CONCERNED CITIZENS OF MARSH COVE, 2 (DISPLAY)

Exhibit Content Summary:

This is an excerpt from the Aquaculture Siting Study from the State of Washington Department of Ecology (https://apps.ecology.wa.gov/publications/documents/8610.pdf, pp. 1,8,10-14,16-17)

Relevant *Mitigating Measures* are discussed on page 6. Key takeaways are:

- Blue will "complement the natural setting". While c.2.37.1.A.10 lists other colors, that is because the natural setting can vary across sites; what matters is that the color "not contrast with the surrounding area".
- Aquaculture sites should be located in waters "with existing commercial/industrial maritime activity". Marsh Cove is the opposite of that which highlights the need to reduce "contrast with the surrounding area".
- Aquaculture sites should have a cone of vision less than 10%. This proposed lease is 50%. Impacts are proportional to buoy quantity, size and distance as well as color. This increases the need for the Applicant to adjust controllable parameters such as buoy size, color and hue.
- Colors should be consistent ("limited variation") across all buoys/markers at the site.

Aquaculture Siting Study

State of Washington
Department of Ecology

Prepared by:
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Environmental Planning, Urban Design, Landscape Architecture

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86-10

The Aquaculture Siting Study documents the analysis of potential visual and cumulative impacts from proposed aquaculture facilities. The intent is to provide an environmental assessment tool for use in evaluating and regulating these facilities. It was prepared for the State of Washington Department of Ecology by a private consultant team led by EDAW Inc.

Aquaculture is the development, maintenance and harvest of aquatic organisms in marine waters. In the Puget Sound, it includes shell, finfish and algae culture. Mussels, oysters, hardshell clams and geoduck clams are the main shellfish cultures. Salmon are the prime finfish culture. Nori is the prime algal species. Oysters and clams have been grown and harvested here since the nineteenth century, while shellfish longlines, rafts, salmon pens, and nori are recent industry developments.

Oyster and mussel cultures are grown on intertidal beds or float on the water surface suspended from lines or rafts. Shellfish longlines are suspended from cables, strung between anchored buoys. Shellfish rafts suspend cultured stock from horizontal poles supported by wood beams on styrofoam floats. Salmon culture utilizes rearing pens which float on the water surface. Nori culture utilizes nets which float on the water surface.

Recent proposals to site these aquaculture facilities in the Puget Sound and the Strait of Juan de Fuca have often been accompanied by intense and bitter opposition from adjacent shoreline residents. They are concerned about potential visual impact and cumulative impact from facilities that may follow. The information and analyses in this study will assist industry members, citizens' groups, planners, upland owners and elected officials in their effort to assess and mitigate such impacts.

Study Process

The two key elements of the study are a Visual Impact Analysis and a Cumulative Impact Analysis. Each is documented though this report and an accompanying slide show (see Appendices). Each is developed with the assistance and review of an advisory committee. Its membership includes adjacent upland landowners, aquaculture industry representatives, and staff of state and local planning agencies. Three presentations were made to the committee during the course of this study.

Visual Impact Analysis

The Visual Impact Analysis has four components. A display of Computer and Photo Simulations provide the basis for the Visual Impact Assessment and the accompanying Workbook.

The Computer Simulations provide an understanding of how different size aquaculture facilities would appear under a range of offshore distances and viewing heights.

The Photo Simulations, at five representative Puget Sound sites, illustrate a range of facility types, sizes, and designs in a variety of marine settings.

The Visual Impact Assessment examines the Computer and Photo Simulations to produce two related analyses. The first identifies the three major variables affecting visual impact -- the landscape, the viewer, and the facility. The second identifies two categories of mitigation measures -- alternate site selection, and facility layout and design.

The Visual Assessment Workbook utilizes the Visual Impact Assessment to develop an analytic process for evaluating proposed aquaculture facilities. The inventory component rates the site's scenic quality, the number of viewers, and the visibility of the facility. The analysis component synthesizes the inventory data to determine one of four levels of potential visual impact.

Cumulative Impact Analysis

The identification and evaluation of Cumulative Impacts and Cumulative Impact Controls provide the basis for a tailored regulation mechanism for aquaculture facilities.

The Cumulative Impact component identifies four major problems related to aquaculture. They are biological, navigational, visual, and access.

The Cumulative Impact Controls component analyzes the four problems and reviews seven approaches for achieving separation of facilities, or otherwise lessening cumulative impact.

The following paragraphs summarize the key elements and conclusions of this study.

Visual Impact Analysis

Visual Impact

The degree of visual impact from aquaculture facilities is highly variable. Depending on the landscape setting, the attitude of the viewer, and the facility siting and design, aquaculture can have a positive or negative visual impact.

Landscape Setting

The environmental condition of the landscape, its spatial definition, adjacent scenery and topography all affect the potential for visual impact. A permanently visible aquaculture facility along a pristine shoreline can degrade its scenic quality, while the same facility along a highly industrial shoreline may enhance is visual quality. Open shorelines and large embayments are generally less susceptible to visual impact than small, enclosed embayments. Concave embayments focus the viewer's attention on the flat plane of the water. Floating aquaculture facilities disrupt the plane and are visually evident. Landforms and vegetation can frame and focus views and heighten the viewer's attention; aquaculture facilities located in these areas will have a higher potential for visual impact. As the height of the adjacent shoreline increases, an aquaculture facility will become more visually evident. The viewer's line of sight is now more perpendicular to the plane of the water, and the foreshortening of objects on the water has decreased.

The Viewer

The attitude of the viewers, their number, and the duration of their viewing all affect potential visual impact. The potential for visual impact is higher along shorelines where a majority of residents or visitors have a high level of concern for scenic quality. Along the Puget Sound, this includes full-time and temporary residents with views of the water, those who visit public parks and use areas, and those who travel scenic highways. This potential increases as the number of viewers and their viewing time increases. Conversely, aquaculture facilities may have a visual interest as an intrinsic Puget Sound industry. Out of curiosity, people may wish to visit, examine, and understand their operation.

Facility Siting and Design

Eight major siting and design variables affect potential visual impact. They are distance offshore, vertical profile, size, surface coverage, color, solar orientation, form, and materials. At distances greater than 1,500 to 2,000 feet offshore, the visual presence of most facilities is reduced to a line near the horizon. At this distance, size and surface coverage doesn't seem to affect visual impact. Closer to the shoreline, those facilities with limited surface coverage or those with dispersed buoys or rafts have less visual impact than those with a large surface area or continuous coverage. Facilities which repeat the flat plane of the water have less visual impact than those which project vertically above the water surface. Sky conditions, sun angle, wind, and direction of view all affect color. In general, blues and greens complement the natural setting; greys and earth tones are neutral; white and black are highly variable in their response to lighting conditions; and oranges, yellows and reds have a high visual presence. Although highly variable, the glare of the sun off the water, or the shadow cast by adjacent landforms, can obscure aquaculture facilities. Finally, those facilities which borrow from structures and forms already in the marine environment (pilings, docks, marinas) can minimize visual impact.

Mitigating Measures

The study identifies two categories of mitigating measures related to visual impact. They are alternate site selection and modification of siting and design.

When feasible, aquaculture facilities should be located in waters offshore:

- o Culturally modified landscapes, preferably those with existing commercial/industrial maritime activity;
- o Rural or uninhabited shorelines;
- o Low bank shorelines; or
- o Open shorelines.

When feasible, aquaculture facilities should be sited or designed to be:

- o At least 1,500 to 2,000 feet offshore;
- o Horizontal in profile;
- o Incorporated as part of, or designed to appear as, docks or marinas;
- o Limited in overall size and surface coverage so as not to cover more than 10% of normal cone of vision (dependent on the degree of foreshortening created by distance offshore to the facility and the height observer above sea level);
- o Of a color which complements the dominant blue/green colors of the Puget Sound; or
- o Ordered and of limited variations in material and color.

Cumulative Impact Analysis

Cumulative Impacts

The four major areas of cumulative impact related to aquaculture are biological, navigational, visual, and access. Each is described below.

Biological

Intense aquaculture may result in the pollution of nearby waters from digestive waste and unused fish food, or potentially transfer disease from cultured stock to free run or native stock. The cautious approach to dealing with these biological concerns is to incrementally develop facilities, with testing in between increments to detect possible impacts.

Navigational

Aquaculture, in certain locations or densities, may restrict navigation, making it inconvenient or unsafe. Designating areas where impact to navigation is negligible can be handled through development controls or standards.

Visual

Multiple aquaculture facilities in the same area can have a visual impact higher than the same facilities located separately. The size of the proposed project, size of the embayment, distance offshore, and viewing height all contribute to the potential for cumulative impact. Pre-defining areas where probable visual impacts would be lessened can be accomplished through performance standards or other development controls that would guide projects to locations with low visual access or areas with existing visual disruption.

Access

Most aquaculture facilities require land-based access for staging, parking, launching, and storage of equipment and supplies. If several facilities are located adjacent to each other in an area with limited land access, a conflict may arise between aquaculture operators and abutting upland property owners. Shoreline permits for aquaculture can list conditions to address the impacts of staging if they appear to be a concern.

Cumulative Impact Controls

The key approaches for controlling density and placement of aquaculture projects are Zones/Districts, Density Standards, Performance Standards, Floating Zones, Conditional Use, Phasing with Monitoring, and No Action. Each has aspects which local planning officials, industry members, and concerned citizens can use to regulate, develop and monitor the industry. At the same time, each has aspects which make them hard or expensive to administer, adversely impact the industry, or aggregates impacts in one area.

Therefore, the study recommends a tailored regulation mechanism for aquaculture and its special set of impacts (biological, navigational, visual, and access). The control mechanism should be predictable and address impacts through performance standards and conditional use requirements.

If an agency can describe or limit the probable areas where aquaculture can and cannot go, industry members and concerned citizens will have a more predictable review mechanism. It would eliminate much of the case-by-case controversy.

Performance Standards would establish acceptable levels of impacts, providing the needed environmental control. If problems are encountered, additional permits would be denied.

Conditional Use Standards would contain a formalized agreement for use, stating terms of performance and obligations of both the project proponent and the permitting agency. The conditions may include terms under which the permit may be revoked.

The Visual Impact Analysis provides visual and analytic tools for evaluating and mitigating the visual impact of proposed aquaculture facilities. The objective of the analysis is to provide a methodology for resolving potential conflict between the goals of maintaining scenic shoreline quality, and developing the State's aquatic resources. As such, it provides a guide that state and local governments can use to review projects subject to the Shoreline Management Act.

COMPONENTS

The visual component illustrates a range of prototypical aquaculture facilities. The computer simulations illustrate the relationship between the distance offshore to the facility and the observer's position above sea level. Twelve views of a hypothetical grid are shown. The photo simulations show detailed renderings of a range of facility types and designs at five representative Puget Sound sites. Both types of simulations represent the normal human 60-degree cone of vision.

The analytic component provides a description of the components of visual impact and a list of potential mitigating measures. It also provides a visual assessment workbook.

SHORELINE MANAGEMENT ACT

The State of Washington Shoreline Management Act identifies aquaculture "as an activity of statewide and national interest. [Because] aquaculture is dependent on use of the water, [it] is a preferred use of the water area when the environment is properly protected."[1] It also implies that each local master program address potential visual impact from proposed aquaculture facilities.

The Act requires local governments develop shoreline master programs to manage and regulate use and development in shoreline area. They are mandated to address seven objectives in the following order:

(1) Recognize and protect the statewide interest over local interest (i.e. aquaculture);

(2) Preserve the natural character of the shoreline;

(3) Result in long-term over short-term benefit;

(4) Protect the resources and ecology of the shoreline;

(5) Increase public access to publicly owned areas of the shorelines;

(6) Increase recreational opportunities for the public in the shoreline;

(7) Provide for any other element as defined in RCW 90.58.100 deemed appropriate or necessary.[2]

1 Hurlburt, p. 32.
2 Ibid.

The Act also requires each local master program to address potential visual impact from proposed aquaculture facilities. It requires:

> "the protection of visual assets of shorelands and water bodies as a primary objective of shoreline management. In developing and applying a program to shorelands and adjacent areas, consideration must be given to protection of the visual quality of the shoreline resource and to maintenance of view corridors to waterways and shoreland features. In the implementation of this policy, the public's opportunity to enjoy the physical and aesthetic qualities of natural shorelines of the state shall be preserved to the greatest extent feasible consistent with the overall best interest of the state and the people generally."[3]

Several local programs require minimization of potential visual conflict with current upland residents. They also define types of aquaculture, list potential impact, and list locational restrictions. Shellfish longlines and rafts, and fish pens, are specifically mentioned in several programs.

Computer Simulations

The computer simulations provide an understanding of how different size aquaculture facilities would appear under a range of offshore distances and viewing heights. As such, they provide an easy review tool in evaluating aquaculture proposals.

They indicate that distance offshore and the observer's height above sea level are critical variables affecting the visibility of aquaculture facilities. The greater the distance offshore the facility is, or the closer the observer is to sea level, the less visible the facility is.

The computer simulations illustrate hypothetical five acre, and two adjacent three and seven-and-a-half acre aquaculture facilities. The matrix below summarizes each simulation.

		OBSERVER POSITION (Height Above Sea Level)			
		5 ft.	30 ft.	55 ft.	105 ft.
DISTANCE OFFSHORE (closest edge)	300 ft.	View 1	View 2	View 3	View 4
	750 ft.	View 5	View 6	View 7	View 8
	1,500 ft.	View 9	View 10	View 11	View 12

Figure 1 Computer Simulations Matrix

3 WSDOE, p. 43.