due to the presence of several homeless encampments and associated trash and debris.

Sixty-three 63 Garry Oaks were identified on the subject property; however, only one tree that is located within the "middle" of the site where a development building will be constructed will be removed. The proposal initially identified 7 Garry Oaks for removal; however, modification along Madison Avenue for the sidewalk will allow the retention and protection of the Garry Oaks along that street.

Wildlife Review

DNR Stream Typing and WDFW Salmonscape do not identify any potential streams or salmonid habitat on or within 300 feet of the site. PHS identifies potential Western Pond turtle (*Actinemys marmorata*) and little brown bat (*Myotis lucifugus*) presence within the township, but not necessarily onsite. FEMA also identifies mapped 100-year floodplain in the western portion of the site. The City of Tacoma maps a Biodiversity Area and Corridor on the western portion of the subject property adjacent to the mapped stream. No other wetlands, streams, or priority habitats or species are documented on or within 300 feet of the subject property.

A species of Mazama Pocket Gophers (*Thomomys mazama*) once lived within the Tacoma area. However, this species was believed to be extirpated from the area primarily due to the urban development within the City limits. In order to fully evaluate the presence, up to twelve (12) live traps were set in the area and monitored for eight (8) weeks in 2007 as associated with the previous expired issued permit (WET2007-40000099831 Prologis).

The questionable mounds were also contained within an area known to flood and were flooded by at least 1-2 feet of water during a December storm event. The temporary flooding occurred prior to the live trapping and it is possible that whatever animal created the mounds drowned or moved away during the flood event. No animals were trapped during the 8 weeks and there were no sightings of a Mazama Pocket Gopher on site. The last reported sighting of the Tacoma Pocket Gopher was in 1947 in the Wapato Hills area. Extensive surveys in the 1980's and 1990's did not reveal additional Mazama Pocket Gopher sites.

In summary, the consultant determined that the past development of the site, habitat reduction, human activity, and domestic animal predation may have helped exterminate the Mazama Pocket Gophers at the site and would likely prevent a re-establishment of the animal. The

WDFW biologist, Michelle Tirhi concurred and considered the matter closed.

The previous study to identify possible Mazama pocket gophers continues to suffice regarding any potential for the currently proposed project. The landscape continues to flood in various areas and there are no new identified mound areas and the specie has been extirpated from the area.

Project Description and Wetland Mitigation proposal

The Mitigation Plan for the BNSF Property proposes on site and in-kind enhancements for wetland buffer impacts and on-site and out-of-kind mitigation for the stream impacts through stream re-location and wetland creation. In addition, innovative mitigation is proposed for the indirect impacts to Wetland B.

Wetland/Stream Category/Type and Mitigation Proposed

Critical Area	Approximate Size/Length	Category/ Type	Buffer (ft)	Permanent Impacts Square feet	Mitigation: Buffer Restoration/Enhancement and wetland creation for Wetland B
Wetland A	30,080 sq. ft.	III	75		2,566 sq. ft. buffer decrease 20,867 sq. ft. buffer increase 18,301 sq. ft. net gain of buffer area
Wetland B	123,270 sq. ft.	II	150	230 indirect wetland impacts 600 of permanent impacts for storm trench	22,647 sq. ft. buffer decrease 46,549 sq. ft. buffer increase 23,902 sq. ft. net gain of buffer area 11,789 sq. ft. of wetland creation
Wetland C	28,380 sq. ft.	III	75	N/A	
Wetland D	2,500 sq. ft.	III	75	N/A	
Stream Z	6,360 linear feet	Ns2	25		17,860 sq. ft. buffer decrease 159,641 sq. ft. buffer increase 141,781 sq. ft. net gain of buffer area

Impacts associated with project

The project desertion describes the critical area impacts as follows:

- Stream impacts. Due to required frontage improvements and road widening of South Madison Street to meet current road standards and provide safe site access, approximately 1,101 linear feet of Stream Z must be relocated/shifted slightly westward along its alignment adjacent to proposed Building D. No changes in site design would result in avoidance or less impacts to Stream Z, as any industrial project would require road improvements resulting in similar impacts.
- Wetland A and Wetland B buffer impacts. In addition, buffer averaging is necessary and unavoidable along the eastern portions of the buffers associated with Wetlands A and B and Stream Z, resulting in a net gain of buffer area for Wetland A (18,301 square feet), Wetland B (23,902 square feet), and Stream Z (141,781 square feet).
- Two hundred and thirty (230) square feet of additional permanent indirect impacts to Wetland B are necessary and unavoidable to maintain adequate parking and safe site access.
- An additional 143,383 square feet of temporary buffer impacts are necessary for slope grading as part of the full buffer restoration.
- Six hundred (600) square feet of permanent buffer impacts for a stormwater trench.
- The addition of two new bottomless crossings to provide safe site access from South Madison Street to proposed Building D on the southwest portion of the site. These bottomless crossings will result in minor, temporary construction impacts to Stream Z.
- One Garry Oak shall be removed.

Mitigation Plan

The overall mitigation plan includes 11,789 sq. ft. of wetland creation to offset the 230 square feet of indirect wetland impacts caused by reducing the wetland buffer in one area further than allowed outright in the critical area code. Wetland and stream buffer restoration and enhancement within the entire onsite buffer areas (upland buffer and flood compensation areas) will be conducted adjacent to the proposed development (700,052 square feet) to increase ecological functions onsite. Wetland B will have a 23,902 square-foot net gain in buffer area. Wetland A will have a 18,301 square foot net gain of buffer area. Non-native and invasive plants will be removed from on-site and non-impacted area of the buffer of Wetland A and Wetland B as well as the wetland re-establishment area and associated buffer, and the relocated stream buffer. Native trees and shrubs and non-invasive herbaceous species will be planted within the wetland and stream buffer as shown on the site plans. Miscellaneous debris will be removed from all on-site wetlands, channel, and associated buffers.

The proposed relocation to a portion of Stream Z (1,101 linear feet) will ensure 1:1 ratio for no net loss of stream length. The existing channel along South Madison Street proposed for realignment is anthropogenically modified as it has been ditched in a linear alignment and contains nearly vertical banks and as such provides minimal functions. The proposed channel will be shifted slightly westward from its current alignment and will be contained within a wider area to allow more gradual, lower sloped banks above OHW to better accommodate occasional flood events. The gradual topography will also allow the stream to form natural sinuosity with pool and riffle structure. The permanent buffer impacts associated with the channel realignment

will be compensated by additional buffer creation along the new channel, thus maintaining adequate buffer area. In addition, the entire degraded stream buffer along the realigned channel will be fully restored and replanted to provide increased ecological functions and screening from the proposed development and widened roadway along South Madison Street. The Type Ns2 stream buffer will be restored with native trees and shrubs along with the remaining stream corridor will be retained and enhanced.

Buffer restoration activities will consist of pulling back and re-sloping the banks of Stream Z above the OHWM and outside of any wetland areas, removing existing fill material, non-native invasive species, trash, and debris, and replanting with a native plant palette. The proposed mitigation actions, along with the new stormwater infrastructure, including infiltration, will ensure no adverse impacts to the FWHCA and will result in a net gain in ecological functions when compared to the existing degraded conditions of the onsite critical areas proposed to be impacted.

The project sequencing will be as follows:

- Pre-construction conferences and regulatory notifications;
- Pre-treatment of non-native invasive plant species;
- Install TESC measures;
- Remove debris and invasive plant material from the mitigation areas;
- Rough grade the wetland creation area, stream realignment area, flood compensation areas, and re-slope the banks of Stream Z above the OHW according to the approved grading plan;
- Rough grade inspection;
- Finish grade and prepare grounds for planting in all mitigation and flood compensation areas;
- Seed entire mitigation and flood compensation areas;
- Monitor site hydrology if necessary;
- Plant inspections;
- Install plant materials;
- Post-construction inspection and as-built survey; and
- Post-construction maintenance, monitoring, and annual reporting.

The FEMA floodplain compensation areas will be located within the onsite wetland buffer areas as necessary to meet the floodplain development requirements (no net rise). Areas within the onsite buffers will be graded to provide shallow depressions that will store occasional floodwaters and can accommodate up to the 100-year modeled flood event. Each shallow depression will have a low topographic point (outlet) that will allow the occasional floodwaters to recede. As such, the compensation areas will not hold water for long durations. Rather, the compensation areas will be replanted with primarily facultative (FAC) to facultative-wetland (FACW) native vegetation – species that can withstand short periods of inundation and would otherwise likely survive in drier conditions adjacent to the stream and provide terrestrial habitat and screening. The general upland buffer areas will be planted with FAC to facultative-upland (FACU) plant species more suitable to drier areas. As such, the restored buffer areas will function as standard buffers and occasionally as flood compensation areas.

The proposed mitigation plan for re-establishment of historic wetlands and enhancement of buffer plantings will improve overall wetland habitat and buffer functions and values which are currently limited due to the degraded nature of the site and the presence of invasive plant species. The mitigation plan is proposed to offset to offset the impacts to the Wetland and channel relocation, and buffers associated with construction activities. All non-native vegetation within the proposed mitigation area will be removed, soil amendments and exposed soils will be hydroseeded with the appropriate seed mix prior to re-planting.

The plant schedule for the restoration and enhancement of the wetland and stream buffer, and created wetland area will include a variety of native trees, shrubs including Bigleaf maple, Cascara, Oregon Ash, Sitka Spruce, shore pine, Douglas fir, Oregon White Oak, Pacific willow, western red cedar, western hemlock, vine maple, serviceberry, red-osier dogwood, Douglas hawthorne, salal, oceanspray, black twinberry, tall Oregon grape, low Oregon grape, Indian plum, bald hip rose, clustered wild rose, salmonberry, Scouler's willow, red elderberry, Douglas spirea, common snowberry. The seed mixes will include Blue wildrye, California brome, Meadow barley, Roener's fescue, Slender hairgrass, Spike bentgrass, tufted hairgrass, Red fescue, Western mangrass, American sloughgrass, Meadow barley, shortawn foxtail.

The vegetation will be placed in planting zones separated into wetland creation, buffer enhancement, buffer restoration, and buffer restoration/flood compensation area. Appropriate vegetation will reflect the degree of wetness expected according to wetland vegetation classifications (facultative, facultative wet, facultative upland) which corresponds to (moist, moist/wet and dry) to ensure better survival and establishment.

TMC 13.11 Applications and Analysis

Applicable Provisions of the Tacoma Municipal Code (hereinafter TMC):

TMC 13.01.110 Definitions

13.01.110.B

"Biodiversity Areas". Biodiversity Areas include those areas that contain native vegetation that is diverse with a mosaic of habitats and microhabitats. They include areas dominated by a vertically diverse assemblage of native vegetation containing multiply canopy layers and/or areas that are horizontally diverse with a mosaic of habitats and microhabitats. They also include areas with rare or uncommon plant species and associations designated by the City or identified by Federal and State agencies such as the Department of Natural Resources Heritage Program. They are not associated with a specific priority species and their overall habitat function may be limited due to their location in a highly urbanized area; however, they are diverse relative to other areas in the City and support common urban species. "Biodiversity Corridors." Areas of relatively undisturbed and unbroken tracts of vegetation that connect Biodiversity Areas, other Priority Habitat and Critical Areas, including shorelines and serve to protect those areas and allow movement of common urban species.

"Buffer or Buffer zone." An area required by this chapter that is contiguous to and protects a critical area which is required for the continued maintenance, functioning, and/or structural stability of a critical area. The area may be surrounding a natural, restored, or newly created critical area.

13.01.110.S.

"Stream corridor." Perennial, intermittent or ephemeral waters included within a channel of land and its adjacent riparian zones which serves as a buffer between the aquatic and terrestrial upland ecosystems.

"Streams." An area where open surface water produces a defined channel or bed, not including irrigation ditches, canals, storm or surface water runoff structures or other entirely artificial watercourses, unless they are used by fish or are used to convey a naturally occurring watercourse. A channel or bed need not contain water year-round, provided there is evidence of at least intermittent flow during years of normal rainfall.

13.01.110.W

"Wetlands." Areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include small lakes, ponds, swamps, marshes, bogs, and similar areas. Wetlands do not include those artificial wetlands intentionally created from non-wetland sites, including but not limited to irrigation and drainage ditches, grass-lined swales, canals, detention facilities, farm ponds, and landscape amenities if routinely maintained for those purposes. Wetlands do not include those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street, or highway. However, wetlands do include those artificial wetlands intentionally created to mitigate conversion of wetlands.

TMC 13.11.220.B.3 Development Permit.

3. Development Permit. A decision will be issued where, the Director determines that avoidance and minimization have not eliminated all impacts and compensatory mitigation will be required as a result of the proposal.
 - a. The applicant must meet the requirements of one of three legal tests: No Practicable Alternatives, Public Interest or Reasonable Use, and
 - b. Demonstrate Mitigation Sequencing, and
 - c. Provide mitigation as required in accordance with this Chapter

TMC 13.11.240 Legal Test(s).

A. No Practicable Alternatives. *An alternative is considered practicable if the site is available and the project is capable of being done after taking into consideration cost, existing technology, infrastructure, and logistics in light of overall project purposes. No practicable alternatives need be considered if the applicant can demonstrate all of the following:*

1. *The project cannot be reasonably accomplished using one or more other sites in the general region that would avoid or result in less adverse impacts to the Critical Area;*
2. *The goals of the project cannot be accomplished by a reduction in the size, scope, configuration or density as proposed, or by changing the design of the project in a way that would avoid or result in fewer adverse effects on the Critical Area; and*
3. *In cases where the applicant has rejected alternatives to the project as proposed, due to constraints on the site such as inadequate zoning, infrastructure or parcel size, the applicant has attempted to remove or accommodate such constraints, unless the applicant can demonstrate that such attempt would be futile.*

The applicants provided an argument documenting that there is no other area within the region that is available to the applicant that would offer the same development scale that would make the project economically feasible due to the spatial requirements for warehouses and associated infrastructure. The applicant further argues that the site is heavily impacted and the development layout has been changed to avoid all wetlands and observe their required buffers while providing appropriate mitigation. The changes include narrowing building widths, redesigning parking and stormwater infrastructure, and redesigning Building D to have only 1-sided truck loading and access to prevent further impacts to Stream Z and the associated buffer. No changes in site design would result in avoidance or less impacts to Stream Z, as any industrial project consistent with the site zoning would require road improvements resulting in similar stream relocation. Specific modifications are being made to avoid the Garry Oaks along the same access way to preserve an additional 6 trees that were initially proposed to be removed for the Madison

Street access and sidewalk. The stream will be relocated in one reach and the buffer restored to provide a higher functioning system. I concur that the applicant has demonstrated that they meet the requirements for this legal test.

- B. Reasonable Use.** *A Reasonable Use exists when the standards of this chapter deny all reasonable economic use of the property. To demonstrate Reasonable Use, the applicant must demonstrate all of the following:*
1. *There is no reasonable economic use or value with less impact on the Critical Area;*
 2. *There are no feasible on-site alternatives to the proposed activity or use (e.g., reduction in density or use intensity, scope or size, change in timing, phasing or implementation, layout revision or other site planning considerations) that would allow reasonable economic use with less adverse impact;*
 3. *The proposed activity or use will be mitigated to the maximum practical extent and result in minimum feasible alteration or impairment of functional characteristics of the site, including contours, vegetation, fish and wildlife habitat, groundwater, surface water and hydrological conditions;*
 4. *The proposed activity or use complies with all local, state, and federal laws and will not jeopardize the continued existence of endangered, threatened, sensitive or priority habitat or species; and*
 5. *The inability to derive reasonable economic use is not the result of any action, such as but not limited to, in segregating or dividing the property in a way that makes the property unable to be developed after the effective date of the ordinance codified in this chapter.*

The applicant argued that the site would not be economically feasible without the level of development currently proposed for their project. However, the Reasonable Use Legal Test takes into account other development that may occur on site that may not need the same level of development to achieve an economic gain. This test is not well suited for this type of industrial proposal and the argument does not achieve the test requirements. However, I note that the applicant only must meet only one of the legal tests and they do for the Practicable Alternatives and Public Interest Legal Tests.

- C. Public Interest.** *In determining whether a proposed use or activity in any Critical Area is in the public interest, the public benefit of the proposal and the impact to the Critical Area must be evaluated by the Director. The proposal is in the public interest if its benefit to the public exceeds its detrimental impact on the Critical Area. In comparing the proposal's public benefit and impact, the following should be considered:*
1. *The extent of the public need and benefit;*
 2. *The extent and permanence of the beneficial or detrimental effects of the use or activity;*
 3. *The quality and quantity of the Critical Area that may be affected;*
 4. *The economic or other value of the use or activity to the general area and public;*
 5. *The ecological value of the Critical Area;*
 6. *Probable impact on public health and safety, fish, plants, and wildlife; and*
 7. *The policies of the Comprehensive Plan.*

The proposal is in the public interest if its benefit to the public exceeds its detrimental impact on the wetland, stream and Fish and Wildlife Habitat Conservation Areas (Biodiversity Areas). The applicant has satisfied the Public Interest test by demonstrating that the current state of the Type Ns 2 stream and the Category II and III wetlands offer limited functional value due to their highly impacted state and location within an intense urban environment. Public use at the site includes dumping of various refuse and debris and illegal activities, homeless encampments and non-native invasive species. In contrast, the restoration of

Category II and Category III wetlands, with the re-establishment of additional wetland area along the channel will likely elevate all functions within this area including habitat, water quality, health and safety of surrounding residents. In addition, aesthetic benefits will be realized, and common urban animals and birds will have the opportunity to enjoy a clean, natural healthy habitat area. I concur that the applicant has met the requirements of this test demonstrating that the benefit to the public exceeds its impact to the wetlands and streams and mitigation.

TMC 13.11.250 General Standards. A. General permit standards. No regulated activity or use shall be permitted in or adjacent to a Critical Area or buffer, management area, or geo-setback without prior approval and without meeting the provisions of this section.

1. The applicant has taken appropriate action to first, avoid adverse impacts, then minimize impacts and finally, compensate or mitigate for unavoidable impacts;
2. The result of the proposed activity is no net loss of Critical Area functions;
3. The existence of plant or wildlife species appearing on the federal or state endangered, sensitive, or threatened species list will not be jeopardized;
4. The proposal will not lead to significant degradation of groundwater or surface water quality; and
5. The proposal complies with the remaining standards of this chapter, which include those pertaining to compensation and the provision of bonds.

TMC 13.11.270 General Mitigation Requirements.

F. Mitigation Sequencing. When an alteration to a critical area or its buffer/management area/geo-setback is proposed, such alteration shall be avoided, minimized, or compensated for in the following order of preference.

1. Avoiding the impact altogether by not taking a certain action or parts of an action.
2. Minimizing impacts by limiting the degree or magnitude of the action and its implementation, by using appropriate technology, or by taking affirmative steps to avoid or reduce impacts.
3. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
4. Reducing or eliminating the impact over time by preservation and maintenance operations.
5. Compensating for the impact by replacing, enhancing, or providing substitute resources or environments.
6. Monitoring the required mitigation and taking remedial action where necessary.

Analysis for Avoidance Hierarchy

The applicant has provided an appropriate mitigative hierarchy analysis as required by the CAPO. In this analysis, the applicant demonstrates that impacts to the wetland buffer and stream are unavoidable for construction of the proposed project due to due to the necessary warehousing components of the anticipated occupants, including the railroad. The applicant redesigned the project to avoid all direct wetland impacts and minimize indirect impacts through continued design changes during the permit process. The impact to the Type Ns 2 stream channel is necessary to allow general and emergency vehicle access for any development within the interior of the site.

L. Critical Area Enhancement as Mitigation. Impacts to critical area functions may be mitigated by enhancement of existing significantly degraded critical areas, but should be used in conjunction with restoration and/or creation where possible. Applicants proposing to enhance critical areas or their buffers must include in a report how the enhancement will increase the functions of the degraded critical area or buffer and how this increase will adequately mitigate for the loss of critical area and function at the impact site. An

enhancement proposal must also show whether any existing critical area functions will be reduced by the enhancement action.

M. Innovative Mitigation

The Director may approve innovative mitigation projects that area based on best available science including but not limited to activities such as advance mitigation and preferred environmental alternatives. Innovative mitigation proposals must offer an equivalent or better lever of critical area functions and values than would be provided by the strict application of this chapter. Such mitigation proposals must demonstrate special consideration and protection measures for anadromous fishes. The Director shall consider the following for approval of an innovative mitigation proposal.

1. Creation or enhancement of a larger system of natural areas and open space is preferable to the preservation of many individual habitat areas;

Applicant's response:

The proposed wetland creation will increase the size of existing Wetland B, a high-functioning Category II wetland that is contiguous with a recognized biodiversity area/corridor as well as Stream Z. Wetland creation in this location will provide additional high quality wetland habitat within a larger preserved area beneficial to urban wildlife utilizing the area.

2. The applicant demonstrates that long-term protection and management of the habitat area will be provided;

Applicant's response:

All identified critical areas onsite will be preserved within a critical areas tract marked with appropriate signage and fencing. In addition, all mitigation areas will be maintained and monitored for a period of 10 years to ensure success of the actions.

3. There is clear potential for success of the proposed mitigation at the proposed mitigation site;

Applicant's response:

The proposed mitigation plan includes wetland creation contiguous with the existing Wetland B on the west-central portion of the site. The creation area will be graded to similar topography as the existing wetland to receive the occasional overbank flooding from Stream Z and/or tie into or near the groundwater level. In addition, treated stormwater will be discharged into the buffer of Wetland B (near the wetland creation area) to provide supplemental hydrology. In addition, hydrologic models indicate that there will be no substantive change in hydrology from pre- to post-development. Given the several sources of hydrology, there is clear potential for success of the proposed wetland creation.

4. Mitigation according to TMC 13.11.270.E is not feasible due to site constraints such as parcel size, stream type, wetland category, or excessive costs;

Applicant's response:

No site constraints will limit the use of onsite mitigation. The proposed mitigation is considered innovative given that the proposed indirect wetland impacts are not specifically addressed in local code and will utilize wetland creation at a the required 3:1 ratio. Given that the impact is considered a type of wetland impact, onsite wetland mitigation is

considered appropriate compensation. It is also the most ecologically preferable option given that the mitigation plan will expand existing high quality Category II wetland area within a biodiversity corridor.

5. *A wetland of a different type is justified based on regional needs or functions and values;*

Applicant's response:

The proposed project will indirectly impact Wetland B, a Category II riverine wetland and provide wetland creation contiguous with the same Category II wetland.

6. *The replacement ratios are not reduced or eliminated; unless the reduction results in a preferred environmental alternative; and*

Applicant's response:

Per TMC 13.11.340.D, direct impacts to Category II wetlands require a standard 3:1 ratio for wetland creation actions. However, these proposed impacts are considered indirect, rather than direct, wetland impacts. Per Section 6B4.7 of Wetland Mitigation in Washington State – Part 1 (Version 2) (WSDOE et al., 2021), when indirect impacts are proposed, agencies typically require compensation at one-half of the recommended ratio for permanent impacts. As such, a minimum of 33,921 square feet is required for compensation, and 11,789 square feet of wetland creation is proposed. In addition, the wetland creation area will be much higher functioning than the existing wetland area proposed to be impacted. The existing wetland area is severely degraded due to the extent of gravel fill surrounding the wetland, nearby homeless encampments and associated trash and debris, and dominance of nonnative invasive species. Wetland creation will remove these degradations and create wetland functional wetland area through the establishment of native plant species that will improve water quality, hydrologic, and habitat conditions. As such, the proposed wetland creation will provide a net lift in ecological functions when compared to the existing degraded condition of the wetland proposed to be indirectly impacted.

7. *Public entity cooperative preservation agreements such as conservation easements are applied.*

Applicant's response:

Long-term protection of the mitigation site shall be provided per TMC 13.11.280.A.7 by placement in a separate tract in which development is prohibited or by execution of an easement dedicated to the City of Tacoma, a conservation organization, land trust, or similarly preserved through a permanent protective mechanism acceptable to the city.

Analysis for use of innovative mitigation:

Innovative mitigation is primarily used for buffer reductions or stream impacts in excess of the code standard requirements. In this case, the primary need to demonstrate Innovative Mitigation would be for the 230 square feet of Wetland B buffer reduction that exceeds code standard requirements. Other standards are being met through approved restoration and enhancement ratios or standards. The applicant is proposing 11,789 square feet of wetland creation is being proposed for the loss of 230 square feet of indirect impacts to Wetland B.

TMC 13.11.320 Buffers

A. General. A buffer area shall be provided for all uses and activities adjacent to a wetland area to protect the integrity, function, and value of the wetland. Buffers adjacent to wetlands are important because they help to stabilize soils, prevent erosion, act as filters for

pollutants, enhance wildlife diversity, and support and protect plants and wildlife. A permit may be granted if it has been demonstrated that no adverse impact to a wetland will occur and a minimum buffer width will be provided in accordance with this section. The buffer shall be measured horizontally from the delineated edge of the wetland. The buffer shall be vegetated with the exception of areas that include development interruptions as described within this chapter.

TMC 13.11.330 Wetland Buffer Modifications

C. Buffer Averaging. The widths of buffers may be averaged if this will improve the protection of wetland functions, or if it is the only way to allow for use of the parcel. Averaging may not be used in conjunction with the provisions for buffer reductions.

2. *Averaging to allow a reasonable use of a legal lot of record may be permitted when all of the following are met:*

a. There are no feasible alternatives to the site design that could be accomplished with the standard buffer averaging; and

Applicants response:

The project was carefully designed in order to avoid and minimize impacts to critical areas to the greatest extent feasible by utilizing all developable upland areas onsite, and no direct impacts to the identified wetlands or stream are proposed. Alternative designs and locations were considered for the project, including narrowing building widths and redesigning parking and stormwater infrastructure to be located outside of the critical area buffers to the greatest extent feasible. While direct impacts are completely avoided, wetland buffer averaging is necessary and unavoidable due to the large building footprints required for industrial development, provide ample parking for employee cars and semi-trucks and trailers, and provide safe and efficient access throughout the site. The use of buffer averaging is the best option that meets the project goals while minimizing permanent loss of buffer area and increasing ecological functions onsite. No other feasible option in site design would result in less impacts to critical areas while allowing for reasonable site development due to the encumbrance of critical areas on the western portion of the subject property, limiting the developable space necessary to support the industrial project.

b. The averaged or reduced buffer will not result in degradation of the wetland's functions and values as demonstrated by a report from a qualified wetland expert, and

Applicant's response:

The proposed minor buffer averaging for the buffers associated with Wetlands A and B will result in a net gain of buffer area (18,301 square feet for Wetland A and 23,902 square feet for Wetland B) and functionality. Buffer decrease and increase areas are accounted for each wetland separately. The total buffer area will be no less than the buffer area prior to the averaging. The existing conditions of the wetland buffers onsite are severely degraded due to prior clearing and grading activities, dominance of non-native invasive vegetation, and the presence of trash and debris associated with homeless encampments. As such, following the wetland buffer averaging, the project proposes to restore the entirety of onsite critical area buffers adjacent to the development by pulling back and re-sloping the banks of Stream Z above the OHW, removing existing fill material, non-native invasive species, trash and debris, and replanting with a native plant palette. The buffer restoration actions along with the proposed water quality treatment are anticipated to provide a net gain in ecological functions onsite when compared to the existing degraded and impacted conditions of the

site and critical areas.

c. *The total area of buffer after averaging is equal to the area required without averaging; and*

Applicant's response:

Buffer averaging will result in 2,436 square feet buffer decrease and 2,739 square feet buffer increase for Wetland A and 22,675 square feet buffer decrease and 29,013 square feet buffer increase for Wetland B, resulting in a net gain of buffer area (18,301 square feet for Wetland A and 23,902 square feet for Wetland B). In addition, all onsite buffer areas will be restored from their degraded conditions, resulting in a net gain in ecological functions.

d. *The buffer at its narrowest point is never less than ¾ of the required width.*

Applicant's response:

The proposed buffer areas associated with Wetlands A and B at the narrowest points will not be less than 75 percent of the required buffer widths (56.25 feet for Wetland A and 112.5 feet for Wetland B). It should be noted, however, that one portion of buffer for Wetland B adjacent to proposed Building C must be impacted beyond the allowable 25 percent per TMC 13.11.330.C to allow safe vehicle circulation. These additional impacts are not considered further buffer decrease associated with buffer averaging, but rather indirect wetland impacts to be compensated per the standards under TMC 13.11.340 (Wetland Mitigation Requirements).

Analysis for Buffer Averaging:

The applicant has provided an accurate and thorough response for each buffer modification criteria used. The buffer averaging proposal has avoided direct impacts to the wetlands and continued modification of the development proposal resulted in further reducing the indirect impacts to a portion of the buffer from 22,614 square feet to 230 square feet. The mitigation proposed will provide a fully functioning wetland and stream buffers even though the buffers have been modified through averaging. The 230 square feet of indirect wetland impacts occur due to the reduction of the wetland buffer further than allowed through TMC 13.11.C. However, the additional creation of wetland area proposed through innovative mitigation will provide heightened wetland functions directly.

TMC 13.11.340 Wetland Mitigation Requirements

- A. *The applicant shall avoid all impacts that degrade the functions and values of wetland and their buffers. Unless otherwise provided in this Title, if alteration to the wetland or its buffer is unavoidable, all adverse impacts resulting from a development proposal or alteration shall be mitigated using the best available science, so as to result in no net loss of critical area functions and values.*
- B. *All wetland mitigation will comply with applicable mitigation requirements specified in 13.11.270, including, but not be limited to, mitigation plan requirements, monitoring and bonding.*
- C. *Preference of Mitigation Actions. Methods to achieve compensation for wetland functions shall be approached in the following order of preference:*
 - 1. *Restoration (re-establishment and rehabilitation) of wetlands on upland sites that were formerly wetlands.*
 - 2. *Creation (Establishment) of wetlands on disturbed upland sites such as those with*

vegetative cover consisting primarily of non-native introduced species. This should only be attempted when there is an adequate source of water and it can be shown that the surface and subsurface hydrologic regime is conducive for the wetland community that is being designed.

3. Enhancement of significantly degraded wetlands in combination with restoration or creation. Such enhancement should be part of a mitigation package that includes replacing the impacted area and meeting appropriate ratio requirements.

D. *Mitigation ratios.*

1. The ratios contained within Table 5 shall apply to all Creation, Re-establishment, Rehabilitation, and Enhancement compensatory mitigation.

Table 5. Mitigation ratios for projects in Western Washington that do not alter the hydro-geomorphic setting of the site***				
Category and Type of Wetland	Re-establishment or Creation	Rehabilitation	1:1 Re-establishment of Creation (R/C) and Enhancement (E)	Enhancement Only
All Category III	2:1	4:1	1:1 R/C and 2:1 E	8:1
All Other Category II	3:1	8:1	1:1 R/C and 4:1 E	12:1

Analysis for Mitigation Requirements:

The applicant has proposed in-kind, and on-site mitigation that will increase the functions and values of the wetland using buffer averaging ratios and wetland and standards contained in the code, including innovative mitigation.

Mitigation for the unavoidable impacts is proposed by reestablishing a historic wetland area as well as enhancing or restoring wetland buffer through the planting of native trees, shrubs, and grasses. The mitigation proposal will restore functions to the wetland and buffer by increasing vegetative structure and diversity, and providing cover to the wetland resulting in additional habitat. The remaining enhanced buffer will provide vegetative structure, plant diversity and a native plant community for wildlife, compared to the existing condition of the site, which is comprised of unconsolidated fill material, grasses and weeds, debris, refuse and at times, homeless encampments.

Elevated functions within the existing wetlands and stream will not only replace functions as those lost, but the reestablished area will add functional capacity to an area that is degraded. And, the replacement functions will include additional functions such as habitat, stormwater quality and runoff control, and aesthetic value to a highly degraded undeveloped area that was historically a highly functioning wetland.

The proposed mitigation site is located where a historic wetland (Tacoma Swamp) was once found and is currently significantly impacted by filling and deposition of refuse over a long period of time.

The applicant is proposing to mitigate fully on site and has provided a mitigative hierarchy analysis as required by TMC Section 13.11.340. A reduced-scale development which would

avoid all wetland, wetland buffer and stream channel impacts was determined to be cost prohibitive in comparison to land cost, required size of buildings given the likely use and traffic and parking considerations. Various development scenarios resulted in complete wetland impact avoidance and mitigation for wetland buffer and stream channel impacts that will result in habitat improvements while still allowing successful development of the project site.

The mitigation proposal includes the reestablishment of high-quality wetland area in order to compensate for the additional reduction of Wetland B buffer (230 sq. ft.) that will result in a loss of functions of Wetland B due to the elimination of buffer area. This action is referred to as an indirect impact which means that while the actual wetland area is not physically filled, the resultant functional loss within the remaining wetland is treated as though wetland area is lost and mitigation is proposed that will satisfy actual loss of wetland area.

The wetland creation mitigation proposal will replace wetland buffer loss with additional wetland area, and the buffer enhancement and restoration will also provide mitigation for the stream relocation and culverts needed for crossing by complete re-establishment of the stream channel and stream buffer planting.

In summary, the wetland creation mitigation proposal is designed to comply with and exceed the required wetland creation mitigation area for filled wetlands for ratio requirements involved with filling wetland area. The indirect impacts are being treated as filled wetlands rather than buffer loss by creating additional wetland area as though wetland area was lost. The proposed mitigation will result in the reestablishment of high-quality Category II wetland adjacent to a restored stream.

TMC 13.11.420 Stream Buffers.

A. General. A buffer area shall be provided for all uses and activities adjacent to a stream to protect the integrity and function of the stream. Buffers adjacent to streams are important because they help to stabilize soils, prevent erosion, act as filters for pollutants, enhance wildlife diversity, and support and protect plants and wildlife. The buffer shall be measured horizontally from the edge of the ordinary high water mark.

B. Minimum Requirement. 1. Streams. Stream buffer widths shall be established according to the following table which is based on stream classification:

<i>Table 6. Stream Types</i>	
<i>Stream Type</i>	<i>Buffer (feet)</i>
<i>Type Ns2 (Not connected to S, F, or Np)</i>	<i>25</i>

TMC 13.11.430. B Stream buffer Averaging and Reduction.

Stream buffer averaging may be permitted when the following conditions are met:

- 1. The stream buffer areas that are reduced through buffer averaging will not reduce stream or habitat functions, including those of nonfish habitat;*

Applicant's response:

The entire existing onsite buffer area is severely degraded due to the presence of cleared, graded, and filled areas, homeless encampments, associated trash and debris, and

dominance of non-native invasive species. All buffer averaging will occur along contiguous buffer area between the stream and proposed development so that adequate protection is maintained, and a net gain in buffer area is proposed. In addition, all onsite buffer areas will be restored from their degraded conditions, resulting in a net gain in ecological functions. While Stream Z is a non-fish stream, the removal of buffer degradations and replanting with a dense screen of native trees, shrubs, and groundcover will significantly improve habitat suitability for a wide variety of common terrestrial urban wildlife species, increase structural complexity, increase pollutant and sediment filtration, and slow surface water runoff.

- 2. The stream buffer areas that are reduced will not degrade the habitat, including habitat for anadromous fish;*

Applicant's response:

See response to number 1 above.

- 3. The total area contained in the stream buffer of each stream on the development proposal site is not decreased;*

Applicant's response:

Buffer averaging will result in 7,366 square feet buffer decrease and 33,203 square feet buffer increase, resulting in a net gain of buffer area (141,781 square feet). In addition, all onsite buffer areas will be restored from their degraded conditions, resulting in a net gain in ecological functions.

- 4. The recommended stream buffer width is not reduced by more than twenty-five (25%) percent in any one location;*

Applicant's response:

The proposed buffer areas associated with Stream Z at the narrowest points will not be less than 75 percent of the required 25-foot buffer width (18.75 feet). It should be noted, however, that a few portions of buffer for Stream Z must be impacted beyond the allowable 25 percent. These additional impacts are not considered further buffer decrease associated with buffer averaging, but rather permanent buffer impacts to be compensated at a 1:1 ratio.

- 5. The stream buffer areas that are reduced will not be located within another critical area or associated buffer;*

Applicant's response:

The stream buffer decrease areas will not be located within another critical area or associated buffer

- 6. The stream buffer areas that are reduced and required mitigation are supported by best available science; and*

Applicant's response:

Updated mitigation guidance documents, including the interagency mitigation guidance (WSDOE et al., 2021), state that incorporating avoidance and minimization measures are necessary prior to proposing impacts. Please refer to the avoidance and minimization measures outlined under Section 1.1.2 above. The proposed stream buffer averaging will allow buffer modification to the extent practicable to reduce the amount of permanent buffer

impacts.

7. *When averaging the stream buffer, the proposal will provide additional habitat protection by including more highly functioning areas and reducing the buffer only in the low functioning areas.*

Applicant's response:

The entire existing onsite buffer area is severely degraded due to the presence of cleared, graded, and filled areas, homeless encampments, associated trash and debris, and dominance of non-native invasive species. The buffer decrease areas will occur in the outer 25 percent of the stream buffer, and the increase areas are proposed along contiguous buffer area between the stream and proposed development so that adequate protection is maintained. In addition, all onsite buffer areas will be restored from their degraded conditions, resulting in a net gain in ecological functions.

TMC 13.11.440 Stream Standards.

A. *Type F1, F2, Np, and Ns1, and Ns2 streams may be relocated or placed in culverts provided it can be demonstrated that:*

1. *There is no other feasible alternative route with less impact on the environment;*

Applicant's response:

The project will require the relocation/shift of a segment of Stream Z along South Madison Street to accommodate required frontage improvements and road expansion to meet current road standard and safe site access. In addition, two new bottomless crossings for Stream Z are necessary to provide efficient logistical operations, provide safe truck, vehicle and fire access and meet traffic requirements. South Madison Street is the primary site access point from South 56th Street. There are no alternative routes or existing crossings that provide access to the location of proposed Building D. South Madison Street is along the entire site frontage adjacent to proposed Building D and also provides direct access to the main development area on the northern portion of the site. South Monroe Street does connect to the southernmost parcel and is already fully utilized by the existing commercial/industrial developments on parcels 4695000780, 4695000794, and 4695000793 and would not provide direct access to the remainder of the site. Further, car and truck parking and truck courts already exist along this roadway associated with logistical operations of the adjacent commercial sites and could not support additional traffic from the proposed development. In addition, due to topographic constraints access from Tyler Street is not feasible.

2. *Existing location of the stream would prevent a reasonable economic use of the property;*

Applicant's response:

The existing alignment of Stream Z along South Madison Street would prevent reasonable economic use of the property. To meet current road standards and safe site access and traffic requirements, Stream Z must be shifted slightly westward for expansion of South Madison Street. To provide access direct access to the site from South Madison Street, two new bottomless stream crossings are also necessary for industrial operations onsite. No changes in site design would result in avoidance or less impacts to Stream Z, as any industrial project would require road improvements and proposed stream crossings resulting in similar impacts.

3. *No significant habitat area will be destroyed;*

Applicant's response:

The proposed relocation to a portion of Stream Z will ensure 1:1 replacement ratio for no net loss of stream length. The entire onsite buffer areas adjacent to the proposed development will be fully restored to increase ecological functions onsite. The existing buffer area is severely degraded due to the extent of gravel fill, nearby homeless encampments and associated trash and debris, and dominance of non-native invasive species. As such, the existing de minimis buffer functions will be significantly improved to provide essential ecological functions and provide effective screening from the proposed development.

4. *The crossing minimizes interruption of downstream movement of wood and gravel;*

Applicant's response:

The new bottomless crossings will be designed to minimize interruption of downstream movement of wood and gravel.

5. *The new channel or culvert is designed and installed to allow passage of fish inhabiting or using the stream and complies with WDFW requirements;*

Applicant's response:

The new, relocated stream and bottomless stream crossings will be designed to WDFW requirements; stream simulation guidelines are not a requirement as no fish species are identified within the onsite reach of Stream Z as it is recognized as a Type Ns2 stream.

6. *The channel or culvert also complies with the City of Tacoma current Stormwater Management Manual.*

Applicant's response:

The new, relocated stream and bottomless stream crossings are both designed to comply with the City of Tacoma's current Stormwater Management Manual.

7. *The applicant will, at all times, keep the channel or culvert free of debris and sediment to allow free passage of water and fish;*

Applicant's response:

The relocated channel and stream crossings will be periodically maintained to monitor debris and sediment and allow free passage of water.

8. *Roads in riparian habitat areas or buffers shall not run parallel to the water body;*

Applicant's response:

South Madison Street is already located within the riparian habitat/buffer areas and runs parallel to Stream Z. Improvements and expansion of South Madison Street is required to meet current road standards and safe site access and traffic requirements. The new stream crossings will be constructed perpendicular across Stream Z to provide access from South Madison Street to the southwest portion of the site where Building D will be located.

9. *Crossing, where necessary, shall only occur as near to perpendicular with the water body as possible;*

Applicant's response:

The new bottomless crossings are proposed perpendicular to Stream Z.

10. Road bridges are designed according to 2013 Washington Department of Fish and Wildlife Water Crossing Design Guidelines, and the National Marine Fisheries Service Guidelines for Salmonid Passage at Stream Crossing, 2000.

Applicant's response:

The new stream crossings will consist of bottomless culverts and will not be traditional bridge crossings.

TMC 13.11.450 Stream Mitigation Requirements.

All proposed alterations in the buffer of a stream shall be in accordance with the standards for the applicable wetland category, where riparian wetland exists. In the event stream corridor alterations or relocations, as specified above, are allowed, the applicant shall submit an alteration or relocation plan prepared in association with a qualified professional with expertise in this area. In addition to the general mitigation plan standards, the plan shall address the following information:

1. Creation of natural meander patterns and gentle side slope formations;
2. Creation of narrow sub channel, where feasible, against the south or west bank; Tacoma Municipal Code (Updated 07/2022) 13-492 City Clerk's Office
3. Provisions for the use of native vegetation;
4. Creation, restoration or enhancement of fish spawning and nesting areas;
5. The proposed reuse of the prior stream channel;
6. Provision of a qualified consultant, approved by the City, to supervise work to completion and to provide a written report to the Director stating the new channel complies with the provisions of this chapter; and
7. When streambank stabilization is necessary, bioengineering or soft armoring techniques are required, where possible.

The Washington Department of Fish and Wildlife has authority over all projects in State Waters which impact fish. Construction in State Waters is governed by Chapter 75.20 RCW, Construction Projects in State Waters.

Analysis for stream modification:

The restoration of the Type Ns2 stream buffer along the project site will enhance the stream and also provide better functioning capacity of the wetland portions on site. The creation, restoration and enhancement of vegetation and the removal of refuse and debris, the control of stormwater impacts and flow control through the stream through engineering and culvert replacement will result in a "system" improvements where the mitigation will not only elevate the functional capacity of each individual wetland and stream but will elevate functional capacity for the entire system which provides complimentary, sustainable functions for the entire area, making the project likely to be very successful. In addition, the proposal includes stream re-alignment and culvert placement as impacts, while some of these impacts will result in control of water flow and duration as well as habitat improvements. The associated floodplain areas will also be mitigated through compensatory storage areas that empty into the wetlands and stream during periods of heavy inundation thereby improving the water transfer system within the critical areas. I concur that the applicant has met the stream modification requirements.

TMC 13.11.550.E. Fish and Wildlife Habitat Conservation Area Standards

Applicant's response:

The additional tree assessments completed in March 2022 determined that only the identified area adjacent to Wetland B met the criteria as a biodiversity corridor; the remainder of intact

tree groves along the western portion of the site were too small to be classified as such. All proposed development will remain outside of the designated biodiversity corridor; however, the proposed wetland creation actions will take place within a small area of the biodiversity corridor to the west of Wetland B. Per TMC 13.11.550.E, the following shall apply for proposed modifications within or affecting biodiversity areas and corridors:

1. In determining which areas are least sensitive to development impacts, the following criteria shall apply:

A. A minimum of 65% of the Biodiversity Area and Corridor area shall be left in an undisturbed natural vegetated state. The undisturbed area set aside shall contain all other Priority Habitats, Priority Species, and Critical Areas and Buffers that may be present, per applicable standards.

Applicant's response:

The proposed project will maintain and improve the potential biodiversity area and corridor which contains a small portion of the west-central portion of the site primarily around Wetland B, associated intact buffer, and additional contiguous forested areas. The proposed development actions will take place outside of the identified FWHCA, except for the proposed wetland creation to expand Wetland B, thus providing additional wetland habitat onsite and within the FWHCA. The entire onsite wetland and stream buffer areas adjacent to development will also be fully restored to increase ecological functions as they are currently severely degraded due to the presence of gravel fill, homeless encampments and associated trash and debris, and dominance of non-native invasive species. As such, the proposed project will not adversely affect the degraded biodiversity area and corridor, and instead will result in additional protection and function of this area.

B. A contiguous Biodiversity Corridor with a width of 300-feet shall be retained connecting onsite and offsite Priority Habitats and Critical Areas including shorelines, as well as significant trees per the definition below. The minimum 300 feet shall be a contiguous area that enters and exits the property.

Applicant's response:

The proposed project will maintain the entire potential biodiversity area and corridor onsite as all proposed development activities will be located outside of the identified FWHCA, except for the proposed wetland creation activities which will increase ecological functions within the FWHCA. No offsite priority habitats or critical areas were identified to connect to the FWHCA to create a 300-foot protected area. However, the entire western portion of the site containing the steep forested slopes will remain intact as no development is proposed on this portion of the site. As such, a much larger area beyond the identified FWHCA will remain post-development.

C. Retain exceptional trees and rare or uncommon plant species or habitat types as identified by the City or by state or federal agencies. Conifers and Madrone are considered exceptional trees.

Applicant's response:

No development is proposed on the west-central portion of the site containing the FWHCA; only wetland creation areas are proposed within the FWHCA contiguous with Wetland B. The degraded biodiversity area and corridor west of Stream Z contains Douglas fir (*Pseudotsuga menziesii*) and Pacific madrone (*Arbutus menziesii*) trees which will be fully retained and protected (outside of the wetland creation area) post-construction.

Analysis for Fish and Wildlife Conservation Areas impacts (Biodiversity Areas and Garry Oak):

The applicant has proposed no impacts to the identified Biodiversity Areas on site. The Biodiversity Area was identified through tree surveys, tree "stand" identification, and numerous site visits by the applicant's consultants and City Staff. Treed areas that exist within the wetland and stream buffers will be enhanced and restored through planting of native trees, shrubs and herbaceous material which will likely increase the extent of Biodiversity Areas on site. The future community type identified by the applicant at approximately 10 years include mature forested and scrub shrub areas. Preservation of Garry oaks and associated tree species will provide a mixed forest community ideal for common urban species to utilize. The creation of a forested wetland with tree hummocks will enhance the diversity of the Biodiversity Area and provide greater environmental benefits through restoration and long-term monitoring.

TMC 13.11.620 Flood Hazard Areas Standards.

All development proposals shall comply with Sections 2.12.040 through 2.12.050, Flood Hazard and Coastal High Hazard Areas, and Chapter 12.08 Surface Water Management Manual of the TMC for general and specific flood hazard protection. Development shall not reduce the base flood water storage ability. Construction, grading, or other regulated activities which would reduce the flood water storage ability must be mitigated by creating compensatory storage on- or off-site. Compensatory storage provided off-site for purposes of mitigating habitat shall comply with all applicable wetland, stream, and fish and wildlife habitat conservation area requirements. Compensatory storage provided off-site for purposes of providing flood water storage capacity shall be of similar elevation in the same floodplain as the development. Compensatory storage is not required in Coastal A and V Zone flood hazard areas or in flood hazard areas with a mapped floodway but containing no functional salmonid habitat on the site. For sites with functional connection to salmonid bearing waters that provide a fish accessible pathway during flooding, compensatory storage areas shall be graded and vegetated to allow fish refugia during flood events and their return to the main channel as floodwater recede without creating flood stranding risks. Base flood data and flood hazard notes shall be shown on the face of any recorded plat or site plan, including, but not limited to, base flood elevations, flood protection elevation, boundary of floodplain, and zero rise floodway.

Applicant's response:

The FEMA floodplain compensation areas will be located within the onsite stream and wetland buffer areas as necessary to meet the floodplain development requirements (no net rise). Areas within the onsite buffers will be graded to provide shallow depressions that will store occasional floodwaters and can accommodate up to the 100-year modeled flood event. Each shallow depression will have a low topographic point (outlet) that will allow the occasional floodwaters to recede. As such, the compensation areas will not hold water for long durations. Rather, the compensation areas will be replanted with primarily facultative (FAC) to facultative-wetland (FACW) native vegetation – species that can withstand short periods of inundation and would otherwise likely survive in drier conditions adjacent to the stream and provide terrestrial habitat and screening. The general upland buffer areas will be planted with FAC to facultative-upland (FACU) plant species more suitable to drier areas. As such, the restored buffer areas will function as standard buffers and occasionally as flood compensation areas.

Analysis for Flood Hazard Areas:

The associated floodplain areas will also be mitigated through compensatory storage areas

that empty into the wetlands and stream during periods of heavy inundation thereby improving the water transfer system within the critical areas.

Summary Recommendations:

The applicant has met the requirements for the Critical Area Development Permit. The legal test requirement was satisfied under the Public Interest Test and the No Practicable Alternatives Test and the applicant has provided an appropriate mitigation proposal that will include a larger, reestablished, protected wetland area in a historic wetland area currently highly degraded through deposition of fill, refuse, and the establishment of homeless encampments.

The applicant's proposal will result in the reestablishment and restoration of a historic wetland area that will not only replace the functions lost with the indirect impacts of Wetland A and Wetland B; it will add to the functional benefits of the Type Ns2 stream and downstream systems including Wetlands C and D and provide long-term highly functioning habitat for the existing Category II and Category III wetlands found on site as well as the proposed Category II created wetland that is proposed. The site conditions will be stabilized, flood waters will be controlled, critical areas will be restored and enhanced, and the 10-year mitigation monitoring will be conditioned to ensure that the created wetland area meets the three-parameter wetland criteria.

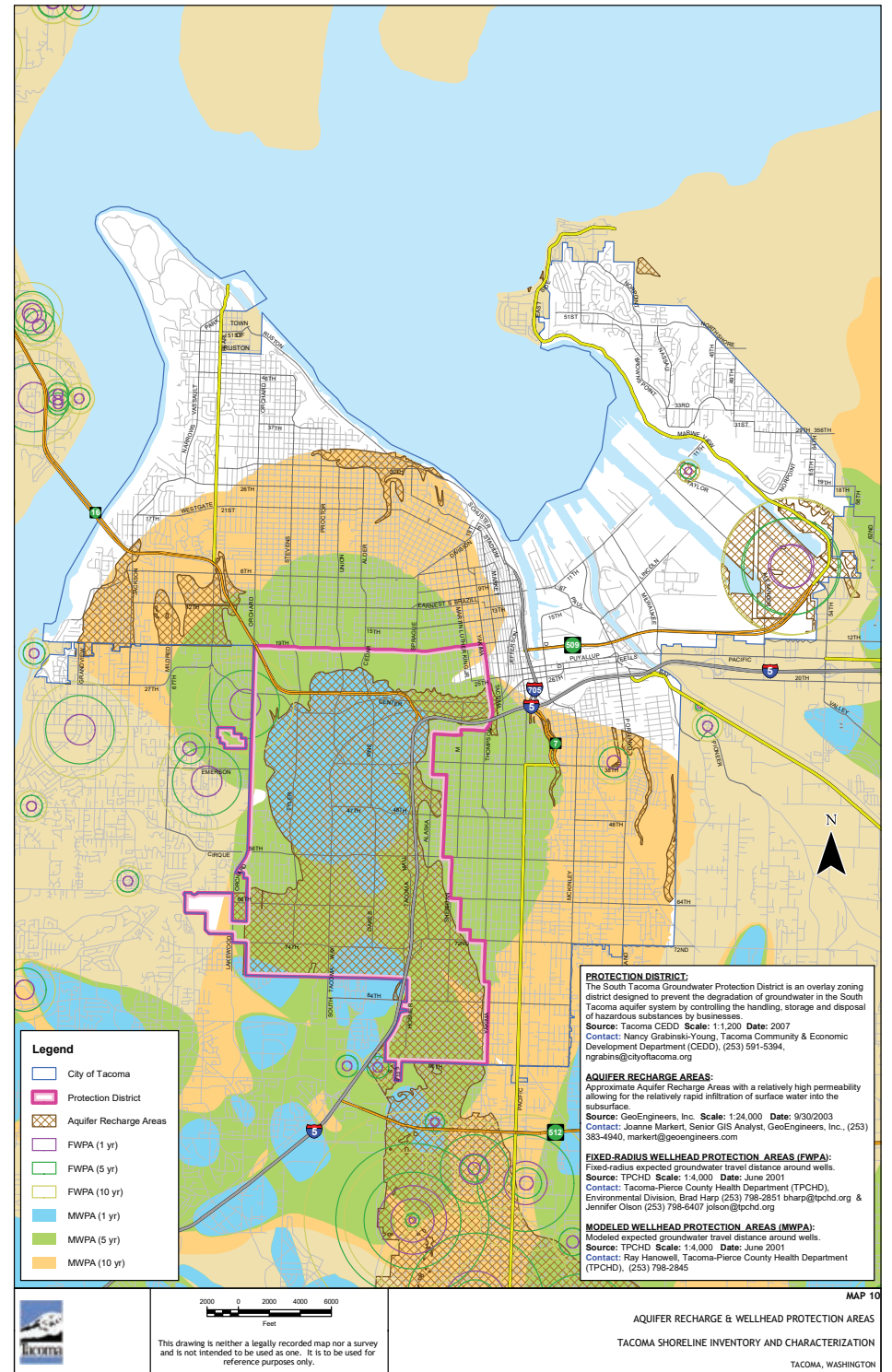
The following conditions are recommended if the application is approved:

Conditions

1. Notice on Title. The applicant must record Notice on Title per TMC Section 13.11.280 prior to the issuance of all development permits.
2. The applicant shall conduct mitigation, monitoring and maintenance in accordance with the approved, signed plan based upon the *Mitigation Plan, BNSF Tacoma, Revised November 2022*, prepared by Soundview Consultants and the *Tree Retention Plan, 8/5/2022*, prepared by Soundview Consultants with the changes/corrections highlighted by the City. A final plan incorporating the highlighted changes/corrections shall be provided to the City prior to issuance of any development permits.
3. Invasive species found within the wetlands and/or stream shall be removed to prevent downstream seed transfer.
4. The Garry Oaks along Madison Street will be retained and protected as provided in the updated Mitigation Plan. The one removed Garry Oaks shall be replaced at a 3:1 ratio, and any failure to preserve the Garry Oaks along Madison Street shall also be replaced at a 3:1 ratio. In addition, all invasive species within the wetlands must be removed and any barren areas restored to prevent transfer of seeds within the wetland/stream system downstream.
5. Sureties (Performance and Monitoring) shall be provided per TMC 13.11.290 prior to issuance of any development permits.
6. Plant Installation Requirements. The applicant shall inform the City SES when the plantings will be installed. The applicant shall have a qualified wetland specialist on site during the plant installation. The applicant shall provide to the City a Year 0, or an "as-built", of the vegetation on site following planting along with the associated fee.
7. Barricade and silt fencing-placement and removal-need construction sequencing. The

applicant shall provide a barricade fence along the perimeter of the wetlands and stream buffer following the removal of refuse, debris and grading and placement of soil amendments to protect the area from impacts during development of the remaining areas on site. The applicant shall erect silt fencing on the development side of the barricade fence along the barricade fence and inform the City SES and the City Building Inspector when the fence is erected in order to allow the City SES and the City Building Inspector to inspect silt fence prior to beginning site development work. The applicant shall ensure that once the development is complete and erosion control is no longer needed, the barricade and silt fence must be removed.

8. **Monitoring Period and Reporting.** The applicant shall provide vegetative maintenance and monitoring of the entire mitigation area for a period of 10 years and provide annual monitoring reports and associated review fees to the City of Tacoma Planning and Development Services Department during years 1, 2, 3, 5, 7 and 10 with the report due by October 1st each year.
9. **Monitoring of Reestablished Wetland.** The monitoring report for year 10 shall contain a wetland map and wetland delineation data sheets demonstrating that the newly created wetland area meets the three parameters of the wetland definition. If the newly created area does not meet the wetland definition, appropriate contingency actions and potentially additional mitigation must be taken to ensure final compliance with the proposed development and intended mitigation.
10. **Fencing and Signage.** Permanent fencing such as a split rail fence or approved walls or other fence design shall be constructed along the outside perimeter of the wetland and stream buffer and signage shall be attached to the fence to alert the public of the boundary limits of the Critical Area. The applicant shall use the approved sign template of the City of Tacoma and signs shall be placed approximately every 50 feet where large open areas border the wetland or stream.
11. A Conservation Easement shall be placed on the remaining critical areas including the wetlands, streams, Biodiversity Areas on the subject site prior to the issuance of any development permits.
12. The applicant shall provide a copy of permits required from the Washington Department of Fish and Wildlife Hydraulic Project Approval (HPA) and Army Corp of Engineers (ACE), or concurrence that a permit is not required, prior to issuance of any development permits.



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

IN THE MATTER OF AN) ADMINISTRATIVE ORDER
ADMINISTRATIVE ORDER) DOCKET # 21612
AGAINST) Construction Stormwater General Permit
Sierra Construction Company) WAR311285
Bridge Point Tacoma, LLC)

To: Sierra Construction Company Bridge Point Tacoma, LLC
Attention: Bryan Floetz Attention: Matt Gladney
14800 NE Woodinville Way 9525 Bryn Mawr Ave, Suite 700
Woodinville, WA 98072 Rosemont, IL 60018

On March 31, 2022, Sierra Construction Company and Bridge Point Tacoma, LLC (Applicants) applied to the Washington State Department of Ecology (Ecology) for coverage under the Construction Stormwater General Permit (CSWGP) to construct an industrial warehouse project in Tacoma, Washington (Project). On August 15, 2023, Ecology received the final outstanding item related to the CSWGP coverage application for the Project. On August 28, 2023, Ecology informed Applicants that it could not make a CSWGP coverage decision because a State Environmental Policy Act (SEPA) appeal had stayed the Mitigated Determination of Nonsignificance (MDNS) for the Project. On November 15, 2023, Ecology was informed that the SEPA appeal associated with the Project had been resolved and the Project's MDNS was effective.

Applicants propose to construct and operate an industrial warehouse facility in the South Tacoma neighborhood of Tacoma, Washington. The completed industrial warehouse facility would cover approximately 156 acres and consist of four buildings, freight loading docks, parking lots, private access roads, pedestrian walkways, landscaping, stormwater infrastructure, public sanitary sewer and water main extensions. The Project would be constructed in two phases (soil mitigation and site development/construction) and involves approximately 119 acres of soil disturbance. During full operation the Project will generate an estimated 4,980 new weekday daily vehicle trips, including 1,411 trips by heavy-duty diesel trucks. Eighty percent of these daily truck trips will travel through a residential area located between the Project site and SR 16.

The Project is located within and adjacent to the delisted Commencement Bay, South Tacoma Channel Superfund site (Toxics Cleanup Site ID 734 and 1640) and is contaminated with arsenic, lead, copper, PCBs, and cPAHs. On the Project site there are four wetlands, a stream that is a tributary to Flett Creek, and a Fish and Wildlife Conservation Area. There are a substantial number of residences within one-quarter mile of the Project site. The residential parcels nearest to the Project site are approximately 250 feet away from the Project site's northwest boundary. In addition, there are residences located along the primary and secondary truck routes to and from the Project site. The communities surrounding the Project are on the Climate Commitment Act list of overburdened communities for fine particles and cumulative criteria air pollution, and rank 10 (out of 10) for health disparities, diesel exhaust, and proximity to heavy traffic roadways on

the Washington Environmental Health Disparities Map. Accordingly, Ecology has determined that these communities face disproportionate impacts from air pollution.

The primary air pollutants from the Project will include dust emissions during construction and diesel particulate matter, nitrogen oxides, and greenhouse gases from vehicle traffic during construction and operation. To mitigate the Project's air, climate, and traffic impacts below levels of significance, the City of Tacoma required construction equipment engines meet Tier 4 standards for fuel efficiency and emissions, best management practices for fugitive dust emissions, signage and tenant agreements implementing a no-idling policy for all vehicles on site, compliance with the Project site's Soil Management Plan, new streets/access roads, new sidewalks, new traffic signals, intersection modifications, and monitoring.

I. AUTHORITIES

In exercising its authority under 33 U.S.C. § 1318, RCW 90.48.120(2), and RCW 43.21C.060, Ecology has examined Applicants' application for coverage under the CSWGP pursuant to the following:

1. Conformance with 33 U.S.C. § 1251 et seq. and Chapter 90.48 RCW.
2. Conformance with the state water quality standards contained in Chapter 173-200 WAC and Chapter 173-201A WAC.
3. Conformance with the CSWGP.
4. Conformance with applicable SEPA policies under RCW 43.21C.060 and WAC 173-802-110.

Pursuant to the foregoing authorities and in accordance with 33 U.S.C. § 1318, RCW 90.48.120(2), RCW 43.21C.060, Chapter 173-200 WAC, Chapter 173-201A WAC, WAC 197-11-660, and WAC 173-802-110, as more fully explained below, Ecology is granting with conditions Applicants' request for coverage under the CSWGP.

II. CONDITIONS OF APPROVAL

a. Water Quality

Section S2.A.1.e of the CSWGP requires applicants to notify Ecology if they are aware of contaminated soils and/or groundwater at their project sites. To enable Ecology to cover contaminated construction sites under the CSWGP while preventing discharges that may cause violations of any water quality standard, CSWGP Condition G12 allows Ecology to include in a companion administrative order additional requirements for known constituents of concern.

Applicants notified Ecology that the Project site contains contaminated groundwater and contaminated soil that has the potential to discharge in stormwater and dewatering water to Flett Creek due to the proposed construction activity. The CSWGP does not have water quality sampling or benchmarks for Arsenic, Lead, Copper, PCBs, and cPAHs (See Table 1 below);

however, the permit requires compliance with the Water Quality Standards for Surface Water of the State of Washington (173-201A WAC), Groundwater Quality Standards (173-200 WAC), sediment management standards (WAC 173-204), and human-health based criteria in the Federal water quality criteria applicable to Washington (40 CFR Part 131.45).

Ecology is establishing indicator levels for the Project site. Indicator levels express a pollutant concentration used as a threshold, below which a pollutant is considered unlikely to cause a water quality violation and above which it may. Indicator levels in this Order were derived from the Acute Freshwater Aquatic Life Criteria and the method's minimum quantitation level. Groundwater Benchmarks were derived from the Industrial Stormwater General Permit because there are no groundwater benchmark standards for construction related projects.

For these reasons, and in accordance with RCW 90.48.120(2), it is ordered that to remain in compliance with Construction Stormwater General Permit WAR311285 Applicants must take the actions listed below at the location known as the Bridge Industrial site, East side of South Taylor Street between South 36th Street and South 56th Street, Tacoma WA 98409.

1. Follow Barghausen Engineering Construction Stormwater Pollution Prevention Plan Report (21633-R-SWPPP-2022-03-28.pdf).
2. Phase 1 (soil mitigation) shall include stripping of approximately the top one foot of potentially contaminated soil and placing the removed soil in the locations specified for buildings A or B as identified in the TRC Environmental Corporation Soil Management Plan for Property Development.
3. Temporary Erosion and Sediment Control Best Management Practices (BMPs) shall be installed before land disturbance activities begin.
4. On site stormwater runoff during Phase 1 shall initially flow over land, via constructed temporary channels and V ditches, to the on-site temporary infiltration basins as identified in TRC Soil Management Plan for Property Development.
5. The temporary infiltration basins consist of a lined settling forebay that discharges into an oversized infiltration basin. The infiltration basins shall be sized to have enough capacity to hold all potentially contaminated dewatering water or stormwater.
6. Install a water sampling station between the settling forebay and the infiltration basin to monitor for the groundwater benchmarks listed in Table 1. Conduct Groundwater Benchmark sampling monthly. Ecology reserves the right to request additional sampling.
7. Submit monitoring results to the Contaminated Construction Stormwater Inspector, Evan Wood, at evan.wood@ecy.wa.gov, within 24 hours of receipt by Applicant(s) or any other responsible party.
8. Sampling for contaminants found in Table 1 must be reported on the required Discharge Monitoring Report (DMR) according to Permit conditions (S5.B Discharge Monitoring Reports).
9. If Groundwater Benchmarks are exceeded, Applicant(s) shall implement and maintain appropriate source control and/or treatment BMPs within 10 days of the date of the benchmark exceedance. If installation of necessary treatment BMPs is not feasible within 10 days, Ecology may approve additional time if Applicant(s) requests an extension within the initial 10-day response period.
10. During Phase 1, all stormwater shall be infiltrated and there shall be no discharge to Flett Creek or any other surface waters of the State. Any surface water discharge must be immediately reported to Ecology (ERTS (360) 407-6300) and Applicants must cease the discharge immediately.
11. Applicants shall install additional storage capacity using Baker Tanks, or equivalent, if needed to prevent discharge to surface water during Phase 1.
12. Phase 2 (site development/construction) shall include grading and development of the planned industrial warehouses, parking areas, and infrastructure. Phase 2 shall include treatment of potentially contaminated construction stormwater and dewatering water with discharge to Flett Creek.
13. Capture, contain, and treat all potentially contaminated dewatering water or contaminated stormwater prior to discharge to Flett Creek during Phase 2.
14. Install all pre-treatment and treatment systems prior to any discharge of dewatering water or potentially contaminated construction stormwater to Flett Creek during Phase 2. Treatment systems shall include, but are not limited to, Temporary Erosion Sediment and Control ponds with a silt fence baffle, sediment riser outlet and Chitosan Filtration System. Applicants shall provide the locations, connection systems, specifications, and discharge points of all treatment systems to Ecology for review and approval before they are installed.
15. The treatment system must have enough capacity to hold the treated dewatering water or stormwater until it has been tested to determine if any of the indicator levels listed in Table 2 have been exceeded. No dewatering water or stormwater may be discharged before it has been tested for the parameters listed in Table 2. If any of the indicator levels listed in Table 2 are exceeded, Applicants must stop the discharge of treated dewatering water or contaminated stormwater to the Flett Creek, until it has been retested to determine that all parameters are equal to or below the indicator levels in Table 2. If any of the indicator levels are exceeded after being retested, Applicants shall install an additional treatment system. Additional treatment systems must be approved by Ecology before use.
16. Once the effectiveness of the treatment system has been determined, Applicants may revert to a flow-through treatment system after the minimum three sampling and testing events and upon written approval from Ecology. The flow-through treatment system design must be submitted to Ecology for review prior to use.

17. If a flow-through treatment system is adopted, all contaminated dewatering water or contaminated stormwater must be sampled weekly while discharging and tested for the parameters listed in Table 2. If a flow-through system is utilized, the lab samples shall be the fastest method to determine compliance.
18. When using a flow-through treatment system, if any of the indicator levels listed in Table 2 are exceeded, Applicants must stop the discharge of treated dewatering water or stormwater to the Flett Creek until it has been retested to determine that all parameters are equal to or below the indicator levels in Table 2. If any of the indicator levels are exceeded after being retested, Applicants shall modify the existing flowthrough treatment system to increase its effectiveness or install an Ecology approved- treatment system or truck the contaminated stormwater or groundwater off-site for disposal in an approved manner.
19. Sampling for contaminants found in Table 2 must be reported on the required DMR according to Permit conditions (S5.B Discharge Monitoring Reports).
20. If sampling is conducted more frequently than required by this Order, the results of this monitoring must be included in the calculation and reporting of the data that is submitted in the DMRs.
21. Any discharge to waters of the state above the indicator levels for contaminants found in Table 2 must be immediately reported to Ecology (ERTS (360) 407-6300). Cease the discharge until Indicator Levels can be met.
22. All captured sediment from the treatment of the dewatering water or contaminated stormwater shall be transported to the locations specified for buildings A or B or be transported to an approved disposal facility based on the level of contamination.
23. When it is not feasible to immediately haul contaminated soils offsite or to the building A or B locations, the soils shall be placed in a covered area to minimize contact with stormwater.
24. All monitoring data shall be prepared by a laboratory registered or accredited under the provisions of, Accreditation of Environmental Laboratories, Chapter 137-50 WAC. Final lab reports shall state the units provided in Table 1 and Table 2. Final lab reports shall be submitted to the Ecology Contaminated Construction Stormwater Inspector, Evan Wood, at evan.wood@ecy.wa.gov, within 24 hours of receipt by Applicant(s) or any other responsible party.
25. All sampling data shall be reported monthly on DMRs electronically using Ecology's secure online system WQWebDMR, in accordance to permit condition S5.B. If the measured concentration is below the detection level, Applicants shall report single analytical values below detection as "less than the detection level (DL)" by entering "<"

followed by the numeric value of the detection level (e.g., "<0.1"). All other values above DL must be reported as the numeric value.

26. Noncompliance with permit requirements or the provisions of this Order shall be immediately reported to the Southwest Regional Office of the Department of Ecology in accordance with Permit Condition S5.F, Noncompliance Notification.

Table 1. Bridge Industrial Infiltration Basin Monitoring

Sierra Construction Company must use the specified analytical methods and benchmarks in the following table for monitoring unless the method used produces measurable results in the sample and The Environmental Protection Agency (EPA) has listed it as an EPA-approved method in 40 CFR Part 136. If the Sierra Construction Company uses an alternative method, not specified in the order and as allowed above, it shall be approved by Ecology prior to the use of the alternate methodology.

Pollutant & CAS No. (if available)	Sampling Frequency	Sample Type	Required Analytical Protocol	Groundwater Benchmark Level, µg/L
POLYCHLORINATED BIPHENYLS (PCBs)				
Total PCBs*	Monthly	Grab	EPA Method 8082A	Report Only
CARCINOGENIC POLYCYCLIC AROMATIC HYDROCARBONS (CPAH)				
Benzo(a)anthracene (56-55-3)	Monthly	Grab	EPA Method 8270E	Report Only
Benzo(b)fluoranthene (205-99-2)	Monthly	Grab	EPA Method 8270E	Report Only
Benzo(k)fluoranthene (207-08-9)	Monthly	Grab	EPA Method 8270E	Report Only
Benzo(a)pyrene (50-32-8)	Monthly	Grab	EPA Method 8270E	Report Only
Chrysene (218-01-9)	Monthly	Grab	EPA Method 8270E	Report Only
Dibenz(a-h)anthracene (53-70-3)	Monthly	Grab	EPA Method 8270E	Report Only
Indeno(1,2,3-cd)pyrene (193-39-5)	Monthly	Grab	EPA Method 8270E	Report Only
METALS				
Arsenic, Dissolved (7440-38-2)	Monthly	Grab	200.8	150
Copper, Total (7440-50-8)	Monthly	Grab	200.8	14
Lead, Total (7439-92-1)	Monthly	Grab	200.8	64.6

NONCONVENTIONAL POLLUTANTS				
Diesel and Oil-Range Hydrocarbons (NWTPH-Dx)*	Monthly	Grab	Ecology NWTPH Dx	10 mg/L
Gasoline-Range Hydrocarbons (NWTPH-Gx)*	Monthly	Grab	Ecology NWTPH-Gx	10 mg/L
Construction Stormwater General Permit Benchmarks				
Parameter	Sampling Frequency	Sample Type	Benchmark	Analytical Method
Turbidity	Monthly	Grab	25-250 NTU	SM2130 ^d
pH	Monthly	Grab	6.5 - 8.5 SU	SM4500-H ⁺ B
<p>a) Total PCBs are the sum of all congeners or all isomer or homolog or Aroclor analyses.</p> <p>b) NWTPH-Dx = Northwest Total Petroleum Hydrocarbons - Semi-volatile ("diesel") for diesel range organics and heavy oils (includes jet fuels, kerosene, diesel-oils, hydraulic fluids, mineral oils, lubricating oils, and fuel oils). The detection level and quantification levels for this pollutant is representative of the sum of its components.</p> <p>c) NWTPH-Gx = Northwest Total Petroleum Hydrocarbons - Volatile petroleum products (includes aviation and automotive gasolines, mineral spirits, Stoddard solvent and naphtha). The detection level and quantification levels for this pollutant is representative of the sum of its components.</p> <p>d) Or equivalent.</p>				

Table 2. Bridge Industrial Surface Water Monitoring

Sierra Construction Company must use the specified analytical methods, detection limits (DLs) and quantitation levels (QLs) in the following table for monitoring unless the method used produces measurable results in the sample and EPA has listed it as an EPA-approved method in 40 CFR Part 136. If the Sierra Construction Company uses an alternative method, not specified in the order and as allowed above, it shall be approved by Ecology prior to the use of the alternate methodology.

Pollutant & CAS No. (if available)	Sampling Frequency	Sample Type	Indicator Level, µg/L	Required Analytical Protocol	Detection Level, µg/L	Quantitation Level, µg/L
POLYCHLORINATED BIPHENYLS (PCBs)						
Total PCBs ^a	Batch/ Weekly ^a	Grab	2.0 ¹	EPA Method 8082A	0.065	0.195
CARCINOGENIC POLYCYCLIC AROMATIC HYDROCARBONS (CPAH)						
Benzo(a)anthracene (56-55-3)	Batch/ Weekly ^a	Grab	23.4 ^a	EPA Method 8270E	7.8	23.4
Benzo(b)fluoranthene (205-99-2)	Batch/ Weekly ^a	Grab	14.4 ^a	EPA Method 8270E	4.8	14.4
Benzo(k)fluoranthene (207-08-9)	Batch/ Weekly ^a	Grab	7.5 ^a	EPA Method 8270E	2.5	7.5
Benzo(a)pyrene (50-32-8)	Batch/ Weekly ^a	Grab	7.5 ^a	EPA Method 8270E	2.5	7.5
Chrysene (218-01-9)	Batch/ Weekly ^a	Grab	7.5 ^a	EPA Method 8270E	2.5	7.5

Dibenzof(a,h)anthracene (53-70-3)	Batch/ Weekly ^a	Grab	7.5 ^a	EPA Method 8270E	2.5	7.5
Indeno(1,2,3-cd)Pyrene (193-39-5)	Batch/ Weekly ^a	Grab	11.1 ^a	EPA Method 8270E	3.7	11.1
METALS						
Arsenic, Dissolved (7440-38-2)	Batch/ Weekly ^a	Grab	360 ^b	200.8	0.1	0.5
Copper, Total (7440-50-8)	Batch/ Weekly ^a	Grab	6.5 ^b	200.8	0.4	2.0
Lead, Total (7439-92-1)	Batch/ Weekly ^a	Grab	20.9 ^b	200.8	0.1	0.5
NONCONVENTIONAL POLLUTANTS						
Diesel and Oil-Range Hydrocarbons (NWTPH-Dx) ^c	Batch/ Weekly ^a	Grab	250 ^a	Ecology NWTPH Dx	250	250
Gasoline-Range Hydrocarbons (NWTPH-Gx) ^d	Batch/ Weekly ^a	Grab	250 ^a	Ecology NWTPH-Gx	250	250

Construction Stormwater General Permit Benchmarks			
Parameter	Frequency	Benchmark	Analytical Method
Turbidity	Weekly	25-250 NTU	SM42130*
	Weekly	6.5 - 8.5 SU	SM4500-H* B
Flow-Through Turbidity ¹	Continuous	25-250 NTU	SM42130*
	Continuous	6.5 - 8.5 SU	SM4500-H* B
Flow-Through pH ¹	Continuous	6.5 - 8.5 SU	SM4500-H* B
<p>a. No surface water standard, value is laboratory quantitation level.</p> <p>b. Acute – Freshwater Toxic Substances Criteria (WAC 173-201A-240) based on hardness of 36.0 mg/L for hardness dependent metals. The indicator level for hardness dependent metals is expressed as a dissolved metal value. At or below the indicator level using analytical protocol for total or dissolved metal values meets the water quality standard.</p> <p>c. NWTPH-Dx = Northwest Total Petroleum Hydrocarbons – Semi-volatile (“diesel”) for diesel range organics and heavy oils (includes jet fuels, kerosene, diesel-oils, hydraulic fluids, mineral oils, lubricating oils, and fuel oils). The detection level and quantitation levels for this pollutant is representative of the sum of its components.</p> <p>d. NWTPH-Gx = Northwest Total Petroleum Hydrocarbons – Volatile petroleum products (includes aviation and automotive gasoline, mineral spirits, Stoddard solvent and naphtha). The detection level and quantitation levels for this pollutant is representative of the sum of its components.</p> <p>e. Or equivalent.</p> <p>f. Report the average turbidity for each day a discharge occurs while the system is in operation.</p> <p>g. Report the daily minimum and maximum pH for each day a discharge occurs while the system is in operation.</p> <p>h. If permission granted for flow-through, sampling will be weekly.</p> <p>i. Total PCBs are the sum of all congeners or all isomer or homolog or Aroclor analyses.</p>			

b. Air Quality

The MDNS issued by the City of Tacoma and attachments and exhibits thereto clearly identify adverse environmental and human health impacts that would result from the construction and operation of the Project. These documents show that vehicle traffic generated by the Project will cause increased emissions of several harmful air pollutants including diesel particulate matter, nitrogen oxides, and greenhouse gases, primarily from heavy-duty diesel trucks traveling to, on, and from the Project site.

The Air Quality Study for the Project concluded that operational phase onsite emissions of toxic air pollutants from the Project are not expected to produce an unacceptable human health risk to the surrounding community because ambient impacts did not exceed the acceptable source impact levels (ASILs). However, the study also found that diesel particulate matter and nitrogen dioxide emitted by heavy-duty diesel trucks as they travel to, from, and on the Project site will exceed both de minimis and small quantity emission rate (SQER) thresholds and pose a threat to the environment and public health. The study revealed the greatest adverse impacts from onsite emissions of these two toxic air pollutants are expected to be felt by the residential communities closest to the onsite trucks emitting them. While the study did not identify what nearby areas would experience the greatest impacts from diesel particulate matter and nitrogen oxides emitted from trucks traveling to and from the Project site, it did disclose that these emissions are approximately 500 times higher than the Project's onsite diesel particulate matter emissions and 10 times higher than the Project's onsite nitrogen oxides emissions and would adversely impact the greater community surrounding the Project site. Ecology expects that the residential parcels that will experience the greatest adverse air quality and health impacts from the increased offsite diesel particulate matter and nitrogen oxides emissions attributable to the Project will be those adjacent to the primary and secondary truck routes to and from the Project site, especially the route through which 80% of Project-related truck traffic (565 round trips daily) will travel.¹

Local, state, and federal requirements and enforcement are insufficient to mitigate the adverse air quality and human health impacts attributable to the Project. The Project is located within the jurisdictional boundaries of the Puget Sound Clean Air Agency, but this project does not require a permit under the Washington Clean Air Act; therefore, there is no air permitting pathway to sufficient mitigation of the impacts associated with increased emissions of diesel particulate matter and nitrogen oxides. As described in the MDNS, Applicants have agreed or will be required to use construction equipment with engines that meet Tier 4 fuel efficiency and emissions standards, control fugitive dust emissions, curb on-site vehicle idling, make various traffic-related improvements, and conduct monitoring to bring environmental and human health impacts below SEPA levels of significance. However, these measures will not eliminate the hundreds of heavy-duty diesel truck trips through residential areas or vehicle delays (queuing/idling) at stop lights surrounding the Project site that will result in increased emissions

¹ Based on an analysis of tax parcel data, there are approximately 32, 68, and 117 residential parcels within 100, 200, and 300 meters respectively along the S Union Avenue south of SR 16 route segment. Residential parcels are those identified with a land use code of 11 through 19. Other sensitive land uses include Oakland High School located approximately 200 meters from this route.

of diesel particulate matter and nitrogen oxides and associated adverse environmental and health impacts.

Therefore, to further mitigate the impacts of increased diesel particulate matter and nitrogen oxides emissions generated by the Project, Ecology is requiring as conditions of approval that:

1. Any and all Project-related heavy-duty trucks that travel to or from the Project site follow routes designed to minimize impacts to residences within the South and East Tacoma communities caused by diesel particulate matter and nitrogen oxides emissions.
2. Applicants make any and all necessary traffic-related improvements to minimize vehicle delays (queuing/idling) if the traffic volume, location, or number of heavy-duty truck routes changes as a result of designing truck routes to minimize diesel emissions in residential areas.
3. Within five years of the start of the operational phase of the Project, all Project-related heavy duty diesel trucks that travel to, on, or from the Project site be model year 2007 or later. Heavy duty diesel trucks from these model years have significantly lower particulate matter emission rates than pre-2007 heavy duty diesel trucks. Heavy duty diesel trucks from model years 2010 and later have significantly lower nitrogen oxides emission rates than pre-2010 heavy duty diesel trucks.
4. Applicants install infrastructure, including but not limited to charging stations, at the Project site for future use by electrified heavy-duty trucks, which would substantially reduce diesel emissions as well as greenhouse gas emissions resulting from the Project when they become commercially available.

These conditions of approval are designed to address the adverse impacts caused by the Project and are based on the following substantive SEPA policies in WAC 173-802-110:

- Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
- Assure for all people of Washington safe, healthful, productive, and aesthetically and culturally pleasing surroundings;
- Attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences;
- Achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities; and
- Each person has a fundamental and inalienable right to a healthful environment.

Applicants shall submit to Ecology for review and approval plans and/or proposed actions related to the foregoing conditions of approval before implementation and within 180 days of the

date of the receipt of this Order. Any such approval following Ecology's review of Applicants' plans and/or proposed actions shall be in writing.

Applicants may petition Ecology to waive one or more of the foregoing conditions of approval by completing and submitting a study and/or modeling regarding the sufficiency of a subset of these conditions of approval to completely mitigate the incremental adverse air quality and human health impacts attributable to the Project. Any such waiver following Ecology's review of Applicants' study and/or modeling shall be in writing.

III. EFFECT; TRANSFER; MODIFICATIONS; FAILURE TO COMPLY

This Order does not exempt Applicants from any Construction Stormwater General Permit requirement. The Order remains in effect during construction and operation of the Project or until written notice from Ecology that the conditions no longer apply. In the event of a permit transfer to another Permittee during construction, or in conjunction with future permit requirements triggered by facility operations, compliance with this Order and the actions listed above are required. Applicants shall notify Ecology of any change in Project site owner or operator as soon as possible, and no later than within 30 days of such change. Ecology retains the right to make modifications to this Order through supplemental Order, or amendment to this Order, if it appears necessary to further protect the public interest. Failure to comply with this Order may result in the issuance of civil penalties or other actions, whether administrative or judicial, to enforce the terms of this Order.

IV. YOUR RIGHT TO APPEAL

You have a right to appeal this Order to the Pollution Control Hearings Board (PCHB) within 30 days of the date of receipt of this Order. The appeal process is governed by Chapter 43.21B RCW and Chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal you must do all of the following within 30 days of the date of receipt of this Order:

File your notice of appeal and a copy of this Order with the PCHB (see filing information below). "Filing" means actual receipt by the PCHB during regular business hours as defined in WAC 371-08-305 and -335. "Notice of Appeal" is defined in WAC 371-08-340. Serve a copy of your notice of appeal and this Order on the Department of Ecology by mail, in person, or by email. (See addresses below.)

You must also comply with other applicable requirements in Chapter 43.21B RCW and Chapter 371-08 WAC. Your appeal alone will not stay the effectiveness of this Order. Stay requests must be submitted in accordance with RCW 43.21B.320.

Filing with the PCHB

For the most current information regarding filing with the PCHB, visit: <https://chubo.wa.gov/> or call: 360-664-9160.

Service on Ecology

Street Address:
 Department of Ecology
 Attn: Appeals Processing Desk
 300 Desmond Drive SE
 Lacey, WA 98503

E-Mail Address:
 Ecologyappeals@ecy.wa.gov

Mailing Address:
 Department of Ecology
 Attn: Appeals Processing Desk
 PO Box 47608
 Olympia, WA 98504-7608

V. CONTACT INFORMATION

Please direct all questions about this Order to:

Evan Wood
 Southwest Region Office
 Water Quality Program
 Department of Ecology
 300 Desmond Drive SE
 Lacey, WA 98503

Phone: (360) 706-4599
 Email: evan.wood@ecy.wa.gov

Or

Rich Doenges
 Southwest Region Office
 Department of Ecology
 300 Desmond Drive SE
 Lacey, WA 98503

Phone: (360) 407-6307
 Email: rich.doenges@ecy.wa.gov

VI. MORE INFORMATION

- **Pollution Control Hearings Board Website**
<http://www.eluho.wa.gov/Board/PCHB>

- **Chapter 43.21B RCW - Environmental and Land Use Hearings Office – Pollution Control Hearings Board**
<http://app.leg.wa.gov/RCW/default.aspx?cite=43.21B>
- **Chapter 371-08 WAC – Practice And Procedure**
<http://app.leg.wa.gov/WAC/default.aspx?cite=371-08>
- **Chapter 34.05 RCW – Administrative Procedure Act**
<http://app.leg.wa.gov/RCW/default.aspx?cite=34.05>
- **Ecology's Laws, rules, & rulemaking website**
<https://ecology.wa.gov/About-us/How-we-operate/Laws-rules-rulemaking>

VII. SIGNATURE


 Rich Doenges
 Southwest Region Director

12/19/23
 Date



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
 PO Box 47600, Olympia, WA 98504-7600 • 360-407-6000

December 19, 2023

Bryan Ploetz
 Sierra Construction Company
 14800 NE North Woodinville Way
 Woodinville, WA 98072

RE: Coverage under the Construction Stormwater General Permit (CSWGP)

Permit number: WAR311285
Site Name: Bridge Industrial
Location: East side of S Taylor St between S 36th St and S 56th St
 Tacoma, WA County: Pierce
Disturbed Acres: 119.4

Dear Bryan Ploetz:

The Washington State Department of Ecology (Ecology) received your Notice of Intent for coverage under Ecology's Construction Stormwater General Permit (CSWGP). This is your permit coverage letter. Your permit coverage is effective December 19, 2023.

Retain this letter as an official record of permit coverage for your site. You may keep your records in electronic format if you can easily access them from your construction site. You can get the CSWGP, permit forms, and other information at Ecology's [CSWGP eCoverage Packet webpage](#)¹. Contact your Permit Administrator, listed below, if you want a copy of the CSWGP mailed to you. Please read the permit and contact Ecology if you have any questions.

Additional Monitoring

Please refer to the attached Administrative Order, number 21612, for additional monitoring requirements.

Electronic Discharge Monitoring Reports (WQWebDMR)

This permit requires you to submit monthly discharge monitoring reports (DMRs) for the full duration of permit coverage (from first full month of coverage to termination). Your first sampling and reporting period will be for the month of **January** and your first DMR must be submitted by **February 15, 2024**. You must submit DMRs electronically using Ecology's secure online system, WQWebDMR. To sign up for WQWebDMR go to Ecology's

¹ <http://www.ecology.wa.gov/eCoverage-packet>

Bryan Ploetz
 December 19, 2023
 Page 2

[WQWebPortal guidance webpage](#)². If you have questions, contact the portal staff at (360) 407-7097 (Olympia area), or (800) 633-6193/option 3, or email WQWebPortal@ecy.wa.gov.

Appeal Process

You have a right to appeal coverage under the general permit to the Pollution Control Hearing Board (PCHB). Appeals must be filed within 30 days of the date of receipt of this letter. Any appeal is limited to the general permit's applicability or non-applicability to a specific discharger. The appeal process is governed by chapter 43.21B RCW and chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2). For more information regarding your right to appeal, please reference Ecology's Focus Sheet: [Appeal of General Permit Coverage](#)³.

Annual Permit Fees

RCW 90.48.465 requires Ecology to recover the costs of managing the permit program. Permit fees are invoiced annually until the permit is terminated. Termination conditions are described in the permit. For permit fee related questions, please contact the Water Quality Fee Unit at wqfeeunit@ecy.wa.gov or (800) 633-6193, Option 2. You can also visit [Water Quality Permit Fees Webpage](#)⁴ for more information.

Ecology Field Inspector Assistance

If you have questions regarding stormwater management at your construction site, please contact your Regional Inspector, Evan Wood of Ecology's Southwest Regional Office in Lacey at evan.wood@ecy.wa.gov, or (360) 706-4599.

Questions or Additional Information

Ecology is here to help. Please review our [Construction Stormwater General Permit webpage](#)⁵ for more information. If you have questions about the Construction Stormwater General Permit, please contact your Permit Administrator, Melinda Wilson at melinda.wilson@ecy.wa.gov or (360) 870-8290.

Sincerely,

Jeff Killelea, Manager
 Permit and Technical Services Section
 Water Quality Program

² <https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Water-quality-permits-guidance/WQWebPortal-guidance>

³ <https://apps.ecology.wa.gov/publications/summarypages/1710007.html>

⁴ <https://ecology.wa.gov/Water-Shorelines/Water-quality/Water-quality-permits/Fees>

⁵ www.ecology.wa.gov/constructionstormwaterpermit

RESPONSE TO PUBLIC COMMENTS

On the Construction Stormwater General Permit Notice of Intent for the Bridge Industrial Project in Tacoma, WA

The Washington State Department of Ecology (Ecology) received public comments on the Notice of Intent (NOI) for coverage under the Construction Stormwater General Permit (CSWGP) that was submitted on March 31, 2022. As part of the NOI process, applicants are required to post public notices to a newspaper with general circulation within the geographical area of the proposed discharge. Following the second public notice, a 30-day public comment period begins. Public comments were submitted by a range of stakeholders and interested parties during the public comment period from April 9, 2022 until May 8, 2022. We also received a few comments following the close of the formal comment period and have included response to all comments received in this summary document.

*Copies of all public comment letters and emails are uploaded and can be viewed in our public [PARIS database](#)¹.

ADA ACCESSIBILITY

The Department of Ecology is committed to providing people with disabilities access to information and services by meeting or exceeding the requirements of the Americans with Disabilities Act (ADA), Section 504 and 508 of the Rehabilitation Act, and Washington State Policy #188.

To request ADA Accommodation, contact Water Quality Reception at 360-407-6600. For Washington Relay Service or TTY call 711 or 877-833-6341. Visit [Ecology's ADA Accessibility web page](#)² for more information.

For document translation services, call Water Quality Reception at 360-407-6600.

Por publicaciones en español, por favor llame Water Quality Reception al 360-407-6600.

PURPOSE OF THE CSWGP

The CSWGP authorizes construction stormwater (and authorized non-stormwater) discharges to waters of the state, only if those discharges comply with permit conditions. The permit is triggered by a potential to discharge stormwater from construction activity to a receiving surface water; however, once under coverage, all discharges (including to ground) are required to meet permit conditions.

Section S2.A.1.e of the CSWGP requires applicants to notify Ecology if they are aware of contaminated soils and/or groundwater at their project sites. Construction site owners and operators at locations with known contamination may be issued an Administrative Order (AO), as a companion to their permit coverage, which requires additional monitoring for known constituents of concern, in order to prevent discharges that may cause violations of any water quality standard. Permit Condition G12 (Additional Monitoring) is based on Section 308 of the Clean Water Act and 40 CFR 122.41(h), and allows Ecology to cover contaminated construction sites under the general permit. Discharges must comply with Chapter 173-201A WAC (Surface Water Quality Standards), Chapter 173-200 WAC (Ground Water Quality Standards), Chapter 173-204 WAC (Sediment Management Standards), and the federal water quality criteria applicable to Washington (40 CFR Part 131.45).

Ecology's Permit Decision for the Bridge Industrial Project

The construction operator for this project submitted a complete application for coverage under the CSWGP. Based on the information provided to Ecology, this project meets the conditions for coverage. Ecology determined that the permit conditions, in conjunction with an AO requiring additional treatment and monitoring, are sufficient to protect water quality and, if properly implemented, will enable the permittee to comply with state water quality standards.

To help mitigate adverse environmental impacts identified in the project's SEPA documents related to increased truck traffic, Ecology is exercising substantive SEPA authority to further condition the project via the AO. You can view the AO and other coverage information for this project in our PARIS database (link provided above).

Ecology granted permit coverage to this project, effective December 19, 2023. It should be noted that this permit is not an authorization for construction activity to occur, and all other local, state, and federal permits and authorizations must be in place for the activity to proceed.

¹ <https://apps.ecology.wa.gov/paris/FacilitySummary.aspx?FacilityId=94800>

² <https://ecology.wa.gov/About-us/Accessibility-equity/Accessibility>

COMMENTS WERE RECEIVED FROM THE FOLLOWING:

Nancy Bickford	Stephen E Van Holde
Ann Brock	Sally Perkins
William (Kit) Burns	Lester C Pogue Jr (Black Collective)
Barbara Church (Conversation 253)	Nori (April) Retherford
Erin Dilworth (Communities for a Healthy Bay)	Georgette Reuter
Desiree Douglass (Douglass Consulting)	Jim Reuter
Annie Downey	Hillary Ryan (Ryan Communications)
Dr. Barak Gale (Olympia Host Lions Club-Thurston County)	Anneliese Simons
Doug Holmes	Timothy Smith
Patricia Holmes	Heidi Stephens
Samantha Hughes-Lutge	Daniel Villa
Indivisible Tacoma (Ellen Floyd and Julie Andrzejewski)	Amy Weller (Puget Sound Fly Fishers Club)
Michael Johnson	Caroline Swinehart
Dr. Michelle S Mood	Kirk Kirkland (Tacoma Audubon Society)
	Kurt Niedermeier (Neidermeier Design)
	350 Tacoma – commenting for 453 people who signed a petition on Action Network

Comments unrelated to water quality

Ecology received comments unrelated to potential impacts to water quality. These comments included concerns related to air quality, the South Tacoma Groundwater Protection District's authority, and the economic green impact zone. There were also several concerns identified related to the State Environmental Policy Act (SEPA process). These concerns include increased noise, impacts to critical areas, greenspace etc. and the potential for a full Environmental Impact Statement (EIS). The SEPA lead for this project is the City of Tacoma; however, Ecology is exercising substantive SEPA authority to condition the project to further mitigate adverse air quality impacts from increased truck traffic attributable to the project.

Comment summaries and Ecology's responses (organized by topic)

Ecology has assembled summaries and excerpts from the relevant comments received into this document and organized them by topic. Each topic or category includes a summary of the comments received, a list of commenters that expressed the concern, and a written response from Ecology. Numerous commenters provided introductory statements and general comments along with more detailed questions and comments on specific permit conditions. These statements and comments provided important perspective and context that ultimately helped Ecology decide about issuing coverage under the CSWGP.

STATE ENVIRONMENTAL POLICY ACT (SEPA) CONCERNS

The Department of Ecology will not issue coverage without a final SEPA decision.

Summary of Public Comments Received:

CSWGP coverage should not be issued prior to the SEPA decision made by the City of Tacoma. Additionally, the City of Tacoma should be requiring an Environmental Impact Statement (EIS) for this project. Commenters also expressed significant concern with critical areas, such as wetlands and aquifers, and how they were addressed through the SEPA process.

Responding to comments from: *Floyd, Andrzejewski, Perkins, Johnson, Ryan, Mood, Van Holde, Villa, Hughes-Lutge, Church, Weller, Retherford, Stephens, Swinehart, Pogue, Goudlass, Burns, Kirkland, Downey, Simons, Niedermeier, Holmes & 350 Tacoma, Tacoma Audubon Society, Douglass Consulting, Black Collective, Puget Sound Fly Fishers Club, Conversation 253, Indivisible Tacoma, Neidermeier Design.*

Ecology's Response:

Each construction site covered under the permit is required to comply with the State Environmental Policy Act (SEPA). Specifically, applications for coverage under the CSWGP must include certification by the applicant that the applicable SEPA requirements under Chapter [197-11](#)³ WAC have been met (WAC 173-226-200(2)F.2.). Additionally, the CSWGP Notice of Intent (NOI) states that construction sites are required to have either a SEPA decision from the SEPA lead agency or meet requirements for SEPA exemption and provide supporting documentation. This site was not exempt from SEPA and received a SEPA decision from the City of Tacoma.

Ecology provided comment to the City during the SEPA process to express concerns related to air quality and environmental justice impacts from the proposed project. The applicant received a final SEPA decision from the City of Tacoma on April 21, 2023. The final decision, a Mitigated Determination of Non-Significance (MDNS), did not address the concerns expressed by Ecology and other agencies. Based on the City's failure to condition the project to sufficiently mitigate the project's adverse air quality impacts, we are exercising substantive authority under SEPA to further condition the project as described in the AO. Additional concerns related to the MDNS should be directed to the City.

³ <http://app.leg.wa.gov/WAC/default.aspx?cite=197-11>

EXISTING CONTAMINATION CONCERNS

Ecology determined that this project requires an Administrative Order (AO) to address existing contamination in addition to the standard permit coverage. The AO outlines additional water quality treatment, monitoring and reporting requirements for the pollutants of concern.

Summary of Public Comments Received:

The Bridge Industrial construction site is the delisted South Tacoma Channel Superfund site with known contamination. The site is known to have cPAHs, arsenic, lead, and PCBs. Disturbing the soil could have environmental impacts, specifically to Flett Creek, the aquifer, and the surrounding watershed. Contaminated water getting to these waterbodies could negatively impact humans, salmon, and other aquatic life.

Responding to comments from: *Villa, Van Holde, Mood, Stephens, Smith, Burns, Kirkland, Dilworth, Hughes-Lutge & Tacoma Audubon Society, Communities for a Healthy Bay.*

Ecology's Response:

S2.A.1.e of the CSWGP states that applicants are required to notify Ecology if they are aware of contaminated soils and/or groundwater. Condition G12 (Additional Monitoring) is based on Section 308 of the Clean Water Act and 40 CFR 122.41(h), and allows Ecology to cover contaminated construction sites under the general permit.

The applicant notified Ecology about known contamination on their NOI and provided the information needed to do a secondary review of the project. Ecology staff reviewed the existing contamination concerns to determine if the site needs an accompanying Administrative Order (AO) under the authority of Chapter 90.48 RCW to be protective of water quality, or if the standard permit conditions are sufficient. After review, Ecology has issued this site an AO (docket #21612) along with the CSWGP.

The AO establishes additional pollution prevention requirements and water quality monitoring for arsenic, lead, copper, PCBs, and cPAHs.

For the first phase of construction (soil mitigation), monitoring and reporting for arsenic, lead, copper, PCBs and cPAHs is required at locations prior to discharging to infiltration ponds; benchmarks have been established to protect groundwater quality; and if benchmarks are exceeded, additional best management practices (BMPs), or treatment is required. During Phase I, all stormwater must be infiltrated and not discharged to surface waters. Monthly groundwater monitoring is required to verify groundwater standards will be met.

For the second phase of construction (site development/construction), stormwater treatment is required. Stormwater discharge to Flett Creek is only authorized if surface water quality standards can be met. If surface water quality standards cannot be met, then additional BMPs must be implemented, or additional treatment must be provided prior to discharge.

INDIVIDUAL PERMIT VERSUS GENERAL PERMIT

Individual permits are required when a general permit cannot adequately authorize or does not apply to a specific discharger. After receiving site-specific project information and conducting our review of the existing contamination concerns, Ecology believes that the permit conditions, combined with the additional requirements of the AO, will adequately protect water quality.

Summary of Public Comments Received:

Require the Bridge Industrial project to get Individual Permit coverage instead of coverage under the CSWGP.

Responding to comments from: *Floyd, Bickford, Andrzejewski, Perkins, Ryan, Mood, Van Holde, Hughes-Lutge, Church, Weller, Retherford, Stephens, Swinehart, Pogue, Douglass, Burns, Kirkland, Downey, Simons, Niedermeier, Holmes & 350 Tacoma, Tacoma Audubon Society, Douglass Consulting, Black Collective, Puget Sound Fly Fishers Club, Conversation 253, Indivisible Tacoma, Neidermeier Design.*

Ecology's Response:

Individual permits can be written for entities with discharge characteristics that do not fit the intended coverage of a general permit or cannot be adequately covered by a general permit. The ability to issue an AO in conjunction with standard permit coverage allows Ecology to proactively require additional conditions be met before a discharge is authorized. Furthermore, the individual permit would most likely include the same requirements as the CSWGP and accompanying AO.

As part of the contamination review for this project, the applicant was required to provide excerpts of their Stormwater Pollution Prevention Plan (SWPPP). The SWPPP shows how the applicant will manage their stormwater and comply with the permit. When the SWPPP is reviewed, Ecology can make recommendations in areas of potential deficiency and work with the operator to determine an adequate treatment train. In addition to the SWPPP excerpts, the applicant must also provide all existing data related to the contamination on site. Based on the history of contamination at this site, there was a lot of existing information, which helped Ecology create an AO to protect Water Quality Standards (WQS), without the need for an individual permit.

TIER II ANTIDEGRADATION PLAN

Ecology's Tier II Antidegradation Plan meets EPA standards, and the CSWGP meets Tier II requirements given in WAC 173-201A-320(6).

Summary of Public Comments Received:

Tier II antidegradation requirements under WAC 173-201A-320 requires Ecology to determine measurable change to water quality, but the current application does not provide the information necessary; therefore, Ecology cannot measure those changes. Additionally, the project is not in the overriding public interest.

Responding to comments from: *Floyd, Andrzejewski, Perkins, Mood, Van Holde, Hughes-Lutge, Church, Weller, Retherford, Stephens, Swinehart, Pogue, Douglass, Burns, Kirkland, Downey, Simons, Niedermeier, Holmes & 350 Tacoma, Tacoma Audubon Society, Douglass Consulting, Black Collective, Puget Sound Fly Fishers Club, Conversation 253, Indivisible Tacoma, Neidermeier Design.*

Ecology's Response:

Washington's Antidegradation Policy (WAC 173-201A-300 to -330) applies to various activities that are likely to have an impact on the water quality of a surface water, such as construction, and is meant to help restore and maintain the highest possible quality of surface waters of Washington. Additionally, it ensures that all human activities that will likely contribute to lowering of water quality, at a minimum, apply all known, available, reasonable methods of prevention, control, and treatment (AKART). As part of Ecology's antidegradation approach, the CSWGP is reissued every five years, at which time compliance with EPA's effluent limitation guidelines (ELGs) and other requirements must be reviewed to determine if permit conditions should become more stringent.

Tier II requirements for the CSWGP are met at individual sites through the adaptive management scheme of the permit, combined with regular updates to our Stormwater Management Manuals which capture new and emerging technologies. The permit requires that BMPs are consistent with the most recent versions of the manuals, which helps meet AKART requirements. To further meet AKART requirements, the CSWGP has also adopted EPA's list of prohibited discharges in Section S1.D.

Tier II analysis is required for new or expanded actions that are expected to cause a measurable change in the physical, chemical, or biological quality in the overall receiving water. WAC 173-201A-020 defines "new or expanded actions" as "human actions that occur or are regulated for the first time"; as it relates to this project, construction activity has been regulated since the federal Phase I and II stormwater regulations were enacted. Individual activities covered under a general permit do not require individual Tier II analysis; however, the discharge cannot create a measurable change in receiving water quality as defined in WAC 173-201A-320(3). The additional requirements of the AO are intended to supplement the general permit conditions to be protective of the receiving water(s).

WATER QUALITY STANDARDS AND US DISTRICT COURT SUMMARY JUDGMENT

The December 2021 District Court decision did not determine that Ecology's authority to issue NPDES permits is in violation of the Federal Order or the Clean Water Act.

Summary of Public Comments Received:

In December of 2021, the United States District Court, Western District of Washington at Seattle sided with Northwest Environmental Advocates in a summary judgment. The comments provided indicate concern that certain Water Quality Standards (WQS) had not been reviewed or updated since 1992 and that the U.S. Environmental Protection Agency (EPA) had a responsibility to meet its oversight obligations to ensure adequate standards.

Responding to comments from: *Floyd, Andrzejewski, Mood, Van Holde, Church, Retherford, Stephens, Swinehart, Pogue, Douglass, Burns, Kirkland, Downey, Simons, Holmes & 350 Tacoma, Douglass Consulting, Black Collective, Conversation 253, Indivisible Tacoma.*

Ecology's Response:

Washington's aquatic life criteria are still in effect for both state and federal Clean Water Act actions. In December 2021 the U.S. District Court ordered EPA to determine whether new or revised aquatic life criteria for the State were necessary, and if so, formally issue WQS for Washington. As part of its duties under the Clean Water Act (CWA), EPA reviews a state's action or inaction in complying with the CWA. If EPA determines that a state's new or revised WQS is inconsistent with the CWA, or that a new or revised standard is necessary to meet the requirements of the CWA, EPA has the authority to propose WQS regulations for the state.

Neither EPA nor the Court have made any decision or determination on the sufficiency of Washington's current WQS. This means that no decision was made about the consistency of Washington's aquatic life criteria with the CWA, nor were such standards disapproved. Since the December 2021 decision, EPA will be evaluating the WQS for several pollutants by June 1, 2023, with additional determinations to be made in the three years following. Ecology preemptively began evaluating the criteria as part of its 2022-2024 triennial review and has initiated rulemaking to propose revisions to aquatic life toxics criteria. Additional information can be found on Ecology's website under [Chapter 173-201A WAC \(Aquatic Life Toxics Criteria\)](https://ecology.wa.gov/Regulations-Permits/Laws-rules-rulemaking/Rulemaking/WAC-173-201A-Aquatic-Life-Toxics-Criteria)⁴.

⁴ <https://ecology.wa.gov/Regulations-Permits/Laws-rules-rulemaking/Rulemaking/WAC-173-201A-Aquatic-Life-Toxics-Criteria>

ENVIRONMENTAL JUSTICE

The HEAL Act was passed by Legislation in 2021, and requires Ecology to assess, implement, and improve its Environmental Justice practices.

Summary of Public Comments Received:

Tacoma is a racially diverse and highly populated area with few green spaces. It has some of the highest rates of air pollution illness and mortality rates in the county. The comments received express concern for significant environmental impacts of this project which could impact an already overburdened community of color, and potentially adversely affect resident's health and safety.

Responding to comments from: *Floyd, Brock, Andrzejewski, Perkins, Johnson, Ryan, Mood, Van Holde, Hughes-Lutge, Church, Weller, Retherford, Stephens, Swinehart, Pogue, Goudlass, Burns, Kirkland, Downey, Simons, Niedermeier, Holmes & 350 Tacoma, Tacoma Audubon Society, Douglass Consulting, Black Collective, Puget Sound Fly Fishers Club, Conversation 253, Indivisible Tacoma, Neidermeier Design:*

Ecology's Response:

The CSWGP authorizes construction stormwater discharges to Waters of the State, which must be in compliance with various standards to address water quality concerns related to the proposed project. It does not authorize the construction activity itself. To protect Flett Creek and the water quality of any other receiving water(s), including groundwater, this project is required to sample and monitor for pollutants known to exist at the site, including arsenic, lead, copper, PCBs and cPAHs. Discharge of stormwater and authorized non-stormwater, such as dewatering water, is prohibited until water samples from the site are shown to comply with the water quality thresholds outlined in the AO. This must be determined via laboratory analysis and the results will be entered on the project's monthly Discharge Monitoring Reports (DMRs). This information can be viewed in our PARIS database.

Because of the nature and complexity of constructing at a site with existing contamination, this project will be prioritized for regular inspection by Ecology staff.

We understand through the comments received that there are additional environmental justice concerns related to traffic, noise, and air quality, should this project be constructed and become operational. While these comments are unrelated to potential water quality impacts during the construction phase, Ecology holds environmental justice as a high priority in our work, and we are exercising our substantive authority under SEPA to further mitigate the adverse environmental impacts attributable to the project.

CONCLUSION:

It is the responsibility of the permit applicant to obtain all necessary permits and permissions to complete their construction project. The CSWGP does not exempt the Permittee from compliance with any applicable federal, state, or local statutes, ordinances, or regulation.

You have a right to appeal Ecology's decision to cover the Bridge Industrial project under the general permit to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of this letter. Appeals are limited to the general permit's applicability or non-applicability to a specific discharger. For more information regarding your right to appeal, please view Ecology's [Focus Sheet: Appeal of General Permit Coverage](#)⁵.

If you observe an environmental problem related to this project, please report the information through Ecology's Environmental Response Tracking System (ERTS), which will refer your report to the appropriate contact for follow up. Reports can be made through the following methods:

Online: [Through our online form](#)⁶

Email: swroerts@ecy.wa.gov

Phone: (360) 407-6300

Thank you for your interest and sharing our common goal of protecting our environment. You can find additional stormwater and other environmental information on Ecology's [Construction Stormwater General Permit](#)⁷ webpage.

If you have any questions regarding this response to comments, please contact Melinda Wilson at melinda.wilson@ecy.wa.gov, or (360) 870-8290.

ECOLOGY FIELD INSPECTOR ASSISTANCE

If you have questions regarding stormwater management at this construction site, please contact the Regional Inspector, Evan Wood of Ecology's Southwest Regional Office in Lacey at evan.wood@ecy.wa.gov, or (360) 706-4599.

⁵ <https://fortress.wa.gov/ecy/publications/SummaryPages/1710007.html>

⁶ <https://ecology.wa.gov/Footer/Report-an-environmental-issue/Statewide-reporting-form-ERTS>

⁷ <https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Stormwater-general-permits/Construction-stormwater-permit>

From: [Heidi S.](#)
To: matthewgmartenson@gmail.com; asstele@msn.com; jordanrash.tacoma@gmail.com; TPCDorner@gmail.com; bsanthuff@gmail.com; sandeshtpc@gmail.com; robb.krehbiel@gmail.com; brettmarlo18@gmail.com; chris.tacoma@gmail.com
Cc: [Planning](#)
Subject: STGPD info for Planning Commissioners
Date: Monday, December 11, 2023 5:40:18 PM

To: Tacoma Planning Commission

Two items for your review regarding general understanding and future consideration of the South Tacoma Groundwater Protection District:

1. Brief overview of STGPD -- six-minute audio presentation to IPS (prior to moratorium passage) and discussion.

(Start at the 1hr, 34 min / 45 second mark, timestamp 1:34:45)

https://cityoftacoma.granicus.com/player/clip/5747?view_id=2&redirect=true&h=b71ffcddb2434b6a9f2d4357a95e19c1

2. What Tacoma should have done (could still have the chance to do) within the South Tacoma Groundwater Protection District, especially the "channel" area:

Making cities 'spongy' could help fight flooding — by steering the water underground

<https://www.npr.org/2023/10/03/1202252103/china-floods-sponge-cities-climate-change>



... green infrastructure, low-impact development, sensitive urban design. But it's all about giving water space and creating conditions so that it can be absorbed back into the earth, instead of flowing into channels, pipes or streets.

~ Heidi Stephens