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USE ATTAINABILITY ANALYSIS FOR SOQUEL LAGOON IN SANTA CRUZ COUNTY, CALIFORNIA

California Regional Water Quality Control Board, Central Coast Region
895 Aerovista Place, Suite 101
San Luis Obispo, CA 93401

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Prepared by:

Shanta Keeling
Water Resources Control Engineer
Telephone: 805-549-3464
Email: skeeling@waterboards.ca.gov

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List of Acronyms and Abbreviations

This document contains numerous acronyms and abbreviations. In general, an abbreviation will be given in parentheses ( ) following the first time a title or term is used, and the abbreviation will be used in almost all cases in place of that term later. The following alphabetical list of abbreviations used in this document is provided for the convenience of the reader:

CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
City	City of Capitola
County	The County of Santa Cruz
CWA	Clean Water Act
CWC	California Water Code
DHS	California Department of Health Services
E. coli	*Escherichia coli* bacteria
FDA	United States Department of Health and Human Services Food and Drug Administration
Lagoon	Soquel Lagoon
MF	Membrane Filter
MPN	Most Probable Number
NMFs	National Marine Fisheries
NOAA	National Oceanic and Atmospheric Administration
REC-1	Water Contact Recreation
REC-2	Non-contact Water Recreation
SHELL	Referring to the beneficial use of shellfishing
SSO	Site Specific Objective
SWRCB	State Water Resources Control Board
TMDL	Total Maximum Daily Load
UAA	Use Attainability Analysis
Water Board	Central Coast Water Board
WDR	Waste Discharge Requirements
WQO	Water Quality Objective
WWTP	Waste Water Treatment Plant

1. Introduction

Section 303(c) of the Clean Water Act (CWA) requires each State to develop water quality standards that protect the chemical, physical, and biological integrity of the State's waterbodies. Water quality standards under the Clean Water Act consist of three elements: Use Classification, Water Quality Criteria, and Antidegradation Policy (CWA § 303(c)(2); 40 C.F.R §§ 130.3, 131.6, 131.10, 131.11). Use Classification, termed "beneficial uses" under California law, are "uses specified in water quality standards for each water body or segment whether or not they are being attained." (40 C.F.R § 131.3(f)). Beneficial uses must be consistent with the goal of CWA section 101(a)(2)[1], which is to provide for "the protection and propagation of fish, shellfish, and wildlife and ... recreation in and on the water" (the so-called "fishable/swimmable" uses), unless the state demonstrates that those uses are not attainable. Beneficial uses must also consider, among others, the use and value of water for public water supplies, agriculture and industry, and the water quality standards of downstream waters (40 C.F.R. § 131.10).

Beneficial uses for surface waters in the Central Coast Region of California are designated in The Water Quality Control Plan (Basin Plan) for the California Regional Water Quality Control Board Central Coast Region, 1994. The Basin Plan lists the beneficial uses for approximately 1,000 water bodies under their jurisdiction.

Soquel Lagoon is located within the City of Capitola. Beneficial uses for this water body include: Contact and Non-contact Recreation (REC-1 and REC-2), Wildlife Habitat (WILD), Cold Freshwater Habitat (COLD), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), Rare, Threatened, or Endangered Species (RARE), Estuarine Habitat (EST), Commercial and Sport Fishing (COMM), and Shellfish Harvesting (SHELL).

Recently, while reviewing bacteria water quality objectives related to Total Maximum Daily Loads (TMDLs), Water Board staff questioned the validity of assigning the SHELL beneficial use to an area where it is highly unlikely that any shellfish are living. The Soquel Lagoon has never been thoroughly examined to determine if the SHELL beneficial use is appropriate for this waterbody. The definition of this beneficial use is:

> *Uses of water that support habitats suitable for the collection of filter-feeding shellfish (e.g., clams, oysters, and mussels) for human consumption, commercial or sport purposes. This includes waters that have in the past, or may in the future, contain significant shellfisheries.*

Preliminary assessments indicate that the beneficial use of shellfishing may not be appropriate. Beneficial uses attained on or after November 28, 1975 are "existing uses" and indicate that there is evidence that the use is occurring or that water quality is sufficient to allow the use to occur. A beneficial use that is determined to be "existing"

[1] Hereto referred to as the fishable/swimmable use.

may not be removed. To remove a use that is not intended to satisfy the minimum of "fishable/swimmable," it must be demonstrated that the use is not attainable through one of the factors listed in 40 CFR 131.10(g). To remove "fishable/swimmable" uses, a use attainability analysis (UAA), supported by at least one of the factors listed in 40 CFR 131.10(g), must be conducted. (U.S. EPA Water Quality Standards Handbook, pp. [2-6]-[2-8].)

The purpose of this UAA is to provide an assessment of the beneficial use of shellfishing for Soquel Lagoon that would serve as the basis for amending the Basin Plan to remove the beneficial use of shellfishing for this waterbody. Such a determination must coordinate with the pathogen Total Maximum Daily Load (TMDL) for this waterbody so the TMDL sets the proper level of water quality protection.

2. Characterization of the Segments and Watershed

Soquel Lagoon is located in Santa Cruz County, California (see Figure 1).

In general, the lagoon systems along the Central California coastline typically develop a sandbar at the ocean interface in the spring or summer months, due to decreased summer and fall fresh water flows and increased tidal delivery of sand to the beach environment (Swanson, 2003).

Soquel Lagoon is located approximately 5 miles due east of San Lorenzo River Estuary. Soquel Lagoon (Figure 2 and Figure 3) is an example of a managed Lagoon that is manually closed and opened every spring and fall by the City of Capitola. The water clarity is high and the fresh water column appears to remain well oxygenated throughout the closed season (Swanson, 2003).

Figure 1: Map of Santa Cruz area (Swanson Hydrology)

The following watershed characterization is from a State Water Resources Control Board draft staff report (SWRCB, 1982, pp. 12) regarding San Lorenzo River Estuary. We are

presenting it here because the climate and topography of the San Lorenzo River Estuary is very similar to Soquel Lagoon:

"The San Lorenzo River drains an area of 138 square miles in northern Santa Cruz County. The river flows southward to empty into Monterey Bay at the City of Santa Cruz. Much of the watershed is rugged and forested as is typical of the Coast Range south of San Francisco.

"The climate of the watershed is affected by its proximity to the Pacific Ocean. Winters are cool and wet with an average annual rainfall of about 47 inches, ranging from about 30 inches in the City of Santa Cruz to 60 inches at the community of Boulder Creek. Summers are warm and dry although cooled at times by morning fog at the lower elevations. Eighty-two percent of the rainfall occurs in the period December through April."

The following is a characterization from Swanson Hydrology & Geomorphology's Biogeochemical Function of the San Lorenzo River Lagoon (2003):

"Hydrologic alterations have restricted the summer lagoon habitat in coastal streams such as the San Lorenzo River, resulting in relatively rapid increases in groundwater elevations and the inundation of an unvegetated beach environment. Therefore, the San Lorenzo River Lagoon rarely remains closed for a sustained period of time [anywhere between a couple days and a 3-4 weeks], either due to natural exceedance of the water storage area in the Lagoon or unauthorized breachings of the sandbar (pp. 2).

"The physical distribution of water within the San Lorenzo Lagoon has a direct impact on the amount and the quality of the available aquatic habitat. When the mouth of the lagoon is breached, the water depth and areas of inundation are controlled by the tidal elevations, as shown by the diurnal variations in water depth recorded during the early 2002 season. Following closure (the development of the sand bar at the mouth), the lower stream channel gradually continues to inundate upstream locations as the water surface elevation increases and water backs up behind the sandbar (pp. 9)."

For the purposes of this report, Soquel Lagoon will be defined as the creek's outlet at the ocean to just upstream of Perry Park on Soquel Creek (where the saltwater influence ceases). The saltwater influence ends somewhere between the Trestle and just upstream of Perry Park on Soquel Creek, depending on tidal influence. We will use Perry Park as our boundary for the Lagoon because that is the furthest tidally influenced point.

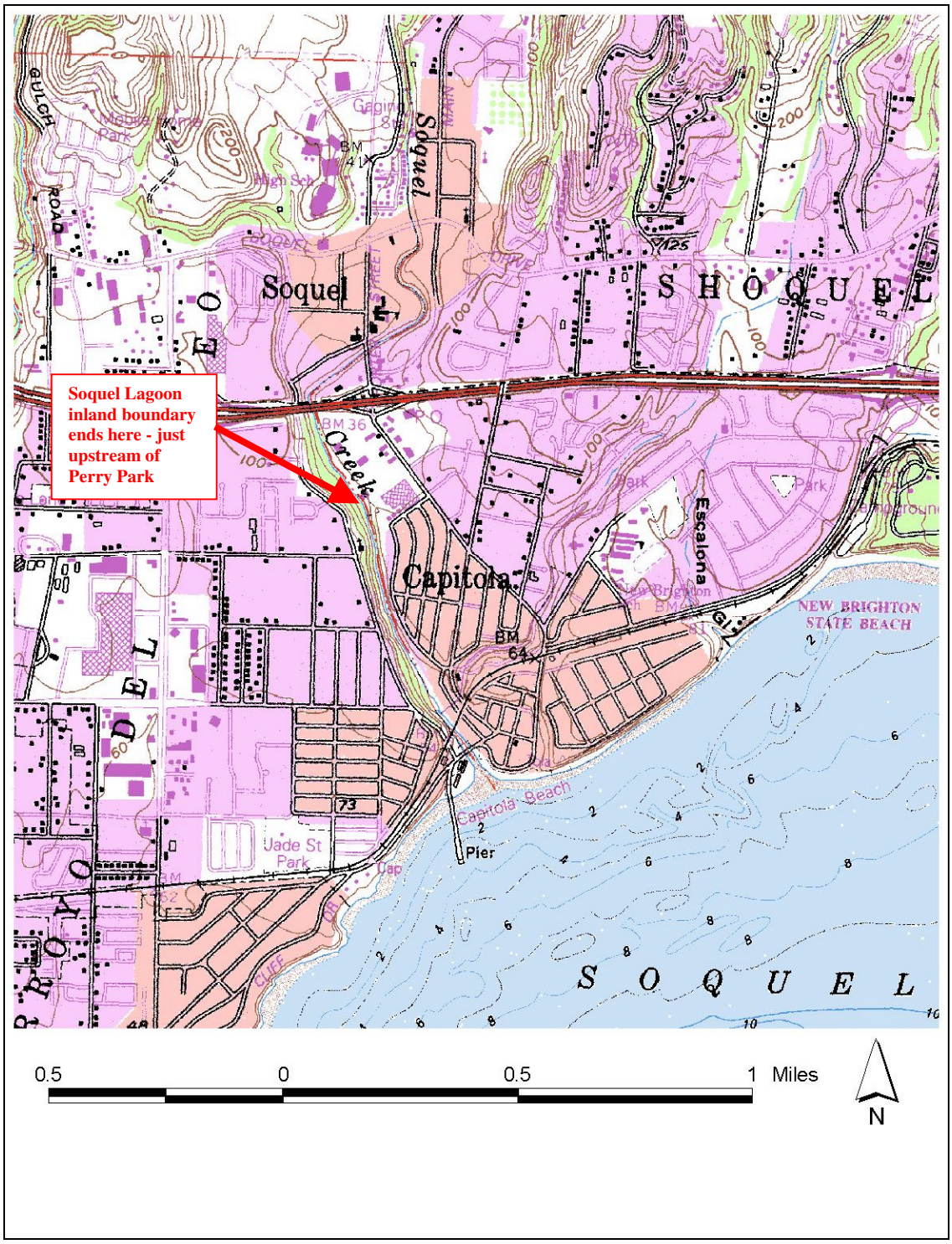

Figure 2: Map of Soquel Lagoon

Figure 3: Photos of Soquel Lagoon (Swanson Hydrology)

3. Methodology

A use attainability analysis (UAA) is a structured scientific assessment of the physical, chemical, biological, and economic factors affecting the attainment of a designated use (40 CFR 131.3). The purpose of a UAA is to provide information in order to decide whether a designated use is attainable or not.

Staff used the following methodology for this UAA: Staff analyzed existing water quality data, conducted reconnaissance work in the area, contacted persons with knowledge of the area and performed a literature review on the lifecycle and habitat requirements of shellfish. These methods allowed staff to compare information gathered to the six factors that may provide a legal basis for changing or removing a designated use (40 CFR 131.10(g)). These factors are:

(1) Naturally occurring pollutant concentrations prevent the attainment of the use.

(2) Natural, ephemeral, intermittent, or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating State water conservation requirements to enable uses to be met.

(3) Human-caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place.

(4) Dams, diversions, or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or to operate such modification in a way that would result in the attainment of the use.

(5) Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unless these

conditions may be compensated, unrelated to water quality preclude attainment of aquatic life protection uses.

(6) Controls more stringent than those required by Sections 301(b) and 306 of the Clean Water Act would result in substantial and widespread economic and social impact.

To remove a designated use that is not an existing use the state must demonstrate that attaining the designated use is not feasible under one or more of the six conditions listed above. If a state wishes to remove any fishable/swimmable uses, it must perform a UAA (40 C.F.R. § 131.10(j)). Prior to removing a use, the state also must provide notice and an opportunity for a public hearing (40 C.F.R § 131.10(e)).

The determination of whether or not a use is "existing" must include an evaluation of both the actual occurrence of the use activity (e.g., have shellfish been present?) and whether or not the level of water quality necessary to support the use has been achieved at any time since November 28, 1975. If the level of water quality necessary to support a use has been achieved within that time period, the use is considered "existing" and must be protected, regardless of whether or not the use activity has actually occurred.

Figure 4 shows the generalized methodology used in this UAA process. This methodology was taken from the Impaired Waters Guidance (SWRCB, 2005) for completing a UAA. Explicit in these analyses is a determination of specific waterbody attributes that are either conducive to attaining or preventing a given use. These attributes are evaluated to determine if certain modifications or controls would allow the use to be attainable and, if so, the feasibility or reasonableness of those options.

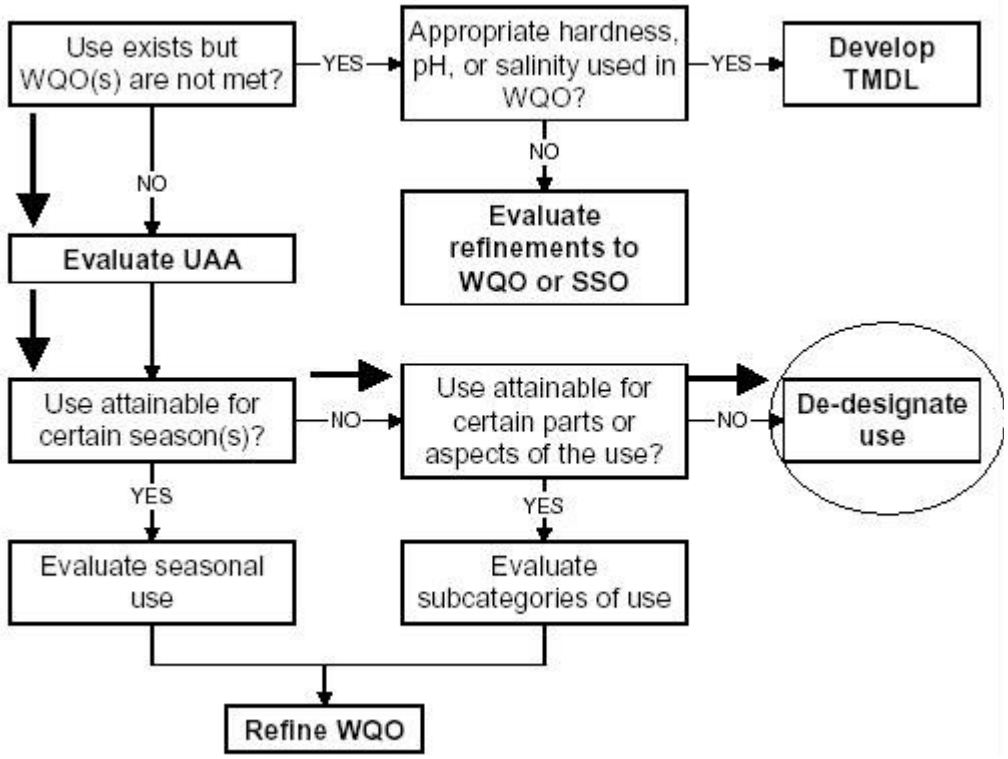

Figure 4: Summary of steps to determine whether to de-designate the SHELL beneficial use.

3.1 Methodology Steps

3.1.1 Step 1: Is the designated use being attained?

A beneficial use that is currently being attained, or that has been attained anytime on or after November 28, 1975 (the date on which the Federal Water Quality regulations took effect), is defined as an "existing use." A beneficial use that is defined as an existing use is evidence that the use is occurring or that water quality is sufficient to allow the use to occur. An existing designated use may not be removed.

Staff researched reports, performed literature reviews and contacted knowledgeable individuals in order to ascertain if the use is being attained.

3.1.2 Step 2: Is water quality sufficient to attain the beneficial use?

When a beneficial use does not appear to exist, the waterbody may still "attain" the use. For example, a waterbody that is not being used as a drinking water supply source may be of sufficient quality and quantity to be a future source of drinking water. In this case, the beneficial use is being attained (although it is not being used) and that beneficial use may not be removed from the waterbody.

Therefore, for the SHELL beneficial use, we evaluated the concentration of bacteria in the waterbody from 1987 to present. (Data were unavailable before 1987.) Additionally, Water Board staff tried to determine if the hydrology, salinity and temperature of the water, along with the substrate of the waterbody, would allow shellfish to live in these environments.

Step 2a: Can the condition be compensated for with effluent discharges without violating water conservation requirements?

If the condition can be compensated for with effluent discharges without violating water conservation requirements, the use may not be removed.

3.1.3 Step 3: What factors preclude the attainment of the beneficial use?

This step determined what factors preclude the attainment of the beneficial use.

3.1.4 Step 4: Is restoration feasible?

In this step we evaluated if there was any practical way to restore the beneficial use of shellfishing.

4. Data Collection and Evaluation

4.1 Discussion of Bacterial Water Quality Objectives to Protect the Beneficial Use of Shellfishing

The Central Coast Water Board's Basin Plan's numeric water quality objective for bacteria for the SHELL beneficial use reads as follows:

> *At all areas where shellfish may be harvested for human consumption, the median total coliform concentration throughout the water column for any 30-day period shall not exceed 70/100 mL, nor shall more than 10% of the samples collected during any 30-day period exceed 230/100 mL for a five-tube decimal dilution test or 330/100 mL when a three-tube decimal dilution test is used.*

The DHS' standards for fecal coliform are as follows[2]:

> *i. The total coliform median or geometric mean MPN of the water does not exceed 70 per 100 mL and not more than 10 percent of the samples exceed a MPN of 230 per 100 mL for a five-tube decimal dilution test.*

[2] These numbers are derived from the United States Department of Health and Human Services Food and Drug Administration (FDA), which operates a specific regulatory program directed at shellfish known as the National Shellfish Sanitation Program (1990). If these standards are not attained, the growing areas will be shut down on either a conditional or restricted basis.

> *ii. The fecal coliform median or geometric mean MPN of the water does not exceed 14 per 100 mL and not more than 10 percent of the samples exceed a MPN of 43 for a five-tube decimal dilution test.*

In California, the fecal coliform standard that DHS uses is most often used to classify growing areas (as opposed to total coliform).

Staff chose to use DHS' standards of fecal coliform concentrations for the beneficial use of shellfishing for the UAA because they are the most conservative and are the most protective of the beneficial use of shellfishing. The Basin Plan's total coliform standards will not be used because 1) fecal coliform standards are more stringent and therefore more protective of water quality, and 2) total coliform standards in the Basin Plan are not currently used by DHS to manage the shellfish growing areas in other areas of California, and, 3) the majority of data we have from the County of Santa Cruz are fecal coliform numbers as opposed to total coliform. DHS uses fecal coliform standards to determine whether or not a growing area should be open or closed, therefore, monitoring for fecal coliform is more protective of the beneficial use of shellfishing, since that is the numeric objective that determines whether the public may consume the shellfish, commercially or recreationally.

4.2 Water Quality Data

The County of Santa Cruz has been collecting bacterial water quality data in Soquel Lagoon since April 1, 1987. From April 1, 1987 to June 9, 2004, Soquel Lagoon has never achieved the United States Department of Health Service's National Shellfish Sanitation Program's standards of 14 MPN fecal coliform. (Please see Appendix A for Water Quality Data.) To the best of staff's knowledge, there are no water quality data available for the period before 1987. Nor do we have any basis for inferring that water quality conditions would differ substantially from data collected from 1987 to the present day.

4.3 Site Visit

Staff visited Soquel Lagoon at a low tide on July 14, 2004. Staff visually inspected the area to look for the presence of shellfish. Staff took water quality measurements (pH, specific conductivity, dissolved oxygen, temperature and salinity) and observed the substrate characteristics. Please see Appendix B for the field sheets.

Staff visited the mouth of Soquel Lagoon. Visual inspection did not show any shellfish present. Additionally, during staff's site inspection, we came across NOAA (National Oceanic and Atmospheric Administration) staff scuba diving in the Lagoon. They reported that they did not observe any shellfish during their inspection.

4.4 Information From Other Agencies

Staff contacted several other agencies to gather information on the potential presence of shellfishing in Soquel Lagoon. The following is what we discovered:

4.4.1 California Department of Health Services

Discussions with A. Marc Commandatore of the California Department of Health Services (DHS) (pers. comm. A. Commandatore, 6/7/04) indicate that there have not been any commercial shellfish leases in the area. The closest historic commercial shellfishing lease was in Elkhorn Slough, which is approximately 15 miles south east of Soquel Lagoon. During historic shellfish operations, seed shellfish were used. In other words, Elkhorn Slough was not harvesting native shellfish for commercial sale.

DHS does not do bacterial sampling for recreationally collected shellfish and therefore does not have data on if/where shellfish are collected in this waterbody.

4.4.2 California Department of Fish and Game

Department of Fish and Game staff person Paul Reilly (pers. Comm. Reilly, 6/23/04) is unsure if people are collecting shellfish or if they exist in this waterbody.

4.4.3 County of Santa Cruz, Environmental Health Services

County of Santa Cruz, Environmental Health Services staff person Steve Peters (pers. comm. Peters 6/16/04) indicated that they are not aware of any recreational shellfish collection in Soquel Lagoon. He indicated that there might be too much flushing for shellfish to occur in this area. Additionally, Soquel Lagoon has pilings and the pilings do not have any mussels attached to them. Pilings would be a typical place that mussels would attach themselves to. Peters did mention that there are some tiny–size of a thumbnail–fresh water clams where the water is continually fresh. He is not aware of anyone who consumes these clams.

4.4.4 Consultants – 2nd Nature

Nicole Beck and Maggie Mathias (pers. comm. 11/30/04), are evaluating Scott Creek Lagoon, Laguna Creek Lagoon, San Lorenzo Lagoon (upper and lower), Aptos Lagoon and Soquel Lagoon. Their project is entitled, Comparative Lagoon Ecological Assessment Project. This study is being conducted in conjunction with NOAA and NMFs (National Marine Fisheries).

Although the purpose of their study is not to determine whether filter-feeding shellfish are present in Soquel Lagoon, Beck and Mathias are very familiar with the sampling efforts that have taken place in these areas and therefore are able to inform Water Board staff of their observations.

Sampling, of one kind or another, has been taking place in Soquel Lagoon for 5 or 6 years now (approximately 1999–2004). During their sample collections and observations of these lagoons, samplers have not seen any living shellfish, whether during snorkeling, wading, or performing benthic invertebrate sampling.

There was no evidence of shellfish material found in Soquel Lagoon during benthic invertebrate sampling.

Since there were no living shellfish found, it is difficult to assert that shellfish are actually able to live and reproduce in this lagoon.

4.4.5 UC Santa Cruz Biology Professor

Dr. Peter Raimondi, a Biology Professor at UC Santa Cruz, stated there were not any shellfish present in Soquel Lagoon (pers. comm. 2/23/05).

4.4.5 City of Capitola

Steve Jesberg, of the City of Capitola, said he had never seen any shellfish in Soquel Lagoon nor had he seen anyone collecting shellfish in the area (pers. comm. 1/11/05).

4.5 Literature Review

Staff conducted library research at the California Polytechnic State University, San Luis Obispo. Staff looked for journal articles as well as textbooks to determine if shellfish are or were present in Soquel Lagoon. Additionally, staff looked for information regarding typical habitats for shellfish to see if this waterbody would support hypothetical shellfish populations; i.e. do these waterbodies have the correct temperature, salinity, substrate, etc.

Staff did not find any journal articles that indicated that shellfish were living in Soquel Lagoon. Subsequently, staff found no information that there were individuals collecting shellfish in this area.

Textbook information was broad. The textbooks did not give any specific information on shellfish living in this waterbody. The biological, chemical and physical information regarding shellfish reproduction and habitat was wide-ranging for all the different species of shellfish. For example, some shellfish are able to tolerate a wider range of salinities than others. Others had more specific requirements having to do with temperature and salinity. This made it difficult to determine whether shellfish would be able to survive or not in this waterbody.

4.6 Basin Plan Designation Questionable

Soquel [Point] Lagoon was listed as having SHELL as a beneficial use in the 1975 Basin Plan. Staff found no documentation as to why SHELL was designated for this waterbody.

4.7 Public Outreach Meeting, November 15, 2005

Staff sought stakeholder input during a public meeting held at the Health Services Agency in Santa Cruz on November 15, 2005. The County of Santa Cruz facilitated the

meeting. Staff presented our consideration to de-designate the beneficial use of shellfishing from the Soquel Lagoon and gave a brief presentation why. Staff asked all in attendance (see Appendix C for details) the following questions and asked them to fill out a form with any information they might have:

1) Do YOU think the shellfishing beneficial use exists in either the San Lorenzo River Estuary or the Soquel Lagoon? If you think shellfishing is occurring, why do you think so? Or if not, why do you think so?
2) Do you know of anyone you think Regional Board staff should contact regarding this issue?

There were over 20 people in attendance at this meeting and no one submitted a form. At that time staff had already spoken in detail with four of the attendees at the meeting.

5. Evaluation of Attainability of the Shellfishing Beneficial Use

The shellfishing beneficial use specifies uses of water that support habitats suitable for the collection of filter-feeding shellfish (e.g., clams, oysters, and mussels) for human consumption, commercial or sport purposes. This includes waters that have in the past, or may in the future, contain significant shellfisheries (emphasis added). In this next section, we evaluate the attainability of the shellfishing beneficial use.

5.1 Attainability of Shellfishing Beneficial Use

5.1.1 Step 1: Is the beneficial use being attained?

The presence of shellfish and/or any records of shellfish being present *since* November 28, 1975 would demonstrate that the SHELL beneficial use exists. Staff's investigation found no known records, individual or agency knowledge that shows shellfish collection occurred anytime after November 28, 1975.

5.1.2 Step 2: Is water quality sufficient to attain the beneficial use?

Bacterial concentrations are persistently higher than water quality objectives, as presented in section 4, and water quality has never been sufficient to attain the beneficial use of shellfishing since November 28, 1975.

Step 2a: Can the condition be compensated for with effluent discharges without violating water conservation requirements?

Soquel Lagoon is not an effluent dominated waterbody. Nor would any amount of increased effluent discharges help to create an environment where shellfish would be able to survive.

5.1.3 Step 3: What factors preclude the attainment of the beneficial use?

The habitat of this area is not conducive to the growth and reproduction of shellfish. Staff does not completely understand exactly why the habitat is not supportive of shellfish but hypothesizes that it has to do with the substrate of the Lagoon, along with

seasonal closures of the mouth and the subsequent effects this creates. Historically, Soquel Lagoon temporarily lost its connection to the ocean, or "closed," during the portions of the dry season.

The contemporary conditions of closure in this waterbody, while still driven principally by natural phenomenon, are affected by both the infrastructure surrounding the waterbody and by activities relating to habitat enhancement, flood control, and recreational use. Soquel Lagoon is manually opened and closed and maintained by the City of Capitola.

5.1.4 Step 4: Is restoration feasible?

"Restoration" does not seem feasible because habitat and closures at certain times of the year are very similar to the natural conditions of the Lagoon. Additionally, even if changes were made to this waterbody (which seems economically infeasible), the return of shellfish to the area is highly questionable as it is unclear when/if shellfish inhabited these areas in the last half of the 1900's.

6. Findings of the UAA

6.1 Basis for Removal of Designated Use

The CWA factors for allowing a State to remove a designated use are listed in 131.10(g). Based on staff's UAA, three factors preclude attainment of SHELL in Soquel Lagoon.

(2) Natural, ephemeral, intermittent, or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating State water conservation requirements to enable uses to be met;

(4) Dams, diversions, or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or to operate such modification in a way that would result in the attainment of the use.

(5) Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unless these conditions may be compensated, unrelated to water quality preclude attainment of aquatic life protection uses.

6.2 Alternatives for Addressing the SHELL Beneficial Use Designation

6.2.1 Alternative A – Removing the SHELL beneficial use

In this case, SHELL is determined to be an inappropriate beneficial use for Soquel Lagoon. Additionally, it seems the Central Coast Water Board designated the Lagoon as SHELL, assuming this waterbody had shellfishing present, without an evaluation to confirm the use. Soquel Lagoon has not demonstrated the SHELL beneficial use qualities nor have there been any societal demands to use this waterbody in this way.

Therefore, as a result of a combination of factors described in 40 CFR 131.10(g)(2), (4), and (5) of the Federal water quality standards regulation, Central Coast Water Board staff concludes that the SHELL designation of Soquel Lagoon does not apply.

6.2.2 Alternative B – No action. Maintain SHELL beneficial use designation

In this case, the status quo is maintained. Not taking any action would make it difficult to write and enforce a pathogen TMDL for Soquel Lagoon because the numeric targets would have to be SHELL targets, even though the SHELL use is questionable. Enforcing a TMDL with SHELL numeric targets may impose unnecessary economic impacts on the City and County when they try to implement management measures to achieve a low level of bacteria concentration to protect a use that does not exist. Additionally, it may not be possible to achieve a level that is this low due to potential amounts of natural background levels of coliform.

6.3 Considerations Required for Recommended Alternative

Staff recommends alternative A. In making this recommendation, staff has considered all factors set out in §13241 of the Porter-Cologne Water Quality Control Act:

(a) *Past, present, and probable future beneficial uses of water.*
Shellfish collection did not likely exist in the recent past (i.e. the last 50 years, 1950 - present); shellfishing does not appear to exist currently; and shellfishing is unlikely to be a beneficial use in the future.

(b) *Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto.*
Water quality objectives are currently not being met to support the beneficial use of SHELL, however the Soquel Lagoon pathogen TMDL addresses bacterial water quality objectives and bacterial loading in the context of the REC-1 and REC-2 beneficial uses. Once the requirements in the TMDL are implemented, the environmental characteristics (bacterial concentrations) are expected to improve over existing conditions.

(c) *Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area.*
Although past and current water quality conditions do not allow for the attainment of SHELL beneficial use, there are other habitat factors such as substrate, salinity, temperature and flow that cannot be reasonably achieved through coordinated control of various factors in the area. However, improved concentrations of bacteria should occur via TMDL implementation, regardless of removal of the SHELL beneficial use.

(d) *Economic considerations*.
With regard to economic considerations, the recommended alternative is not expected to impose any additional cost on either the City or County and may reduce costs by making it more likely to achieve the REC-1 bacterial water quality objectives as opposed to the SHELL bacterial water quality objectives.

(e) *The need for developing housing within the region.*
Alternative A will have no significant impact on the need for developing housing within the region.

(f) *The need to develop and use recycled water.*
The need to develop and use recycled water will not be affected by the proposed modifications.

6.4 Anti-Degradation

Staff considered that there might be concern about the following: Does removal of the SHELL beneficial use allow higher levels of bacteria to further impair the Lagoon? The current bacteria level in this waterbody regularly exceeds water quality objectives for REC-1 and REC-2 uses. The pathogen TMDL for Soquel Lagoon establishes substantial reductions in allowable bacteria loading, regardless of the proposed de-designation.

The recommended alternative is also consistent with the Anti-degradation Policy, as it will not lower the water quality of the Lagoon, relative to existing conditions. In assigning water quality objectives to the REC-1 and REC-2 uses that exist, this alternative fulfills the requirement of protecting the level of water quality necessary to protect existing and anticipated beneficial uses.

6.5 Future Considerations

Amending the potential SHELL designated use of Soquel Lagoon does not preclude re-designation of this use should conditions within this waterbody change in the future. For example, should some major hydrologic changes modify the habitat of this waterbody to the point where shellfish would be able to grow and thrive in numbers that would allow for their collection and consumption, the beneficial use designation could be modified.

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