

# Washington State Department of Health Office of Shellfish and Water Protection

## Annual Growing Area Review

**PREPARED BY:** Jule Schultz  
**AREA:** Henderson Inlet  
**YEAR ENDING:** December 31, 2013  
**CLASSIFICATION:** Approved, Conditionally Approved, Prohibited

### Activities in the Growing Area in 2013

All stations in growing area were sampled between 6 and 12 times in 2013 in accordance with the NSSP Systematic Random Sampling method. Stations in and near the Conditionally Approved area were sampled 12 times, 10 while in Open status. The Conditionally Approved portion of the growing area was closed 12 times for 68 days. The entire growing area was closed once for five days due to extreme rainfall conditions. The Henderson Inlet Shellfish Protection District continues to work in the watershed.

### Analytical Results Of Water Samples

Table 1 shows a minimum of the last 30 samples collected from each station. Table 2 shows the most recent 30 sample summary from the Conditionally Approved area sorted by 0.75-inch of rainfall. When sorted by 0.75-inch of rainfall, Station 189 does not meet NSSP standards for a Conditionally Approved classification. Table 3 shows that all stations in the Conditionally Approved area meet the Approved standard when sorted by 0.50-inch of rainfall. Stations 200, 201, 187, 189, and 190 are “Threatened” and stations 191, 195, 197, and 202 are “Concerned”.

### Change In Actual Pollution Sources That Impact The Growing Area

We have no information of new pollution sources in Henderson Inlet.

### Classification Status

- Well within the classification standards
- Meets standards, but some concerns
- Meets standards, but threatened with downgrade in classification
- Fails to meet current classification standards

### Remarks and Recommendations

The Conditionally Approved area should be evaluated for a change in rainfall closure limit to 0.5 inch.

**Washington State Department of Health  
Office of Shellfish and Water Protection**

**Annual Growing Area Review**

**Management Plan Evaluation:**

1. Have all parties involved complied with the conditions of the management plan..... Yes
2. Has reporting been adequate to manage the conditional area ..... Yes
3. Does the area consistently meet approved area criteria when it is open for harvest..... Yes
4. Has a field inspection of critical pollution sources been conducted ..... Yes

**TABLE 1**  
**Unsorted data summary of Approved, Prohibited, and Conditionally Approved**  
**Stations**

**SUMMARY OF MARINE WATER DATA (SRS)**

Growing Area: **HENDERSON INLET**

Classification:

From **05/01/2011** To **12/31/2013**

**FECAL COLIFORM ORGANISMS/100 ML**

<b>Station Number</b>	<b>Classification</b>	<b>Number of Samples</b>	<b>Range</b>	<b>Geometric Mean</b>	<b>Est. 90th Percentile</b>	<b>Meets Std.</b>
190	Approved	31	1.7 - 130.0	6.8	35.0	Yes
191	Approved	31	1.7 - 33.0	5.4	20.0	Yes
194	Approved	31	1.7 - 130.0	4.4	17.0	Yes
195	Approved	30	1.7 - 33.0	5.3	20.0	Yes
196	Approved	31	1.7 - 49.0	4.1	17.0	Yes
197	Approved	31	1.7 - 130.0	6.3	26.0	Yes
198	Approved	30	1.7 - 110.0	4.4	19.0	Yes
199	Approved	31	1.7 - 33.0	4.2	14.0	Yes
200	Approved	31	1.7 - 240.0	5.6	38.0	Yes
201	Approved	31	1.7 - 79.0	6.7	36.0	Yes
185	Prohibited	30	1.7 - 350.0	14.1	96.0	No
186	Prohibited	31	1.7 - 240.0	14.1	71.0	No
212	Prohibited	31	1.7 - 540.0	9.8	72.0	No
187	Conditionally Approved	31	1.7 - 79.0	8.5	34.0	Yes
188	Conditionally Approved	31	1.7 - 130.0	11.8	61.0	No
189	Conditionally Approved	31	1.7 - 170.0	10.4	50.0	No

All tides information is presented

The standard for approved shellfish growing waters is fecal coliform geometric mean not greater than 14 organisms/100 ml and an estimate of the 90th percentile not greater than 43 organisms/100 ml. The above table shows bacteriological results in relation to program standards.

† All samples have been verified.

**TABLE 1 continued**  
**Unsorted data summary of Approved, Prohibited, and Conditionally Approved**  
**Stations**

**SUMMARY OF MARINE WATER DATA (SRS)**

Growing Area: **HENDERSON INLET**

Classification:

From **08/10/2009** To **12/31/2013**

**FECAL COLIFORM ORGANISMS/100 ML**

<b>Station Number</b>	<b>Classification</b>	<b>Number of Samples</b>	<b>Range</b>	<b>Geometric Mean</b>	<b>Est. 90th Percentile</b>	<b>Meets Std.</b>
192	Approved	32	1.7 - 17.0	3.9	11.0	Yes
193	Approved	32	1.7 - 23.0	4.9	15.0	Yes
202	Approved	32	1.7 - 79.0	5.3	22.0	Yes
203	Approved	31	1.7 - 70.0	3.6	12.0	Yes
204	Approved	31	1.7 - 23.0	3.9	12.0	Yes
205	Approved	31	1.7 - 49.0	4.1	17.0	Yes
206	Approved	30	1.7 - 22.0	3.1	8.0	Yes
207	Approved	31	1.7 - 13.0	2.5	5.0	Yes
208	Approved	31	1.7 - 33.0	3.4	9.0	Yes
209	Approved	31	1.7 - 23.0	2.4	5.0	Yes
698	Approved	31	1.7 - 17.0	2.2	4.0	Yes
723	Approved	31	1.7 - 49.0	3.6	12.0	Yes
724	Approved	31	1.7 - 27.0	3.7	10.0	Yes

From **03/01/2012** To **12/31/2013**

**FECAL COLIFORM ORGANISMS/100 ML**

<b>Station Number</b>	<b>Classification</b>	<b>Number of Samples</b>	<b>Range</b>	<b>Geometric Mean</b>	<b>Est. 90th Percentile</b>	<b>Meets Std.</b>
767	Approved	30	1.7 - 7.8	2.0	3.0	Yes

All tides information is presented

The standard for approved shellfish growing waters is fecal coliform geometric mean not greater than 14 organisms/100 ml and an estimate of the 90th percentile not greater than 43 organisms/100 ml. The above table shows bacteriological results in relation to program standards.

† All samples have been verified.

**TABLE 2**  
**Data summary of Conditionally Approved Stations with 0.75” rainfall sort**

**SUMMARY OF MARINE WATER DATA (SRS)**

Growing Area: **HENDERSON INLET**

Classification: **Conditionally Approved**

From **09/02/2010** To **12/31/2013**

**FECAL COLIFORM ORGANISMS/100 ML**

Rainfall Information is **Day 1** for 5 days prior between **0.00** and **0.75**

<b>Station Number</b>	<b>Classification</b>	<b>Number of Samples</b>	<b>Range</b>	<b>Geometric Mean</b>	<b>Est. 90th Percentile</b>	<b>Meets Std.</b>
187	<b>Conditionally Approved</b>	30	1.7 - 49.0	7.7	31.0	Yes
188	<b>Conditionally Approved</b>	30	1.7 - 130.0	9.4	43.0	Yes
189	<b>Conditionally Approved</b>	30	1.7 - 110.0	9.4	45.0	No

All tides information is presented

The standard for approved shellfish growing waters is fecal coliform geometric mean not greater than 14 organisms/100 ml and an estimate of the 90th percentile not greater than 43 organisms/100 ml. The above table shows bacteriological results in relation to program standards.

† All samples have been verified.

**TABLE 3**  
**Conditionally Approved Area Rainfall Sort: 0.50”**

Growing Area: **HENDERSON INLET**

Classification: **Conditionally Approved**

From **02/09/2010** To **12/31/2013**

**FECAL COLIFORM ORGANISMS/100 ML**

Rainfall Information is **Day 1** for 5 days prior between **0.00** and **0.50**

<b>Station Number</b>	<b>Classification</b>	<b>Number of Samples</b>	<b>Range</b>	<b>Geometric Mean</b>	<b>Est. 90th Percentile</b>	<b>Meets Std.</b>
187	<b>Conditionally Approved</b>	30	1.7 - 79.0	7.3	33.0	Yes
188	<b>Conditionally Approved</b>	31	1.7 - 130.0	7.9	35.0	Yes
189	<b>Conditionally Approved</b>	31	1.7 - 110.0	8.3	31.0	Yes

All tides information is presented

The standard for approved shellfish growing waters is fecal coliform geometric mean not greater than 14 organisms/100 ml and an estimate of the 90th percentile not greater than 43 organisms/100 ml. The above table shows bacteriological results in relation to program standards.

† All samples have been verified.

**TABLE 4**  
**Sample by day of threatened stations**

**SUMMARY OF SHELLFISH GROWING AREAS**  
**WATER QUALITY STUDY RESULTS**

Growing Area: **HENDERSON INLET**

Sampling Station Number: **187**

Classification: **Conditionally Approved**

<b>Sample Date</b>	<b>Sample Time</b>	<b>Tide</b>	<b>Fcoli/100ml</b>	<b>Temperature</b>	<b>Salinity</b>
09/02/2010	12:30	Flood	1.7	16	28
12/08/2010	09:42	Ebb	23	9	25
02/08/2011	11:41	Ebb	7.8	8	22
03/24/2011	10:00	Ebb	23	9	13
04/20/2011	08:14	Ebb	2	10	22
05/12/2011	13:21	Flood	17	12	24
06/21/2011	10:49	Ebb	7.8	15	24
07/25/2011	13:19	Flood	2	18	27
08/02/2011	10:06	Ebb	49	17	26
09/14/2011	08:55	Ebb	13	15	26
10/04/2011	09:39	Flood	11	13	28
11/16/2011	09:59	Flood	3.7	9	28
12/13/2011	09:40	Ebb	2	8	28
03/01/2012	09:24	Flood	6.8	7	10
05/30/2012	14:19	Flood	4.5	14	26
06/25/2012	10:13	Flood	7.8	14	24
07/11/2012	12:56	Flood	13	18	25
08/07/2012	09:59	Flood	1.7	17	27
09/20/2012	09:55	Flood	33	15	28
10/17/2012	09:32	Ebb	23	12	27
01/16/2013	10:15	Ebb	17	7	25
02/20/2013	10:41	Flood	2	8	22
03/18/2013	09:59	Flood	1.7	8	26
04/18/2013	09:46	Flood	6.1	10	25
05/15/2013	09:38	Ebb	33	14	21
06/26/2013	08:57	Ebb	49	15	23
07/25/2013	09:21	Ebb	23	18	26
08/26/2013	10:57	Flood	4.5	16	28
10/09/2013	11:32	Ebb	6.8	13	25
12/10/2013	10:04	Flood	1.7	6	29

**Number of Samples: 30**

**Range: 1.7 - 49**

**Geometric Mean: 7.7**

**Estimated 90th Percentile: 31**

† All samples have been verified.

**SUMMARY OF SHELLFISH GROWING AREAS  
WATER QUALITY STUDY RESULTS**

Growing Area: **HENDERSON INLET**  
 Sampling Station Number: **188**  
 Classification: **Conditionally Approved**

<b>Sample Date</b>	<b>Sample Time</b>	<b>Tide</b>	<b>Fcoli/100ml</b>	<b>Temperature</b>	<b>Salinity</b>
09/02/2010	12:39	Flood	2	16	28
12/08/2010	09:50	Ebb	49	8	16
02/08/2011	11:55	Ebb	6.8	8	16
03/24/2011	10:28	Ebb	7.8	9	19
04/20/2011	08:25	Ebb	11	9	22
05/12/2011	13:32	Flood	7.8	12	24
06/21/2011	11:03	Ebb	17	17	22
07/25/2011	13:34	Flood	2	18	26
08/02/2011	10:21	Ebb	23	16	26
09/14/2011	09:04	Ebb	2	15	28
10/04/2011	09:50	Flood	7.8	13	28
11/16/2011	10:08	Flood	4.5	8	28
12/13/2011	09:51	Ebb	2	7	26
03/01/2012	09:36	Flood	7.8	6	6
05/30/2012	14:04	Flood	1.7	14	26
06/25/2012	10:01	Flood	4.5	14	25
07/11/2012	13:07	Flood	4.5	19	26
08/07/2012	10:11	Flood	7.8	17	27
09/20/2012	10:04	Flood	33	15	28
10/17/2012	09:43	Ebb	33	11	23
01/16/2013	10:23	Ebb	22	6	17
02/20/2013	10:52	Flood	4.5	6	14
03/18/2013	10:11	Flood	1.7	8	26
04/18/2013	09:31	Flood	7.8	10	22
05/15/2013	09:47	Ebb	130	14	25
06/26/2013	09:06	Ebb	70	15	25
07/25/2013	09:30	Ebb	33	18	24
08/26/2013	11:04	Flood	49	17	28
10/09/2013	11:48	Ebb	11	12	26
12/10/2013	10:15	Flood	7.8	6	28

**Number of Samples: 30**

**Range: 1.7 - 130**

**Geometric Mean: 9.4**

**Estimated 90th Percentile: 43**

† All samples have been verified.

**SUMMARY OF SHELLFISH GROWING AREAS  
WATER QUALITY STUDY RESULTS**

Growing Area: **HENDERSON INLET**  
 Sampling Station Number: **189**  
 Classification: **Conditionally Approved**

Sample Date	Sample Time	Tide	Fcoli/100ml	Temperature	Salinity
09/02/2010	12:41	Flood	13	16	28
12/08/2010	09:53	Ebb	110	9	24
02/08/2011	11:57	Ebb	4.5	8	16
03/24/2011	10:29	Ebb	4	9	14
04/20/2011	08:27	Ebb	7.8	8	11
05/12/2011	13:34	Flood	7.8	12	21
06/21/2011	11:07	Ebb	13	17	21
07/25/2011	13:31	Flood	4.5	18	27
08/02/2011	10:22	Ebb	11	16	26
09/14/2011	09:05	Ebb	13	15	28
10/04/2011	09:52	Flood	2	13	28
11/16/2011	10:10	Flood	2	8	28
12/13/2011	09:53	Ebb	13	6	21
03/01/2012	09:39	Flood	2	6	8
05/30/2012	14:03	Flood	1.7	14	26
06/25/2012	09:59	Flood	1.7	14	26
07/11/2012	13:09	Flood	11	18	26
08/07/2012	10:13	Flood	17	17	27
09/20/2012	10:06	Flood	13	15	28
10/17/2012	09:46	Ebb	79	12	26
01/16/2013	10:25	Ebb	22	5	13
02/20/2013	10:53	Flood	6.8	6	14
03/18/2013	10:12	Flood	2	8	26
04/18/2013	09:29	Flood	7.8	10	18
05/15/2013	09:49	Ebb	49	14	24
06/26/2013	09:08	Ebb	110	15	23
07/25/2013	09:32	Ebb	49	18	25
08/26/2013	11:06	Flood	23	17	27
10/09/2013	11:51	Ebb	4.5	13	29
12/10/2013	10:16	Flood	4	6	29

**Number of Samples: 30**  
**Geometric Mean: 9.4**

**Range: 1.7 - 110**  
**Estimated 90th Percentile: 45**

† All samples have been verified.

**SUMMARY OF SHELLFISH GROWING AREAS  
WATER QUALITY STUDY RESULTS**

Growing Area: **HENDERSON INLET**  
Sampling Station Number: **190**  
Classification: **Approved**

<b>Sample Date</b>	<b>Sample Time</b>	<b>Tide</b>	<b>Fcoli/100ml</b>	<b>Temperature</b>	<b>Salinity</b>
05/12/2011	13:37	Flood	4.5	12	24
06/21/2011	11:13	Ebb	1.7	16	22
07/25/2011	13:38	Flood	2	18	26
08/02/2011	10:24	Ebb	33	16	27
09/14/2011	09:07	Ebb	13	15	28
10/04/2011	09:54	Flood	2	13	28
11/16/2011	10:12	Flood	2	8	28
12/13/2011	09:55	Ebb	6.8	8	27
01/31/2012	09:58	Flood	17	7	24
02/23/2012	10:43	Ebb	2	7	24
03/01/2012	09:42	Flood	1.7	6	11
04/03/2012	14:16	Flood	1.7	9	26
05/30/2012	14:00	Flood	2	15	25
06/25/2012	09:57	Flood	13	14	26
07/11/2012	13:12	Flood	4	19	25
08/07/2012	10:16	Flood	17	18	25
09/20/2012	10:08	Flood	23	15	27
10/17/2012	09:48	Ebb	23	12	27
12/04/2012	11:43	Ebb	130	10	21
01/16/2013	10:27	Ebb	7.8	7	27
02/20/2013	10:56	Flood	1.7	7	22
03/18/2013	10:14	Flood	2	8	26
04/18/2013	09:26	Flood	1.7	10	21
05/15/2013	09:52	Ebb	23	12	25
06/26/2013	09:10	Ebb	79	15	27
07/25/2013	09:34	Ebb	13	17	27
08/26/2013	11:08	Ebb	22	17	26
09/23/2013	09:55	Ebb	17	14	21
10/09/2013	12:01	Ebb	2	13	28
11/07/2013	10:10	Ebb	23	11	29
12/10/2013	10:19	Flood	2	5	27

**Number of Samples: 31**

**Range: 1.7 - 130**

**Geometric Mean: 6.8**

**Estimated 90th Percentile: 35**

† All samples have been verified.

**SUMMARY OF SHELLFISH GROWING AREAS  
WATER QUALITY STUDY RESULTS**

Growing Area: **HENDERSON INLET**  
Sampling Station Number: **200**  
Classification: **Approved**

<b>Sample Date</b>	<b>Sample Time</b>	<b>Tide</b>	<b>Fcoli/100ml</b>	<b>Temperature</b>	<b>Salinity</b>
05/12/2011	13:15	Flood	1.7	11	27
06/21/2011	10:40	Ebb	13	16	23
07/25/2011	13:15	Flood	1.7	18	27
08/02/2011	10:01	Ebb	33	16	26
09/14/2011	08:50	Ebb	33	15	27
10/04/2011	09:34	Flood	14	13	28
11/16/2011	09:54	Flood	2	9	28
12/13/2011	09:34	Ebb	13	8	27
01/31/2012	09:37	Flood	7.8	8	28
02/23/2012	10:20	Ebb	2	7	18
03/01/2012	09:19	Flood	2	7	16
04/03/2012	14:48	Flood	1.7	9	27
05/30/2012	14:28	Flood	1.7	15	26
06/25/2012	10:18	Flood	1.7	14	27
07/11/2012	12:50	Flood	4.5	19	25
08/07/2012	09:52	Flood	2	17	27
09/20/2012	09:48	Flood	9.3	15	28
10/17/2012	09:25	Ebb	240	12	28
12/04/2012	11:25	Ebb	170	10	18
01/16/2013	10:08	Ebb	1.7	7	27
02/20/2013	10:34	Flood	1.7	8	26
03/18/2013	09:53	Flood	1.7	8	28
04/18/2013	09:52	Flood	1.7	10	28
05/15/2013	09:32	Flood	1.7	13	25
06/26/2013	08:47	Ebb	130	15	25
07/25/2013	09:15	Ebb	4	17	22
08/26/2013	10:51	Flood	2	17	27
09/23/2013	09:33	Flood	13	14	28
10/09/2013	11:26	Ebb	4.5	13	26
11/07/2013	09:50	Ebb	17	11	29
12/10/2013	09:57	Flood	2	5	28

**Number of Samples: 31**

**Range: 1.7 - 240**

**Geometric Mean: 5.6**

**Estimated 90th Percentile: 38**

† All samples have been verified.

**SUMMARY OF SHELLFISH GROWING AREAS  
WATER QUALITY STUDY RESULTS**

Growing Area: **HENDERSON INLET**

Sampling Station Number: **201**

Classification: **Approved**

<b>Sample Date</b>	<b>Sample Time</b>	<b>Tide</b>	<b>Fcoli/100ml</b>	<b>Temperature</b>	<b>Salinity</b>
05/12/2011	13:40	Flood	11	11	26
06/21/2011	11:21	Ebb	2	16	25
07/25/2011	13:44	Flood	6.8	18	25
08/02/2011	10:27	Ebb	23	16	27
09/14/2011	09:12	Ebb	17	15	25
10/04/2011	09:56	Flood	33	13	26
11/16/2011	10:16	Flood	1.7	8	28
12/13/2011	09:59	Ebb	1.8	6	27
01/31/2012	10:01	Flood	4.5	7	24
02/23/2012	10:48	Ebb	1.7	8	27
03/01/2012	09:46	Flood	4.5	6	17
04/03/2012	14:09	Flood	1.7	8	26
05/30/2012	13:53	Flood	1.7	15	26
06/25/2012	09:53	Flood	13	14	25
07/11/2012	13:15	Flood	2	19	24
08/07/2012	10:21	Flood	49	18	25
09/20/2012	10:12	Flood	79	15	27
10/17/2012	09:52	Ebb	33	12	27
12/04/2012	11:47	Ebb	70	10	16
01/16/2013	10:31	Ebb	7.8	6	25
02/20/2013	11:00	Flood	1.7	8	25
03/18/2013	10:18	Flood	1.7	8	27
04/18/2013	09:22	Flood	1.7	10	27
05/15/2013	09:56	Ebb	1.7	14	26
06/26/2013	09:14	Ebb	23	15	26
07/25/2013	09:36	Ebb	33	18	27
08/26/2013	11:11	Ebb	4.5	17	27
09/23/2013	09:58	Ebb	33	14	22
10/09/2013	12:05	Ebb	2	12	25
11/07/2013	10:13	Ebb	4.5	11	28
12/10/2013	10:24	Flood	4.5	5	28

**Number of Samples: 31**

**Range: 1.7 - 79**

**Geometric Mean: 6.7**

**Estimated 90th Percentile: 36**

† All samples have been verified.

