



To: Erin Ewald, Taylor Shellfish
cc: Jesse DeNike, Plauché & Carr

From: Phil Bloch, Managing Senior Ecologist

A handwritten signature in blue ink that reads "Phil Bloch".

Date: May 17, 2023

Re: Oakland Bay Floating Oyster Permit (SHR2023-00003) – Public Comments on Water Circulation

This memo has been prepared for the Taylor Shellfish Farms (Taylor Shellfish) Oakland Bay Floating Culture Project (the project), located in Mason County, Washington. The purpose of the project is to grow oysters in subtidal waters from seed. The proposed project involves installation, maintenance, and operation of a floating oyster bag system in Oakland Bay. Oyster bags will be stocked with seed oysters to increase capacity and relieve pressure on the nearby Oakland Bay Floating Upweller System (FLUPSY) installation and will also be used for full grow-out of oysters.

Floating culture operations are proposed in Oakland Bay at a depth of approximately -5 feet to -10 feet mean lower low water (MLLW). The project site is within Washington State Department of Natural Resources state-owned aquatic land and is approximately 50 acres. The floating oyster bags will occupy a total surface area of approximately 9.1 acres within the 50-acre site.

During the State Environmental Policy Act (SEPA) public comment period, two comments noted potential interactions between the proposed project and water circulation in Oakland Bay and suggested additional information was needed to assess potential impacts. The purpose of this memo is to review the public comments and relevant information and evaluate whether the potential effect warrants a determination of significance under SEPA.

1.0 PUBLIC COMMENTS

1.1 Laurie Elder Comment Letter (May 4, 2023)

Commenter Laurie Elder states: “Surely this large a structure will interfere with the strong tidal action in the bay that feeds the perfect environment for clam AND oysters on the beach.” The comment continues by noting the historic use of the bay for log floats and suggests that the “impact on the tides [from log floats] was so great that the clam population nearly died.”

1.2 Friends of Oakland Bay/Bricklin and Griefen (May 4, 2023)

Commenter Friends of Oakland Bay states: “low energy [tidal environment in Oakland Bay] would likely be further lowered by the project, because floating aquaculture significantly reduces the strength of currents. Ahmed OO, Solomon OO (2016) Ecological Consequences of Oysters Culture. J. Fisheries Livest Prod 4: 198. Doi: 10.4172/2332-2608.1000198. Because of Oakland Bay’s low energy environment, ecological impacts are likely to accumulate and remain concentrated in the 50-acre proposed project area.”

2.0 EFFECTS OF PROPOSED PROJECT TO WATER CIRCULATION AND TIDAL CURRENTS

The Oakland Bay Floating Culture Habitat Management Plan (HMP) addresses water quality effects of the project proposal in Section 6.1, and Water Circulation in Section 6.1.1 (Confluence 2022a). The information presented in the HMP appears to be either accepted by, or not contradicted by, the commenters. However, the commenters contend that the analysis provided in Confluence (2022a) is incomplete or reaches conclusions inconsistent with no significant impact.

Friends of Oakland Bay (FOOB) cites Ahmed and Solomon (2016) to contend that floating aquaculture reduces strength of currents. However, this is a misrepresentation of Ahmed and Solomon who state that “the presence of [intertidal] trestles arranged in parallel rows in the intertidal area [] significantly reduces the strength of tidal currents.” The proposed project occurs in a subtidal area and proposes floating bag culture. Ahmed and Solomon (2016) includes a figure showing the type of culture referenced (Figure 1).



Figure 1: Tray or Trestle Culture as shown in Figure 1 of Ahmed and Solomon (2016).

Substantive differences between the fixed trestles described in the Ahmed and Solomon (2016) paper and floating culture proposed for the Oakland Bay project exist that affect the significance of an environmental effect:

- Water depth – As described in Ahmed and Solomon (2016), fixed trestles occur in shallow intertidal areas where plastic bags containing shellfish are on trays or racks a few feet above the seabed. Due the shallow intertidal locations where the structures are installed, they will intercept a much larger proportion of the water column and is much more likely to have an effect on the strength of tidal currents. The proposed Oakland Bay floating bags are approximately 6 inches tall. In an intertidal area where water depth ranges between 0 to 15 feet, the bags would intercept 3 to 25% (assuming trays hold bags approximately 2-feet above the seabed) of the water column. Bags occurring at water depths of -5 to -10 feet MLLW, as in the proposed project, will intercept far less of the water column, between approximately 2% and 10% of the water column depending

on tidal elevation. That smaller fraction of the water column intercepted reduces the potential for effects.

- Movement – Fixed off-bottom gear like trestles hold oyster bags a few feet above the seabed. The trestles and bags are stationary. Fixed objects directly obstruct and redirect water flow and have a much greater impact on water circulation compared to the floating culture bags proposed by Taylor Shellfish, which increased friction or drag in the water column while moving in response to water movements.

It should be noted that the use of the term “significantly” by Ahmed and Solomon (2016) has a different meaning than the use of that term under SEPA. In the scientific literature, the term “significant” is typically employed in regard to statistical significance to inform readers that an effect of the treatment has been detected that is not due to random chance. Under SEPA, a determination of significance is instead warranted by an action that has “a reasonable likelihood of more than a moderate adverse impact on environmental quality” (Ecology 2023). Even if the floating bag culture is found to reduce the strength of tidal currents, a determination of significance under SEPA would require that that effect have more than a moderate adverse impact on environmental quality.

For these reasons, the statements by FOOB are an invalid application of scientific information and fail to demonstrate a significant effect under SEPA. Suspended shellfish farms add drag to the tidal environment causing current redistribution and reduction (Lin et al. 2016; Plew et al. 2006; Wu et al. 2014), turbulence generation (Plew 2011), and suppression of flow (Liu and Huguenard 2019; Plew et al. 2005; Plew et al. 2006; Stevens & Peters 2011). Observations of water flow patterns near farms using floating oyster bags or cages suggest that farms may affect the velocity profile by reducing water velocities in the zone where bags intercept flow and accelerating them below and outside of those zones (Liu and Huguenard 2019). Turbid mixing occurs as surface waters are forced under the floating structures. As discussed in Confluence (2022a), studies suggest that differences in current speeds are confined near the area where culture gear is deployed and that the differences are minor and within the range of natural variation. Furthermore, natural features including eelgrass and kelp have similar effects on water currents (e.g., Lacy and Wyllie-Echeverria, 2011 and Morris et al. 2020). Field studies evaluating potential environmental interactions of floating bag culture in intertidal portions of Samish Bay showed no observable effect to sediment or seabed vegetation after a 2-year study period (Confluence 2022b). Therefore, while there is an interaction between floating gear and currents, it is not expected to have a more than moderate adverse impact on environmental quality and thus does not meet the threshold for significance under SEPA.

Laurie Elder’s comment compares the potential impacts from the proposed project to anecdotal reports of potential impacts associated with log storage in the area. Oakland Bay has considerable historic use not only for log storage, but also lumber and pulp mill operations. Contamination throughout the bay has been associated with historic discharges from untreated pulp mill waste, dumping of ash/debris, and discharges of baghouse ash from Simpson Mill boiler (Herrera and Ecology & Environment 2008). Although historic sulfite liquor discharges into Oakland Bay caused high mortality rates and lack of shell growth in shellfish (Hopkins et al. 1931), it is now recognized as one of the most productive shellfish growing areas in the country (Steinberg and Hampden 2009). While log storage is associated with a wide range of impacts, including anaerobic conditions from decomposition of bark that may impact shellfish (Sedell et al. 1991), impacts of log storage on circulation or “tides” have not been associated with the shellfish impacts as suggested here. It is inappropriate to conflate the adverse impacts associated with log storage and industrial pollution with the proposed shellfish project. The analysis above and in the Confluence (2022a) report addresses the interactions of the proposed project with tides and currents and shows those interactions are not expected to be significant as defined in SEPA.

3.0 REFERENCES

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