

2006 SHORELINE SURVEY OF THE HOLMES HARBOR SHELLFISH GROWING AREA

FINAL
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-March 2006-

Summary

The purpose of this report is to serve both as the routine shoreline survey for the existing APPROVED portions of the Holmes Harbor growing area, and as the initial survey of the entire shoreline of the Harbor in response to a commercial harvest request from the Tulalip Tribe. The Washington State Department of Health, Office of Food Safety and Shellfish (DOH) identified 16 different drainage/discharge points, 165 developed parcels, and five agricultural sites along the 16 marine shoreline miles and upland areas of the Holmes Harbor shellfish growing area. NO DIRECT OR INDIRECT IMPACTS were identified that could be attributed directly to the developed parcels evaluated. Of the 165 parcels evaluated, 81 were determined to have the potential to impact the growing area, 81 were determined to have no impact, and three were not surveyed.

Based on water quality data the southernmost part of Holmes Harbor, including Freeland County Park (BIDN 240440), should be PROHIBITED/CLOSED to commercial and recreational shellfish harvest until the impacts are identified and remediated.

In addition, the PROHIBITED/CLOSURE area, and the UNCLASSIFIED area, may be impacted by the past and present activities at Nichols Brothers Boat Builders Inc. (NBBBI). In order to understand what impact this shoreline activity may have upon shellfish resources, DOH, Office of Environmental Health Assessments will be conducting a literature review of the area that could lead to a risk assessment study. This area should not be classified for recreational or commercial harvest of shellfish until the impacts from NBBBI are known.

Introduction

Between July and December 2005, DOH, in cooperation with the Island County Health Department (ICHHD), conducted an evaluation of the existing and requested shoreline of Holmes Harbor, including the recreational beach at Freeland County Park. *Figure 1 on page 4* illustrates the existing APPROVED portions of the shellfish growing area, marine water stations, and area surveyed for both the existing and proposed growing area.

According to the *Soil Survey of Island County, Washington* published by the United States Department of Agriculture, Soil Conservation Service the typical soil types around Holmes Harbor are as follows:

- Whidbey gravelly sandy loam, 5 to 15 percent slopes
- Whidbey gravelly sandy loam 15 to 30 percent slopes
- Hoypus gravelly loamy sand, 5 to 15 percent slopes
- Hoypus gravelly loamy sand, 15 to 30 percent slopes

Traditionally, these soil types provide good treatment and disposal of on-site septic system effluent. However, depth of the soils along the shoreline of Holmes Harbor are unknown. Appropriate depth is required for adequate treatment and disposal.

Cathy Barker and Kim Zabel-Lincoln of DOH surveyed the shoreline shown in *Figure 1 on page 4*. DOH evaluated drainage discharges, on-site sewage systems, agricultural activities, and other practices that could potentially have an adverse effect on the classification of the area. Each of the actual and potential sources were defined according to the following categories:

DIRECT IMPACT – a pollution source that is defined by the National Shellfish Sanitation Program (NSSP) as any waste discharge that has an immediate adverse effect on the growing area.

INDIRECT IMPACT – a pollution source that is defined by the NSSP as any waste discharge that reaches the growing area in a roundabout way.

POTENTIAL SOURCE – a pollution source that may influence the water quality in the area. Inadequate setbacks, neglect or abuse of sewage disposal systems, overgrazed pastures and a large number of wildlife are examples that could cause a site to be identified as a potential source of contamination.

NO IMPACT – the potential source is managed via proper on-site practices or treatment methods so that there is no negative impact on water quality.

At the conclusion of each parcel review the evaluation is considered either:

COMPLETE - the location of the on-site sewage system was identified via the property owner, county records, or returned survey forms.

LIMITED - staff made visual observations, however, the property owner was not interviewed or the exact location of the on-site sewage system could not be verified.

Results

Drainages & Shoreline Discharges

DOH identified 16 drainage/discharge points. The coordinates and a general description of each site were recorded and are listed in *Appendix A*. The location of each site is shown in *Figure 2 on page 9*.

A May 2004 report by Herrera Environmental Consultants (Herrera), prepared for the Island County Public Works Department, details the drainage located at Site 062b (*Figure 2 on page 9*) that flows on to the beach at Freeland County Park. The intent of the report, titled *Freeland Water Quality Improvement Project*, was to provide a detailed analysis of existing water quality and flooding problems in the Freeland drainage basin.

Table 1 on page 5 summarizes the water quality data from Herrera Station 3 located approximately 100 feet upland from the Stewart Road culvert that discharges on to the beach at Site 062b. The drainage is an open ditch drainage system that is culverted under Stewart Road and discharges on the beach at Freeland County Park.

The Herrera report states that the watershed associated with Station 3 drains 531 acres of the Freeland drainage basin and that land use is primarily rural property (54 percent), low density residential (18 percent), and commercial (16 percent). A full listing of all parameters and a map of the stations are located in *Appendix B*.

The state water quality standard for fecal coliform bacteria concentrations in the Freeland drainage basin is a geometric mean less than 100fc/100ml, with no more than 10 percent of all samples obtained for calculating the geometric mean value exceeding 200fc/100ml. Or, if fewer than 10 sample points exist, no single sample shall exceed 200fc/100ml.

DOH and the ICHD collected water samples, and estimated flows, for six of the 17 drainages identified. The results can be seen in *Table 2 on page 6*.

Figure 1
 Holmes Harbor Shellfish Growing Area,
 Currently Approved Portions, Marine Water
 Stations & Area Surveyed

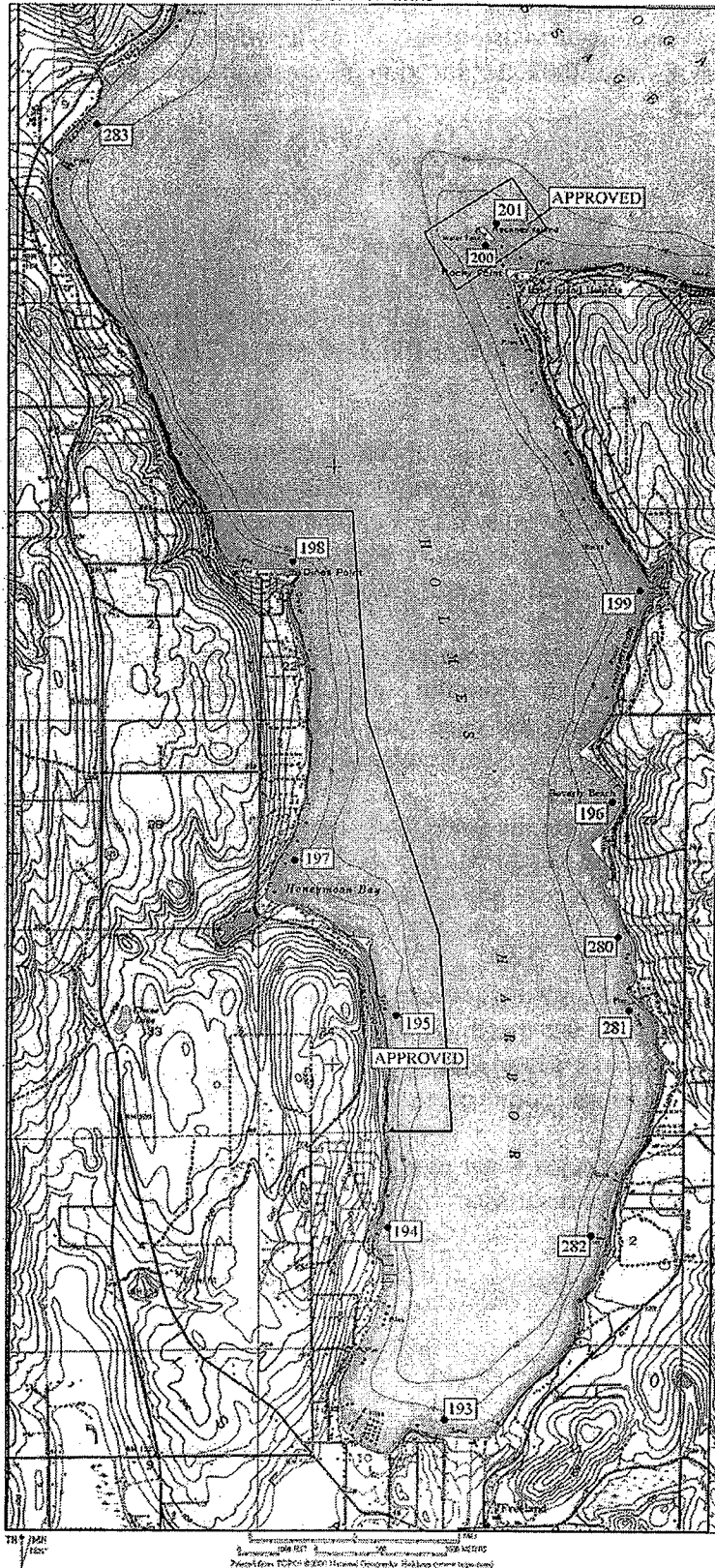


Table 1
Herrera Environmental Consulting
Freeland Open Ditch Drainage Station 3

Date	Fecal coliform per 100 ml	Cubic feet per sec.	Gallon Per Minute	Fecal Coliform Loading/day
1/8/02	110	.080	36	2.15E+08
4/29/02	2	.040	18	1.96E+06
11/5/02	120			
1/22/03	1360	1.410	633	4.69E+10
3/12/03	400	1.730	777	1.69E+10
4/13/03	440	.630	283	6.78E+09
4/24/03	1420	.490	220	1.70E+10
10/20/03	251	.560	251	4.1E+10
11/10/03	520	.019	9	2.4E+08
11/16/03	340	.340	153	2.83E+09
11/18/03	500	.960	431	1.17E+10

Marine water quality data collected by ICHD for the Washington State Swimming Beach Program (BEACH Program) at Freeland County Park Site C (located nearest to the outfall at Site 62b and Herrera Station 3) can be seen in *Table 3 on page 7*. For all Freeland County Park Sites sampled by the BEACH Program in 2005, see *Appendix B*. The marine samples are collected at Sites A and C by wading knee-deep into the marine water and dipping the bottle six inches below the surface. At Site B, the sample is collected from the end of the dock, dipping down at least six inches. The samples are collected and shipped using Standard Methods and are analyzed for enterococci (ec/100ml) at a state certified laboratory. The *BEACH Program Guidance* for MINIMUM ADVISORY LEVEL states that a single sampling station shall not exceed 104ec/100ml or 200fc/100ml; or a geometric mean based on a minimum of five samples shall not exceed 35ec/100ml or 200fc/100ml. The CRITICAL WARNING LEVEL definition states that a single sample station shall not exceed 276ec/100ml or 400fc/100. The 2005 marine water quality data, at Freeland County Park Site C, collected by ICHD for the BEACH Program, exceeded the CRITICAL WARNING LEVEL twice, and exceeded the MINIMUM ADVISORY LEVEL six of the 16 sampling events. The results for Site C ranged from < 10 to > 2,000ec/100ml.

**Table 2
Holmes Harbor Water Quality Data
Collected by DOH & ICHD**

Site	Description	Date	FC/100ml
53	LARGE DRAINAGE AT HARBOR ESTATES	10/18/2005	540
		11/3/2005	1600
	Influenced by marine water	11/9/2005	350
	Influenced by marine water	12/20/2005	4
56	DRAINAGE AT HONEYMOON BAY	10/18/2005	13
		11/3/2005	240
	Influenced by marine water	11/9/2005	2
	Influenced by marine water	12/20/2005	4.5
61a	NICHOLS BROTHERS WEST- 24" CULVERT	10/18/2005	540
		11/3/2005	2400
	Influenced by marine water	11/9/2005	1.8
	Influenced by marine water	12/20/2005	240
61b	NICHOLS BROTHERS EAST- 24" CULVERT	10/18/2005	170
		11/3/2005	2400
	No sample tide over outfall	11/9/2005	
	Influenced by marine water	12/20/2005	170
62b	DRAINAGE FROM SEDIMENT TRAP ON BEACH AT FREELAND COUNTY PARK(near swimming beach Station C and Herrera Station 3)	10/18/2005	2400
		11/3/2005	1600
	Influenced by marine water	11/9/2005	49
	Influenced by marine water	12/20/2005	7.8
62a	DRAINAGE EAST OF PARK TO BEACH	10/18/2005	350
		11/3/2005	240
	Influenced by marine water	11/9/2005	1.8
	Influenced by marine water	12/20/2005	350

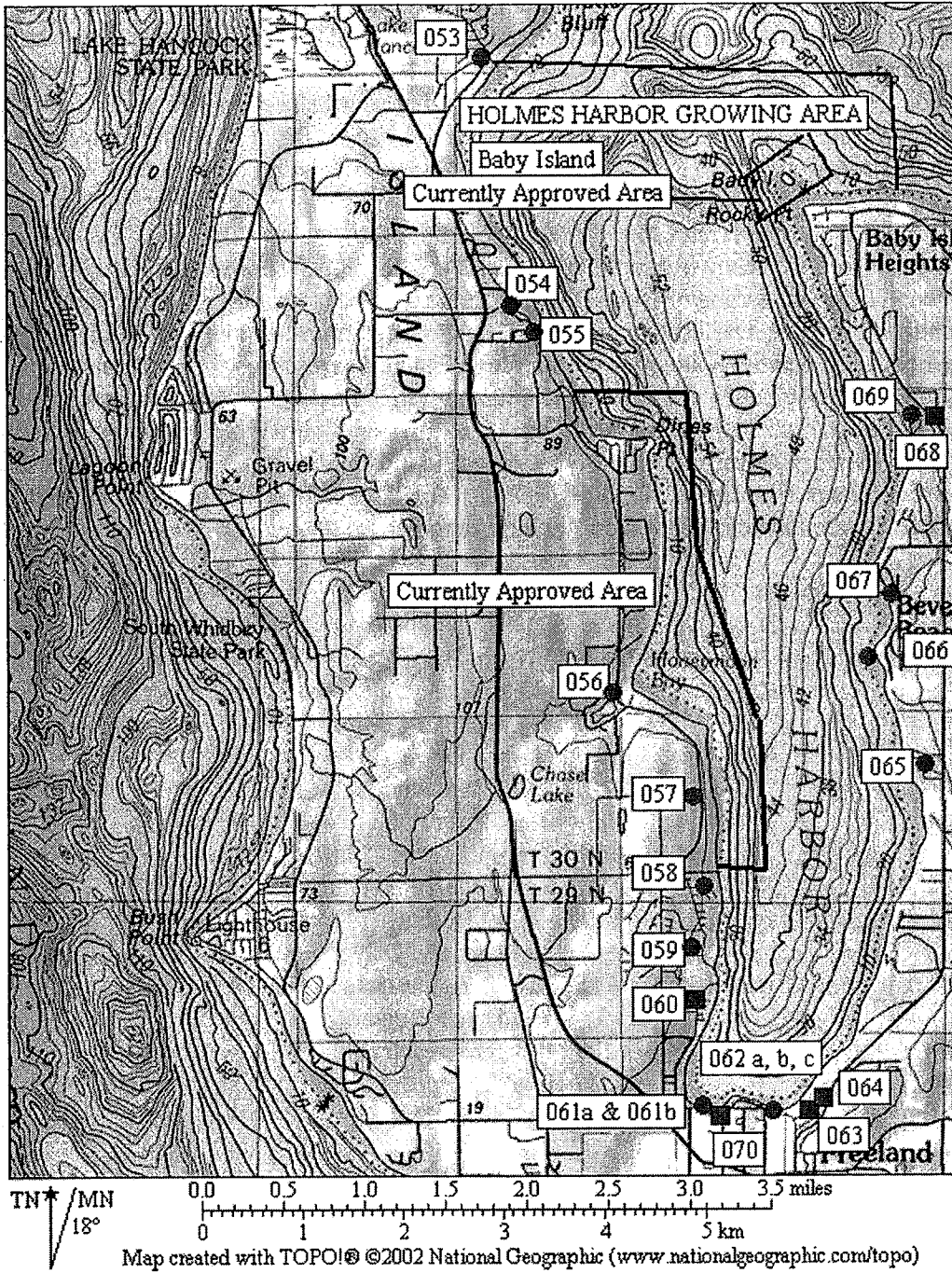
Table 3
BEACH Program
Marine Water Quality Data 2005 - Site C
Collected by ICHD

Date	Site	enterococci colonies forming units per 100 ml of water
6/6/2005	Freeland County Park / Holmes Harbor Site C	<10
6/13/2005	Freeland County Park / Holmes Harbor Site C	<10
6/20/2005	Freeland County Park / Holmes Harbor Site C	87
6/27/2005	Freeland County Park / Holmes Harbor Site C	31
7/4/2005	Freeland County Park / Holmes Harbor Site C	10
7/13/2005	Freeland County Park / Holmes Harbor Site C	<10
7/18/2005	Freeland County Park / Holmes Harbor Site C	88
7/25/2005	Freeland County Park / Holmes Harbor Site C	10
8/1/2005	Freeland County Park / Holmes Harbor Site C	238
8/8/2005	Freeland County Park / Holmes Harbor Site C	10
8/15/2005	Freeland County Park / Holmes Harbor Site C	>2000
8/22/2005	Freeland County Park / Holmes Harbor Site C	306
8/22/2005	Freeland County Park / Holmes Harbor Site C	226
8/29/2005	Freeland County Park / Holmes Harbor Site C	42
9/5/2005	Freeland County Park / Holmes Harbor Site C	111
9/14/2005	Freeland County Park / Holmes Harbor Site C	10

Rainfall data during and prior to the DOH/ICHD shoreline sampling events, as recorded by Washington State University Extension Office on Whidbey Island, is shown below in *Table 4*. Data was collected from both the northern portion of the area at Greenbank and southern portion at East Point. This information includes the rainfall recorded the day of the sampling event and for each of the five days prior to the sampling event. Rainfall did not appear to impact the water quality results for the samples taken during the survey.

<p style="text-align: center;">Table 4 2005 Rainfall in Inches As recorded by the WSU Extension Office</p>		
Date	Greenbank	East Pt/Saratoga
Oct 13	.00	.00
Oct 14	.01	.07
Oct 15	.42	.40
Oct 16	.04	.09
Oct 17	.13	.03
Oct 18	.17	.00
Oct 29	.12	.02
Oct 30	.06	.00
Oct 31	.04	.28
Nov 1	.70	.74
Nov 2	.07	.00
Nov 3	.48	.47
Nov 4	.17	.13
Nov 5	.21	.66
Nov 6	.96	.65
Nov 7	.00	.05
Nov 8	.07	.00
Nov 9	.00	.00
Dec 15	.00	.00
Dec 16	.00	.00
Dec 17	.00	.00
Dec 18	.00	.00
Dec 19	.02	.06
Dec 20	.16	.06

Figure 2
 Holmes Harbor
 Area Surveyed, Drainage Points, &
 Agricultural Sites



Key

● - Drainage/Discharge	■ - Agricultural Activity
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On-site S...

DOH identified 165 developed parcels along the shoreline of the survey area, all using on-site sewage systems as the method of waste treatment and disposal. Of the 165 parcels identified, 28 were considered COMPLETE, 134 were LIMITED, and three were not surveyed due to the inability to access the developed area or inspection refusal by the homeowner. The assumed use of these sites, based on site characteristics and interviews, is listed in *Table 5 on page 11*.

DOH identified no DIRECT OR INDIRECT IMPACTS to the growing area that could be directly attributed to the on-site septic systems on the developed shoreline parcels evaluated. However, failing on-site sewage systems may be contributing to the elevated fecal coliform levels found in four shoreline discharges. A more detailed pollution study will be needed to positively identify the sources of bacteria present in those drainages. Eighty-one of the 162 developed parcels evaluated utilized on-site sewage systems defined as POTENTIAL SOURCES of pollution. These systems were typically designated as such due to their age, location, and/or type. Specific information regarding each of these on-site sewage systems can be found in *Appendix D*. Parcels for which addresses could be identified were located within the following ranges:

2837 – 2929 North Bluff Road
2303 – 2325 Hidden Cove
3716 – 3723 Fisherman's Alibi
A – I Harbor Drive
3721 – 3728 Arcadia
1328 – 1332 Dines Point
1633 – 1689 Hazen Shores Court
4250 – 5256 South Maple Avenue
5127 – 5349 Bercot
1367 – 1371 Shoreview Drive
1605 – 1621 Washington Drive
4110 – 4160 Beach Road
1824 – 4092 Beverly Beach Road
4325 – 4387 Honeymoon Bay Road

**Table 5
Developed Parcel Use**

Use	Total Evaluated	Percentage
Full-Time Residential	93	58%
Part-Time Residential	65	40%
Commercial	3	<2%
Recreational	1	<1%
TOTAL	162	100%

Agricultural Practices

Five agricultural sites were identified during the shoreline survey. Two sites 060 and 070, may have the potential to impact the growing area during heavy rainfall. Three other sites are high bank and were determined to have NO IMPACT. Location of these sites can be seen in *Figure 2 on page 9* and are located at the following address or roads:

- Site 060 Bercot Road-small parcel, one horse
- Site 063 1689 Hazen Road-high bank
- Site 064 5360 East Harbor Road-high bank
- Site 068 East Harbor Road- high bank
- Site 070 Shoreview Avenue and Woodard, two horses

Wildlife

No wildlife was observed during the survey. The *Atlas of Seal and Sea Lion Haulout Sites in Washington, February 2000* published by Washington Department of Fish and Wildlife (WDFW), reports that a seal population of less than 100 resides on the beaches and intertidal area around Baby Island.

Other

Freeland County Park is located within the Holmes Harbor growing area. According to the WDFW, this beach had 4,877 recreational harvesters in 2005, and is part of the WDFW Shellfish Enhancement Program. The Park itself was determined to have NO IMPACT to the growing area.

Nichols Brothers Boat Builders Incorporated (NBBBI) operates a shipyard just west of Freeland County Park, along the shoreline of Holmes Harbor. According to the Department of Ecology (DOE) *Fact Sheet for State Waste Discharge Permit ST-7396 Nichols Brothers Boat Builders, Inc., (Fact Sheet)* the shipyard has been operating since 1964. Prior to this operation, the site was used as sawmill and a machine shop from the 1920's through the 1940's. The *Fact Sheet* states that all aspects of boat and ship repair and construction are performed including fabrication, pressure washing, abrasive

blasting, and painting. Under the previous permit pressure wash wastewater, dry blasting wastewater, rinse water, and stormwater were all discharged to the infiltration basin. Any wastewater in excess of the design capacity bypassed the infiltration basin and discharged directly to Holmes Harbor via a stormwater drainage ditch.

The current permit requires all pressure wash water, which is typically the most contaminated, and wet blasting wastewater to be contained and hauled off-site. Only process rinse water and stormwater are discharged to the infiltration basin and no overflow is allowed to surface water. The current design includes a treatment vault (4900 gallons), four 200-micron fabric filters, and an infiltration basin. The permit requires the treatment facility to accommodate the 10-year, 24-hour storm event. Currently NBBBI has a maximum discharge of approximately 35,200 gallons per day and an average monthly discharge of 22,000 gallons per day. The infiltration basin has a capacity of 120,000 gallons.

Although surface water discharges are not allowed under a *State Waste Discharge Permit*, the *Fact Sheet* states that "...due to the proximity of the shipyard to Holmes Harbor and the hydrogeologic conditions between the infiltration basin and the beach, there are unsubstantiated indications of a discharge to the marine waters of Holmes Harbor...". The permit additionally requires sampling to be done of the wastewater generated. All discharges in exceedence of standards and/or outside of the permit allowance (e.g., surface water discharges) must be reported to the DOE.

In order to understand what impact this shoreline activity may have upon shellfish resources, DOH, Office of Environmental Health Assessments will be conducting a literature review on this area that could lead to a risk assessment study.

Conclusions

During the survey DOH identified 16 drainage/discharges, 165 developed parcels, and five agricultural sites along the 16 shorelines miles and upland area of the APPROVED and requested Holmes Harbor shellfish growing area. Of the 165 parcels identified, 81 have the POTENTIAL to impact the growing area, 81 have NO IMPACT and three were not surveyed. Although the parcel evaluations identified no DIRECT OR INDIRECT IMPACTS to the growing area, the water quality data analyzed identified four drainages that transport fecal coliform from upland sources to the growing area. Two drainages discharge onto the beach at Freeland County Park (Sites 062a and 062b) and two (Sites 061a and 061b) discharge onto the beach just east of Nichols Brothers Boat Builders (NBBBI). Site 53 also exhibited high bacterial counts, however, the water sampled was stagnant and a connection to the growing area, although probable, was never identified.

The water quality data collected by Herrera at Station 3, which discharges to the public beach at Freeland County Park, has a geometric mean of 246fc/100ml. Station 3 exceeded the state water quality standard for bacteria during storm sampling 100 percent of the time, and had a loading rate that ranged from 1.96E+06 to 4.69E+10. The samples

collected by DOH and ICHD at Site 62b that impact the public beach at Freeland County Park had a geometric mean of 196fc/100ml. Marine water influence was noted in half the samples taken. Samples taken at Site 62a had a geometric mean of 82fc/100 with marine water influence noted in half of the samples taken. The noted marine water influence may explain the lower fecal coliform levels found during those sampling events.

The 2005 marine water quality data collected by the BEACH Program exceeded the CRITICAL WARNING LEVEL twice at Site C and exceeded the MINIMUM ADVISORY LEVEL six of the 16 sampling events. The results for Site C ranged from < 10 to > 2,000 enterococci bacteria colonies per 100 milliliters and had a geometric mean of 46ec/100ml.

Water quality data collected from 61a and 61b, which discharge on the beach just east of NBBBI, had a geometric means of 154fc/100ml of water and 411fc/100ml respectively, with marine water influence likely during all sampling events. Due to the elevated levels of bacteria, this area should be PROHIBITED/CLOSED for recreational and commercial shellfish harvest.

The PROHIBITED/CLOSED area, and the UNCLASSIFIED area, may be impacted by the past and present activities at NBBBI. Due to the unknown contribution and/or persistence of pollutants discharged, to the beach from NBBBI the DOH, Office of Environmental Health Assessments will be conducting a literature review on this area that could lead to a risk assessment study. This area should not be classified for recreational or commercial harvest of shellfish until the impacts from NBBBI are known.

Based on the findings of this report the areas currently classified as APPROVED should remain APPROVED. The UNCLASSIFIED area north of the Boundary Line A, depicted in *Figure 3 on page 15*, should also be classified as APPROVED. The area between Boundary Line A and B should remain UNCLASSIFIED until the effects of the past and present industrial uses/practices at NBBBI have been assessed. The southernmost portion of the area, including the public beach at Freeland County Park, should be PROHIBITED/CLOSED to the harvest of shellfish until the sources of bacteria can be identified and remediated and further analysis of the possible industrial impacts is completed. The reclassification of the public beach at Freeland County Park, from OPEN to CLOSED to recreational shellfish harvest constitutes a downgrade under the Revised Code of Washington (RCW) Chapter 90.72, Shellfish Protection Districts.

DOH used Cormix3 modeling software to determine the extent of the area that should be closed due to the bacterial loading results calculated from Herrera Station 3 (DOH Site 62b). This application is designed to establish the zone required to dilute the discharge to meet the marine water quality standard of 14fc/100ml. Based only on this discharge (62a, 61a, and 61b were not included) the model indicated that the entire beach should be CLOSED except the small portion to the west that is around the point. Due to the other three discharges, and the inability to manage such a small area, the entire beach should be PROHIBITED/CLOSED to commercial and recreational harvesting at this time.

The recommended closure area is currently UNCLASSIFIED and no subtidal geoduck tracts are affected by this closure area.

Recommendations

- Shoreline conditions dictate that the area north of Boundary Line A, shown in *Figure 3 on page 15*, should be APPROVED.
- The area between Boundary Line A and Boundary Line B should remain UNCLASSIFIED until additional information regarding the possible industrial impacts is available. DOH, Office of Environmental Health Assessments, is currently conducting a literature review that may lead to a study of the impacts in this area. The Department should review this information and any additional studies prior to considering classification of the area near NBBBI.
- The area south of Boundary Line B should be classified as PROHIBITED for commercial shellfish harvest based on the water quality data
- Based on the water quality data contained in this report, the public beach at Freeland County Park should be classified as CLOSED to recreational shellfish harvest until further analysis and remediation can be done.
- DOH should offer technical assistance to help ICHD identify the sources of bacteria at Freeland County Park and the two discharges near NBBBI.

*Figure 3
Holmes Harbor
Proposed Classifications*

