



**GROWING AREA WF – Fortunes Rocks
Town of Biddeford**

TRIENNIAL REVIEW for 2007

Final Report Date: 7/23/08

LAURA LIVINGSTON

APPROVAL

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Figure 1. Growing Area WF with Active Water Quality Stations



Maine Department of Marine Resources

Growing Area WF



2/1/08





Executive Summary

Growing area WF is located in the city of Biddeford, and spans from Timber Island to East Point. The area consists of four coves, New Barn, Curtis Horseshoe and Fortunes Rocks Coves, and one long stretch of beach, Fortunes Rocks Beach. The only major pollution sources in the growing area are licensed overboard discharges in the coves. Along the beach, there is a pond outlet, which spills over through a culvert pipe during wet weather and does not impact water quality at Station WF 4.5 on the beach. Houses along the coves and beach, which do not have overboard discharges, have properly functioning in-ground septic systems. There are no new actual or potential pollutions sources in this growing area and no stations have been created or deactivated in the past year. One overboard discharge (OBD), located in Horseshoe Cove, was removed in October 2007, but there is still one OBD remaining in the cove. No classification changes are required at this time.

The next sanitary survey for growing area WF is due in 2010.

Growing Area Description

Growing area WF lies inside a line from the east tip of Timber Island, Biddeford, extending due south offshore following the shellfish management zone line, and also, extending north to the southeast tip of Timber Point, then north up the middle of the Little River to the head of the river, then north to the intersection of Pool Street and Granite Point Road, then north on Pool Street to the intersection of Maddox Pond Road, then east to the intersection of Fortunes Rocks Road and Thorndike Avenue, then north on Fortunes Rocks Road, which becomes Mile Stretch Road, to the intersection of Lester B. Orcutt Boulevard, then east to East Point, Biddeford, then due east offshore following the shellfish management zone line.

Current Classification(s)

Shellfish growing area WF currently has areas classified as:

Approved

Fortunes Rocks Beach (3 Stations)

Prohibited (due to the presence of licensed overboard discharges)

Fortunes Rocks Cove (1 Station)

Horseshoe Cove (1 Station)

New Barn Cove (1 Station)

Curtis Cove (1 Station)

Please visit the DMR website to view Legal Notices:

DMR Regulation 95.10 Z, Closed Area No. 9, Batson River to Fortunes Rocks (Kennebunkport and Biddeford)



DMR Regulation 95.10 S, Closed Area No. 10, Saco River and Saco Bay (Biddeford, Saco, Old Orchard Beach)

http://www.maine.gov/dmr/rm/public_health/closures/closedarea.htm

Current Management Plan(s)

There are no conditional areas in growing area WF.

Review of Water Quality

Table 1 lists all active stations in Growing Area WF, with their respective Geomean and P90 calculations for 2007. Please refer to Appendix A for a key to interpreting the headers on the columns of Table 1. The approved and restricted standards for each station are also displayed in Table 1. These standards will fluctuate yearly as a result of the DMR transition from a most probable number (MPN) fecal coliform test method to a membrane filtration (MF) method and are dependent on the number of sample analyzed by MPN verses MF. The total number of data points used in the calculations is displayed in the Count column and includes both MPN and MF values. The number of data points analyzed by MF is displayed in the MFCNT column. This fluctuating standard will cease when all 30 data points have been analyzed by the MF method. A more detailed explanation of this transition can be found in Appendix B. All approved stations met the approved standard. All active stations were sampled six times in 2007, following a systematic random sampling schedule (Appendix C).

Table 1. Geomean and P90 Scores, Growing Area WF

STATION	CLASS	CNT	MFCNT	GM	SDV	MAX	P90	APPD_STD	RESTR_STD
WF001.00	P	30	8	5.4	0.61	460	32.0	43	255
WF002.00	P	30	8	3.2	0.29	43	7.4	43	255
WF003.00	P	30	8	3.4	0.34	43	9.4	43	255
WF004.00	P	30	8	3.1	0.25	43	6.3	43	255
WF004.50	A	30	8	3.4	0.28	23	7.8	43	255
WF006.00	A	30	8	3.3	0.37	93	9.8	43	255
WF006.10	A	30	8	2.8	0.14	9.1	4.1	43	255

Shoreline Survey Activity

All of growing area WF was surveyed in 2002. A drive-through survey was completed on July 5, 2007. During the most recent survey, no new housing or business developments, drainage alterations, or any other changes in the shoreline were observed.



Pollution Source Assessment

Evaluation of New Pollution Sources

During the most recent survey, no new housing or business developments, drainage alterations, or any other changes in the shoreline were observed.

Re-evaluation of Existing Pollution Sources

Storm Water

Non-point pollution from pond runoff is the only potential pollution source on Fortunes Rocks Beach. During wet weather, the pond overflows through a road culvert onto the beach. On July 19, 2007, a sample was collected from the pond side of the culvert and the fecal score was 78 CFU/100ml (Figure 2). There was not enough water flowing through the culvert to get a sample on the beach side, and there was no measurable flow to associate with the sample. The P90 score at station WF 4.5 is 7.8. Additional sampling of the culvert outfall and station WF 4.5 are needed to investigate the effects of rainfall at this potential pollution source. The work should be scheduled so that there is adequate data to analyze for the next sanitary survey report which is due in 2010.

Residential Overboard Discharges

Residential overboard discharge #6000, which was located in the Horseshoe Cove prohibited area, was removed in 2007. There is one remaining discharge in Horseshoe Cove and six others south of Horseshoe Cove (Figure 2). Table 2 shows the calculation results for the area that is needed to dilute the potential fecal load (10,000 fc/100 ml) from the seven discharges to less than 14 fc/100 ml. The required area necessary for proper dilution is 0.64 acres and the current closure around the discharges is 247 acres. The prohibited area is large, because the discharges are located in all of the four coves. There has been no interest expressed by the local shellfish industry for the area; if there is interest expressed, the DMR would consider adjusting the closure lines so that public health would be protected from the outfalls but shellfish harvesting area would be available.

Table 2. Residential Licensed Overboard Discharges in Growing Area WF

DEP ID	TAX MAP	LOT	Flow (gpd)	Depth of Water(ft mid tide)	Acres	EXPIRATION
001452	68	42	360	10	0.08	8/7/2006
001561	4	53	300	10	0.07	4/10/1996
001628			300	10	0.07	9/30/1991
001655	4	05301	300	10	0.07	4/10/1996
003564	68	30-3	300	10	0.07	9/30/1991
003768			300	10	0.07	9/20/1993
006275	67	26	300	10	0.07	10/28/2009
007969	67	047	300	10	0.07	3/20/2007
001561	4	53	300	10	0.07	4/10/1996



Total					0.64	
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Other Pollution Sources

There are no marinas, no agricultural waste discharges, no industrial waste discharges and no known clusters of domestic animals located near shore in growing area WF.

Figure 2. Growing Area WF Pollution Source Locations

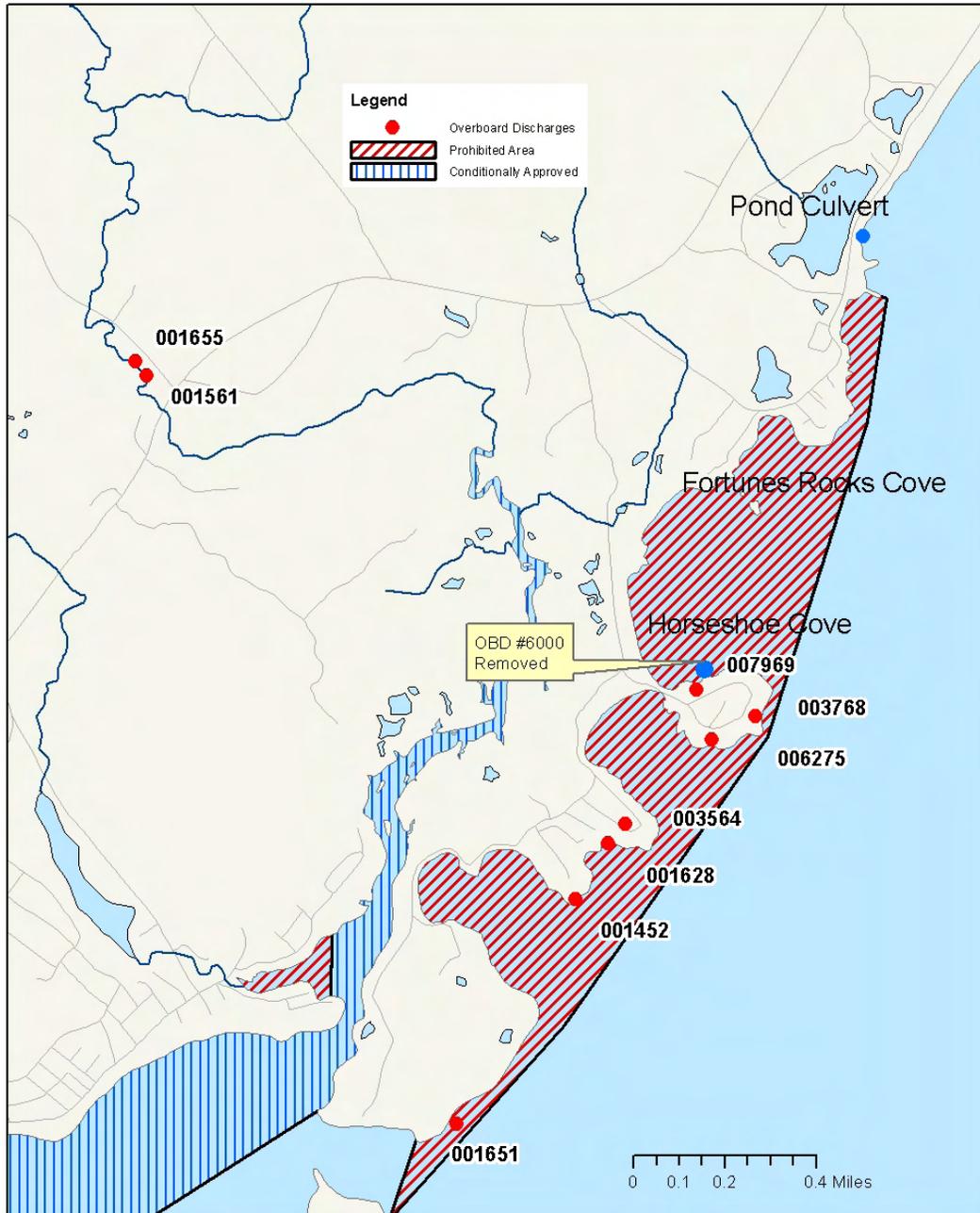


Maine Department of Marine Resources

Growing Area WF Pollution Sources



2/1/08



Meteorological/ Hydrodynamic Assessment

A comprehensive assessment of rainfall, salinity and tidal impact on water quality will be completed for the next sanitary survey report, due in 2010. A basic assessment of rainfall and



salinity data was completed in this report. In selecting stations for rainfall evaluation, the variability of the 30 most recent data points was considered. At all stations, except station WF 1, the data had little variability and had low standard deviation (Table 1). Station WF 1, classified as prohibited, had three elevated scores (>50) and the highest standard deviation of all station in growing area WF. An examination of data at this station showed that the three highest scores were associated with sampled collected after less than 0.5 inches of rainfall within 48 hours of sample collection. A preliminary assessment of salinity data for all stations showed that the range of salinity values over the past five years is narrow. This suggests that there is little impact of fresh water sources on water quality in growing area WF.

Aquaculture/Wet Storage Activity

There currently are no active aquaculture lease sites in shellfish growing area WF.

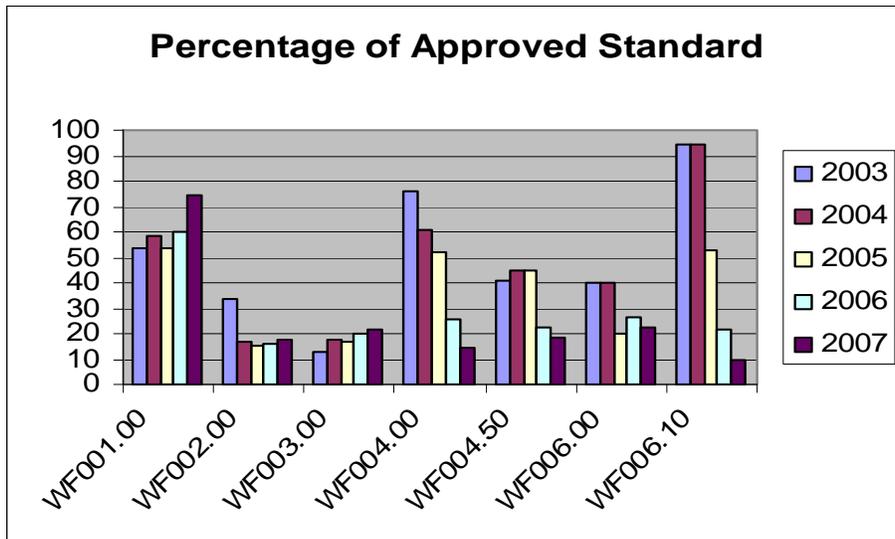
Classification Changes Required

No classification changes are required at this time.

Discussion & Summary

Growing Area WF has had no changes in pollution sources or water quality during the review period. A review of P90 scores over the past five years, shown as a percentage of the approved standard, is shown in Figure 3. In 2006, DMR switched from MPN fecal coliform test method to a membrane filtration (MF) fecal coliform test method. The precision of the MF method far exceeds that of MPN with a resulting lower P90 approved standard (MPN P90 49 verses MF P90 31). During the transition from MPN to MF data points, each year the approved standard will be lower than the previous year until all samples have been analyzed by the MF method. In order to show the trend of the P90 over the years, the calculated P90s are expressed as a percentage of the approved standard. The chart shows that, since 2004, water quality has been improving at the three approved stations WF 4.5, 6 and 6.1. This may be due to improved water quality in the Saco River, which ebbs east and then south around East Point, Biddeford. The remaining stations, which are classified as prohibited, have also met the approved standards for the past five years, but must remain prohibited due to the presence of overboard discharges.

Figure 3. P90 scores (as percent of the approved standard) for Stations in Growing Area WF



No classification changes are required at this time. The town and the MDEP need to continue working on the replacement of the licensed overboard discharges.



Appendix A. Key to water quality table headers.

Station = water quality monitoring station

Class = classification assigned to the station; prohibited (P), restricted (R), conditionally restricted (CR), conditionally approved (CA) and approved (A).

Count = the number of samples evaluated for classification, must be a minimum of 30.

MFCNT = the number of samples evaluated with the MTec method (included in the total Count column)

Geo_Mean = means the antilog (base 10) of the arithmetic mean of the sample result logarithm (base 10).

SDV = standard deviation

Max = maximum score of the 30 data points in the count column

P90 = 90th percentile

APPD_STD = the 90th percentile, at or below which the station would meet approved criteria in the absence of pollution sources or poisonous and deleterious substances.

RESTR_STD = the 90th percentile, at or below which the station would meet restricted criteria.



Appendix B. Transitioning to Membrane Filtration for Seawater and Pollution Source Samples

The Maine Department of Marine Resources has chosen to switch to a fecal coliform method that was approved for use in the National Shellfish Sanitation Program (NSSP) at the Interstate Shellfish Sanitation Conference in 2003. This method is the Membrane Filtration (MF) for Fecal Coliforms using mTEC agar with a two hour resuscitation step. The geometric mean and the 90th percentile are calculated on 30 data points extending over a five year period.

During the transition from MPN to MF, we will be accumulating MF data points. The statistical calculations will be a combination of MPN and MF data points. The FDA has determined that the best way to handle the data is to perform the calculations as always for the data set, but to compare the data set to a hybrid weighted 90th percentile. This hybrid standard is calculated by weighting the relative contributions of each method to the database. This will mean that as the number of MPN data points reduce and the number of MF data points increase the 90th percentile standard that the sample site is compared to will change over time.

Once all 30 data points are analyzed using MF, the 90th percentile for approved classification will be 31 and for restricted (for depuration) will be 163. The geomean approved standard of 14 fecal coliforms per 100 ml and geomean restricted standard of 88 fecal coliforms per 100 ml will remain the same for both methods.

Reports that display 90th percentiles will show the number of data points derived from MF analysis and will show the appropriate 90th percentile standard for that MPN/MF combination for approved and restricted classifications. It must be remembered that this weighted standard is only used for data sets encompassing data from the two different test methods, MF and MPN (3 tube/3 dilution). If decisions are to be made on a single test result analyzed by the MF method or a multiple number of test results all exclusively analyzed by the MF method, the 90th percentile standard is 31 fecal coliforms per 100 ml.



Appendix C. Water Quality Data collected in 2007

	Station	Date	Tide	Temp	Sal	Strat	ADV	Stat	CL	MFCOL	WIND
1	WF001.00	01/03/07	E	5	30	R	P	C	P	<2.0	SW
2	WF001.00	03/06/07	HF		32	R	-	C	P	<2.0	-
3	WF001.00	04/30/07	HE	7	22	R	P	C	P	30	E
4	WF001.00	06/19/07	F	16	28	R	-	C	P	<2.0	CL
5	WF001.00	08/13/07	E	15	31	R	-	C	P	<2.0	S
6	WF001.00	10/16/07	HF	12	32	R	P	C	P	<2.0	CL
1	WF002.00	01/03/07	E	5	32	R	P	C	P	<2.0	SW
2	WF002.00	03/06/07	HF		32	R	-	C	P	<2.0	-
3	WF002.00	04/30/07	HE	7	22	R	P	C	P	2	E
4	WF002.00	06/19/07	F	17	29	R	-	C	P	<2.0	CL
5	WF002.00	08/13/07	E	15	32	R	-	C	P	<2.0	E
6	WF002.00	10/16/07	HF	12	32	R	P	C	P	<2.0	N
1	WF003.00	01/03/07	E	5	32	R	P	C	P	<2.0	SW
2	WF003.00	03/06/07	HF		32	R	-	C	P	<2.0	-
3	WF003.00	04/30/07	HE	7	24	R	P	C	P	<2.0	E
4	WF003.00	06/19/07	F	19	28	R	-	C	P	<2.0	CL
5	WF003.00	08/13/07	E	16	32	R	-	C	P	<2.0	CL
6	WF003.00	10/16/07	H	12	32	R	P	C	P	<2.0	CL
1	WF004.00	01/03/07	E	5	32	R	P	C	P	<2.0	SW
2	WF004.00	03/06/07	HF		32	R	-	C	P	<2.0	-
3	WF004.00	04/30/07	HE	7	22	R	P	C	P	6	E
4	WF004.00	06/19/07	F	14	28	R	-	C	P	<2.0	CL
5	WF004.00	08/13/07	E	13	32	R	-	C	P	<2.0	CL
6	WF004.00	10/16/07	H	12	31	R	P	C	P	<2.0	CL
1	WF004.50	01/03/07	E	5	30	R	P	O	A	16	SW
2	WF004.50	03/06/07	HF		32	R	-	O	A	<2.0	-
3	WF004.50	04/30/07	HE	7	25	R	P	O	A	4	E
4	WF004.50	06/19/07	F	15	28	R	-	O	A	<2.0	CL
5	WF004.50	08/13/07	E	14	32	R	P	O	A	<2.0	CL
6	WF004.50	10/16/07	H	12	31	R	P	O	A	<2.0	CL
1	WF006.00	01/03/07	E	5	32	R	P	O	A	2	SW
2	WF006.00	03/06/07	HF		32	R	-	O	A	<2.0	-
3	WF006.00	04/30/07	HE	7	24	R	P	O	A	<2.0	E
4	WF006.00	06/19/07	LF	14	31	R	-	O	A	<2.0	CL
5	WF006.00	08/13/07	E	15	32	R	-	O	A	2.7	CL
6	WF006.00	10/16/07	H	11	31	R	P	O	A	2	NW
1	WF006.10	01/03/07	E	5	31	R	P	O	A	<2.0	SW
2	WF006.10	03/06/07	H		32	R	-	O	A	<2.0	-
3	WF006.10	04/30/07	HE	7	22	R	P	O	A	<2.0	E
4	WF006.10	06/19/07	LF	15	29	R	-	O	A	<2.0	SE
5	WF006.10	08/13/07	E	14	32	R	-	O	A	<2.0	S
6	WF006.10	10/16/07	H	12	30	R	P	O	A	<2.0	NW