Addendum to
Sanitary Survey for Growing Area WD
Ogunquit River, Ogunquit

December 18, 2007

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APPROVAL

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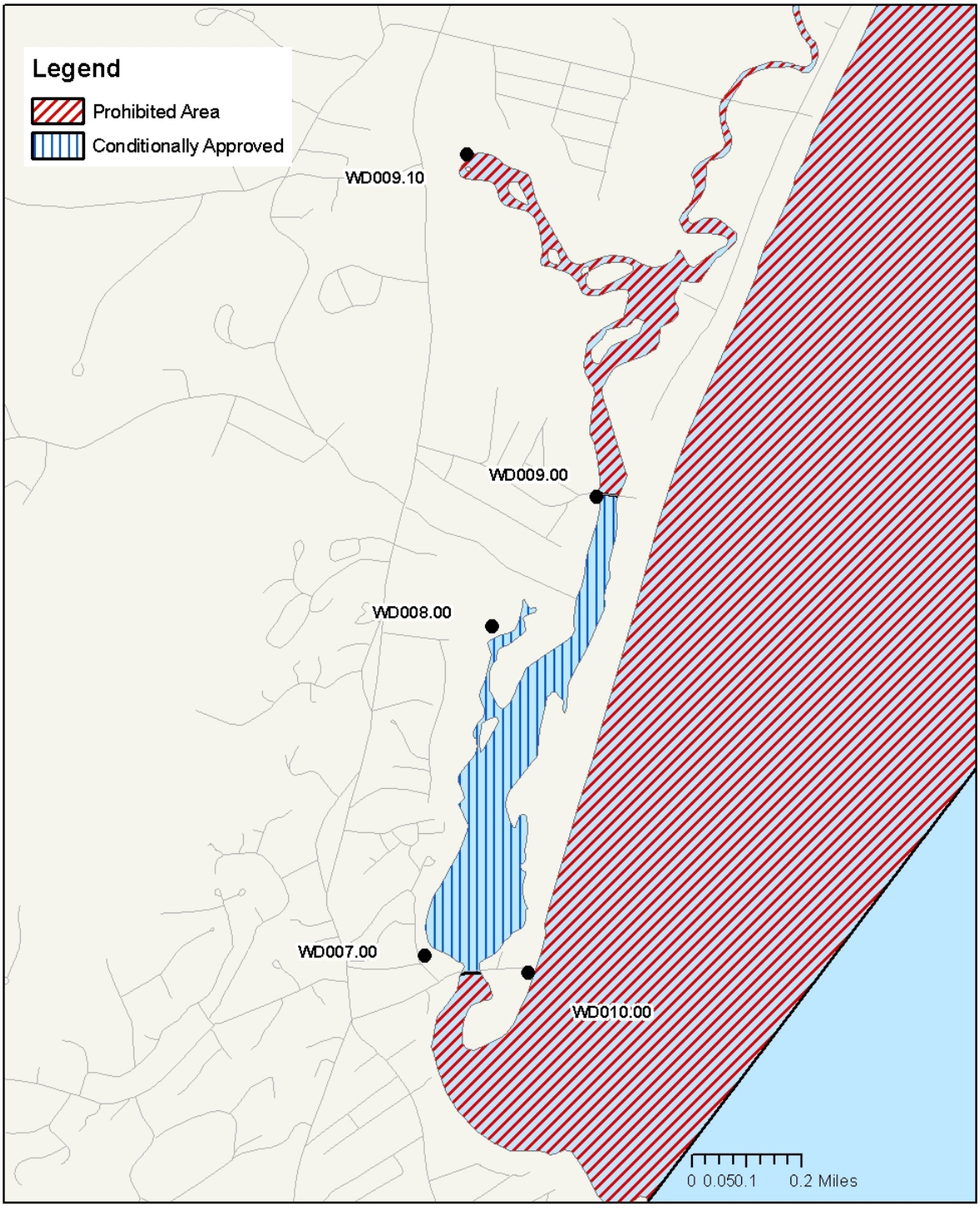
Maine Department of Marine Resources

Pollution Closed Area No. 6

Ogunquit River, Ogunquit

11/27/07



History:

In December 2001, the Ogunquit River was classified conditionally approved based on season with an open status from October 1 through May 31, because water quality during the summer did not meet approved standards. Ogunquit is a summer resort area with most of the motels, and many of the houses, only occupied during the summer creating a substantial increase in shore usage from June through October. There are large public parking areas with water access points at both ends of the river. Most of the dwellings along the river are connected to the town sewer system, but there is potential non-point pollution from parking areas, the head of the river, and from smaller streams draining into the estuary. In October 2002, the open season changed to November 1 through May 31, because of elevated scores in October.

On October 26, 2007, DMR regulation 95.10 W, Closed Area No. 6, Ogunquit River to Webhannet River (Ogunquit and Wells) was promulgated to delay the seasonal opening of the Ogunquit River conditionally approved area because the annual review of data, in September 2007, revealed that station WD 7 did not meet approved standards from November 1 through May 31. The review also identified several elevated scores from samples collected in 2007. It was determined that the area should remain closed for further evaluation to determine if this area can continue to be managed as a conditional area.

During the spring and summer of 2007, the road culvert for the stream draining into the Ogunquit River at Station WD 7 was being torn up and reconstructed. Phil Pickering, Superintendent of the Ogunquit Wastewater Treatment Plant, reported that they started work at the River Road culvert around Patriot's Day in April 2007 with a directional drill. Two weeks later they opened up the line to do a tie over and valve pit. The actual culvert was replaced at the end of May with a pipe that is 6" wider and 6" higher than the old culvert. At the end of June, they did the pave over. In July and August, cosmetic work was done (railings and curbs). On November 5, they cut a new hole in the road, north of the culvert area, to bull head a new line through the old cast iron line that runs along the river and finished it up two weeks later. Nothing was happening in the area in September and October, except the debris jam on the upper part of the Ogunquit River was removed by DOT around the first of September. The water quality samples collected at station WD 7 in 2007 were higher than in previous years. The increase in the scores was possibly due to the construction work, which included digging up the streambed. The stream itself was sampled on 11/14/07 and had a MF score of 24. See supporting data analysis below.

Data Analysis

Ogunquit River conditional area is monitored by stations WD 7 and 8. Station WD 9 monitors water quality on the northern boundary line. The locations are displayed on the map on page 2. The river was seasonally open from November 1 through May 31, but water quality no longer meets approved standards for that season in a portion of the area, as seen in Table 1 below. A key to water quality table headers can be found at the end of this document.

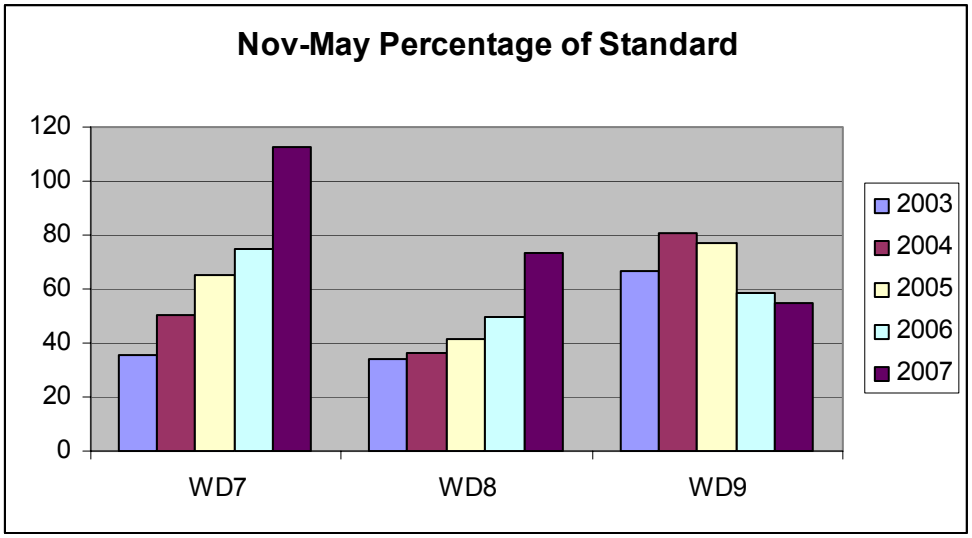
Table 1 Fecal Coliform Report 2001-07 for Ogunquit River Stations for the Season November 1 to May 31

STATION	CLASS	CNT	MFCNT	GM	SDV	MAX	P90	APPD_STD	RESTR_STD
WD007.00	CA	30	9	8.6	0.59	150	48.5	43	250
WD008.00	CA	30	8	8.3	0.45	90	31.4	43	255
WD009.00	P	30	7	6.7	0.44	43	24.2	44	260

Table 2 shows the P90 as a percentage of the approved standard for each year's data set. DMR has 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 P90 trend chart for the current open season of November through May, as seen below in Table 2, indicates that fecal coliform scores at stations WD 7 and WD 8 went up and the fecal coliform scores at station WD 9 went down. In other words, water quality has improved at Station WD 9, and declined at Stations WD 8 and WD 7.

Table 2 P90 Trends for November to May data for Ogunquit River Stations



The actual P90 and applicable P90 standard for the open season for 2003 through 2007 are displayed in Table 3.

Table 3. P90 and Approved P90 Standard 2003 - 2007

	2003		2004		2005		2006		2007	
	P90	Standard	P90	Standard	P90	Standard	P90	Standard	P90	Standard
WD7	17.4	49	24.7	49	31.9	49	35	47	48.5	43
WD8	16.8	49	17.9	49	20.2	49	23.8	48	31.4	43
WD9	32.8	49	39.4	49	37.9	49	28.2	48	24.2	44

A review of the year round data, at station WD 7, shows that there have been few samples collected during the summer months. Since the Ogunquit River was only open from November through May, it was only sampled during the open season from 2001 through 2005. In 2006, the sampling schedule was changed to systematic random sampling over the entire year. This data can be seen in Table 4 below.

Table 4. Ogunquit River Sample Counts for 2001-2007 for station WD7

Count of Samples	Year							
Month	2001	2002	2003	2004	2005	2006	2007	Grand Total
January	1	1	1	1	1	1	1	7
February	1	1		1	1	1	1	6
March	1	1	1	1	1	1	1	7
April	1	1	1	1	1	1	1	7
May			1	1	1		1	4
July						1	1	2
August		1						1
September						1	1	2
October	1	1	1	1		1	1	6
November	1	1	1	1	1	2	1	7
December		1	1	1	1	1		5
Grand Total	6	8	7	8	7	10	8	54

The maximum fecal coliform scores that occurred each month from 2001 to 2007 are shown in Table 5. All months had only 1 data point for that month with the exception of November 2006, when two samples were collected, the highest of which was 11. This table shows the increase in fecal coliform test scores for 2007. Three of the six samples, during the open season, exceeded the P90 standard of 31 for MF (January 52CFU/100ml, April 40CFU/100ml and May 74CFU/100ml). Looking at previous years, the winter months generally had low scores.

Table 5 Maximum Fecal Coliform Scores by Month for 2001-2007 for station WD7

Max of FC	Year						
Month	2001	2002	2003	2004	2005	2006	2007
January	3.6	<3	<3	3.6	9.1	<3	52
February	<3	<3		3.6	9.1	3.6	<2
March	3.6	3.6	<3	43	<3	<3	28
April	<3	<3	<3	3.6	<3	3.6	40
May			<3	<3	150		74
July						23	180
August		<3					
September						18	8
October	23	9.1	3.6	14		124	22
November	3.6	93	<3	<3	150	11	<2
December		<3	23	43	<3	10	

The fecal coliform scores for station WD 7 were plotted by year against rainfall amounts. Table 6 displays the maximum value that year at different amounts of rain that occurred 72 hours prior to collection. The total number of data points in those rainfall amounts is noted. The 0 – 0.25 inches of rain category has the greatest number of data points, since it includes all data when no rain had occurred up to 0.25" of rain. This table shows elevated fecal scores at rainfalls greater than 2 inches; however it also shows elevated fecal coliform scores with no rainfall and all rainfall amounts.

Table 6 Maximum Fecal Scores at WD 7 verses Rain up to 72 hours Prior to Sample Collection

72 hr rain accum	Data	2001	2002	2003	2004	2005	2006	2007	Grand Total
0-0".25"	Maximum Score	3.6	<3	<3	43	9.1	23	40	43
	No. of Samples	5	1	3	4	3	9	3	28
0.25"-0.5"	Maximum Score		<3		3.6	150		<2	150
	No. of Samples		2		1	2		1	6
0.5"-0.75"	Maximum Score		93	23	3.6				93
	No. of Samples		3	2	1				6
0.75"-1"	Maximum Score		9.1	3.6				52	52
	No. of Samples		1	1				1	3
1"-1.25"	Maximum Score		3.6					74	74
	No. of Samples		1					1	2

1.25”-1.5”	Maximum Score			<3	43				43
	No. of Samples			1	1				2
1.5”-1.75”	Maximum Score	23			14	<3		180	180
	No. of Samples	1			1	1		2	5
2”-2.25”	Maximum Score						124		124
	No. of Samples						1		1
3.75”-4”	Maximum Score					150			150
	No. of Samples					1			1

The fecal coliform scores for station WD 7 for the open season October through May were then plotted by year against rainfall amounts. This table shows that during the fall, winter and early spring months that elevated fecal coliform scores have been detected at station WD7 with no rainfall to varying rainfall amounts.

Table 7 Maximum Fecal Scores at WD 7, from October through May verses Rain up to 72 hours Prior to Sample Collection

		Year						
72 hr accum rainfall	Data	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
0”-0.25”	Maximum Score	**3.6**	**< 3**	**< 3**	**43**	**9.1**	**11**	**40**
	Number of Samples	5	1	3	4	3	7	1
0.25”-0.5”	Maximum Score		**< 3**		**3.6**	**150**		**1.9**
	Number of Samples		2		1	2		1
0.5”-0.75”	Maximum Score		**93**	**23**	**3.6**			
	Number of Samples		2	2	1			
0.75”-1”	Maximum Score							**52**
	Number of Samples							1
1”-1.25”	Maximum Score		**3.6**					**74**
	Number of Samples		1					1
1.25”-1.5”	Maximum Score			**< 3**	**43**			
	Number of Samples			1	1			
1.5”-1.75”	Maximum Score					**< 3**		**28**
	Number of Samples					1		1
3.75”-4”	Maximum Score					**150**		
	Number of Samples					1		

Conclusion:

Water quality in 2007 has declined at station WD 7 and 8. WD 7 has declined very dramatically. Four of the samples collected from January through July exceeded the 31CFU/100ml P90 standard. River Road culvert/sewer construction began in mid April 2007. Two of the samples with fecal coliform scores exceeding the P90 standard were collected before the culvert/sewer construction began. Since WD9 has been improving in water quality scores and WD 7 and 8 have been decreasing with WD 7 showing a dramatic increase in 2007, the pollution problem

may be more local to WD 7 rather than coming down the Ogunquit River from WD 9. Sewer construction work near the Ogunquit River has occurred over the past few years.

This report recommends that the lower Ogunquit River seasonal conditional area remain in the closed status until additional shoreline survey work and water quality testing can be done to determine if this is a continuing problem. This report further recommends that the lower seasonal conditional area which will remain in the closed status be monitored by station WD7.5.

The sewer district should be contacted to determine if previous sewer work may be having an impact in the WD 7 area. The codes enforcement/licensed plumbing inspector should be contacted to determine if there have been any malfunctioning septic systems in the area or any repairs/upgrades to septic systems in the area. This report recommends that more frequent water quality testing be done this year than what is scheduled for systematic random sampling.

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.