



**Sanitary Survey Report
Shellfish Growing Area WU**

The St George River

Report Date: December 30, 2009

Fran Pierce

APPROVAL

Division Director:

_____ Date: _____
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DRAFT REVIEW FORM

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Figure 1. Shellfish Growing Area WU with Active Stations

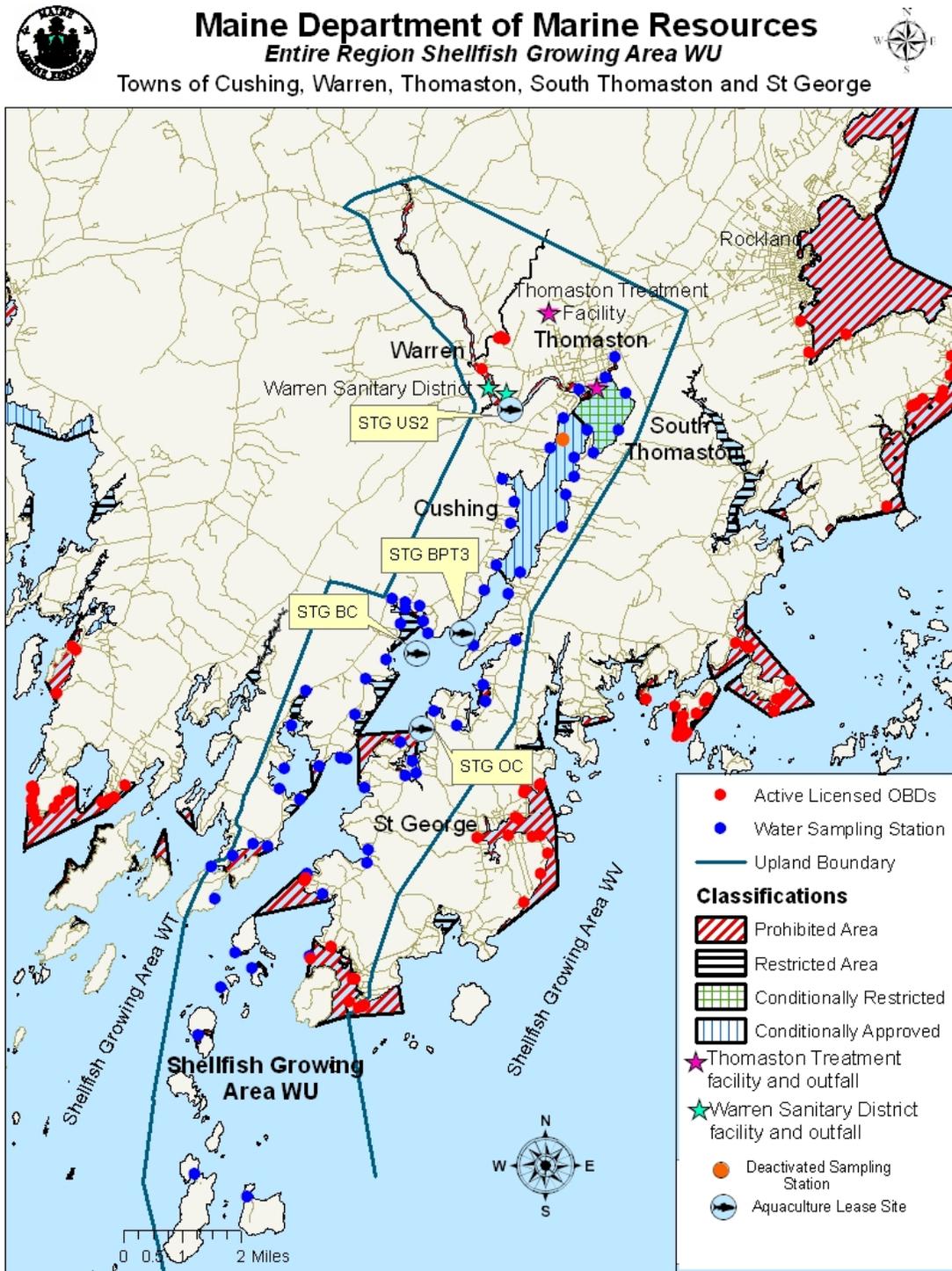




Figure 2. Area WU Detail- Northern Portion of St George River



Maine Department of Marine Resources
Place Names Shellfish Growing Area WU Northern Portion
Towns of Cushing, Warren, Thomaston, South Thomaston and St George

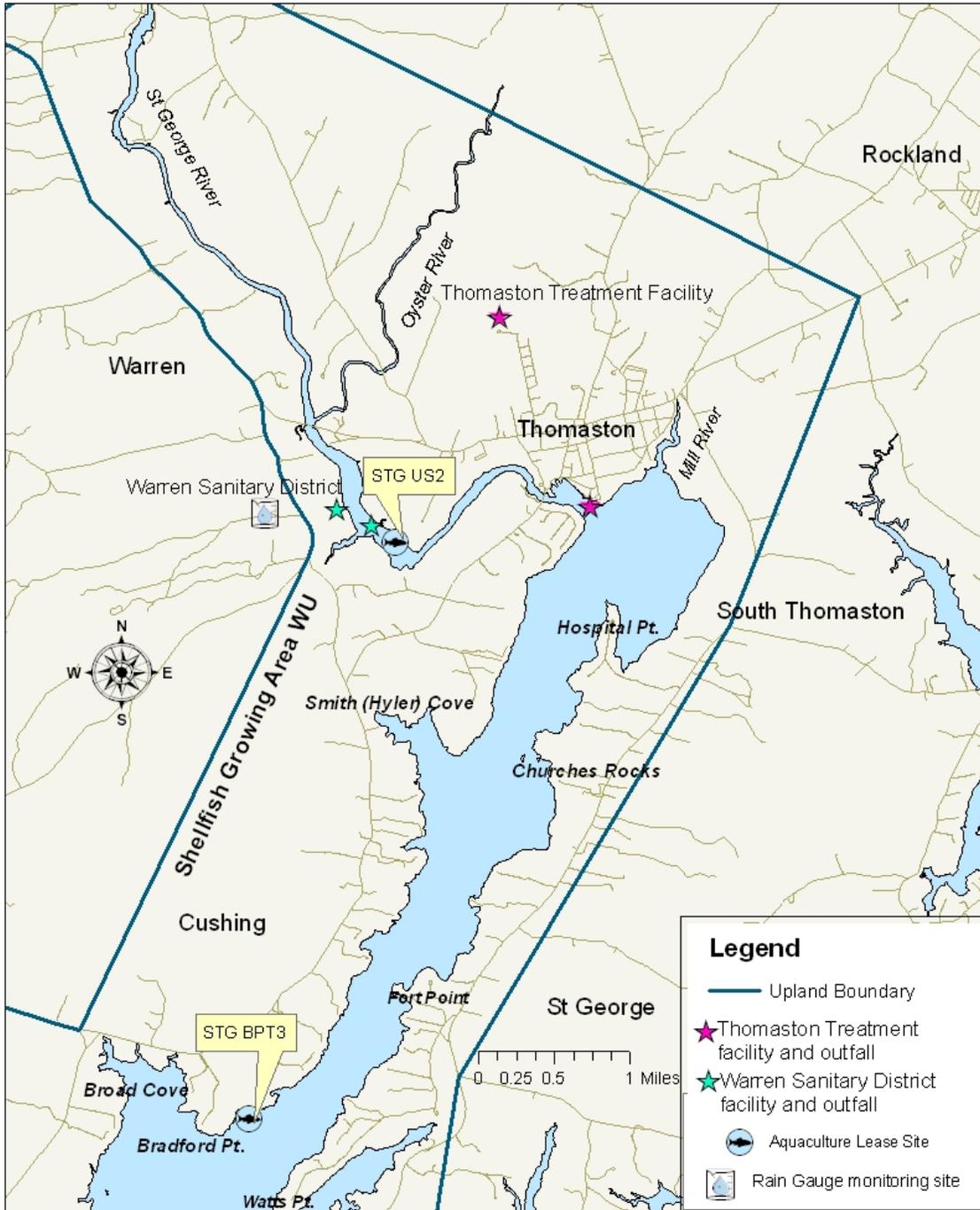




Figure 3. Area WU Detail- Southern Portion of St. George River



Maine Department of Marine Resources
Place Names Shellfish Growing Area WU
Towns of Cushing and St George





Executive Summary

This is a Sanitary Survey Report of Shellfish Growing Area WU-St George River. This report is written in compliance with the requirements of the 2005 Model Ordinance and the Shellfish Sanitation Program. The last Sanitary Survey Report of this area was written by Paul Anderson of the Department of Marine Resources in 1996. The current report covers a shoreline survey of the upper half of the river which was conducted in 2005 and a shoreline survey of the lower half of the river which was completed in 2007. As a result of this Sanitary Survey Report five changes in classification are being proposed and discussed in this report. The specific proposed classification changes include: 1) enlarging the approved area in Pleasant Point Gut, Cushing, due to the removal of two pollution sources; 2) modifying the boundary line between a conditionally restricted and conditionally approved areas on the upper St George; 3) repealing the prohibited area near station WU 42.5; 4) repealing the prohibited area surrounding Teel Island; and 5) creating a closure around Hupper Island, due to lack of sanitary survey.

Description of Growing Area

This report covers the shores of the St George River in growing area WU. Shellfish growing area WU includes shore frontage in the towns of Cushing, Warren, Thomaston, South Thomaston, and St George (Figures 1, 2 and 3). The St. George River is an important resource area for commercial shellfish harvesting in the state of Maine. The resources in area WU are managed by a five town management group which includes diggers from the towns of Cushing, Warren, Thomaston, South Thomaston and St George. The entire harvestable shore frontage in each of these towns is available to each of the licensed diggers from any of the five towns. In 2007, there were 107 resident licensed diggers, 11 non-resident, 9 junior resident, and 1 junior non-resident digger comprising the five town management group.

There are two treatment facilities that discharge into the prohibited area that abuts the conditionally restricted area. The Warren Sanitary District serves approximately 950 residents (250 connections) within the village of Warren. Approximately 72% of the total sanitary wastewater influent flowing to this facility originates at the State of Maine Department of Corrections Minimum and Maximum Security Prison Facility and the Maine Correctional Institute. The Thomaston Treatment Facility serves a population of approximately 2,700 citizens. The Thomaston and Warren waterfront areas are the only portions of this growing area that are served by municipal treatment.

With the exception of the immediate waterfront section of Thomaston, the St George River is very rural. Development along the shore consists of private dwellings with some farm land for grazing animals. There are three subdivisions in this study area. The dwellings at Hospital Point, South Thomaston and Watts Point, St George developments utilize raised-bed in-ground systems. The dwellings in the Atticus Hill subdivision are connected to the municipal treatment lines from the Thomaston Treatment Facility. The majority of private dwellings that are not part of an established subdivision use in-ground systems and there are still a small number of outhouses that serve small, seasonal camps along the shore.



The upper portion of shellfish growing area WU (Thomaston to Bradford Point, Cushing) has been broken down into three shellfish classification regions. The uppermost portion along the Thomaston and Warren waterfronts is classified as prohibited. This area includes Mill River, the Oyster River and the uppermost reaches of the St George River. Abutting this prohibited area is a conditionally restricted area. The conditionally restricted area contains 432 acres of mudflat and is only available for depuration harvesting. This area is conditional on the operations of both the Thomaston Treatment Facility and the Warren Sanitary District. Just south of the conditionally restricted area is a large area that is classified as conditionally approved based on rainfall (≥ 1.5 inches in 24 hours). The conditionally approved area contains 774 acres of mudflat. South of Bradford Point, the lower half of the river contains several smaller flats that are classified as restricted, approved, and prohibited for shellfish harvest. Growing area WU classifications are shown in Figures 4, 5 and 6.



Figure 4. Sampling Stations and Current Classifications - Upper River



Maine Department of Marine Resources Shellfish Growing Area WU Northern Portion Sampling Stations

Towns of Cushing, Warren, Thomaston, South Thomaston and St George

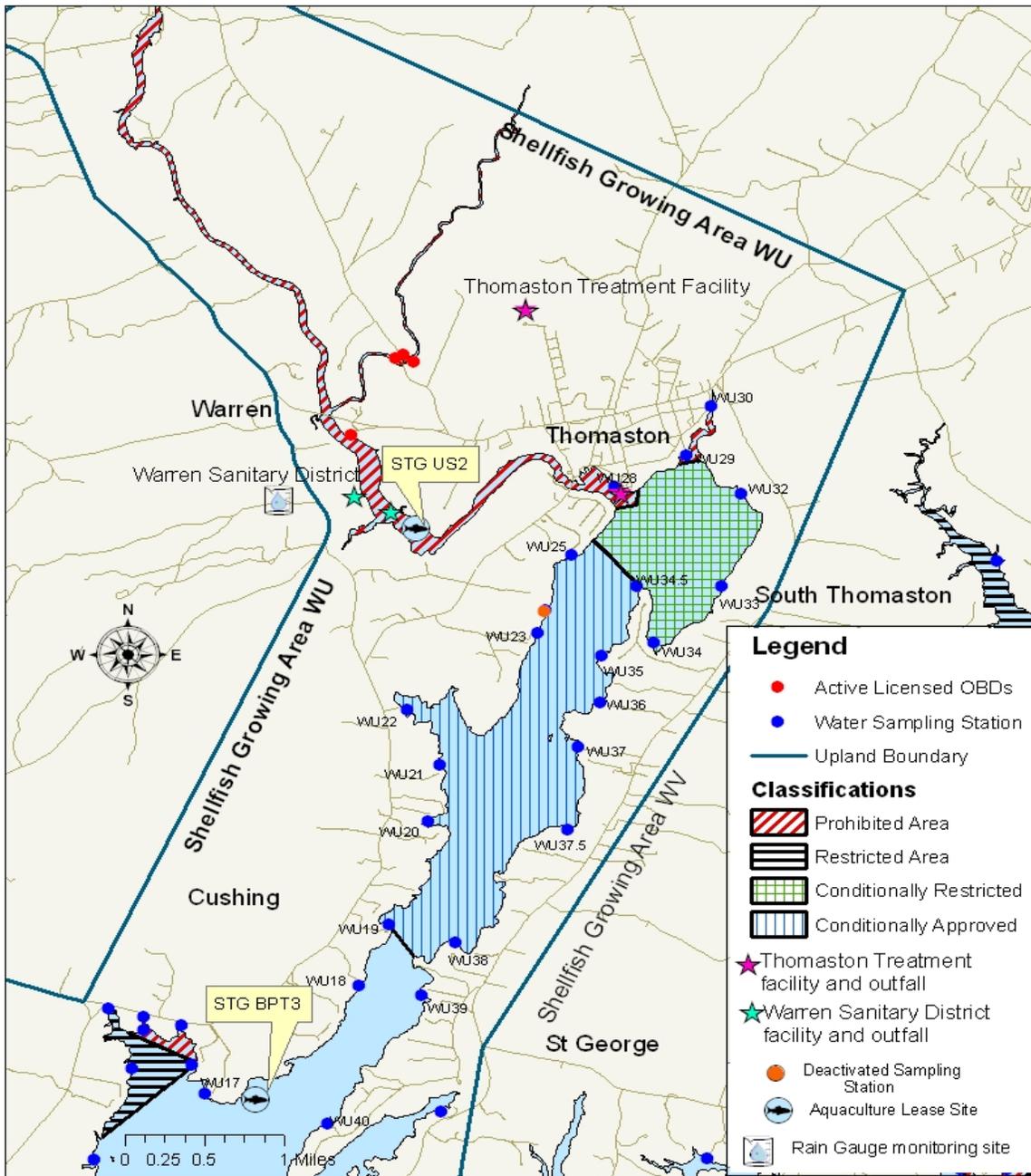




Figure 5. Sampling Stations and Current Classifications- Lower River



Maine Department of Marine Resources
Shellfish Growing Area WU Southern Portion Sampling Stations
Towns of Cushing, and St George

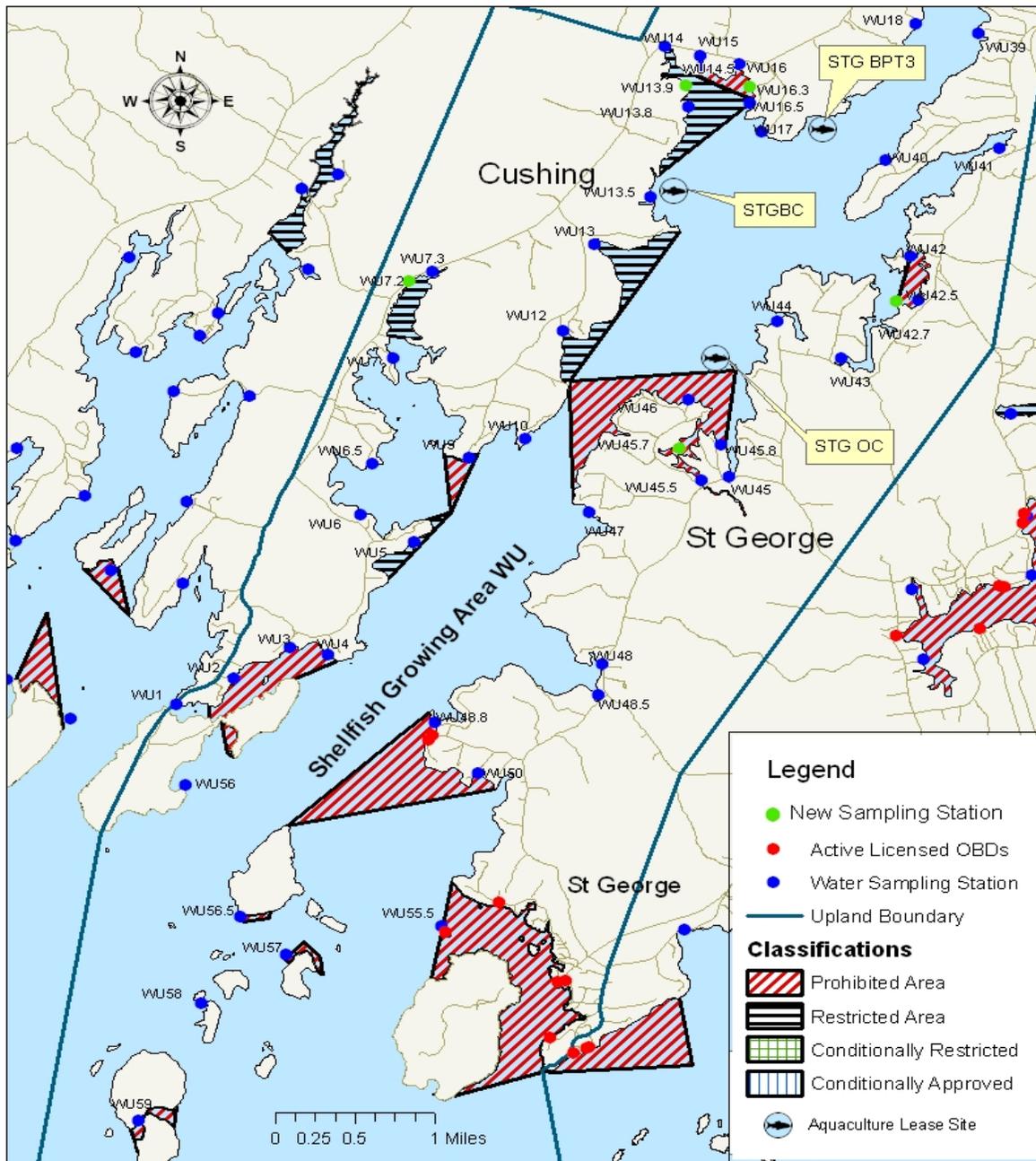
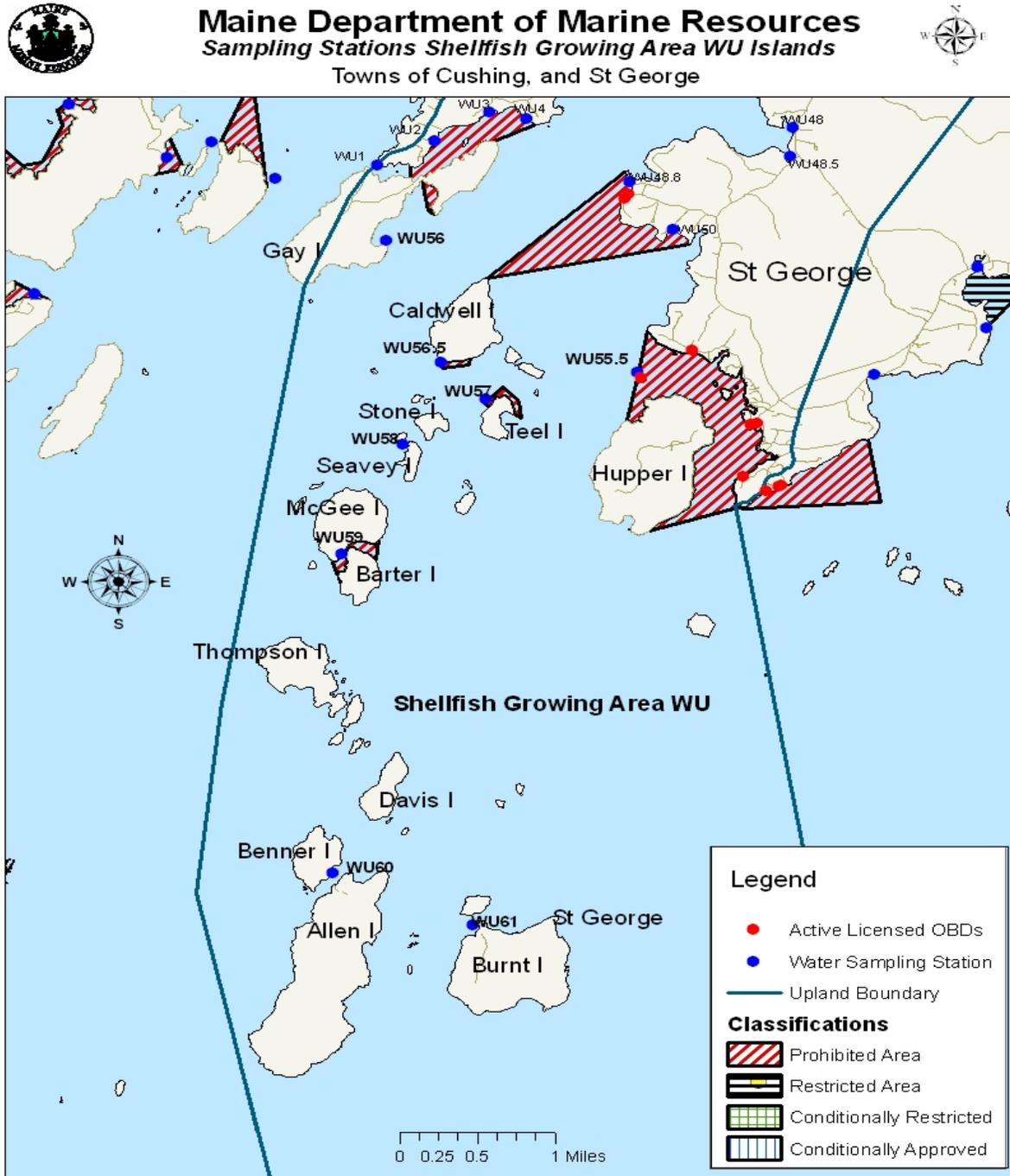




Figure 6. Sampling Stations and Current Classifications, Islands within Growing Area WU





History of Growing Area

Growing Area Classifications

The last Sanitary Survey Report of the entire growing area (WU) was written by Paul Anderson of the Department of Marine Resources in 1996. Tables 1 and 2 list classification changes that have occurred in area WU from 1996 through 2007.

Table 1. History of Classification Changes from 1996 to Present – Upper St George River

YEAR	Classification Discussion
1996	Area was surveyed, new sanitary survey report was written (Paul Anderson). Portions of the conditionally restricted area became conditionally approved based on operations at Thomaston Treatment.
1997	A large portion of the conditionally restricted area is reclassified to prohibited to restrict depuration harvest in anticipation of improvements to water quality due to the new Thomaston Treatment Facility going on line.
1998	The new Thomaston Treatment Facility is operational and the size of the (STP) conditionally approved area is reduced
1999	It is determined that rainfall in excess of 1.5 inches in a 24 hour period impacts the water quality on the river. The conditionally approved area is enlarged and is now conditional on BOTH the operations at the Thomaston Treatment Facility and rainfall > 1.5 inches. A small pie shaped closure is needed between the conditionally restricted and conditionally approved area – it is discovered that operations at a chicken farm are impacting the water quality in this area.
2000	Survey work is ongoing around the chicken farm to document impact and come up with a solution. Portions of the conditionally restricted area now have water quality scores that meet conditionally approved standards.
2001	The conditionally approved area is enlarged to include the former restricted area in Smith Cove. The small pie shaped prohibited area between the conditionally approved and conditionally restricted area is also added to the conditionally approved portion. The chicken farm has gone out of business, water quality improved.
2002 and 2003	A small closure is put in place in the outer portion of Smith Cove due to elevated water quality scores. It is determined that a malfunctioning septic system bordering on a drainage to the area is the cause. The system is replaced and water quality improves.
2004-2006	The small closure in the outer portion of Smith Cove is reclassified to conditionally approved. It is decided that due to near perfect operations at Thomaston Treatment and the new Warren Sanitary District, the portion of the river that was conditionally approved based on both rainfall and the treatment facilities no longer needs to be conditional on the treatment facilities and is now only conditional on rainfall > 1.5 inches. The only portion of the river conditional on the operations at the treatment facilities is the conditionally restricted area in the upper river.

Table 2. History of Classification Changes from 1996 to Present – Lower St George River

YEAR	Classification Discussion
1996	Area was surveyed, new sanitary survey report was written (Paul Anderson).
1997	The closure in Maple Juice Cove, Cushing is enlarged in the southern portion of the cove. The closure in Otis Cove, St George is reduced to just the southern section. A small closure in the north end of Cutler Cove is removed. The large closure around the



YEAR	Classification Discussion
	islands is reduced on the east side of Caldwell Island.
1998	No classification changes.
1999	The large closure around the islands is reduced to three small closures around McGee, Seavey and Caldwell Islands. The closure on the east side of Gay island is reduced in size.
2000	A small closure is needed at Stones Point, Cushing due to deteriorating water quality.
2001	The closure in Pleasant Point Gut, Cushing is reduced in size.
2002-2003	No changes
2004	The closure in the southern end of Maple Juice Cove, Cushing is reduced in size. The two closures between Bailey Pt. And Hawthorne Pt., Cushing are removed due to improved water quality. The closure in Otis Cove, St George is reduced in size. The restricted area in Broad Cove, Cushing is reduced in size. The closure in The Narrows portion of the river is enlarged to meet FDA standards.
2005	The cove south of Bailey Pt., Cushing no longer meets approved standards and is reclassified prohibited.
2006	The closure in Pleasant Point Gut, Cushing is enlarged due to deteriorating water quality. The closure in the southern portion of Maple Juice Cove is removed.
2007	The closures in the northern portion of Maple Juice Cove and at Stones Point, Cushing both become restricted to meet FDA standards (no point sources in the area). The restricted area in Broad Cove is enlarged to meet FDA standards (closure line must be placed between stations). A closure is made in Watts Cove, Cushing due to deteriorating water quality. The prohibited area in Otis Cove, St George is enlarged to meet FDA standards (closure line must be placed between approved stations).

Station Changes, 2005-2007

Table 3 shows the sampling station changes that have taken place in shellfish growing area WU from 2005 to 2007. In 2005, all sample stations in the state were reevaluated to determine if any additional stations were needed or conversely, if any were being sampled unnecessarily. Several stations were deactivated because they were located in prohibited areas that had little chance of upward reclassification in the future.

Table 3. Station Changes, 2005 - 2007

Station ID	Date of Activity C = create R= reactivate D = Deactivate	Class	Location	Justification
WU 8	D 7/8/05	A	Maple Juice Cove	Consistently clean no pollution to monitor
WU 25.5	D 7/19/05	P	Upper St George prohibited area	Very little chance of reclassification
WU 26	D 7/19/05	P	Upper St George prohibited area	Very little chance of reclassification
WU 26.8	D 7/19/05	P	Upper St George prohibited area	Very little chance of reclassification
WU 27	D 7/19/05	P	Upper St George prohibited area	Very little chance of reclassification



Station ID	Date of Activity C = create R= reactivate D = Deactivate	Class	Location	Justification
WU 27.2	D 7/19/05	P	Upper St George prohibited area	Very little chance of reclassification
WU 27.4	D 7/19/05	P	Upper St George prohibited area	Very little chance of reclassification
WU 24	D 11/15/05	CA	Upper St George	Station close to two other stations
WU 51	D 7/8/05	P	Port Clyde	Very little chance of reclassification
WU 54	D 7/8/05	P	Port Clyde	Very little chance of reclassification
WU 55	D 7/8/05	P	Port Clyde	Very little chance of reclassification
WU 7.2	C 7/13/07	P	Maple Juice Cove	Monitor site of proposed closure line
WU 13.9	C 5/24/07	CA	Broad Cove	Monitor site of proposed closure line
WU 16.3	C 5/24/07	CA	Broad Cove	Monitor site of proposed closure line
WU 42.7	C 5/24/07	P	Watts Cove	Monitor site of closure line
WU 45.7	C 5/24/07	P	Otis Cove	Monitor site of proposed closure line

Current Classifications

At the end of 2007, the shores of shellfish growing area WU are classified as approved, conditionally approved, restricted, conditionally restricted and prohibited. There are 70 active water sampling stations monitoring the water quality in shellfish growing area WU.

The station classification break-down is as follows:

Approved

- Twenty five (25) stations are classified as approved.

Conditionally Approved

- Eleven (11) stations are classified as conditionally approved
Area No. 27; 11 stations are conditional on ≥ 1.5 inches of rainfall in 24 hour period; WU 19, 20, 21, 22, 23, 25, 35, 36, 37, 37.5, and 38.

Restricted

- Eight (8) stations are classified as Restricted
Area No. 27-B; due to non-point pollution; WU 5, 12, 13, 13.8, 14, 14.5, 15, and 16.

Conditionally Restricted

- Four (4) stations are classified as conditionally restricted,
Area No. 27; conditional on operations at Warren and Thomaston Treatment Facilities; WU 32, 33, 34, and 34.5.

Prohibited

- Eighteen (18) stations are classified as Prohibited.



Area No. 27: 2 stations - WU29 and WU30, due to non-point pollution

Area No. 27: 1 station - WU28, due to treatment plant outfall

Area No. 27-B: 13 stations – WU2, due to point source

WU 3, 7.2, 7.3, 9, 42.5, 42.7, 45.5, 45.7, 46, 56.5, 57, and 59 due to non-point pollution

Area No. 27-B: 2 stations – WU 48.8 and 55.5 due to point source (OBD) and WU 50 due to a potential septic overflow.

Current Management Plan(s) for Conditional Areas

At the end of 2007, there were two conditionally managed areas in Growing Area WU:

1) Upper Bay, Thomaston and South Thomaston: this area is conditional on operations at Warren and Thomaston sewage treatment facilities. This area also closes during Thomaston Treatment Facility discharge period, between January 1 and March 31. The stations that monitor this conditional area are WU 32, 33, 34, and 34.5.

2) Hospital Point-Fort Point, Cushing/South Thomaston and St George: this area is conditional on rainfall (area closes after ≥ 1.5 " rainfall in 24 hours). The stations that monitor this area are WU 19, 20, 21, 22, 23, 25, 35, 36, 37, 37.5, and 38.

Management plans for WU conditional areas can be found in DMR's central files. The rainfall management plan requires reporting by the St George River Shellfish Warden. The sewage treatment management plan requires reporting by the Warren and Thomaston sewage treatment plan operators.

Current Annual Review of Management Plan

1) The Upper Bay conditionally restricted area has not been closed due to a malfunction since 1997 which is the last year the Thomaston treatment facility was located on the Thomaston waterfront.

2) Hospital Point-Fort Point, Cushing/South Thomaston and St George: rainfall conditional area this area closed 5 times in 2007.

The 2007 management plan review for the conditionally approved and conditionally restricted areas are located in Appendices A and B of this report.

Pollution Source Survey

The shoreline survey of Shellfish Growing Area WU started at the tip of Bradford Point in Cushing in July of 2005 and continued over the course of the summer concluding on the southern tip of Watts Point, St George. The shoreline survey of the lower portion of Shellfish Growing Area WU started at the southern tip of Cushing and continued up to Bradford Point, Cushing. The survey then continued down the opposite shore, starting at the tip of Watts Point and concluding at Hooper Point, St George. The following islands were also surveyed in 2007: Gay, Caldwell, Little Caldwell, Teel, Seavey, McGee, Thompson, Davis, Allen and Benner.



Hupper Island was not surveyed, and the prohibited area around the island is required to be enlarged to include the entire island until the survey has been updated. Shoreline survey work was conducted by staff from the Department of Marine Resources with assistance from staff from The Department of Environmental Protection. All dwellings within 500 feet of the shore were inspected. Drainages were sampled during the survey and are usually sampled once or twice on an annual basis.

Domestic Waste

Twenty actual pollution sources and eight potential sources were identified during the survey of shellfish growing area WU (Tables 4 and 5, Figure 7, 8 and 9). A total of 12 septic malfunctions were identified during the survey. Two dwellings had inadequate systems consisting of sink drains emptying directly onto the shore. One dwelling was identified with an outhouse discharging directly onto rocks above the shore. One straight pipe discharge to a wooded lawn area was identified. It was also noted that straight pipes identified during a previous survey of one of Hupper Island had not been fixed. Hupper Island was not surveyed, and the prohibited area around the island is required to be enlarged to include the entire island until the survey has been updated. One of the islands (McGee) had a dwelling with a seasonal holding tank that has a release valve directly to the shore. Two dwellings had washing machine drains: one to a stream and the other to the surface of the ground. The local plumbing inspector responsible for each of these areas was notified and to date ten of the pollution sources have been fixed.

Eight properties were identified with systems considered capable of potentially malfunctioning in the near future. These systems will be closely monitored to assure that they are functioning. Four septic systems were found to be potential sources of pollution. One outhouse located on a small island in Pleasant Point Gut will be monitored annually. Another outhouse of concern has been replaced with a new septic system. One business was identified as having a drain to the shore that could contribute to pollution in the immediate area. One washing machine or cellar drain was reported to the LPI for inspection to positively identify what the pipe in question was draining. All pollution sources that resulted in a closure in the immediate area are highlighted in yellow. Pollution sources that did not result in a closure were considered too far from the shore to have an impact on the water quality.

Table 4. Actual Pollution Sources, Growing Area WU

PS ID	Type of Pollution	Actual/Potential Direct/Indirect	Fixed Yes/No	Action Taken
AP1	Inadequate system	Actual/Direct	Yes	Reported to LPI and has since been fixed
AP2	Outhouse	Actual/Direct	Yes	Reported to LPI and has since been relocated
AP3	Septic Malfunction	Actual/Direct	No	Reported to LPI, the closure in this area was enlarged
AP4	Septic Malfunction	Actual/Indirect	No	Reported to LPI, revisited Sept. 08 and found in working order
AP5	Septic Malfunction	Actual/Indirect	Yes	Reported to LPI
AP6	Straight Pipe to Lawn	Actual/Indirect	No	Reported to LPI, system is >500' from shore. A closure was made where stream enters the shore.
AP7	Septic malfunction	Actual/Indirect	Yes	Reported to LPI, system is >1000' from shore.
AP8	Septic	Actual/Indirect	Yes	Reported to LPI and has since been fixed



PS ID	Type of Pollution	Actual/Potential Direct/Indirect	Fixed Yes/No	Action Taken
	malfunction			
AP9	Septic malfunction	Actual/Indirect	Yes	Reported to LPI
AP10	Inadequate system	Actual/Direct	No	Reported to LPI. Dwelling will be unoccupied until new system can be built.
AP11	Septic malfunction	Actual/Direct	Yes	Fixed before it was reported to LPI
AP12	Septic Malfunction	Actual/Indirect	No	Located >500' from shore, reported to LPI New system has been designed
AP13	Septic Malfunction	Actual/Indirect	Yes	Trench dug too close to system
AP14	Septic or washing machine drain	Actual/Indirect	No	Lint and hair visible below pipe, located >1000' from shore
AP15	Septic Malfunction	Actual/Indirect	No	Wastewater discharged to pond with drainage, >1000' from shore; New system has been designed
AP16	Septic Malfunction	Actual/Indirect	Yes	Septic discharge to ground above drainage, >1000' from shore
AP17	Septic Malfunction	Actual/Indirect	No	Wastewater discharged to wooded wetland 50' from small brook, located >500' from shore. New system has been designed.
AP18	Washing machine drain	Actual/Direct	Yes	Dye test confirmed washing machine drain went to ditch, drain was connected to septic system.
AP19	Straight Pipes	Actual/Direct	No	Up to eight straight pipes. Island was not surveyed in 2007 – closure enlarged.
AP20	Holding Tank	Actual/Direct	No	Holding tank directly above shore that has release valve at base.

Table 5. Potential Pollution Sources in Area WU

PP#	Type of Pollution	Potential Direct/Indirect	Action Taken
PP1	Septic System	Potential/Direct	Three dye tests completed, but no dye visible
PP2	Shellfish Business Drain	Potential/Direct	Dye tested, but no dye visible
PP3	cellar or washing machine drain	Potential/Direct	Reported to LPI for follow up
PP4	Old Septic System	Potential/Direct	Dye tested twice, but no dye visible
PP5	Old Outhouse no longer in use	Potential/Direct	New system has been installed
PP6	Outhouse on island	Potential/Direct	Annual inspections documented in annual review of growing area
PP7	Old small system	Potential/Direct	Precautionary closure made
PP8	Old small system	Potential/Direct	Precautionary closure made



Figure 7. Locations of Pollution Sources, Upper St George River

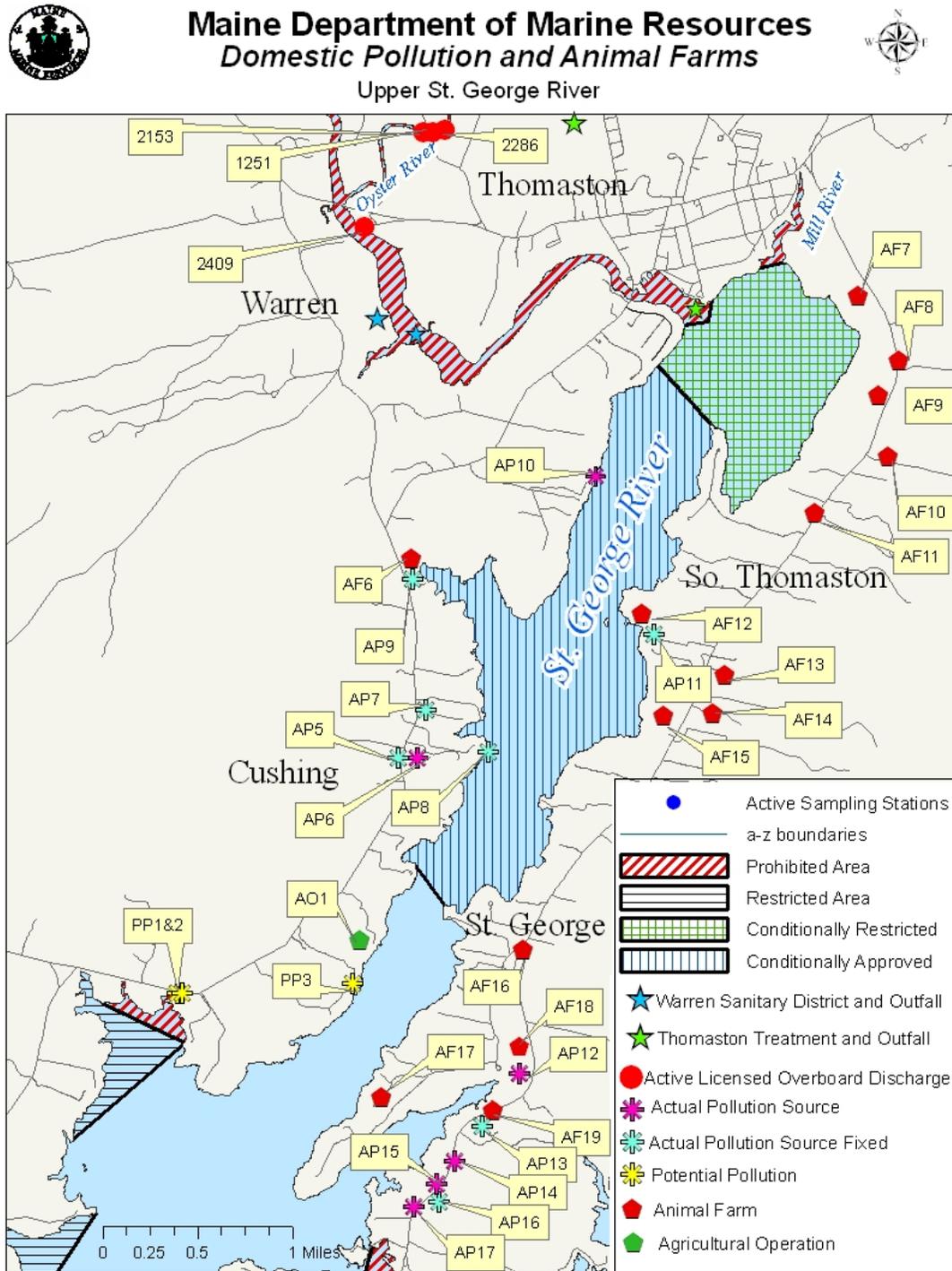




Figure 8. Pollution Sources Lower River

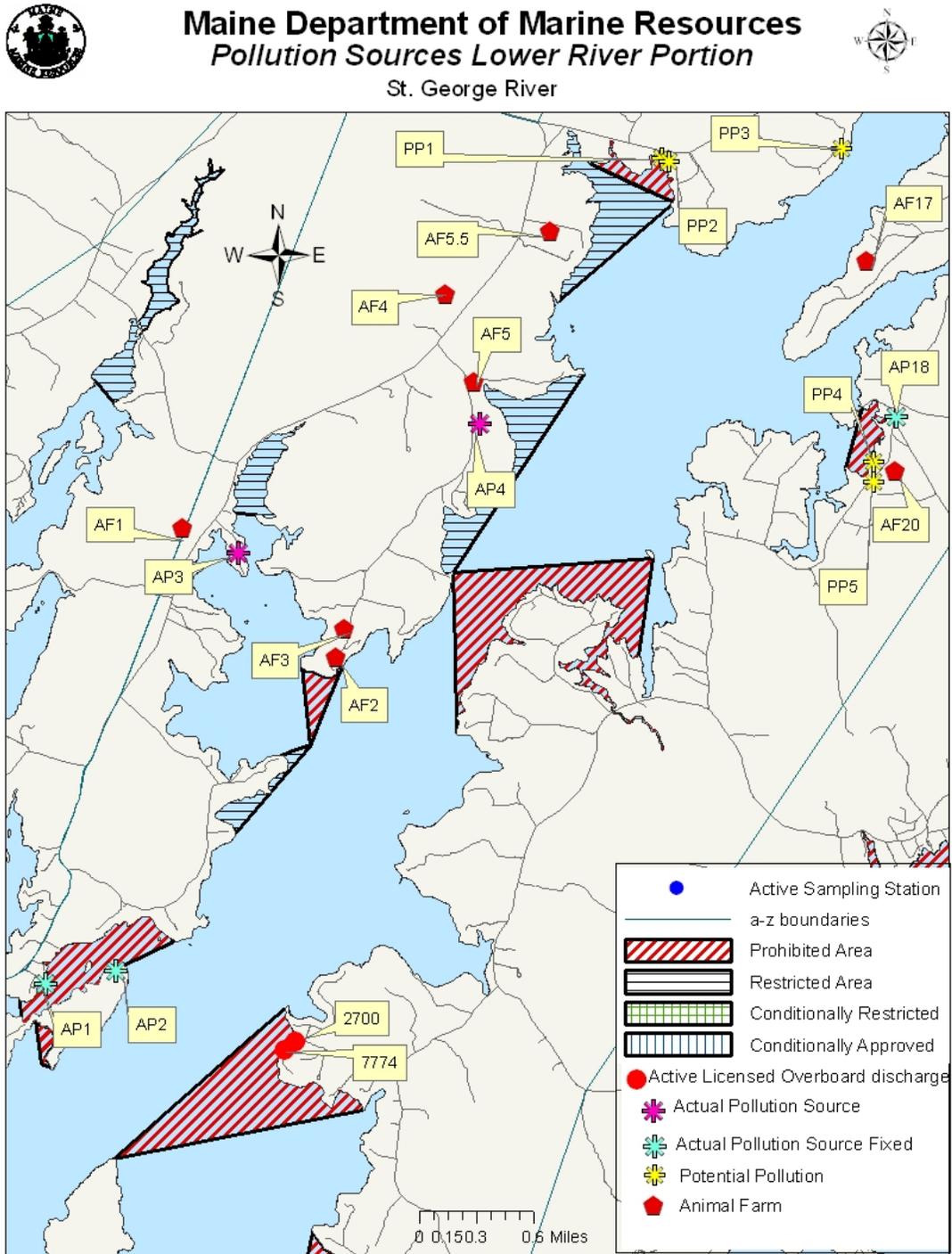
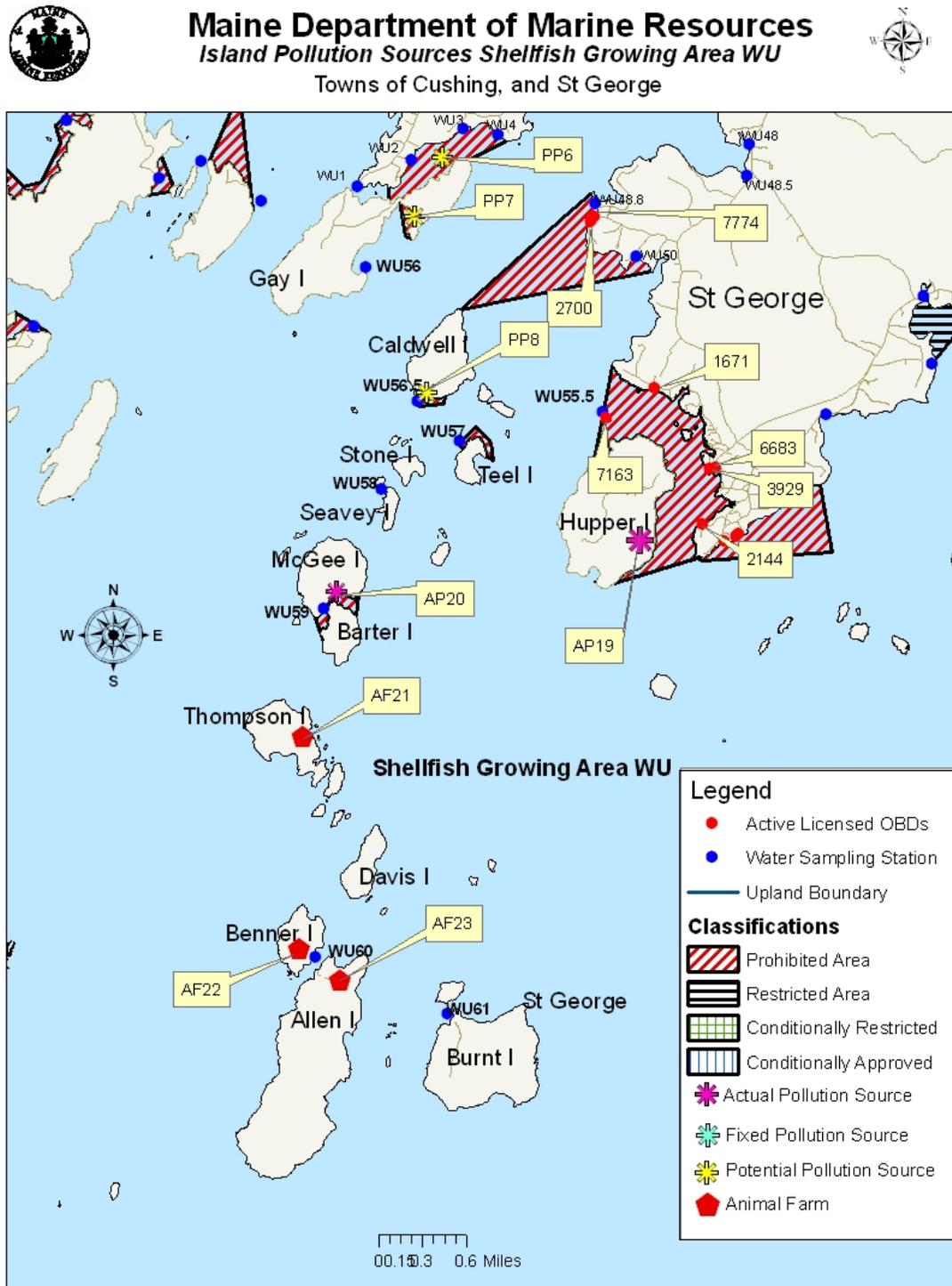




Figure 9. Pollution Locations, WU Islands





Shellfish growing area WU has a total of eleven active licensed overboard discharges (Table 6). Four of these discharges are located inside the closure area for the Warren and Thomaston treatment facilities. Two OBDs are located at Howard Point, St George. Five OBDs are inside the closed area in Port Clyde Harbor. This area was not surveyed due to the relative lack of shellfish resources and the potential and actual pollution sources in Port Clyde and on Hupper Island. None of these overboard discharges are on the Department of Environmental Protection priority list for removal. The closure in this area was expanded to include all of Hupper Island until the survey of the area can be updated. The size of the prohibited area surrounding each OBD was reviewed as part of this report; all closures are of adequate size to protect public health.

Table 6. Licensed Overboard Discharges

OBD #	Town	Flow	Receiving Water	Priority Removal	Required Closure	Actual Closure Acres
1251	Thomaston	300	Oyster River	N	3.07	158
2153	Thomaston	300	Oyster River	N	3.07	158
2286	Thomaston	300	Oyster River	N	3.07	158
2409	Warren	300	Upper St George	N	3.07	158
2700	St George	300	Mouth of St George River	N	1.02	275
7774	St George	300	Mouth of St George River	N	1.02	275
7163	St George	50	Mouth of St George River	N	0.15	345
1671	St George	900	Port Clyde Harbor	N	2.76	345
6683	St George	500	Port Clyde Harbor	N	1.71	345
3929	St George	1500	Port Clyde Harbor	N	5.12	345
2144	St George	300	Port Clyde Harbor	N	1.15	345

Municipal Waste Water Treatment Facilities

The towns of Warren and Thomaston have municipal treatment facilities. The location of these facilities and their outfalls is shown on Figure 7. Both facilities have been operating very effectively for a number of years without any malfunctions. Thomaston Pollution Control Department hasn't had a malfunction since 1997, which is prior to the new plant being constructed at its present site. The new facility became operational in December of 1997. Prior to this date the facility was located on the Thomaston waterfront and served the old Maine State Prison along with the residents of Thomaston. There were numerous malfunctions during this period. State prison inmates flushed clothing and debris down the sewer lines causing back-ups and bypasses. Grease from the prison kitchen was flushed down the sewer lines, which also caused back-ups.

The Maine State Prison was rebuilt in the town of Warren, and the Warren waste treatment facility was enlarged to handle the waste water from the new prison. The new Warren Sanitary District had one minor malfunction event shortly after the new prison facility became operational (April 19th 2002). A manhole became blocked with gravel and construction debris causing water to flow out of the manhole. The line was flushed and samples were collected downstream from the manhole to be tested for fecal coliform bacteria. Staff from both DEP and DMR collected samples. None of the samples revealed the presence of fecal coliform bacteria. The bar grate at



this manhole was checked twice a day following this incident and the prison planned to install a Muffin Monster grinder to clear debris from the site. No wastewater reached the river necessitating a shellfish closure. There have been no other incidents involving the prison sewer lines or the Warren Sanitary District.

Thomaston Pollution Control Department

The Thomaston Treatment Facility serves a population of approximately 2,700 citizens. The collection system consists of 13 miles of pipe; 5 pump stations and no CSOs. The municipal sewer collection system delivers the sewerage to the Ship Street pump station by gravity. The Ship Street pump station consists of a mechanical bar screen and an auxiliary manual bar screen, two influent pumps and a flow meter. Effluent from the Ship Street pump station is pumped to the treatment lagoons, with a total capacity of 21 million gallons, and a storage lagoon with a maximum liquid level depth of 20 feet and a capacity of 36 million gallons. Aeration is provided to the treatment lagoons via three blowers, air distribution piping and 98 fine-bubble tubular membrane diffuser assemblies. The lagoons were designed for an average daily influent flow of 427,000 gallons per day (GPD) and an influent BOD of 885 lbs/day. At an influent rate of 427,000 GPD, the 36 million gallon storage lagoon provides for 84 days of storage. During the months of January, February and March, the effluent from the lagoons is disinfected with sodium hypochlorite and flows by gravity through 7,100 linear feet of pipe to the St George River where it is discharged via the outfall pipe at the former Thomaston Treatment Facility. During the period from April 15 through October 31 of each year, Thomaston is authorized to dispose of wastewater by spray irrigation on approximately 52 acres of a 300 acre site consisting of 5 spray irrigation fields of approximately 10 acres each. The effluent is land applied by a spray irrigation system consisting of two 75 horsepower pumps, approximately 26,000 linear feet of distribution piping, and 130 + spray nozzles. Each spray nozzle is capable of delivering a 150 foot diameter spray pattern. The effluent is applied to one field at a time with each field being used one day each week. The waste water is applied at a maximum rate of 3 inches per week per site. The spray irrigation fields are six hundred feet from the shores of the banks of the Oyster River (northwest of Thomaston waterfront) and more than 3.5 miles from the conditionally restricted area in the upper portion of the river. When the facility is not permitted to use spray irrigation, wastewater is stored in the lagoons.

In 2003, Thomaston Treatment requested to be allowed to change their chlorination requirements during their discharge period. After reviewing their effluent score results for samples taken prior to chlorination, DMR agreed to allow the plant to stop chlorinating with the condition that they continue to test their effluent during the discharge period. The agreement stated: Beginning on the first day of discharge, the permittee shall discharge for one hour and collect a fecal coliform bacteria sample and then shut down the discharge. If the sample has a bacteria level of less than 15 colonies per one hundred ml of sample, the permittee may commence discharging the next morning without chlorination. For each of the next four days of discharge, the permittee shall sample the effluent for fecal coliform bacteria and thereafter twice per week during the discharge period providing no samples have 15 colonies or greater per hundred of fecal coliform bacteria. If any fecal coliform bacteria sample has bacteria at 15 colonies per hundred or greater, the permittee shall resume daily chlorination for the remainder of the period January 1 through March 31.⁴

In 2004, DMR decided that further documentation of the effluent test results was necessary. DMR ran duplicate samples to compare their test results with those of the treatment plant staff (Table 7). The samples were collected as one large sample that was "split" with the treatment



plant lab technician, allowing both DMR and the treatment plant staff member to score the same sample. The samples were processed by the DMR lab, using the membrane filtration test with mTEC agar resuscitation and the A1 test. The Thomaston Treatment Plant processed their sample using membrane filtration using MFC agar.

Table 7. Thomaston Treatment Effluent Samples, 2004

DATE	TIME	DMR A1 Score	DMR mTEC Score	Thomaston MF Score	Comments
2/2/04	0825	<3	<2	0	
2/3/04				20	
2/4/04	0706	230	92		Ice jam, no sample
2/9/04	0735	<3	4	0	
2/11/04				2	
2/18/04				0	
2/19/04	0800	<3	2	0	
2/24/04	0730	3.6	20	0	
2/26/04	0734	<3	6	8	Sample taken before line was flushed
	0740	<3	6	2	Sample taken after line was flushed
3/2/04	0730	<3	8	4	
3/4/04	0734	9.1	16	6 & 16	Duplicate sample run in Thomaston
3/9/04	0800	<3	6	38 & 58	Duplicate samples run in Thomaston
3/11/04	0715	9.1	48	8	
3/23/04	0856	23	6	4	

In 2005, the plant discharged only during the months of February and March. During this discharge period the Department of Marine Resources collected effluent samples at least once per week and additionally as time permitted. The samples were run by the DMR lab, using the membrane filtration test using mTEC agar with a two hour resuscitation, the A1 test and a new viral test known as MSC (male specific coliphage). The Thomaston Treatment Plant ran their samples using the membrane filtration technique using MFC agar with no resuscitation. Effluent scores from both labs were then compared in an effort to document the effluent score results.

Table 8. Thomaston Treatment Effluent Samples, 2005

DATE	TIME	DMR A1 Score	DMR mTEC Score	MSC Score	Thomaston MF Score
2/1/05	0825	<3	<2		0
2/7/05	0810	<3	<2	3MSC/100ml	0
2/14/05	0738	<3	<2	2MSC/100ml	0
2/22/05	0750	<3	10	10MSC/100ml	2
2/28/05	0805	36	<2	3MSC/100ml	0
3/7/05	0745	3.6	12	no sample	
3/14/05	0740	36	24	no sample	
3/16/05	1115	<3	14	no sample	

Following the elevated scores collected on March 14, 2005, DMR conducted a second test on March 16, 2005. The DMR decided that due to the high score results on March 14, 2005, the



Thomaston Treatment Facility would be required to resume chlorination for the remainder of their discharge period OR to discontinue their discharge altogether. The plant opted for curtailing their discharge, as they were only permitted to discharge through the month of March.

A dilution calculation for the Thomaston Treatment Facility was done based on a flow rate of 350,000 gallons per day (average wet weather flow), with a bacteria concentration of 230 fecal coliform colonies/100ml (the most elevated fecal score received at the facility during effluent testing in 2004 and 2005), and an average depth of receiving water of six feet. The calculation determined that the required closure size for fecal coliform to be diluted down to an approved concentration of 14 FCU /100ml is 2.9 acres. The required closure size for viral dilution during the discharge period is 179 acres. There is currently a closure zone of 535 acres surrounding the plant's outfall during the discharge period.

Warren Sanitary District

The Warren Sanitary District serves approximately 950 residents (250 connections) within the village of Warren. Approximately 72% of the total sanitary wastewater influent flows to the facility originate at the State of Maine Department of Corrections Minimum and Maximum Security Prison Facility and the Maine Correctional Institute. The Warren Sanitary District provides secondary treatment of sanitary wastewater via a four-cell, partial mix, aerated lagoon system (Table 9).

Table 9. Warren Sanitary District Lagoon Characteristics

	Cell No. 1	Cell No. 2	Cell No. 3	Cell No. 4
Volume (millions Gallons)	5.59MG	1.58MG	1.58MG	15.0MG
Dimensions (LxWxD)	500'x145'x18'	230'x125'x18'	230'x125'x18'	irregular shaped x18'
Lagoon Acreage	1.66 acres	0.66 acres	0.66 acres	4.5 acres

Wastewater is conveyed to the treatment facility via gravity and force main sewer lines and influent flows from the Bolduc Correctional Facility and Warren Village are measured separately prior to entering Lagoon #1, using influent flow meters. Although any of the four available lagoon cells may be removed from service, flows typically follow the sequential pattern: Lagoon #1 to Lagoon #2 to Lagoon #3 to Lagoon #4. Treated effluent from the lagoons flows by gravity to a dissolved air flotation (DAF) unit for algae removal. A polymer is added to the flow prior to entering the DAF unit to assist in coagulation and flocculation. Floc is skimmed from the surface of the DAF unit to a wet well. The contents of the wet well are periodically (daily basis) pumped back to the head works for additional treatment via the lagoon system. Following the DAF unit, the flow is conveyed to a splitter box located in the disinfection building and evenly distributed to up to four channels equipped with an ultraviolet (UV) disinfection system. The UV system is equipped with an alarm system and automatic shut-off designed to cease discharge upon activation of the alarm. Additionally, the District maintains a secondary UV disinfection system to ensure continued operation and discharge upon failure of the primary system. Final effluent is measured using a Parshall flume installed immediately below the UV system channels. Final effluent is conveyed to the St George River for discharge via an 8 inch diameter outfall pipe. The outfall pipe extends out approximately 120 feet into the tidal river and is submerged to a depth of approximately 20 feet below the surface at mean low water. The outfall includes a diffuser port with four 4-inch diameter outfall ports to enhance mixing with the receiving waters. ¹



Warren's license allows both summer (June 1- September 30) and winter (October 1- May 31) discharge periods. The summer average discharge flow limit is 79,500 gallons per day and the winter average flow limit is 244,200 gallons per day. Wet weather flows are typically not greater than average flow rates.

Dilution calculations were done for both discharge periods based on the summer and winter average discharge flow limits. During the summer discharge period, based on a flow limit of 79,500GPD, using a fecal load of 14,000 FC colonies/100ml, and an average depth of the receiving waters of five feet, the required closure zone for fecal coliform to be diluted down to 14 FC/100ml of water is 48.8 acres. The required acreage for viral dilution is also 48.8 acres. During the winter discharge period, based on a flow limit of 244,200GPD, using a fecal load of 14,000FC colonies/100ml, and an average depth at the receiving waters of five feet, the required closure zone for fecal coliform to be diluted down to 14 FC/100ml of water is 149.9 acres. The required viral dilution would also be 149.9 acres. The size of the prohibited area from the route one bridge to the end of the closure lines outside of Thomaston's waterfront is 158 acres. This closure zone is adequate to dilute Warren Sanitary District's discharge during the winter discharge period. When Thomaston Treatment Facility's required dilution closure area is added to Warren's required closure area (winter discharge period) the required prohibited zone is 329 acres. During Thomaston's discharge period, there are more than 600 acres closed to shellfish harvesting.

Stormwater

Stormwater enters the upper St George River by way of stormwater drains along the Thomaston waterfront. When the new Thomaston Treatment Facility went on line at its new location, new sewer lines were installed at locations in the center of town and the stormwater lines were separated out from the sewer system making them "clean water drains". After the new facility had been operational for 3 years, it became apparent that wastewater was still entering the river in the vicinity of the Thomaston waterfront. A stormwater study was initiated to try to locate the source(s) of the elevated scores. Samples were initially collected at all streams and drains entering the waterfront. After it could be determined if a stream or drain was elevated, a combination of fecal A1 method fecal testing and optical brightener testing was conducted to document the presence of fecal coliform bacteria of human origin.

Fecal (A1) testing was initiated on April 8, 2001 and was followed by a combination of both fecal and optical brightener testing which started on May 18, 2001 and continued into late fall 2001. Samples were collected every Friday and sample locations were added or removed depending on the sample results (Figures 10 and 11). By the end of August two locations had been positively identified. A new sewer line had mistakenly not been connected to a dwelling which allowed the wastewater from the dwelling to flow directly into the stormwater drain that eventually flowed overboard off Knox Street (site 28S3). A cracked force main alongside an old storm drain allowed the wastewater to flow at a good rate into the stormwater drain and then overboard at Thatcher Street (site 29S2). A third location was later discovered by walking along the shore on Mill River. Black sludge was visible flowing out from under an old wooden plank (very old sewer line) at the end of Fish Street (site 30S2). A further investigation with treatment plant staff revealed that the sludge was wastewater. The sewer line was inspected by placing a remote video camera in the line. The camera revealed that roots had cracked the line. Wastewater was leaking out of the sewer line and flowing through holes in the ground into an



abandoned sewer line. All of the sources identified during the storm drain study were fixed by the fall of 2002.

Non-Point Pollution (Streams)

Numerous small streams can be found along both shores of the St George River, and many of these streams were sampled as part of this sanitary survey review (Figures 10 and 11). Results obtained from the most frequently sampled streams and from streams thought to have the greatest pollution impact are shown in Table 10; the classification of the water body that each stream drains into is also shown in the Table. The streams in the northern portion of the river have been sampled with greater frequency than streams found in the lower portion of the river. The northern portion of the river is conditional on rainfall of > 1.5 inches in a 24 hour period and there are also more animal farms that could impact the water quality following rainfall events. Many of the streams enter the shore near DMR's established water sampling stations. The stream sample site numbers are associated with the proximity of the stream to the closest water sampling station. If the sampled stream was not located nearby a water sampling station, it was given a site number starting with "PS". All of the gallons per minute (GPM) data values are estimated. Additional stream data collection is planned for the 2008 sampling season. Streams in the upper portion of the St George River will be mapped and flow rates will be measured; results will be presented in the next triennial report.

Several streams showed elevated fecal scores, however most streams received a combination of low and elevated scores throughout the sampling season (Table 10). Approved areas with consistently elevated stream scores may be of concern. At site 21 S1, stream samples have been collected on the same date the sea water was samples on eight sampling dates; in Table 10, results obtained from seawater samples are noted in parenthesis, below the stream scores. On seven of these dates, the sample was collected after the area had been closed due to >1.5 inches of rainfall. On all of these dates the sea water sample scores are considerably lower than the stream sample score which suggests a rapid dilution when the stream water meets and mixes with sea water at the shore. Dilution calculations were done for stream 21 S1 using two different methods. The first dilution calculation is based on an estimated flow rate of 200 gallons per minute, using the most elevated fecal score recorded at this site to date (1,140 CFU/100ml), and an average water depth of eight feet. These values provide for the worst case scenario for the estimated size of the closure; the required size of the closure in this case is nine acres. The second dilution calculation also uses an estimated flow rate of 200 gallons per minute, but uses an average of all of the fecal scores received at this stream station (302); the closure size based on this calculation is 2.4 acres. However, since the sea water scores suggest a rapid dilution, and the P90 trend chart for station WU 21 shows improving water quality scores for the last three years, with the station continuing to meet approved standards, no closure is recommended around the stream at this time. Stream 6 S8 received a score of 1100; however no flow rate was noted. This site is a small stream that frequently dries up during the summer months. Stream site 36 S1 has also received elevated scores. This site has been sampled four times. Streams 29S1, 29S2 and 30S1 have all received several elevated scores. These sites are located in the prohibited area north of the conditionally restricted area. Stream site 29S1 often has raccoon waste on the banks of the stream. Additional samples should be collected at all of these sites to determine what the current pollution impact is on the surrounding areas.



Figure 10. Stream Sample Sites Northern Portion

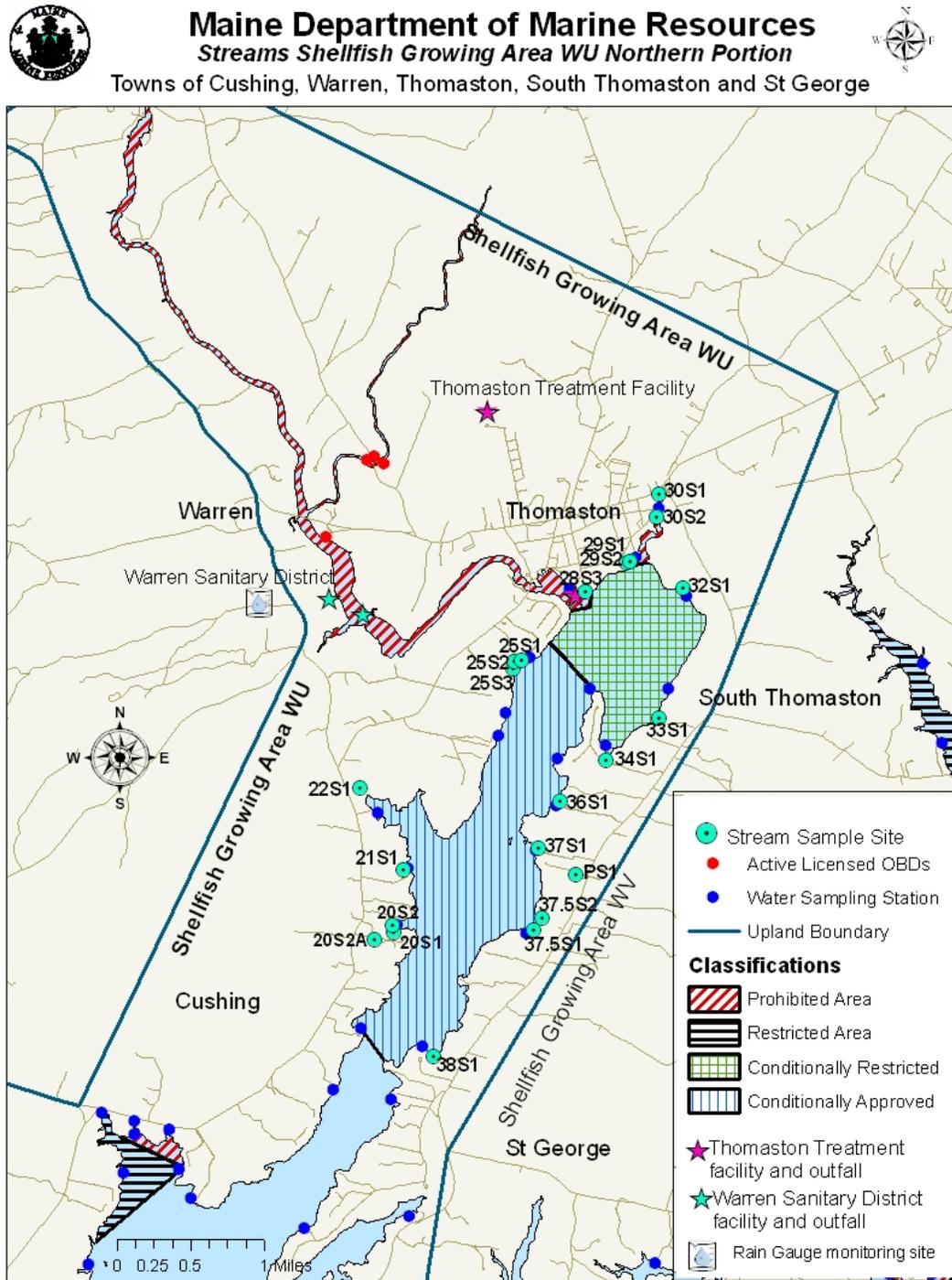




Figure 11. Stream Sample Sites Southern Portion

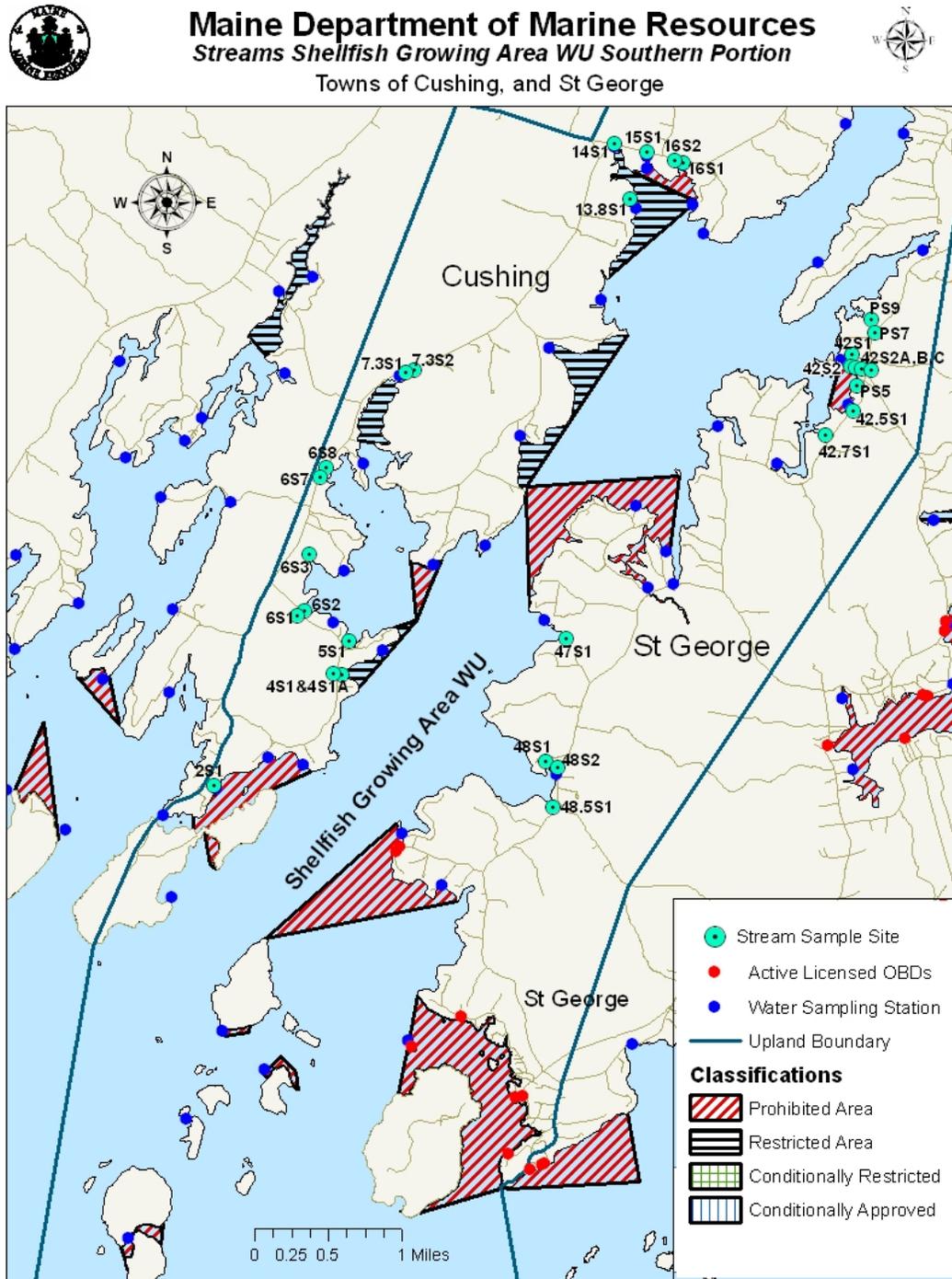




Table 10. Stream Fecal Scores FC/100ml; (marine samples for station WU 21 are shown in parenthesis)

Stream #	Date Sampled	GPM (estimated values)	Fecal Score FC/100ml	Impact: Actual or Potential	Impact: Direct or Indirect	Class at Shore	Comments
2 S1	7/25/06		23	P	D	P	alongside Harbor Lane
4 S1	7/25/06		240	A	D	R	below pond at pink house, ducks
4 S1A	7/25/06		240	A	D	R	stream sampled before entering pond at pink house
5 S1	7/19/05	7	3.6	P	D	A	stream at log cabin Maple Juice Cove
	7/25/06	7	150	P	D	A	stream at log cabin Maple Juice Cove
6 S1	7/13/05	50	93	P	D	A	Payson Property
	7/19/05	15	43	P	D	A	Payson Property
	7/25/06		93	P	D	A	Payson Property
6 S2	7/25/06		150	A	D	A	stream flowing from old cape to stream at Payson property
6 S3	7/19/05	50	43	P	D	A	
	7/25/06		3.6	P	D	A	
6 S7	7/19/05	50	9.1	P	D	A	Below horse farm
	7/25/06		75	P	D	A	
6 S8	7/25/06		1100	A	D	A	stream north of pond with rusty Indian
7.3 S1	7/19/05	7	23	P	D	R	small stream at sta.# WU 7.3
	7/25/06		93	P	D	R	
7.3 S2	7/19/05	200	23	P	D	R	Large stream at sta# WU 7.3
	7/25/06	200	23	P	D	R	
13.8 S1	6/20/07	10	16	P	D	R	Broad Cove north of sta# WU13.8
14 S1	6/20/07	50	64	P	D	R	
15 S1	6/20/07	50	44	P	D	P	
16 S1	6/20/07	200	18	P	D	P	
	8/14/07	200	84	P	D	P	
16 S2	8/7/06	5	3.6	P	D	P	small stream flows through field to sta# WU 16
	6/20/07	DRY		P	D	P	
20 S1	4/10/05	3	2.9	P	D	CA	
20 S2	4/10/05	20	9.1	P	D	CA	
20 S2A	6/21/05	35	93	P	D	CA	Culvert at Martin Lane – this stream flows into Stream site 20S2



Stream #	Date Sampled	GPM (estimated values)	Fecal Score FC/100ml	Impact: Actual or Potential	Impact: Direct or Indirect	Class at Shore	Comments
21 S1	4/10/05	100	2.9	A	D	CA	
	7/5/05	60	743	A	D	CA	
	7/11/06	50	460 (9.1)	A	D	CA	
	7/17/06	150	240 (2.9)	A	D	CA	
	7/31/06	100	93 (9.1)	A	D	CA	
	10/24/06	130	116 (70)	A	D	CA	
	8/14/07	80	1140	A	D	CA	
	9/23/07	100	44 (1.9)	A	D	CA	
	10/14/07	100	400	A	D	CA	
	10/28/07	130	280 (100)	A	D	CA	
	10/30/07	80	74 (16)	A	D	CA	
	10/31/07	80	40 (4)	A	D	CA	
21 S2	7/17/06	30	93	A	D	CA	
22 S1	4/10/05	20	2.9	P	D	CA	
22 S4	4/10/05	15	2.9	P	D	CA	
22 S5	4/10/05	12	2.9	P	D	CA	
25 S1	4/10/05	8	2.9	P	D	CA	
25 S2	4/10/05	10	2.9	P	D	CA	
28 S3	2/22/06	25	2.9	P	D	P	Knox St culvert
	7/17/06	20	93	P	D	P	
29S1	4/10/05	10	93	A	D	P	Stream at station WU29
	7/17/06	30	460	A	D	P	
	10/24/06	50	380	A	D	P	
	7/8/07	30	>1600	A	D	P	
	10/1/07	20	1180	A	D	P	
29 S2	8/9/05	14	93	A	D	P	old sewer line at station WU29
	7/17/06	50	1100	A	D	P	
	2/22/06	50	240	A	D	P	
30 S1	4/10/05	200	2.9	A	D	P	
	8/9/05	200	93	A	D	P	
	7/17/06	200	93	A	D	P	
	7/8/07	200	520	A	D	P	
30 S2	8/9/05	5	2.9	P	D	P	Old sewer line at station WU30
	7/17/06	5	9.1	P	D	P	
32 S1	4/10/05	40	2.9	P	D	CR	
	12/1/05	150	43	P	D	CR	



Stream #	Date Sampled	GPM (estimated values)	Fecal Score FC/100ml	Impact: Actual or Potential	Impact: Direct or Indirect	Class at Shore	Comments
	8/9/05	40	240	P	D	CR	
	7/17/06	150	9.1	P	D	CR	
	10/24/06	80	35	P	D	CR	
32 S2	4/10/05	2	2.9	P	D	CR	
32 S3	4/10/05	6	3.6	P	D	CR	
33 S1	4/10/05	8	2.9	P	D	CR	
	8/9/05	DRY		P	D	CR	
	7/17/06	20	240	P	D	CR	
34 S1	4/10/05	8	3.6	P	D	CR	
	8/9/05	5	23	P	D	CR	
	12/1/05	50	9.1	P	D	CR	
	7/17/07	30	93	P	D	CR	
36 S1	4/10/05	8	2.9	P	D	CA	
	8/9/05	10	460	A	D	CA	
	12/1/05	80	93	A	D	CA	
	7/17/06	10	93	A	D	CA	
37 S1	4/10/05	10	2.9	P	D	CA	
	12/1/05	40	43	P	D	CA	
	7/17/06	DRY		P	D	CA	
	10/24/06	10	138	P	D	CA	
37.5 S1	8/9/05	DRY		P	D	CA	
	12/1/05	80	93	P	D	CA	
37.5 S2	8/9/05	DRY		P	D	CA	south of Riverview Drive, below new horse farm
	12/1/05	100	9.1	P	D	CA	
	10/24/06	80	84	P	D	CA	
38 S1	12/1/05	80	23	P	D	CA	
PS9	12/1/05	200	460	A	D	A	Large stream below old farm house Cutler Cove
	5/23/07	200	18	P	D	A	
PS7	5/23/07	30	28	P	D	A	West side route 131 across from small farm "Elliot"
42 S1	5/23/07	10	1.9	P	D	P	
42 S2	12/1/05	45	43	P	D	P	Stream at Jacobson property sampled at shore
	5/23/07	80	500	A	D	P	
	6/20/07	50	780	A	D	P	



Stream #	Date Sampled	GPM (estimated values)	Fecal Score FC/100ml	Impact: Actual or Potential	Impact: Direct or Indirect	Class at Shore	Comments
	11/26/07	50	10	P	D	P	sampled at shore after system was fixed – mixed with seawater
42 S2A	6/20/07	50	940	A	D	P	Stream at Jacobson property sampled at site of laundry drain
	11/26/07	50	29	P	D	P	Stream at Jacobson property sampled at site of laundry drain after system was fixed
42 S2B	5/23/07	70	64	P	D	P	Stream at Jacobson property sampled under route 131
42 S2C	5/23/07	30	1.9	P	D	P	Stream at Jacobson property sampled west of route 131
PS S5	12/1/05	20	9.1	P	D	P	Watts Cove by large new gambrel
42.5 S1	5/23/07	12	1.9	P	D	P	small stream sampled at road below manure pile
42.7 S1	12/1/05	30	93	P	D	A	Sampled below old cape Watts Cove, suspect septic overflow
	5/23/07	15	2	P	D	A	New system installed
47 S1	12/1/05	80	2.9	P	D	A	Teel Cove
48 S1	12/1/05	3	23	P	D	A	Skippers Way, Turkey Cove
48 S2	12/1/05	40	23	P	D	A	
48.5 S1	12/1/05	200	3.6	P	D	A	Turkey Cove, south corner



Agricultural and Animal Waste

Shellfish Growing Area WU has several small animal operations mostly consisting of a few horses, cows or sheep. The locations of these animal operations and the number of animals are shown in Table 11; animal operations that are listed in the table are shown on the “Domestic Pollution and Animal Farms” maps in Figures 7 and 8. All of the animal operations were visited during the 2005 -2007 shoreline survey of the St George River. The only farm of immediate concern was AF 20. This area is monitored by stations WU 42.5 and 42.7. When this farm was initially inspected a large manure pile 20’ by 6’ was visible above a wooded slope approximately 400 feet from the shore. The manure was not contained in an enclosure and no efforts had been made to remove the manure from the site. A discussion with the property owner, members from the Department of Agriculture, and staff from the Cooperative Extension Service resulted in the majority of the manure being removed to be composted. A small amount was allowed to remain on the property for the owner to use for gardening activities. Prior to the manure being removed a closure was made in Watts Cove (4/11/07). This area will be reviewed as part of the annual review of the growing area. If the property inspection and the water quality data suggest that the area can be reclassified; it will be done at this time.

Table 11. Locations of Animal Waste, Growing Area WU

Farm #	Location	Animal Type	Impact: Direct/Indirect Actual/Potential	Approx Dist. To Shore	Comments
AF1	Maple Juice Cove, Cushing	2 Horses	Indirect/potential	500 ft	
AF2	Burton Pt. Cushing	2 Cows, 1 Horse Chickens	Indirect/potential	40 ft	
AF3	Burton Pt. Cushing	1 Horse	Indirect/potential	30 ft	Horse roams freely
AF4	Hathorne Pt. Rd Cushing	6 Sheep	Indirect/potential	>500 ft	
AF5	Hathorne Pt. Rd Cushing	1 Pig, 2 Dogs, 2 Geese	Indirect/potential	150 ft	pig not always in residence
AF5.5	Broad Cove Rd	2 Horses	Indirect/potential	>500 ft	
AF6	Smith Cove, Cushing	1 Horse & occasionally sheep	Indirect/potential	500 ft	No sheep were present at the time of inspection.
AF7	South Thomaston	2 horses	Indirect/potential	700 ft	
AF8	South Thomaston	8-17 cows; number of animals varies	Indirect/potential	1400 ft -east side Rt. 131 180 ft - west side of Rt. 131	Huge grazing area both sides of Rte. 131
AF9	South Thomaston	2 Horses	Indirect/potential	1300 ft	
AF10	South Thomaston	2 Pulling Horses	Indirect/potential	2100 ft	Very large animals Across Rte. 131 (not on shore side of rd.)
AF11	South	6 Horses	Indirect/potential		Alongside of Rt. 131,



Farm #	Location	Animal Type	Impact: Direct/Indirect Actual/Potential	Approx Dist. To Shore	Comments
	Thomaston				1,800 feet from shore.
AF12	South Thomaston Drury Lane	2 Horses	Indirect/potential	600 ft	
AF13	South Thomaston	7 Miniature horses	Indirect/potential	1800 feet	Across Rte. 131 (not on shore side of rd.) Stream sample collected, with score of 43
AF14	South Thomaston	5 Horses	Indirect/potential	>1400 ft	Across Rte. 131 (not on shore side of rd.)
AF15	South Thomaston	4 Horses and manure pile	Indirect/potential	400 ft	Sampled stream nearby – had A1 score of 9.1 Manure pile will be spread on field away from the river.
AF16	Wileys Corner, St George	1 Goat	Indirect/potential	1,200 ft	
AF17	St George, Snows Point	5 Sheep	Indirect/potential	250 ft	
AF18	River Rd., St George	2 Cows	Indirect/potential	>1000 ft	
AF19	Cutler Cove, St George	2 Horses	Indirect/potential	20 ft	From shore on slope above cove – station WU 41 continues to meet approved
AF20	Watts Cove, St George	9 Horses, some miniature	Indirect/potential	400 ft	Property had large manure pile which has been removed
AF21	Thompson Island	>20 sheep	Indirect/Potential		Sheep graze all over island
AF22	Benner Island	>20 sheep	Indirect/Potential		Sheep graze all over island
AF23	Allen Island	>20 sheep	Indirect/Potential		Sheep graze all over island
AO1	Saltwater Farm Lane, Cushing	Pumpkin and Squash Field	Indirect/potential	250 ft	Large growing area slopes to shore. Spreads manure in field in spring. Never seen impact in water quality.

Wildlife

There are no conservation areas designated as wildlife refuges in this portion of shellfish growing area WU. Sea birds including geese, and a variety of ducks and seagulls, can be found at all locations with the greatest concentrations in the conditional areas, around Churches Rocks (sampling station WU 37) and in Broad Cove, Cushing. The birds will frequent these areas for the majority of the year as long as the area doesn't become iced over. Although their numbers can be large at times, it is difficult to determine the impact they are having on the water



quality in the area. The estimated numbers of birds are not always noted when the samples are collected. So far, the data and bird counts have been inconclusive, with no direct correlation established between elevated scores and the number of birds present at the time of sampling. Table 12 shows fecal coliform scores at stations with wildlife noted on the data sheet as a possible adversity at the time of sample collection.

Table 12. Wildlife Impact, 2000-2007

Station ID	No. of samples collected with wildlife adversity noted	Fecal Coliform Scores (on dates when wildlife was noted)	Comments
WU14.5	10	2.9, 2.9, 2.9, 2.9, 460, 2.9, 7.3, 460, 25, 27	Ducks, geese and gulls
WU20	11	2.9, 9.1, 3.6, 240, 9.1, 9.1, 2.9, 2.9, 43, 2.9, 9.1	Ducks; there were approx. 300 ducks nearby on the date this station received the score of 43. The score of 240 occurred on 5/8/05 following rainfall. There were approx. 100 ducks nearby on the date this station received a score of 9.1.
WU21	11	240, 3.6, 2.9, 3.6, 2.9, 2.9, 43, 3.6, 3.6, 3.6, 93	Ducks; the score of 93 occurred on 5/8/05 following rainfall.
WU22	13	240, 23, 3.6, 2.9, 3.6, 3.6, 9.1, 3.6, 23, 2.9, 39, 2.9, 240	Ducks.; one score of 240 occurred on 5/8/05 following rainfall. There were approx. 200 ducks nearby on the date this station received a score of 23.
WU33	11	2.9, 3.6, 23, 240, 2.9, 3.6, 43, 3.6, 3.6, 93, 2.9	Ducks; there were approx. 2 dozen ducks nearby on the date this station received the score of 240. The score of 43 occurred on 5/8/05 following rainfall.
WU34	11	3.6, 3, 2.9, 2.9, 9.1, 2.9, 9.1, 43, 2.9, 2.9, 2.9	Ducks; there were approx. 200 ducks nearby on the date this station received the score of 3.6.
WU34.5	13	3.6, 2.9, 2.9, 9.1, 2.9, 3.6, 43, 2.9, 15, 2.9, 3.6, 2.9, 3.6	Ducks, gulls, and cormorants; the score of 43 occurred on 5/8/05 following rainfall.
WU37	26	2.9, 2.9, 2.9, 9.1, 23, 3.6, 3.6, 23, 2.9, 2.9, 240, 2.9, 9.1, 2.9, 3.6, 3.6, 3.6, 2.9, 2.9, 9.1, 3, 9.1, 9.1, 2.9, 2.9, 2.9,	Ducks, gulls and cormorants; the score of 240 occurred on 5/8/05 following rainfall.

Industrial Waste

There are no major industries along the immediate shore in Shellfish Growing Area WU. Dragon Cement is located nearby the St George River approximately 0.75 miles away. Dragon Cement has no licenses discharges to the St George River. DEP monitors both the ground water and



surface water at several sites around the facility for a variety of inorganic substances. The wastewater from this facility is recycled and used in the processing of the cement. Information on DEP's monitoring of Dragon Cement's groundwater and surface water sites can be found in DMR central files.

Marinas

In the town of Thomaston there is a boatyard that has dock space for approximately 14 forty foot boats. The boatyard is located, inside the closure zone for both the Thomaston Treatment Facility and the Warren Sanitary District outfalls. The main purpose of the dock space is to "store" the boats while they are being worked on, either until they leave in the springtime or until they are hauled out in the fall. An interview with the manager of the boat yard confirmed that no more than five boats are lived on at any one time. A marina dilution calculation was completed and concluded that a closure of 7.24 acres is necessary to protect public health from potential discharges from docked boats (based on five boats, each having occupancy of two people living aboard); a closure of 20.28 acres is required if all 14 dock spaces are considered in the calculation. The current closure zone in the immediate Thomaston waterfront area is greater than 50 acres, and therefore is adequate in protecting public health from potential pollution associated with this marina.

Jeff's Marine is also located along the Thomaston waterfront. This facility sells and repairs small marine watercraft (10 – 24 feet) that are not lived aboard. Jeff's Marine has dock space for 10 boats.

Aquaculture Activity

There are currently four aquaculture lease sites on the St George River (Figure 1). Two of the sites cultivate oysters, and one site cultivates oysters and quahogs, and another site cultivates oysters, surf, soft and hen clams, mussels and northern quahogs. All four sites use suspended cultivation techniques. Three of the sites are located in areas classified as approved for shellfish harvest. One site is located in the prohibited area in the upper St George River (nearby Warren Sanitary District's outfall). This site grows oysters for seed product only.

For additional information on aquaculture lease sites, please visit the aquaculture website at:

<http://www.maine.gov/dmr/aquaculture/leaseinventory2006/muscongusbay.htm>

Hydrographic and Meteorological Assessment

The NSSP program requires, as part of the sanitary survey, the evaluation of hydrographic and meteorological factors in order to determine the factors that may affect distribution and persistence of pollutants throughout the study area (WU). Climate and weather can affect the distribution of pollutants or can be the cause of pollutant delivery to a growing area. Prevailing winds can determine the distribution of pollutants in a growing area. Rainfall patterns and intensity can affect water quality through pollutant delivery in runoff or cause flooding which can affect the volume and duration of pollutant delivery.



Tides

Area WU is subject to a semidiurnal tidal cycle with two high tides and two low tides per day. In Thomaston, which is located in the upper most portion of the study area, the elevation of the mean high tide is 9.4 feet and the mean spring tide is 10.8 feet. Many of the sample stations in the upper portion of the river are not able to be sampled during low tide stages because there is no water at the sample site. Several sites in the lower half of the river also drain out at lower tide stages. Table 13 shows the sample collection breakdown by tidal stage and the percentage of samples that exceeded the P90 standard (49 for A1 method and 31 for Mtec method). This section of the report was written after the 2008 sampling season was completed, and includes data collected through the end of 2008. Over the past five years (2004-2008), the greatest number of samples was collected under the tide stages of ebb (462) and flood (471). A moderate number of samples were collected at high ebb (245), high (238) and high flood (248) tidal stages. The tide stages that had the greatest percentage of samples exceeding the P90 standard were low ebb (23.91%, 31 samples) and low flood (23.68%, 25 samples). Stations that exceeded the P90 standard during a low ebb tide stage include WU 13, 23, 25, 37.5, 38 and 50. In this grouping station WU 50 is the only station that was sampled two times all of the other stations were sampled only once at low ebb. Station WU 13 is classified as restricted and station 50 is classified as prohibited. The remaining stations in this grouping are classified as conditionally approved. Stations that exceeded the P90 standard during a low flood tide stage include WU 7.3, 12, 13, 13.5, and 14.5. In this grouping station WU 12 is the only station that was sampled two times all of the other stations were sampled only once at low flood. Station 7.3 is classified as prohibited; the remaining stations in this grouping are classified as restricted. There are far fewer samples collected at low ebb and low flood tide stages because many of the stations have no water nearby the station sample site during lower tide stages. With so few samples collected at the lower tide stages it is not possible to know just how much a lower tide stage impacts the sample results.



Table 13. Sample Collection Effort by Tidal Stage, WU Stations Excluding Island Stations (Years 2004-2008)

Station	Class	Ebb Tide								Flood Tide							
		Ebb N	% Ebb Exceed P90	Low N	% Low Exceed P90	High Ebb N	% HE Exceed P90	Low Ebb N	% LE Exceed P90	Flood N	% Fld Exceed P90	High N	% High Exceed P90	High Flood N	% HF Exceed P90	Low Flood N	% LF Exceed P90
WU001.00	A	10	0	1	0	0		3	0	10	0	2	0	1	0	3	0
WU002.00	P	10	20	1	0	0		3	0	11	0	2	0	2	0	2	0
WU003.00	P	11	27	1	0	0		2	0	11	18	2	0	3	0	2	0
WU004.00	A	10	20	2	0	2	0	1	0	10	10	2	0	3	0	1	0
WU005.00	R	10	10	2	0	3	33	1	0	10	0	1	0	2	0	1	0
WU006.00	A	10	0	3	66	3	0	0		9	11	1	0	3	0	1	0
WU006.50	A	10	10	2	0	3	0	1	0	11	0	1	0	2	0	0	
WU007.00	A	8	0	2	50	5	20	1	0	9	0	1	25	4	0	0	
WU007.20	NEW	4	0	0		0		0		5	20	0	25	1	100	0	
WU007.30	P	9	11	1	0	5	40	0		9	22	0		5	40	1	100
WU009.00	P	7	28	2	50	4	50	1	0	7	0	4	0	4	0	1	0
WU010.00	A	7		1	0	3	0	2	0	7	14	4	0	4	0	1	0
WU012.00	R	9		0		3	0	1	0	7	14	4	0	4	25	2	50
WU013.00	R	9	22	0		3	66	1	100	7	0	5	0	4	25	1	100
WU013.50	R	9	11	0		3	33	0		9	0	5	0	3	0	1	100



Station	Class	Ebb Tide								Flood Tide							
		Ebb N	% Ebb Exceed P90	Low N	% Low Exceed P90	High Ebb N	% HE Exceed P90	Low Ebb N	% LE Exceed P90	Flood N	% Fld Exceed P90	High N	% High Exceed P90	High Flood N	% HF Exceed P90	Low Flood N	% LF Exceed P90
WU013.80	R	6	33	1	0	3	0	0		8	0	10	20	1	0	1	0
WU014.00	R	5	0	0		7	14	0		5	20	10	10	3	0	0	
WU014.50	R	6	16	0		7	0	0		4		7	14	6	33	1	100
WU016.00	P	6	50	0		7	42	0		4	25	8	25	6	33	0	
WU016.50	R	5	20	0		7	0	0		5	0	7	28	7	0	0	
WU017.00	A	5	20	0		4	0	1	0	3	0	11	0	6	0	0	
WU018.00	A	4	0	0		3	0	1	0	8	12	10	0	7	0	0	
WU019.00	CA	13	0	2	0	2	0	0		12	8	3	0	7	0	1	0
WU020.00	CA	10	10	0		4	0	0		13	7	3	0	7	0	0	
WU021.00	CA	10	10	0		4	0	0		14	14	5	0	5	0	0	
WU022.00	CA	11	10	0		4	0	0		10	10	4	0	8	12	0	
WU023.00	CA	10	0	0		4	0	1	100	11	9	7	0	4	0	0	
WU025.00	CA	9	0	0		5	0	1	100	10	10	8	0	4	0	0	
WU032.00	CR	7	28	0		10	30	0		20	5	5	0	6	0	0	
WU033.00	CR	6	16	0		10	20	0		17	5	6	0	7	0	1	0



Station	Class	Ebb Tide								Flood Tide							
		Ebb N	% Ebb Exceed P90	Low N	% Low Exceed P90	High Ebb N	% HE Exceed P90	Low Ebb N	% LE Exceed P90	Flood N	% Fld Exceed P90	High N	% High Exceed P90	High Flood N	% HF Exceed P90	Low Flood N	% LF Exceed P90
WU034.00	CR	9	0	0		10	10	0		16	31	4	0	11	9	0	
WU034.50	CR	12	8	0		8	12	0		12	16	3	33	12	16	0	
WU035.00	CA	12	0	0		5	0	0		7	14	8	0	5	0	0	
WU036.00	CA	11	0	0		6	0	0		8	12	8	0	4	0	0	
WU037.00	CA	12	0	0		8	12	0		9	11	5	0	3	0	0	
WU037.50	CA	11	0	0		8	0	1	100	6	16	6	16	5	0	0	
WU038.00	CA	12	0	0		8	0	1	100	5	20	6	0	5	0	0	
WU039.00	A	3	0	0		2	0	1	0	13	0	6	16	3	0	2	0
WU040.00	A	2	0	0		4	0	2	0	13	0	4	0	4	0	1	0
WU041.00	A	3	33	0		8	0	0		7	0	6	0	7	0	0	
WU042.00	A	6	0	0		8	0	0		9	0	3	0	4	0	0	
WU042.50	P	6	0	0		7	14	0		9	11	3	0	5	0	0	
WU042.70	NEW	2	0	0		2	0	0		5	0	1	0	1	0	0	
WU043.00	A	6	0	0		7	0	0		6	0	3	0	8	0	0	
WU044.00	A	4	25	2	0	6	0	1	0	9	11	2	0	6	16	0	



Station	Class	Ebb Tide								Flood Tide							
		Ebb N	% Ebb Exceed P90	Low N	% Low Exceed P90	High Ebb N	% HE Exceed P90	Low Ebb N	% LE Exceed P90	Flood N	% Fld Exceed P90	High N	% High Exceed P90	High Flood N	% HF Exceed P90	Low Flood N	% LF Exceed P90
WU045.00	A	9	11	0		6	0	0		7	28	4	0	4	25	0	
WU045.50	P	12	25	0		3	0	0		8	25	3	0	4	50	0	
WU045.70	NEW	3	0	0		1	0	0		4	0	0		2	0	0	
WU045.80	A	10	0	0		6	0	0		6	16	3	0	5	0	0	
WU046.00	P	11	0	2	0	3	0	0		8	0	2	0	4	0	0	
WU047.00	A	13	7	1	0	1	0	1	0	6	0	3	0	5	0	0	
WU048.00	A	15	13	0		1	0	0		6	0	5	20	3	0	0	
WU048.50	A	14	21	0		2	0	0		6	0	5	0	3	0	0	
WU048.80	NEW	7	0	1	0	4	0	1	0	5	0	3	0	3	0	0	
WU050.00	P	11	18	0		3	33	2	50	5	20	4	0	3	0	1	0
Total		462		27		245		31		471		238		248		25	
Total % Exceeded			10.06		9.76		8.41		23.91		8.61		4.38		6.98		23.68



Rainfall

The St George River has two rainfall monitoring stations. The Thomaston monitoring station is located at the Thomaston Treatment Facility (rainfall reporting station 119). The Port Clyde reporting station is located at a private residence that reports for NOAA (rainfall reporting station 114). Table 14 illustrates rainfall amounts reported at Thomaston and Port Clyde, Maine by month, from 1997 to 2008. In this data grouping, 2005 was the wettest year, with a record amount of rainfall for the year. There were five flood closures impacting this area in 2005. Months that floods occurred (years from 2005-2008) are hi-lighted in yellow. The wettest months are typically March and April in the springtime and October and November in the fall.

Table 14. Rainfall Amounts (in inches) Reported at Thomaston and Port Clyde 1997-2008

Thomaston Rain Station # 119												
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Monthly Mean
January	no data	4.1	2.9	1.0	2.6	0.4	0.4	1.9	9.1	2.3	3.2	2.8
February	no data	3.1	2.0	1.7	2.9	2.0	1.3	2.5	2.9	1.9	6.8	2.7
March	no data	3.8	2.8	4.3	4.0	4.0	1.4	3.3	0.8	5.5	5.2	3.5
April	no data	0.4	4.4	0.8	3.7	2.2	2.7	9.7	2.5	8.7	4.5	3.9
May	no data	2.9	no data	1.0	3.5	2.5	3.6	2.8	4.4	2.5	2.2	2.8
June	no data	2.6	1.3	4.9	3.1	2.5	2.0	2.2	8.8	2.0	3.4	3.2
July	3.9	1.0	3.6	1.9	2.3	1.5	2.9	1.6	4.4	3.9	3.1	2.3
August	1.6	2.9	1.6	0.3	1.5	1.0	3.9	3.9	2.5	2.7	4.8	2.2
September	0.6	5.8	2.6	2.3	6.6	3.0	2.5	2.5	2.6	2.7	8.8	3.5
October	6.7	4.7	2.9	0.9	3.7	5.9	1.9	14.8	6.6	6.0	2.4	4.4
November	1.2	3.4	2.6	2.5	4.6	3.6	4.6	6.4	4.8	5.9	4.9	3.9
December	no data	2.5	3.9	2.5	3.5	2.8	3.1	7.2	2.8	4.6	3.0	3.1
Total Rainfall	14.1*	37.2	30.7*	24.1	42.0	31.4	30.1	58.7	52.1	48.7	52.3	
Annual Mean	2.8	3.1	2.8	2.0	3.5	2.6	2.5	4.9	4.3	4.0	4.3	

* incomplete dataset

Port Clyde Rain Station # 114												
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Monthly Mean
January	8.5	6.0	3.9	1.6	6.3	1.6	0.6	2.9	2.2	2.8	2.9	3.5
February	4.6	2.2	2.9	3.0	3.5	3.1	1.7	2.9	2.2	2.2	7.4	3.1
March	5.1	7.7	4.1	7.9	4.1	4.9	2.3	5.4	0.8	5.6	5.7	4.8
April	3.9	2.3	6.5	1.5	5.2	3.2	3.7	7.8	3.0	8.9	3.4	4.4
May	2.5	4.2	4.0	1.5	3.9	3.5	4.0	9.0	6.8	3.0	2.3	4.0
June	4.9	1.6	2.4	5.4	4.6	2.7	2.1	3.5	9.4	3.0	1.3	3.6
July	2.4	2.2	5.6	1.6	4.1	1.9	3.3	1.7	6.2	3.4	no data	3.5
August	4.7	2.3	1.7	0.6	1.8	1.2	3.4	6.1	3.1	3.3	3.8	2.9



Port Clyde Rain Station # 114

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Monthly Mean
September	1.6	5.2	3.6	2.2	4.4	4.2	2.9	4.0	3.5	2.7	9.1	3.9
October	7.8	4.9	3.4	0.7	3.7	6.0	1.7	14.5	no data	5.8	2.0	5.0
November	1.7	3.8	3.0	3.8	6.9	4.0	4.0	5.8	no data	6.0	3.1	4.6
December	1.5	2.6	4.3	4.0	6.0	4.2	3.8	5.0	no data	5.6	5.0	4.2
Total Rainfall	49.1	45.1	45.3	33.6	54.4	40.3	33.7	68.6	37.2	52.8	46.5	
Annual Mean	4.1	3.8	3.8	2.8	4.5	3.4	2.8	5.7	4.1	4.4	3.8	

While emergency flood closures limit shellfish harvesting during extremely heavy rainfall events, water quality in some shellfish areas may be adversely impacted by polluted run-off that is generated during lesser precipitation events (<2 inches in 24 hours). In order to investigate how water quality is impacted by rainfall events which do not necessitate an emergency flood closure, a rainfall assessment for stations in growing area WU was completed. For this assessment, the geometric mean and P90 scores were recalculated using only data points which were collected after 0.25 or more inches of cumulative rainfall were recorded 72 hours prior to sample collection (sum of rainfall recorded in the AM on day of sample, day before sample and two days before sample was taken, Table 15). In this calculation, all data (excluding those samples collected during flood closures) collected between 2004 and 2008 were included, and calculations were limited to those stations that had at least five samples collected under the defined rainfall condition. In completing this assessment, the data collected under dry (<0.25 inches of rainfall in 72 hours) conditions, and thus not affected by run-off, was omitted from the calculation. While the results of this calculation show that all stations that are classified as approved retain geometric mean scores of less than 14 when using data collected after rainfall, the P90 scores for multiple stations increase when looking at this dataset, indicating that multiple approved stations are impacted by intermittent pollution that occurs after rain events (highlighted in Table 15). Stations that showed the greatest increase in P90 scores include WU2, WU6.5, WU13.5, WU16.5, WU48, and WU48.5. Additional sampling after rainfall events is recommended for these stations, and any surrounding streams that may influence the water quality at these stations; the results of these samples should be presented in the next triennial report. Any downward changes in classification for these stations should be supported by additional water quality data following rainfall events.

Table 15. Growing Area WU Rainfall Assessment, Data Collected between 2004-2008

Station	Class	Count	Geometric Mean	Std Deviation	P90
WU001.00	A	14	5.3	0.4	17.65
WU002.00	P	14	8.15	0.74	73.62
WU003.00	P	14	12.91	0.89	187.25
WU004.00	A	14	6.73	0.61	42.29
WU005.00	R	14	5.01	0.44	18.44
WU006.00	A	14	7.93	0.57	43.2
WU006.50	A	14	8.65	0.64	58.28
WU007.00	A	14	6.78	0.6	41.06
WU007.20	NEW	6	15.79	0.97	297.92
WU007.30	P	14	23.64	0.8	257.75
WU009.00	P	14	7.24	0.58	41.23



Station	Class	Count	Geometric Mean	Std Deviation	P90
WU010.00	A	13	5.58	0.41	18.88
WU012.00	R	14	9.35	0.57	51.51
WU013.00	R	14	19.21	1.04	427.91
WU013.50	A	14	9.73	0.8	107.17
WU013.80	R	14	10.74	0.83	129.13
WU014.00	R	14	8.9	0.52	42.13
WU014.50	R	14	8.78	0.61	54.4
WU016.00	R	15	14.29	0.75	132.93
WU016.50	A	14	7.44	0.62	48.17
WU017.00	A	13	5.75	0.49	25.21
WU018.00	A	11	8.86	0.45	33.84
WU019.00	CA	29	8.71	0.58	48.58
WU020.00	CA	17	7.25	0.65	49.86
WU021.00	CA	29	9.29	0.61	55.48
WU022.00	CA	16	9.56	0.72	81.31
WU023.00	CA	29	11.93	0.62	74.33
WU025.00	CA	29	11.16	0.59	64.11
WU028.00	P	21	10.33	0.73	89.18
WU029.00	P	21	21.02	0.6	124.03
WU030.00	P	20	24.81	0.72	208.68
WU032.00	CR	19	11.74	0.65	80.82
WU033.00	CR	17	15.04	0.7	120.71
WU034.00	CR	18	18.48	0.64	124.95
WU034.50	CR	18	9.02	0.58	50.06
WU035.00	CA	28	9.27	0.66	65.49
WU036.00	CA	17	6.59	0.74	59.78
WU037.00	CA	29	10.63	0.73	90.24
WU037.50	CA	17	6.85	0.78	69.81
WU038.00	CA	29	7.85	0.64	51.33
WU039.00	A	7	5.24	0.36	15.61
WU040.00	A	9	4.54	0.43	16.78
WU041.00	A	9	4.39	0.27	10.02
WU042.00	A	8	2.83	0.12	4.09
WU042.50	P	8	4.93	0.46	19.8
WU042.70	NEW	5	3.07	0.32	8.04
WU043.00	A	9	5.19	0.51	24.16
WU044.00	A	9	5.57	0.59	32.71
WU045.00	A	8	5.03	0.58	28.83
WU045.50	P	8	6.19	0.59	36.16
WU045.70	NEW	6	6.9	0.45	26.85
WU045.80	A	7	2.53	0.11	3.51
WU046.00	P	9	2.99	0.2	5.48
WU047.00	A	9	3.9	0.4	12.98
WU048.00	A	9	8.85	0.62	57.15
WU048.50	A	9	11.9	0.88	169.84

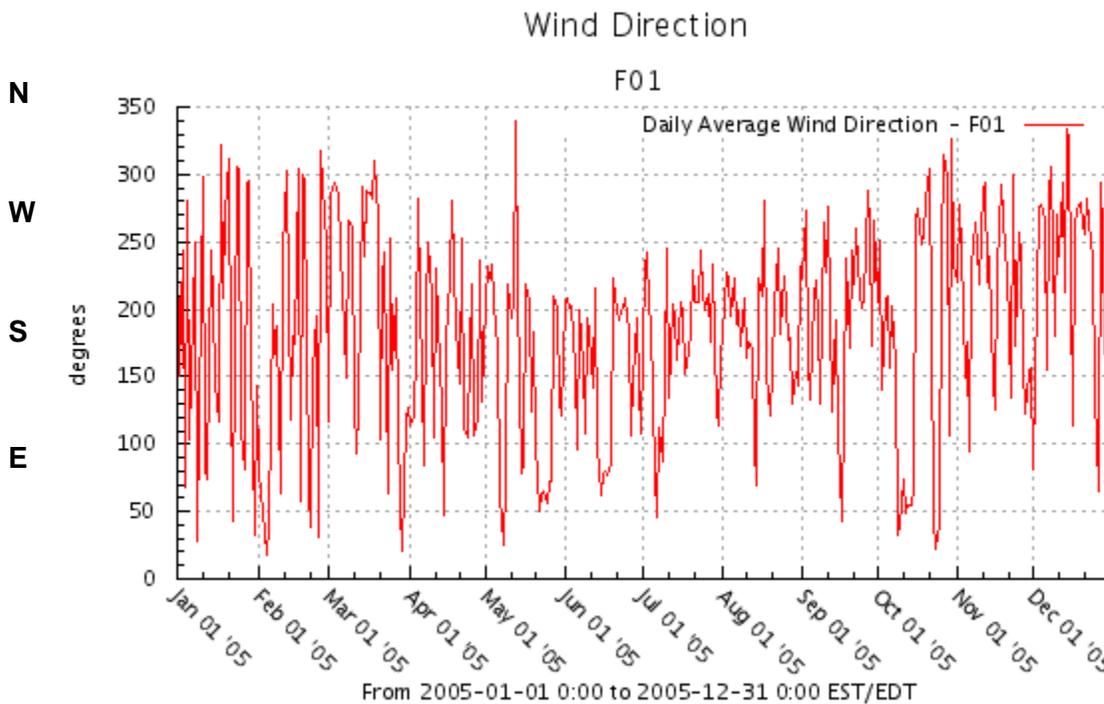


Station	Class	Count	Geometric Mean	Std Deviation	P90
WU048.80	NEW	9	3.66	0.34	10.14
WU050.00	P	9	17.35	0.93	282.6

Winds

2005 was the first year wind data was collected as part of sample collection field work. During the 2005 sampling season, many of the stations were collected during calm wind conditions. There is currently not enough DMR wind data available to determine what effect wind might have on the water quality. An average daily wind direction graph for Penobscot Bay is shown in Figure 12. This data is collected by the GoMOOS Weather Buoy (Gulf of Maine Ocean Observing System) located at Latitude 44, 03'20" North, Longitude 68,59'54" West. The GoMOOS system did not have any data available after 2005.

Figure 12. 2005 Penobscot Bay Daily Average Wind Direction



River Discharge

The St George River is a long and shallow river in the area from the Thomaston waterfront to Fort Point on the St George shore. At low tide this portion of the river becomes a very narrow channel (ranging from 100 – 1000 feet) surrounded on both sides by large mudflat areas. South of Fort Point, the river deepens and mudflat areas are found mainly at the head of small coves. The upper portion of the river also contains three large drainages which transport fresh water into the river during wet weather months in the spring and fall. The upper most region of the St George River meets the salt water portion of the river at Payson Park (head of tide) in the town of Warren. The Oyster River joins the St George River at the route one bridge at the town line separating the towns of Warren and Thomaston. The Mill River enters the St George River



nearby the intersection of route one and route 131 in the town of Thomaston. None of these three upper “river” systems are deep enough to support boats larger than a canoe. At low tide the Mill River and the Oyster River flat out. The small river systems along with several small streams on both shores of the river, do contribute to low salinities during the wet weather months in the Spring and Fall. Currently, there are no river gauges which monitor river height or flow rates on the St. George River.

Water Quality Review

Table 16 lists all active approved, restricted and prohibited stations in Growing Area WU, with their respective geometric mean and P90 calculations for 2007. Please refer to Appendix C for a key to interpreting the headers on the columns of Table 16. The approved and restricted standards for each station are also displayed in Table 16. 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 samples 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 D.

All approved, restricted and prohibited stations met their NSSP classification standard at the end of 2007. Station WU 42.5 meets the approved standard, but was reclassified as prohibited after a large manure pile was discovered nearby. The majority of the manure pile has been removed. The remaining manure on the property is being sold by the property owner as aged manure for gardening operations. This area can be reclassified as approved. Stations WU2 and WU 57 meet the approved standard, and are being proposed for upward reclassification later in this report.

Table 16. Geomean and P90 scores, Growing Area WU, 2002-2007

STATION	CLASS	CNT	MFCNT	GM	SDV	MAX	P90	APPD_STD	RESTR_STD
WU001.00	A	30	9	5.1	0.40	31	16.5	43	250
WU002.00	P	30	9	5.1	0.55	460	25.8	43	250
WU003.00	P	30	9	7.8	0.73	540	66.2	43	250
WU004.00	A	30	9	4.6	0.50	93	19.7	43	250
WU005.00	R	30	9	5.5	0.68	1200	41.2	43	250
WU006.00	A	30	9	6.4	0.50	93	28.0	43	250
WU006.50	A	30	9	5.4	0.49	240	22.8	43	250
WU007.00	A	30	9	5.3	0.51	150	23.6	43	250
WU007.20	NEW	4	4	26.8	0.37	50	82.2		
WU007.30	P	30	9	18.3	0.70	1100	145.8	43	250
WU009.00	P	30	9	6.9	0.69	1100	53.5	43	250
WU010.00	A	30	9	4.9	0.42	93	16.9	43	250
WU012.00	R	30	9	8.6	0.55	93	43.5	43	250
WU013.00	R	30	9	10.1	0.85	1200	123.0	43	250
WU013.50	A	30	9	6.1	0.63	1200	38.8	43	250
WU013.80	R	30	9	7.8	0.66	1100	54.2	43	250
WU013.90	NEW	5	5	6.1	.59	48	36.9		



STATION	CLASS	CNT	MFCNT	GM	SDV	MAX	P90	APPD_STD	RESTR_STD
WU014.00	R	30	9	9.0	0.52	93	41.8	43	250
WU014.50	R	30	10	10.6	0.70	460	83.9	42	245
WU015.00	R	30	9	13.7	0.54	150	67.7	43	250
WU016.00	R	30	9	29.7	0.79	1700	302.7	43	250
WU016.30	NEW	5	5	4.1	.36	12	12.0		
WU016.50	A	30	10	6.3	0.56	240	32.5	42	245
WU017.00	A	30	9	5.7	0.53	240	27.0	43	250
WU018.00	A	30	11	6.6	0.49	93	28.0	41	240
WU028.00	P	30	12	7.2	0.64	1200	46.7	41	235
WU029.00	P	30	11	17.5	0.56	460	91.9	41	240
WU030.00	P	30	11	25.2	0.70	1100	200.4	41	240
WU039.00	A	30	9	4.8	0.41	93	15.9	43	250
WU040.00	A	30	9	4.4	0.36	27	12.4	43	250
WU041.00	A	30	9	5.4	0.40	93	17.8	43	250
WU042.50	P	30	9	6.6	0.60	460	38.1	43	250
WU042.70	NEW	5	5	5.0	0.41	16	17.4		
WU043.00	A	30	9	5.2	0.44	93	19.3	43	250
WU044.00	A	30	9	5.2	0.47	93	20.9	43	250
WU045.00	A	30	9	5.6	0.55	290	28.8	43	250
WU045.50	P	30	9	9.6	0.63	240	60.8	43	250
WU045.70	NEW	4	4	6.4	0.40	16	21.3		
WU045.80	A	30	9	4.5	0.47	240	18.1	43	250
WU046.00	P	30	9	4.0	0.37	93	12.1	43	250
WU047.00	A	30	9	3.5	0.29	33	8.2	43	250
WU048.00	A	30	9	7.2	0.52	240	33.5	43	250
WU048.50	A	30	9	5.8	0.55	240	29.6	43	250
WU048.80	NEW	18	9	3.2	0.26	14	7.1	39	221
WU050.00	P	30	9	6.9	0.67	1100	49.5	43	250
WU055.50	NEW	17	8	2.6	0.17	9.1	4.3	40	225
WU056.00	A	30	9	2.6	0.10	3.6	3.5	43	250
WU056.50	P	30	9	2.7	0.10	3.6	3.6	43	250
WU057.00	P	30	9	3.3	0.31	43	8.1	43	250
WU058.00	A	30	9	2.9	0.26	58	6.2	43	250
WU059.00	P	30	9	2.7	0.10	3.6	3.6	43	250
WU060.00	A	30	9	2.8	0.17	9.1	4.6	43	250
WU061.00	A	30	9	2.7	0.14	9.1	4.0	43	250

Table 17 lists geomean and P90 scores for conditionally approved and conditionally restricted stations in growing area WU. Data includes scores collected when the stations were classified as conditional, and in the open status. Station WU 21 was classified as Prohibited between 2002 and 2004; therefore, the calculation for this station presented in table 17 excludes data points collected while the station was in the prohibited classification status. Using data from this prohibited period (excluding those scores corresponding to when the conditional area was in closed status due to rainfall), station WU 21 has a geometric mean scores of 5.04, and a P90 scores of 18.06, with the approved standard limit of 42.



Table 17. Conditionally Approved and Conditionally Restricted Stations, Open Status, 2003 – 2007

STATION	CLASS	CNT	MFCNT	GM	SDV	MAX	P90	APPD STD	RESTR STD
WU019.00	CA	30	9	3.6	0.29	43	8.4	43	250
WU020.00	CA	30	9	4.7	0.41	93	15.8	43	250
WU021.00**	CA	24	9	5.0	0.39	52	15.9	41	239
WU022.00	CA	30	10	7.0	0.46	93	26.7	42	245
WU023.00	CA	30	9	4.7	0.38	43	14.3	43	250
WU025.00	CA	30	9	6.5	0.40	43	21.1	43	250
WU032.00	CR	30	14	10.7	0.54	150	52.5	40	226
WU033.00	CR	30	14	10.3	0.61	460	61.4	40	226
WU034.00	CR	30	14	7.8	0.50	93	34.2	40	226
WU034.50	CR	30	14	9.5	0.70	1700	75.1	40	226
WU035.00	CA	30	10	4.2	0.28	23	9.7	42	245
WU036.00	CA	30	9	4.8	0.32	23	12.3	43	250
WU037.00	CA	30	9	5.8	0.59	1100	32.4	43	250
WU037.50	CA	30	9	5.4	0.52	460	24.7	43	250
WU038.00	CA	30	9	4.3	0.54	1380	20.8	43	250

** Station WU 21 was classified as prohibited during portions of 2002 – 2004. In table 17, the P90 calculation including only data from when the station was classified as conditionally approved.

The St George River samples are collected following a systematic random sampling (SRS) strategy. The sampling schedule is established during the month of December of the previous year. It is often difficult to sample several sites between the months of December through March, as many of the roads to the sampling sites are either chained off or not plowed, making the sites inaccessible. There is also significant icing in portions of the growing area which frequently precludes winter sampling. Table 18 shows the sampling effort for area WU in 2007; all approved, restricted and prohibited stations active at the beginning of 2007 were sampled 6 times following SRS schedule; all conditionally approved and conditionally restricted stations were sampled 6 times in the open status. On April 1, 2007, run 28 was scheduled to be sampled as part of the random schedule but the conditionally approved stations were in the closed status due to a rainfall event. Therefore, the conditionally approved stations show one sample collected at each site in the closed status.

Table 18. Sample Station Count Table 2007, SRS Samples Only

Station ID	CLASS	STATUS		COMMENTS
		CLOSED	OPEN	
WU001.00	A		6	
WU002.00	P	6		
WU003.00	P	6		
WU004.00	A		6	
WU005.00	R		6	
WU006.00	A		6	
WU006.50	A		6	
WU007.00	A		6	
WU007.20	P	4		Station created 7/13/2007
WU007.30	P	6		



Station ID	CLASS	STATUS		COMMENTS
		CLOSED	OPEN	
WU009.00	P	6		
WU010.00	A		6	
WU012.00	R		6	
WU013.00	R	6		
WU013.50	A		6	
WU013.80	R		6	
WU013.90	R		5	Station created 5/24/2007
WU014.00	R		6	
WU014.50	P		7	
WU015.00	P		6	
WU016.00	P		6	
WU016.30	P		5	Station created 5/24/2007
WU016.50	R		7	
WU017.00	A		6	
WU018.00	A		7	
WU019.00	CA	1	6	Sampled following "random run" schedule in closed status
WU020.00	CA	1	6	Sampled following "random run" schedule in closed status
WU021.00	CA	1	6	Sampled following "random run" schedule in closed status
WU022.00	CA	1	6	Sampled following "random run" schedule in closed status
WU023.00	CA	1	6	Sampled following "random run" schedule in closed status
WU025.00	CA	1	6	Sampled following "random run" schedule in closed status
WU028.00	P	9		
WU029.00	P	8		
WU030.00	P	8		
WU032.00	CR		10	
WU033.00	CR		10	
WU034.00	CR		10	
WU034.50	CR		10	
WU035.00	CA	1	6	Sampled following "random run" schedule in closed status
WU036.00	CA	1	6	Sampled following "random run" schedule in closed status
WU037.00	CA	1	6	Sampled following "random run" schedule in closed status
WU037.50	CA	1	6	Sampled following "random run" schedule in closed status
WU038.00	CA	1	6	Sampled following "random run" schedule in closed status
WU039.00	A		6	
WU040.00	A		6	
WU041.00	A		6	
WU042.00	A		6	



Station ID	CLASS	STATUS		COMMENTS
		CLOSED	OPEN	
WU042.50	P	4	2	Reclassified as P 4/11/07
WU042.70	P	5		Station created 5/24/2007
WU043.00	A		6	
WU044.00	A		6	
WU045.00	A		6	
WU045.50	P	6		
WU045.70	P	4		Station created 5/24/2007
WU045.80	A		6	
WU046.00	P	4	2	Reclassified as P 4/11/07
WU047.00	A		6	
WU048.00	A		6	
WU048.50	A		6	
WU048.80	P	6		
WU050.00	P	6		
WU055.50	P	6		
WU056.00	A		6	
WU056.50	P	6		
WU057.00	P	6		
WU058.00	A		6	
WU059.00	P	6		
WU060.00	A		6	
WU061.00	A		6	

Water Quality Discussion

Figures 13 - 17 show water quality trends, with the P90 expressed as a percentage of the approved standard for each year's data set. 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 value over the years, the calculated P90s are expressed as a percentage of the approved standard. Stations that show the 2007 column at or above the 100 percent line no longer meet approved standards. In Figure 13, stations WU 3, WU 5, WU 7.3 and WU 9 do not meet approved standards. Station WU 3 has had elevated P90 scores for at least three years. The only potential pollution source noted at this site was a flock of domestic ducks. At station WU 5, a failing septic system was replaced three years ago, but the water quality has not improved. Station WU 7.3 has had elevated water quality scores for several years. A very large stream flows into the cove at this site. Beaver have been seen across the road from the sample site. It is likely that they are impacting the water quality in this area. Station WU 9 is located at a lobster wharf that abuts a small family farm that has a variety of animals nearby the shore. Stations WU 3, 7.3 and 9 are classified as prohibited; station WU 5 is classified as restricted.



Figure 13. P90 Trends, Stations WU1 - WU12, 2003-2007

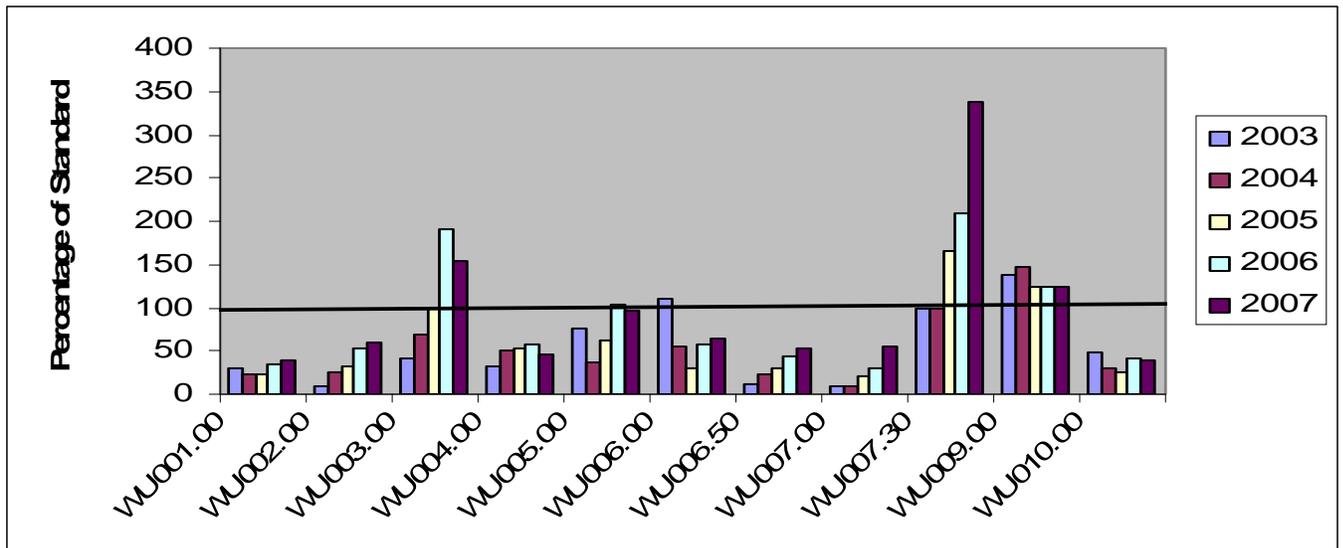


Figure 14 shows the P90 trends for the rainfall conditional stations. In this figure, the most notable trend occurs at station WU 21, where water quality has shown a recent improvement. Contrary, water quality scores at station WU 37 show an upward trend, indicating deteriorating water quality. Two malfunctioning septic systems nearby station WU 37 were replaced with new systems (2005 and 2006). The closest of these systems is approximately 55 feet from the shore, directly above where station WU 37 is sampled. However, two new homes were also built nearby. One of the new homes has two horses, and the other has two goats. The property owners at both of these sites have been visited and have had “best farm practices” explained to them. All of the remaining stations have continued to maintain good water quality during open status.

Figure 14. P90 Trends, Conditionally Approved Stations WU19 - WU38, (Open Status)

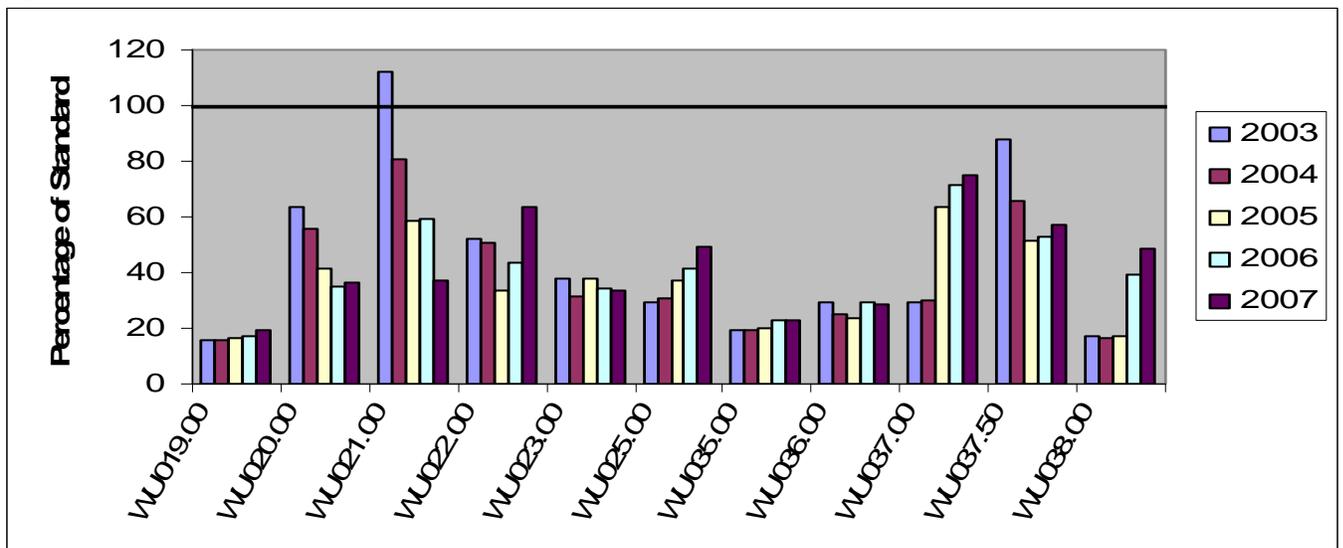
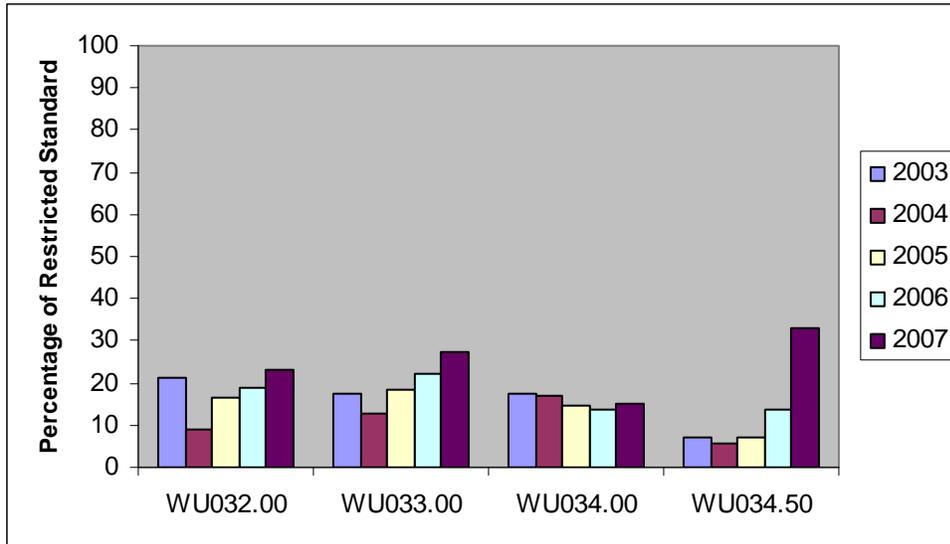




Figure 15 shows the P90 trends for the conditionally restricted stations, WU 32 - WU 34.5. The current (2007) NSSP standard for the restricted stations is 226. All of the conditionally restricted stations are meeting the restricted standard. Station WU34.5 has shown the greatest variability in scores. Prior to 2007, the water quality scores at this site had continued to meet approved standards. In 2007, the site received enough elevated scores to put the final P90 score above approved standard. The only explanation for the elevated scores at this site is a large number of sea birds and seals. Because this site is a boundary station located at the dividing line between the conditionally approved and the conditionally restricted area, the closure line will need to be moved to the next station meeting approved standards, and the new boundary station will be station WU 35.

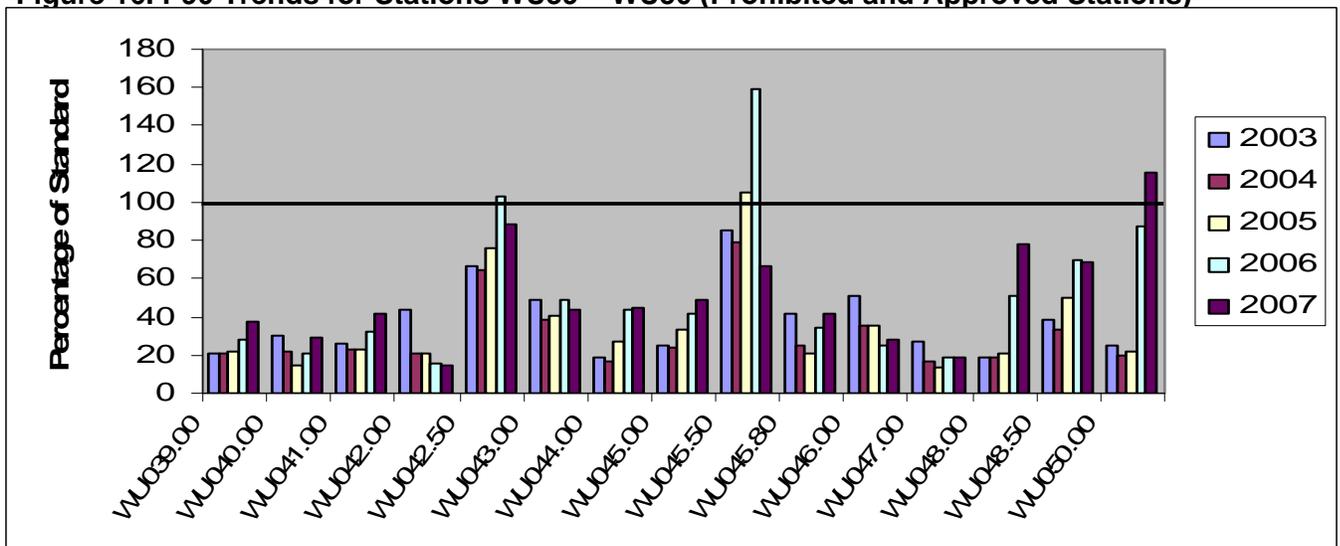


Figure 15. P90 Trends for Conditionally Restricted Stations WU32 - WU34.5, (Open Status)



The stations represented in Figure 16 are all located south of the rainfall conditional area on the east side of the river. Station WU 42.5 has shown some variability over the past few years. This site is located across the road from a horse farm that has nine horses and a large manure pile. Members from the Cooperative Extension Service and the Georges River Shellfish Group have worked together to have this manure pile removed from the property, and plans are also in place for any future removal of manure. Station WU 45.5 also has variability in the data results. This sample site is located at the site of a large stream. The site has some salt water mixing at high tide but has consistently low salinities. Just before the stream enters Otis Cove there is a small dam across the stream. A new station (WU 45.7) has been added on the cove side of the dam in an effort to get more of a “seawater” sample that can be better used to assess the water quality in Otis Cove. To date this station has been sampled a total of 18 times. The water quality at stations WU 48 and WU 50 has trended upward (deteriorating) over the past several years. The shoreline survey of these areas did not reveal any new pollution sources. Station WU 50 is classified as prohibited.

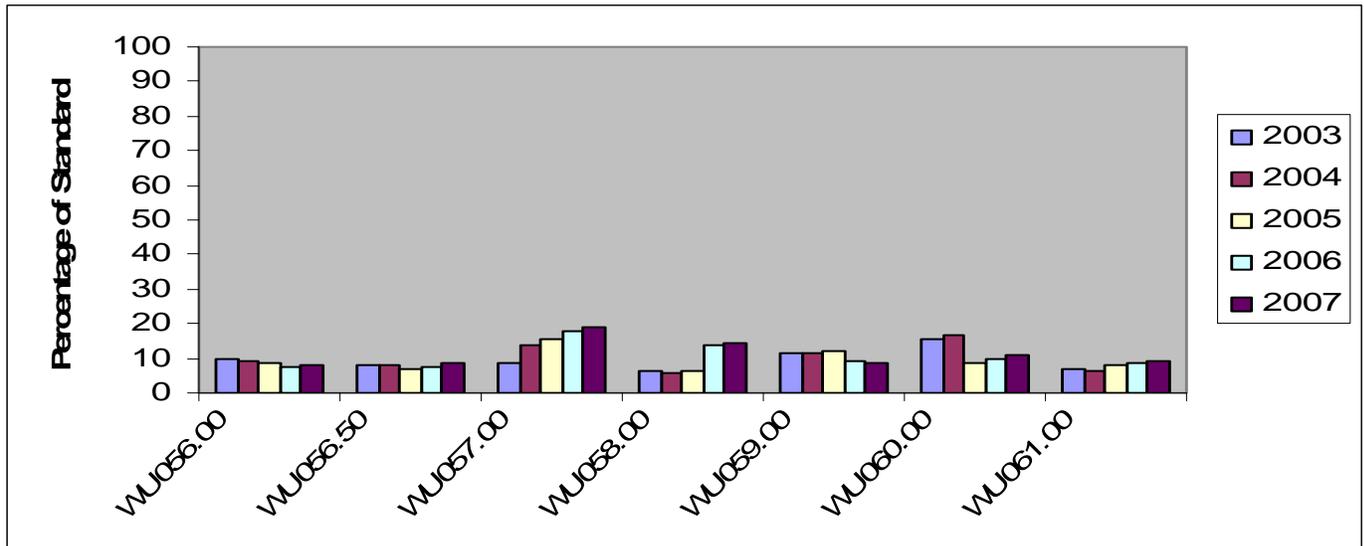
Figure 16. P90 Trends for Stations WU39 – WU50 (Prohibited and Approved Stations)





All of the stations presented in Figure 17 are located on islands within the boundaries of growing area WU. All of these sites have continued to maintain good water quality scores over the past five years.

Figure 17. P90 Trends for Stations WU 56 - WU 61, 2003-2007



Classification Changes Required or Proposed

The required and proposed classification changes are summarized in Table 27 and in Figures 18, 19 and 20.

Table 27. Classification changes required or requested based on current year review

Station #	Current Class	Proposed Class	Reason
WU 2	P	A	Pollution source removed
WU 35	CA	CA	Station will become new boundary line station for CR and CA areas; boundary line will be extended south
WU 42.5	P	A	Pollution source removed
WU 57	P	A	Pollution source removed
Hupper Island	P and A	P	Entire island will become prohibited due to expired survey

Station WU 2, Pleasant Point Gut, Cushing, Pollution Area 27B

Sampling station WU 2 currently has a P90 score of 25.8 with an approved standard of 43. This site has been classified as prohibited for shellfish harvest due to two known pollution sources in the area. The first known pollution source was a dwelling that had a grey water discharge directly to the harbor. The second pollution source was an outhouse that was built on the edge of the shore of Gay Island. When the outhouse was inspected, fecal matter could be seen exiting the back side of the outhouse directly to the shore. Both of these systems were reported to the LPI for the town of Cushing, and both of these systems have been addressed. A new



septic system was installed and the grey water discharge was connected to the new system. The outhouse was relocated away from the shore. Pleasant point Gut harbor also had a potential pollution source on a small un-named island located off the northwest side of Gay Island. The island has a seasonal dwelling on it that has an outhouse on it. The outhouse is located approximately 35 feet from the shore. No seepage from the outhouse was visible at the time of the inspection. The outhouse will be inspected during the summer months to assure that it is not degrading the surrounding water quality. These inspections will be documented in each year's annual review of growing area WU. If at any time the outhouse is found to be an actual source of pollution, the area around the island will immediately be reclassified as prohibited.

Station WU 35, Hospital Point, South Thomaston, Pollution Area 27

This site is not changing classification. The dividing line between the conditionally restricted area and the conditionally approved area will be moved to station WU 35. The reason for this change is deteriorating water quality at sampling station WU 34.5 (current boundary station), as it no longer meets approved standards. It is a requirement that the dividing line stations between a conditionally approved and a conditionally restricted area must have water quality scores that meet the stricter water quality standard. In this case, the closure line stations must meet approved standards during open status.

Station WU 42.5 and 42.7, Watts Cove, St George, Pollution Area 27B

Sampling station WU 42.5 currently has a P90 score of 38.1 with an approved standard of 43. This site was initially reclassified as prohibited due to a mid-year data check in 2006, when this station slightly exceeded the approved standard. At the end of the sampling season, after all of the data for that year was included in the P90 calculation, the P90 score once again met approved standards. It was decided that the area should remain prohibited until the shoreline survey of the area was completed. Following the completion of the survey, it was noted that a large manure pile located in the vicinity of this station was most likely contributing to variability in the data especially following rainfall events. The manure pile was relocated and plans have been made for future removal. The small closure in Watts Cove may be repealed. The new sampling station that was established at the end of the closure line (WU 45.7) will continue to be sampled.

Station WU 57, Teel Island, St George, Pollution Area 28A

Sampling station WU 57 currently has a P90 score of 8.1 with an approved standard of 43. This site had been classified as prohibited because during the previous survey of the area a malfunctioning septic system was noted breaking out along the shore. This former system has been replaced with a new in ground system, and the water quality continues to meet the approved standard. This site may be reclassified as approved.

Hupper Island, St George, Pollution Area 28A

There are currently no active sampling stations along the shores of Hupper Island. The island was not able to be surveyed during the recent update of the survey of shellfish growing area WU. During the previous survey of the island, at least eight straight pipe systems were noted and reported to the LPI for the town of St George. Following that survey, a closure was made around the area containing the straight pipes. The new LPI for the town of St George was contacted to determine how many of the former straight pipe systems had been replaced with in



ground systems, but he could not confirm the number. Due to the lack of new survey information, a closure will be made around the entire island until it can be determined what the pollution impact is from the island. New sampling stations should be established nearby any areas of potential resource.

Conclusion

The water quality in the St George River has remained consistent for the last several years. At the present time the rainfall management trigger amount of ≥ 1.5 inches of rain in a twenty four hour period necessitating a closure is appropriate. All of the stations in the conditionally approved area have continued to meet approved standards when data collected following ≥ 1.5 inches of rainfall is removed from the data set. Survey work will continue to be more intense in this area to assure that this important resource area can remain available for harvest. The water quality in Watts and Cutler Coves will also be closely monitored. Several actual and potential pollution sources in this area are expected to be replaced with new systems in the coming year.

The many small farms along both shores of the river pose a challenge for the water quality program. A greater responsibility needs to be taken by the farm owners to assure that animal waste doesn't contaminate the water quality of the river. It may be necessary to visit each farm annually to make farm owners more aware of the impact they have on the river following rainfall. The streams in the upper portion of the river will be sampled at least annually to assess the impact they have on the rainfall conditional area.

References

- ¹ 2000 Warren Sanitary District Maine Waste Discharge License Application #W007023-5L-B-R
- ² 2006 Warren Sewage Treatment Plant Interview Form DEP Inspector's Comments
- ³ Thomaston Treatment Facility [interview with John Fancy]
- ⁴ Thomaston Treatment and DMR "No Chlorination agreement" dated 3/25/03
- ⁵ Email from John Fancy explaining ice jam in lagoon (2004)
- ⁶ DMR Aquaculture Lease Inventory website
- ⁷ DEP website 1999 St George River Data Report Paul Mitnik
- ⁸ DEP website 1999 St George River Data Report Paul Mitnik
- ⁹ 2000 Warren Sanitary District Maine Waste Discharge License Application #W007023-5L-B-R



Figure 18. Proposed Classifications Closed Area 27



Maine Department of Marine Resources Pollution Area No. 27



Upper St. George River and Tributaries (Warren to St. George)

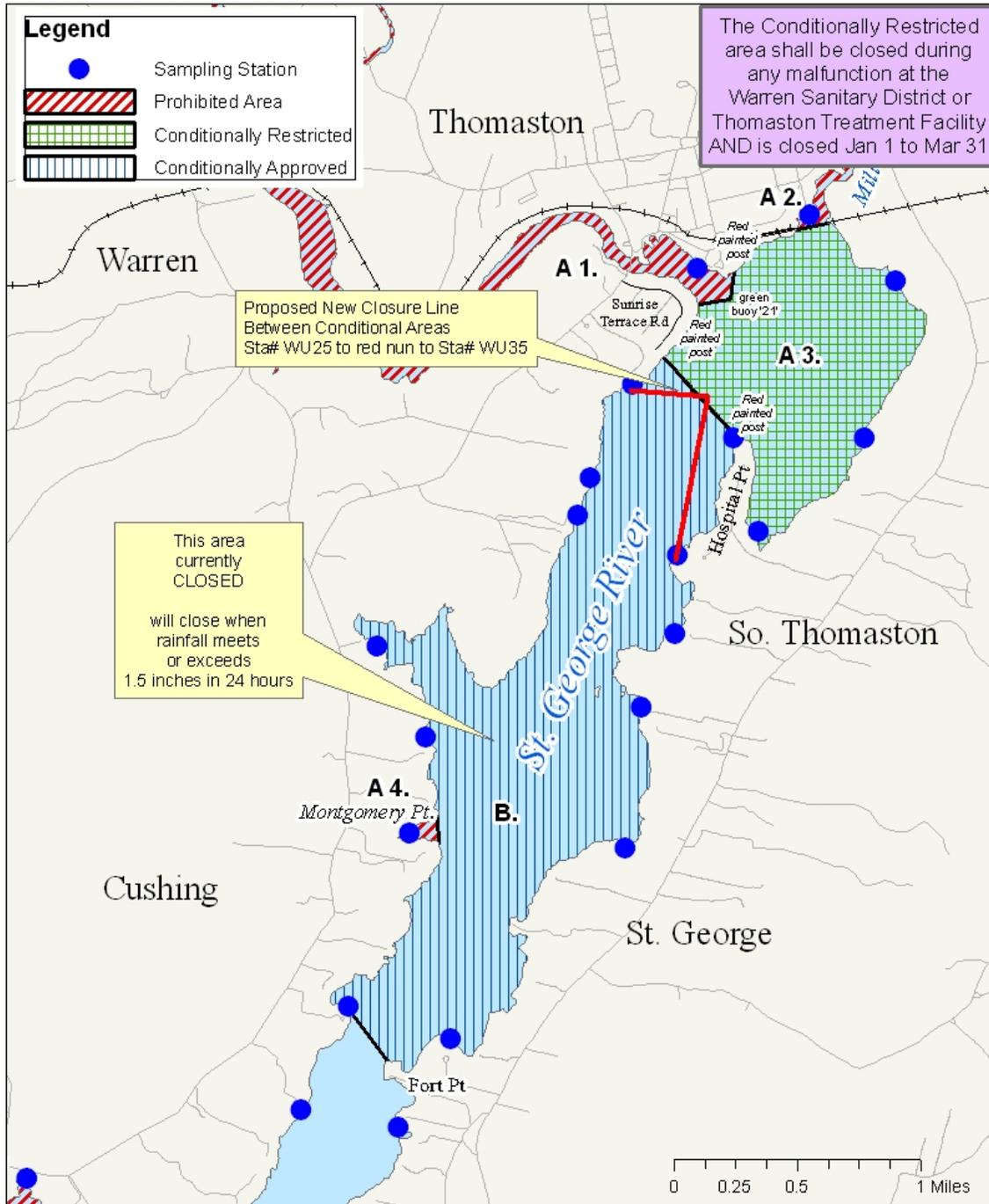




Figure 19. Proposed Classifications Closed Area 27B



Maine Department of Marine Resources Pollution Area No. 27-B



Lower St. George River (Cushing and St. George)

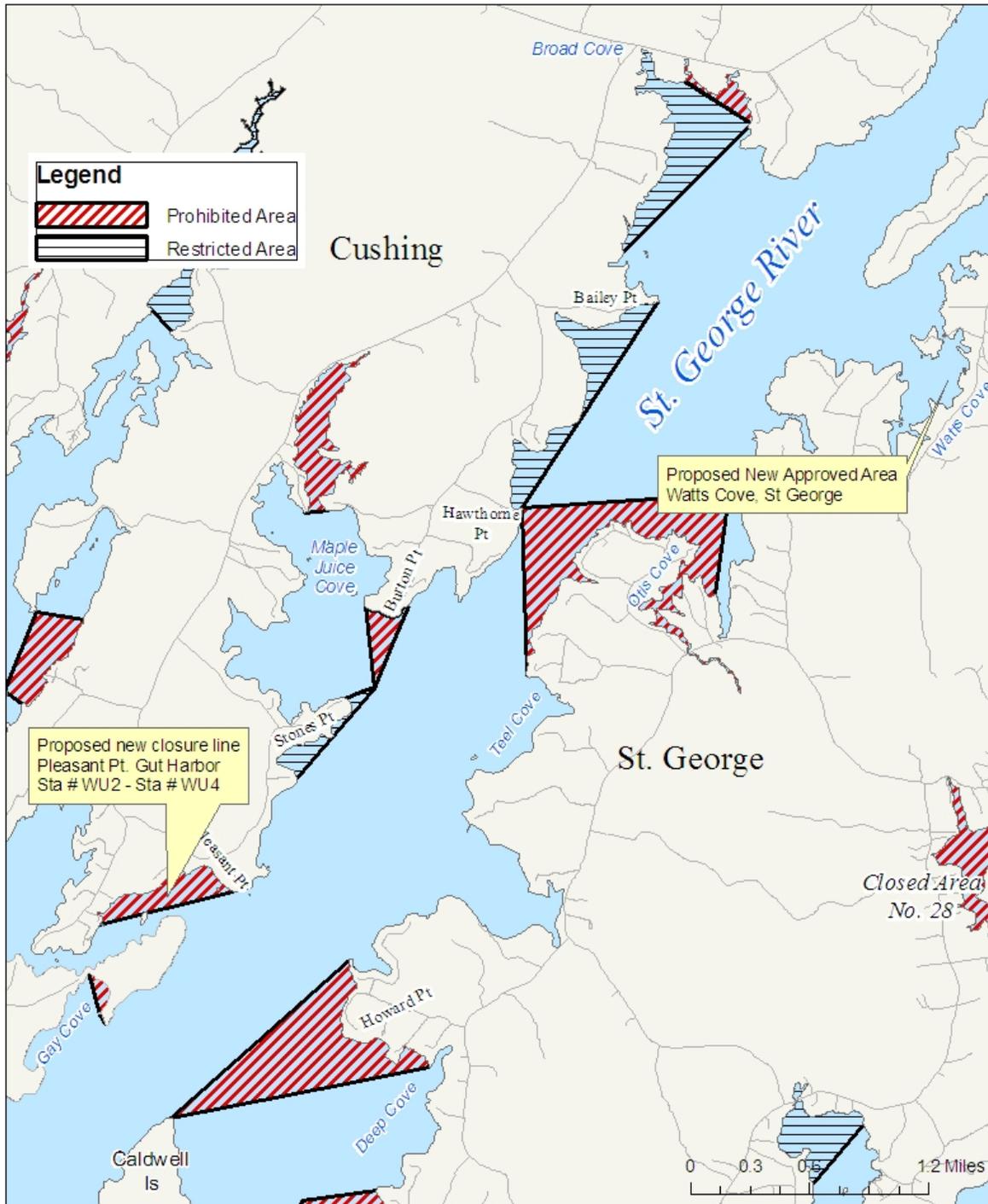




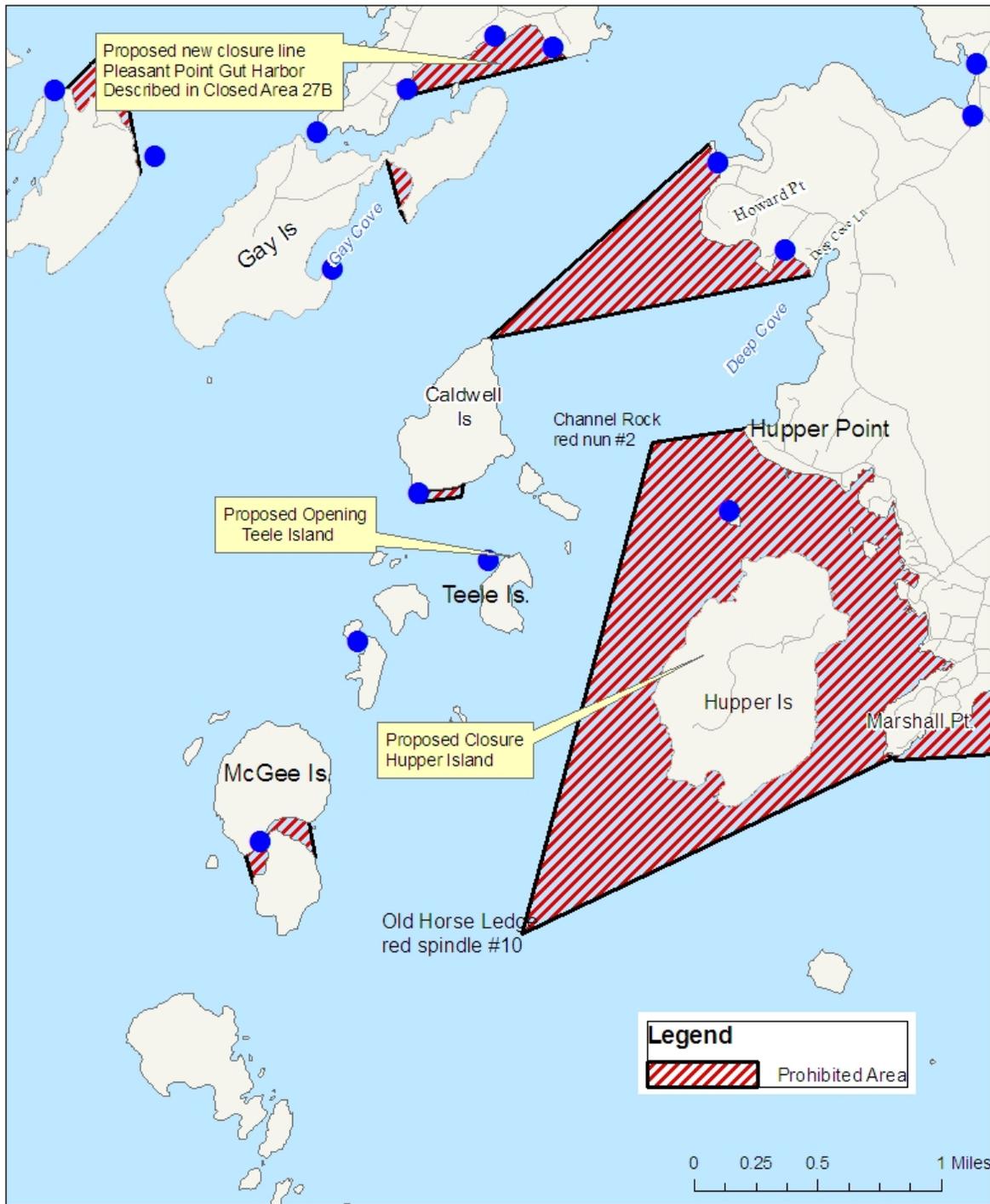
Figure 20 Proposed Classifications Closed Area 28A



Maine Department of Marine Resources Pollution Area No. 28A



C28A Port Clyde and St. George Islands, St. George and Cushing





Appendix A. 2007 Annual Review of Management Plan- WWTP

St George River Conditionally Restricted Area, C 27, Growing Area WU

Scope

A portion of Growing Area WU is classified conditionally restricted, based on the operations at the Thomaston Treatment Facility and the Warren Sanitary District treatment facilities. This area shall be closed when a malfunction or a break in a sewer line at either of these facilities poses a potential threat to the water quality on the St George River. Water quality in the St George conditionally restricted area is monitored by stations WU 32, 33, 34, 34.5, and boundary line station 25. All conditionally restricted stations must be sampled each month that the area is in the open status. The Thomaston Treatment Facility has a discharge to the river during the months of January, February and March. During these months the conditionally restricted area is required to be closed.

Compliance with management plan

There have been no malfunctions at either facility since 1997.

Adequacy of reporting and cooperation of involved persons

In the event that a closure must be implemented due to a malfunction or a break in a sewer line, the management plan for this conditional area requires reporting by Neil Pollis, shellfish warden for the five town management group on the St George River. In 2007, no malfunctions were reported.

Compliance with approved growing area criteria

The annual review of the water quality for all active stations in this conditional area revealed that boundary line (CA and CR areas) station WU34.5 no longer meets approved standards. It is a requirement that all boundary stations meet the stricter classification associated with the boundary line. In this case, station WU34.5 must meet approved standards while in open status. The boundary line must be moved to the next station meeting approved standards in this section of the river. Station WU 35 will become the new boundary line station.

Table 2. Geomean and P90 Calculations for Restricted Stations, Open status

STATION	CLASS	CNT	MFCNT	GM	SDV	MAX	P90	APPD_STD	RESTR_STD
WU025.00	CA	30	9	6.5	0.40	43	21.1	43	250
WU032.00	CR	30	14	10.7	0.54	150	52.5	40	226
WU033.00	CR	30	14	10.3	0.61	460	61.4	40	226
WU034.00	CR	30	14	7.8	0.50	93	34.2	40	226
WU034.50	CR	30	14	9.5	0.70	1700	75.1	40	226



Water sampling compliance history

All Restricted stations in growing area WU were sampled each month the area was in the open status (table 3). Station WU25 (boundary line station) is classified as conditionally approved and is required to be sampled six times in the open status.

Table 3. 2007 Tabulated Data, Open status

Station	Date	Collect	Tide	Temp	Sal	Strat	ADV	Stat	CL	A1COL	BGCOL	WIND
WU025.00	02/28/07	FP	E	-1	24	R	-	O	CA	-	<2.0	CL
WU025.00	05/22/07	EXT	F	18	8	R	-	O	CA	-	8	SE
WU025.00	06/10/07	GLE	E	13	19	R	-	O	CA	-	12	NW
WU025.00	07/08/07	GLE	E	14	28	R	PN	O	CA	-	16	-
WU025.00	08/07/07	FP	E	15	30	R	P	O	CA	-	14	CL
WU025.00	09/23/07	FP	H	15	30	R	-	O	CA	-	26	CL
WU032.00	04/01/07	JHE	F	1	8	R	WNT	O	CR	-	<2.0	CL
WU032.00	05/22/07	EXT	F	19	14	R	-	O	CR	-	4	SE
WU032.00	06/10/07	GLE	HE	12	22	R	-	O	CR	-	4	NW
WU032.00	07/08/07	GLE	E	13.5	22	R	PNH	O	CR	-	40	-
WU032.00	08/07/07	FP	F	34	25	R	P	O	CR	-	14	S
WU032.00	09/23/07	FP	HE	15	30	R	W	O	CR	-	4	NW
WU032.00	10/24/07	FP	HE	14	26	R	-	O	CR	-	54	CL
WU032.00	11/26/07	FP	HF	5	10	R	-	O	CR	-	20	SW
WU032.00	12/02/07	FP	E	0	12	R	-	O	CR	-	2	NW
WU033.00	04/01/07	KHY	F	2	18	R	NT	O	CR	-	2	CL
WU033.00	05/22/07	EXT	F	10	24	R	-	O	CR	-	2	CL
WU033.00	06/10/07	GLE	HE	13	20	R	-	O	CR	-	10	NW
WU033.00	07/08/07	GLE	E	14	27	R	PN	O	CR	-	5.5	-
WU033.00	08/07/07	FP	F	30	30	R	P	O	CR	-	<2.0	CL
WU033.00	09/23/07	FP	HE	15	28	R	-	O	CR	-	2	NW
WU033.00	10/24/07	FP	HE	13	20	R	-	O	CR	-	29	N
WU033.00	11/26/07	FP	HF	5	18	R	W	O	CR	-	4	SW
WU033.00	12/02/07	FP	E	0	8	R	-	O	CR	-	4	NW
WU034.00	04/01/07	JHE	F	-1	4	R	WNT	O	CR	-	<2.0	CL
WU034.00	05/22/07	EXT	F	14	18	R	-	O	CR	-	6	CL
WU034.00	06/10/07	GLE	H	11.5	22	R	-	O	CR	-	4	CL
WU034.00	07/08/07	GLE	E	14	28	R	PNH	O	CR	-	7.3	-
WU034.00	08/07/07	FP	F	28	30	R	P	O	CR	-	8	CL
WU034.00	09/23/07	FP	HE	16	28	R	-	O	CR	-	2	NW
WU034.00	10/24/07	FP	HE	13	19	R	W	O	CR	-	38	CL
WU034.00	11/26/07	FP	HF	5	20	R	W	O	CR	-	2	SW
WU034.00	12/02/07	FP	E	0	6	R	-	O	CR	-	11	CL
WU034.50	04/01/07	KHY	F	2	6	R	NT	O	CR	-	<2.0	CL
WU034.50	05/22/07	EXT	HF	14	18	R	-	O	CR	-	2	SE
WU034.50	06/10/07	GLE	HE	12	20	R	-	O	CR	-	6	NW
WU034.50	07/08/07	GLE	E	14	30	R	P	O	CR	-	2	-



Station	Date	Collect	Tide	Temp	Sal	Strat	ADV	Stat	CL	A1COL	BGCOL	WIND
WU034.50	08/07/07	FP	E	20	30	R	P	O	CR	-	16	S
WU034.50	09/23/07	FP	HE	17	30	R	W	O	CR	-	>1600	NW
WU034.50	10/24/07	FP	H	13	26	R	-	O	CR	-	56	NE
WU034.50	11/26/07	FP	HF	6	25	R	-	O	CR	-	<2.0	SW
WU034.50	12/02/07	FP	E	1	14	R	W	O	CR	-	2	NW

Analysis-Recommendations

Sampling station WU35 will become the new boundary station dividing the conditionally restricted and conditionally approved areas.



Appendix B. 2007 Annual Review of Management Plan-Rainfall Area

St George River Rainfall Conditional Area, C 27, Growing Area WU

Scope

A portion of Growing Area WU is conditionally approved, based on rainfall. This area shall be closed when rainfall meets or exceeds 1.5 inches in a 24 hour period. Water quality in the St George rainfall conditional area is monitored by stations WU 19, 21, 23, 25, 35, 37, and 38. All conditionally approved stations must be sampled 6 times per year, in the open status. If the annual cumulative time in the open-status is 5 months or less, the areas are required to be sampled 5 times.

Compliance with management plan

In 2007, there were 4 rainfall closures in the conditional area located in growing area WU. Per management plan, Maine DMR was notified that rainfall exceeded 1.5' inches and the appropriate closures were made (Table 1).

Table 1. Rainfall closure/re-opening activity for 2007

Date Closed Flood=F Rain>1.5=R	Additional rainfall events ≥1.5 inches in 24 hours	Date area sampled:	# Days closed	Date Opened	Open from (date-date)	# days open	Comments
3/19/07 F	2.23"	4/1/07	15	4/3/07	4/3-4/15	12	Flood closure 3/18 Condit closure 3/19
4/15/07F 4/17/07 R	4/16 had 1.65" of rain 4/17 had 1.98" of rain	4/29, 5/1, 5/2,	19	5/4/07	5/4-10/12	161	preemptive flood closure effective 4/16 at 2:00am
10/12F	10/12 had 2.77" total 10/28 had 1.19"	10/14 all stations 10/24, 10/28 10/29 10/30 10/31	21	11/2	11/2-11/4	2	10/14 sampled to get rainfall data 10/17 flood closure lifted.
11/4/07 F	11/3 had 2.85"	11/14 all clean	15	11/19	11/19-		

Adequacy of reporting and cooperation of involved persons

In the event that a conditional area closure must be implemented due to rainfall, the management plan for this conditional area requires reporting by Neil Pollis, shellfish warden for



the five town management group on the St George River. In 2007, the cooperation between all involved parties was excellent and all necessary notifications were received at appropriate times.

Compliance with approved growing area criteria

The annual review of the water quality for all active stations in this conditional area met approved standards in the open status 2003-2007 (Table 2).

Table 2. Geomean and P90 Calculations for Conditional Stations, Open Status

STATION	CLASS	CNT	MFCNT	GM	SDV	MAX	P90	APPD_STD	RESTR_STD
WU019.00	CA	30	9	3.6	0.29	43	8.4	43	250
WU020.00	P	30	9	4.7	0.41	93	15.8	43	250
WU021.00	CA	24	9	5.0	0.39	52	15.9	41	239
WU022.00	CA	30	10	7.0	0.46	93	26.7	42	245
WU023.00	CA	30	9	4.7	0.38	43	14.3	43	250
WU025.00	CA	30	9	6.5	0.40	43	21.1	43	250
WU035.00	CA	30	10	4.2	0.28	23	9.7	42	245
WU036.00	CA	30	9	4.8	0.32	23	12.3	43	250
WU037.00	CA	30	9	5.8	0.59	1100	32.4	43	250
WU037.50	CA	30	9	5.4	0.52	460	24.7	43	250
WU038.00	CA	30	9	4.3	0.54	1380	20.8	43	250

Water sampling compliance history

All conditionally approved stations in growing area WU were sampled 6 times in the open status.

Analysis-Recommendations

No recommendations for changes to the current management plan or conditional area classification status are needed at this time.



Appendix C. 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 D. Transitioning to Membrane Filtration

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 E. WU Data, 2006 and 2007

Station	Date	Collect	Tide	Temp	Sal	Strat	ADV	Stat	CL	A1COL	BGCOL
WU001.00	03/13/06	JB	E	1.5	32	R	-	O	A	<3.0	-
WU001.00	07/11/06	FP	F	9	29	R	-	O	A	23	-
WU001.00	08/07/06	FP	E	10	31	R	-	O	A	5.7	-
WU001.00	09/06/06	FP	E		31	R	P	O	A	-	18
WU001.00	10/25/06	JXK	F	12	32	R	P	O	A	-	31
WU001.00	11/13/06	LL	LE	9	28	R	P	O	A	-	2
WU001.00	01/24/07	LL	F	3	31	R	-	O	A	-	<2.0
WU001.00	03/28/07	FP	E	-1	28	R	-	O	A	-	<2.0
WU001.00	05/14/07	JB	E	8	30	R	-	O	A	-	<2.0
WU001.00	07/10/07	MHE	LF	15	32	R	-	O	A	-	<2.0
WU001.00	08/28/07	LL	E	17	31	R	-	O	A	-	2
WU001.00	10/29/07	MHE	F	5	32	R	-	O	A	-	10
WU002.00	03/13/06	JB	E	2	32	R	B	C	P	<3.0	-
WU002.00	07/11/06	FP	F	9	29	R	-	C	P	23	-
WU002.00	08/07/06	FP	E	10	30	R	-	C	P	<3.0	-
WU002.00	09/06/06	FP	E		31	R	P	C	P	-	94
WU002.00	10/25/06	JXK	F	13	32	R	P	C	P	-	2
WU002.00	11/13/06	LL	LE	9	28	R	P	C	P	-	7.3
WU002.00	01/24/07	LL	F	3	31	R	-	C	P	-	<2.0
WU002.00	03/28/07	FP	E	-1	28	R	-	C	P	-	<2.0
WU002.00	05/14/07	JB	E	8	29	R	-	C	P	-	<2.0
WU002.00	07/10/07	MHE	LF	14	32	R	-	C	P	-	2
WU002.00	08/28/07	LL	E	17	30	R	-	C	P	-	15
WU002.00	10/29/07	MHE	F	8	32	R	-	C	P	-	8
WU003.00	03/13/06	JB	E	2	30	R	-	O	A	<3.0	-
WU003.00	07/11/06	FP	F	9	29	R	-	O	A	93	-
WU003.00	08/07/06	FP	E	10	30	R	N	O	A	15	-
WU003.00	09/06/06	FP	E		30	R	P	O	A	-	540
WU003.00	10/25/06	JXK	F	12	30	R	PN	O	A	-	7.3
WU003.00	11/13/06	LL	LE	9	28	R	P	O	A	-	5.5
WU003.00	01/24/07	LL	F	3	30	R	-	C	P	-	<2.0
WU003.00	03/28/07	FP	E	1	30	R	N	C	P	-	<2.0
WU003.00	05/14/07	JB	E	10	29	R	-	C	P	-	<2.0
WU003.00	07/10/07	MHE	L	14	32	R	-	C	P	-	4.6
WU003.00	08/28/07	LL	E	20	30	R	W	C	P	-	2
WU003.00	10/29/07	MHE	F	8	32	R	-	C	P	-	3.6
WU004.00	03/13/06	JB	E	2	32	R	-	O	A	3.6	-
WU004.00	07/11/06	FP	F	9	29	R	-	O	A	<3.0	-
WU004.00	08/07/06	FP	HE	10	30	R	-	O	A	3.6	-
WU004.00	09/06/06	FP	HE		30	R	P	O	A	-	13
WU004.00	10/25/06	JXK	F	12	31	R	P	O	A	-	2
WU004.00	11/13/06	LL	LE	9	28	R	P	O	A	-	2
WU004.00	01/24/07	LL	F	3	30	R	-	O	A	-	<2.0



Station	Date	Collect	Tide	Temp	Sal	Strat	ADV	Stat	CL	A1COL	BGCOL
WU004.00	03/28/07	FP	E	1	26	R	-	O	A	-	<2.0
WU004.00	05/14/07	JB	E	10	30	R	-	O	A	-	<2.0
WU004.00	07/10/07	MHE	L	16	32	R	-	O	A	-	6
WU004.00	08/28/07	LL	E	18	30	R	-	O	A	-	<2.0
WU004.00	10/29/07	MHE	F	7	32	R	-	O	A	-	2
WU005.00	03/13/06	JB	E	1.5	30	R	-	C	P	<3.0	-
WU005.00	07/11/06	FP	F	11	29	R	-	C	P	<3.0	-
WU005.00	08/07/06	FP	HE	10	30	R	-	C	P	460	-
WU005.00	09/06/06	FP	HE		31	R	P	C	P	-	11
WU005.00	10/25/06	JXK	F	12	29	R	P	C	P	-	<2.0
WU005.00	11/13/06	LL	LE	9	26	R	P	C	P	-	<2.0
WU005.00	01/24/07	LL	F	3	30	R	-	O	A	-	<2.0
WU005.00	03/28/07	FP	E	1	28	R	-	O	A	-	<2.0
WU005.00	05/14/07	JB	E	9	30	R	-	O	R	-	<2.0
WU005.00	07/10/07	MHE	L	15	30	R	-	O	R	-	2
WU005.00	08/28/07	LL	E	16	30	R	-	O	R	-	<2.0
WU005.00	10/29/07	MHE	F	9	30	R	-	O	R	-	8
WU006.00	03/13/06	JB	E	1	31	R	-	C	P	<3.0	-
WU006.00	07/11/06	FP	F	9	29	R	N	C	P	43	-
WU006.00	08/07/06	FP	HE	10	29	R	B	C	P	23	-
WU006.00	09/06/06	FP	HE		30	R	PN	C	P	-	12
WU006.00	10/25/06	JXK	F	13	28	R	P	C	P	-	48
WU006.00	11/13/06	LL	L	9	22	R	P	C	P	-	20
WU006.00	01/24/07	LL	F	3	30	R	-	O	A	-	<2.0
WU006.00	03/28/07	FP	E	1	23	R	-	O	A	-	<2.0
WU006.00	05/14/07	JB	E	11	29	R	-	O	A	-	20
WU006.00	07/10/07	MHE	L	14	32	R	-	O	A	-	44
WU006.00	08/28/07	LL	E	17	30	R	-	O	A	-	2
WU006.00	10/29/07	MHE	F	4	25	R	-	O	A	-	12
WU006.50	03/13/06	JB	E	2	31	R	-	O	A	<3.0	-
WU006.50	07/11/06	FP	F	9	29	R	-	O	A	43	-
WU006.50	08/07/06	FP	HE	10	29	R	B	O	A	<3.0	-
WU006.50	09/06/06	FP	HE		30	R	P	O	A	-	14
WU006.50	10/25/06	JXK	F	13	30	R	P	O	A	-	8
WU006.50	11/13/06	LL	L	9	26	R	P	O	A	-	8
WU006.50	01/24/07	LL	F	3	30	R	-	O	A	-	<2.0
WU006.50	03/28/07	FP	E	1	28	R	-	O	A	-	<2.0
WU006.50	05/14/07	JB	E	11	28	R	-	O	A	-	2
WU006.50	07/10/07	MHE	LE	15	32	R	-	O	A	-	12
WU006.50	08/28/07	LL	E	20	30	R	-	O	A	-	6
WU006.50	10/29/07	MHE	F	9	30	R	-	O	A	-	10
WU007.00	03/13/06	JB	E	2	31	R	-	O	A	3.6	-
WU007.00	07/11/06	FP	F	9	30	R	-	O	A	43	-



Station	Date	Collect	Tide	Temp	Sal	Strat	ADV	Stat	CL	A1COL	BGCOL
WU007.00	08/07/06	FP	HE	10	29	R	-	O	A	<3.0	-
WU007.00	09/06/06	FP	HE		30	R	P	O	A	-	4
WU007.00	10/25/06	JXK	HF	13	24	R	P	O	A	-	14
WU007.00	11/13/06	LL	L	9	25	R	P	O	A	-	4
WU007.00	01/24/07	LL	F	3	30	R	-	O	A	-	<2.0
WU007.00	03/28/07	FP	E	-1	24	R	-	O	A	-	<2.0
WU007.00	05/14/07	JB	E	7	30	R	W	O	A	-	<2.0
WU007.00	07/10/07	MHE	LE	14	30	R	-	O	A	-	66
WU007.00	08/28/07	LL	HE	17	30	R	-	O	A	-	90
WU007.00	10/29/07	MHE	F	9	30	R	-	O	A	-	8
WU007.20	07/25/07	FP	E	20	30	R	-	C	P	-	27
WU007.20	08/28/07	LL	F	18	30	R	-	C	P	-	50
WU007.20	10/30/07	MHE	HF	8	30	R	P	C	P	-	48
WU007.20	12/12/07	FP	E	3	4	R	-	C	P	-	8
WU007.30	03/13/06	JB	E	3	5	R	NW	C	P	<3.0	-
WU007.30	07/11/06	FP	F	12	0	R	N	C	P	75	-
WU007.30	08/07/06	FP	HE	11	2	R	N	C	P	15	-
WU007.30	09/06/06	FP	HE		29	R	PN	C	P	-	28
WU007.30	10/25/06	JXK	HF	10	4	R	PN	C	P	-	50
WU007.30	11/13/06	LL	L	9	0	R	P	C	P	-	20
WU007.30	03/28/07	FP	E	-1	2	R	N	C	P	-	<2.0
WU007.30	05/14/07	JB	E	12	0	R	-	C	P	-	28
WU007.30	06/12/07	FP	HE	15	27	R	-	C	P	-	180
WU007.30	07/11/07	EXT	E	15	30	R	-	C	P	-	16
WU007.30	08/28/07	LL	HF	18	30	R	-	C	P	-	36
WU007.30	10/29/07	MHE	F	6	4	R	-	C	P	-	84
WU009.00	03/13/06	JB	E	2	31	R	-	C	P	3.6	-
WU009.00	07/11/06	FP	F	10	25	R	-	C	P	23	-
WU009.00	08/07/06	FP	H	10	29	R	-	C	P	3.6	-
WU009.00	09/06/06	FP	HE		31	R	PW	C	P	-	12
WU009.00	10/25/06	JXK	HF	13	30	R	P	C	P	-	<2.0
WU009.00	11/13/06	LL	L	9	28	R	PW	C	P	-	2
WU009.00	01/24/07	LL	F	3	30	R	-	C	P	-	<2.0
WU009.00	03/28/07	FP	E	-1	25	R	-	C	P	-	<2.0
WU009.00	05/14/07	JB	E	6	30	R	-	C	P	-	<2.0
WU009.00	07/10/07	MHE	LE	13	32	R	-	C	P	-	20
WU009.00	08/28/07	LL	HE	17	30	R	W	C	P	-	220
WU009.00	10/29/07	MHE	F	9	31	R	-	C	P	-	5.5
WU010.00	03/13/06	JB	E	2	31	R	-	O	A	<3.0	-
WU010.00	07/11/06	FP	F	10	27	R	-	O	A	3.6	-
WU010.00	08/07/06	FP	H	10	29	R	-	O	A	93	-
WU010.00	09/06/06	FP	H		30	R	P	O	A	-	10
WU010.00	10/25/06	JXK	HF	13	29	R	P	O	A	-	2



Station	Date	Collect	Tide	Temp	Sal	Strat	ADV	Stat	CL	A1COL	BGCOL
WU010.00	11/13/06	LL	LF	9	26	R	P	O	A	-	22
WU010.00	01/24/07	LL	F	3	30	R	-	O	A	-	<2.0
WU010.00	03/28/07	FP	E	-1	20	R	-	O	A	-	<2.0
WU010.00	05/14/07	JB	E	8	30	R	-	O	A	-	<2.0
WU010.00	07/10/07	MHE	E	13	32	R	-	O	A	-	4
WU010.00	08/28/07	LL	HE	18	30	R	-	O	A	-	<2.0
WU010.00	10/29/07	MHE	F	9	31	R	-	O	A	-	10
WU012.00	03/13/06	JB	E	3	24	R	-	O	A	7.3	-
WU012.00	07/11/06	FP	F	10	15	R	N	O	A	93	-
WU012.00	08/07/06	FP	H	10	25	R	N	O	A	15	-
WU012.00	09/06/06	FP	H		30	R	PN	O	A	-	54
WU012.00	10/25/06	JXK	HF	13	8	R	PN	O	A	-	18
WU012.00	11/13/06	LL	LF	9	2	R	P	O	A	-	34
WU012.00	01/24/07	LL	F	3	14	R	-	O	A	-	2
WU012.00	03/28/07	FP	E	-1	20	R	N	O	A	-	<2.0
WU012.00	05/14/07	JB	E	8	28	R	-	O	A	-	<2.0
WU012.00	07/10/07	MHE	E	14	28	R	-	O	A	-	20
WU012.00	08/28/07	LL	HE	19	30	R	-	O	R	-	5.5
WU012.00	10/29/07	MHE	F	10	30	R	-	O	R	-	15
WU013.00	03/13/06	JB	E	3	26	R	N	C	P	<3.0	-
WU013.00	07/11/06	FP	F	10	26	R	N	C	P	3.6	-
WU013.00	08/07/06	FP	H	9	28	R	N	C	P	3.6	-
WU013.00	09/06/06	FP	H		30	R	PN	C	P	-	11
WU013.00	10/25/06	JXK	HF	13	26	R	PN	C	P	-	9.1
WU013.00	11/13/06	LL	LF	9	0	R	P	C	P	-	36
WU013.00	01/24/07	LL	F	3	28	R	-	C	P	-	<2.0
WU013.00	03/28/07	FP	E	-1	25	R	N	C	P	-	<2.0
WU013.00	05/14/07	JB	E	8	28	R	-	C	P	-	2
WU013.00	07/10/07	MHE	E	15	30	R	-	C	P	-	300
WU013.00	08/28/07	LL	HE	19	30	R	-	C	R	-	<2.0
WU013.00	10/29/07	MHE	F	9	30	R	-	C	R	-	26
WU013.50	03/13/06	JB	E	3	30	R	-	O	A	<3.0	-
WU013.50	07/11/06	FP	F	10	26	R	N	O	A	9.1	-
WU013.50	08/07/06	FP	H	10	28	R	N	O	A	3.6	-
WU013.50	09/06/06	FP	H		30	R	PN	O	A	-	2
WU013.50	10/25/06	JXK	H	13	25	R	PN	O	A	-	4
WU013.50	11/13/06	LL	LF	9	15	R	P	O	A	-	35
WU013.50	01/24/07	LL	F	3	30	R	-	O	A	-	<2.0
WU013.50	03/28/07	FP	E	-1	23	R	N	O	A	-	<2.0
WU013.50	05/14/07	JB	HE	6	28	R	-	O	A	-	<2.0
WU013.50	07/10/07	MHE	E	15	32	R	-	O	A	-	18
WU013.50	08/28/07	LL	HF	17	30	R	-	O	A	-	<2.0
WU013.50	10/29/07	MHE	F	9	30	R	-	O	A	-	15



Station	Date	Collect	Tide	Temp	Sal	Strat	ADV	Stat	CL	A1COL	BGCOL
WU013.80	03/13/06	JB	HE	4	30	R	-	O	A	<3.0	-
WU013.80	07/11/06	FP	F	10	27	R	-	O	A	3.6	-
WU013.80	08/07/06	FP	H	10	29	R	-	O	A	43	-
WU013.80	09/06/06	FP	H		30	R	P	O	A	-	100
WU013.80	10/25/06	JXK	H	13	30	R	P	O	A	-	2
WU013.80	11/13/06	LL	LF	9	24	R	P	O	A	-	16
WU013.80	01/24/07	LL	F	3	30	R	-	O	A	-	<2.0
WU013.80	03/28/07	FP	E	-1	24	R	-	O	A	-	<2.0
WU013.80	05/14/07	JB	HE	8	28	R	-	O	A	-	18
WU013.80	07/10/07	MHE	E	14	30	R	-	O	A	-	48
WU013.80	08/28/07	LL	HF	18	30	R	-	O	R	-	12
WU013.80	10/29/07	MHE	F	9	30	R	-	O	R	-	12
WU014.00	03/13/06	JB	HE	3	20	R	N	O	A	<3.0	-
WU014.00	07/11/06	FP	HF	12	27	R	N	O	A	23	-
WU014.00	08/07/06	FP	H	10	28	R	N	O	A	23	-
WU014.00	09/06/06	FP	H		30	R	PN	O	A	-	16
WU014.00	10/25/06	JXK	H	13	28	R	PN	O	A	-	2
WU014.00	11/13/06	LL	F	9	0	R	P	O	A	-	31
WU014.00	03/28/07	FP	E	-1	25	R	N	O	A	-	<2.0
WU014.00	05/14/07	JB	HE	6	25	R	-	O	R	-	2
WU014.00	06/12/07	FP	E	16	28	R	-	O	R	-	3.6
WU014.00	07/11/07	EXT	E	15	30	R	-	O	R	-	16
WU014.00	08/28/07	LL	H	18	30	R	-	O	R	-	18
WU014.00	10/29/07	MHE	HF	9	30	R	-	O	R	-	29
WU014.50	03/13/06	JB	HE	3	30	R	-	O	R	<3.0	-
WU014.50	07/11/06	FP	HF	11	27	R	-	O	R	93	-
WU014.50	08/07/06	FP	HF	10	28	R	W	O	R	460	-
WU014.50	09/06/06	FP	HF		30	R	PNW	O	R	-	25
WU014.50	10/25/06	JXK	H	13	28	R	P	O	R	-	4
WU014.50	11/13/06	LL	LF	9	10	R	P	O	R	-	40
WU014.50	01/24/07	LL	F	3	28	R	-	O	R	-	<2.0
WU014.50	03/28/07	FP	E	-2	24	R	N	O	R	-	2
WU014.50	05/14/07	JB	HE	7	28	R	-	O	R	-	13
WU014.50	06/12/07	FP	E	13	28	R	-	O	R	-	<2.0
WU014.50	07/10/07	MHE	E	14	30	R	-	O	R	-	12
WU014.50	08/28/07	LL	H	18	30	R	W	O	R	-	27
WU014.50	10/29/07	MHE	HF	8	30	R	-	O	R	-	27
WU016.00	03/13/06	JB	HE	2	18	R	N	O	R	460	-
WU016.00	07/11/06	FP	HF	12	23	R	N	O	R	43	-
WU016.00	08/07/06	FP	HF	10	21	R	N	O	R	93	-
WU016.00	09/06/06	FP	HF		24	R	PN	O	R	-	18
WU016.00	10/25/06	JXK	H	13	15	R	PN	O	R	-	36
WU016.00	11/13/06	LL	F	9	2	R	P	O	R	-	148



Station	Date	Collect	Tide	Temp	Sal	Strat	ADV	Stat	CL	A1COL	BGCOL
WU016.00	03/28/07	FP	E	-1	7	R	N	O	R	-	>1600
WU016.00	05/14/07	JB	HE	8	22	R	-	O	R	-	140
WU016.00	06/12/07	FP	E	13	28	R	-	O	R	-	2
WU016.00	07/10/07	MHE	E	14	14	R	-	O	R	-	40
WU016.00	08/28/07	LL	H	17	30	R	-	O	R	-	10
WU016.00	10/29/07	MHE	HF	7	10	R	-	O	R	-	150
WU016.50	03/13/06	JB	HE	2	30	R	-	O	A	<3.0	-
WU016.50	07/11/06	FP	HF	10	27	R	-	O	A	<3.0	-
WU016.50	08/07/06	FP	HF	9	28	R	-	O	A	21	-
WU016.50	09/06/06	FP	HF		30	R	P	O	A	-	18
WU016.50	10/25/06	JXK	H	13	25	R	P	O	A	-	10
WU016.50	11/13/06	LL	F	9	27	R	P	O	A	-	<2.0
WU016.50	01/24/07	LL	HF	3	28	R	-	O	A	-	<2.0
WU016.50	03/28/07	FP	E	-1	14	R	-	O	A	-	4
WU016.50	05/14/07	JB	HE	6	28	R	-	O	A	-	<2.0
WU016.50	06/12/07	FP	E	14	29	R	-	O	A	-	2
WU016.50	07/10/07	MHE	E	13	30	R	-	O	A	-	8
WU016.50	08/28/07	LL	H	17	30	R	-	O	A	-	44
WU016.50	10/29/07	MHE	HF	8	28	R	-	O	A	-	13
WU017.00	03/13/06	JB	H	2	30	R	-	O	A	<3.0	-
WU017.00	07/11/06	FP	HF	10	27	R	-	O	A	23	-
WU017.00	08/07/06	FP	HF	10	28	R	-	O	A	23	-
WU017.00	09/06/06	FP	HF		30	R	P	O	A	-	2
WU017.00	10/25/06	JXK	HE	13	28	R	P	O	A	-	2
WU017.00	11/13/06	LL	F	9	25	R	P	O	A	-	14
WU017.00	01/24/07	LL	HF	3	30	R	-	O	A	-	<2.0
WU017.00	05/14/07	JB	H	5	28	R	-	O	A	-	<2.0
WU017.00	06/12/07	FP	E	13	28	R	-	O	A	-	8
WU017.00	07/10/07	MHE	E	12	30	R	-	O	A	-	4
WU017.00	08/28/07	LL	H	17	30	R	-	O	A	-	<2.0
WU017.00	10/29/07	MHE	HF	8	30	R	-	O	A	-	13
WU018.00	03/13/06	JB	H	2	30	R	-	O	A	<3.0	-
WU018.00	07/11/06	FP	HF	10	27	R	-	O	A	5.7	-
WU018.00	07/31/06	FP	F	11	24	R	-	O	A	23	-
WU018.00	08/07/06	FP	F	10	28	R	-	O	A	43	-
WU018.00	09/06/06	FP	HF		30	R	P	O	A	-	8
WU018.00	10/25/06	JXK	HE	13	25	R	P	O	A	-	4
WU018.00	11/13/06	LL	F	9	24	R	P	O	A	-	56
WU018.00	12/05/06	FP	H	3	26	R	-	O	A	-	2
WU018.00	01/24/07	LL	HF	3	26	R	-	O	A	-	<2.0
WU018.00	03/28/07	FP	HE	-1	16	R	-	O	A	-	<2.0
WU018.00	05/14/07	JB	H	5	28	R	-	O	A	-	<2.0
WU018.00	07/10/07	MHE	E	12	30	R	-	O	A	-	7.3
WU018.00	08/07/07	FP	E	16	30	R	P	O	A	-	8



Station	Date	Collect	Tide	Temp	Sal	Strat	ADV	Stat	CL	A1COL	BGCOL
WU018.00	08/28/07	LL	H	17	30	R	-	O	A	-	12
WU018.00	10/29/07	MHE	HF	8	30	R	-	O	A	-	24
WU019.00	04/09/06	GRTA	HF	3	25	R	HN	O	CA	<3.0	-
WU019.00	06/04/06	GRTA	E	10	26	R	P	C	CA	23	-
WU019.00	07/09/06	GRTA	F	16	26	R	-	C	CA	9.1	-
WU019.00	07/31/06	FP	F	11	25	R	-	O	CA	<3.0	-
WU019.00	08/06/06	GRTA	H	16.5	27	R	NH	O	CA	<3.0	-
WU019.00	09/10/06	GRTA	F	16	30	R	-	O	CA	-	6
WU019.00	10/01/06	GRTA	E	12	30	R	HN	O	CA	-	4
WU019.00	12/05/06	FP	HE	3	25	R	-	O	CA	-	<2.0
WU019.00	02/28/07	FP	E	0	32	R	NW	O	CA	-	<2.0
WU019.00	04/01/07	KHY	F	2	15	R	NHT	C	CA	-	<2.0
WU019.00	06/10/07	GLE	E	12	26	R	-	O	CA	-	<2.0
WU019.00	07/08/07	GLE	E	13.5	30	R	P	O	CA	-	<2.0
WU019.00	08/07/07	FP	E	16	30	R	P	O	CA	-	9.1
WU019.00	09/23/07	FP	HF	15	30	R	-	O	CA	-	2
WU019.00	12/02/07	FP	E	1	21	R	-	O	CA	-	2
WU020.00	04/09/06	GRTA	HF	2.5	20	R	HN	O	CA	<3.0	-
WU020.00	06/04/06	GRTA	E	10	20	R	P	C	CA	93	-
WU020.00	07/09/06	GRTA	F	17	23	R	-	C	CA	23	-
WU020.00	07/31/06	FP	F	14	23	R	N	O	CA	<3.0	-
WU020.00	08/06/06	GRTA	H	16	26	R	N	O	CA	<3.0	-
WU020.00	09/10/06	GRTA	F	16.5	30	R	-	O	CA	-	5.5
WU020.00	10/01/06	GRTA	E	12	28	R	-	O	CA	-	3.6
WU020.00	12/05/06	FP	HE	2	20	R	N	O	CA	-	4
WU020.00	02/28/07	FP	E	-1	32	R	N	O	CA	-	<2.0
WU020.00	04/01/07	GLE	F	2	16	R	NHT	C	CA	-	<2.0
WU020.00	05/22/07	EXT	F	17	15	R	-	O	CA	-	5.5
WU020.00	06/10/07	GLE	E	11	22	R	-	O	CA	-	6
WU020.00	07/08/07	GLE	E	14	30	R	PNH	O	CA	-	<2.0
WU020.00	08/07/07	FP	E	18	30	R	P	O	CA	-	16
WU020.00	09/23/07	FP	HF	14	30	R	-	O	CA	-	<2.0
WU021.00	04/09/06	GRTA	HF	2	20	R	HN	O	CA	3.6	-
WU021.00	06/04/06	GRTA	E	10	10	R	PH	C	P	240	-
WU021.00	07/09/06	GRTA	F	18	21	R	-	C	CA	43	-
WU021.00	07/31/06	FP	F	16	22	R	-	O	CA	9.1	-
WU021.00	08/06/06	GRTA	H	16.5	25	R	N	O	CA	<3.0	-
WU021.00	09/10/06	GRTA	F	17	29	R	-	O	CA	-	<2.0
WU021.00	10/01/06	GRTA	E	12.5	28	R	-	O	CA	-	15
WU021.00	12/05/06	FP	HE	4	24	R	N	O	CA	-	15
WU021.00	02/28/07	FP	E	-1	30	R	N	O	CA	-	<2.0
WU021.00	04/01/07	GLE	F	2	15	R	NHT	C	CA	-	<2.0
WU021.00	05/20/07	GLE	F		12	R	-	O	CA	-	52
WU021.00	06/10/07	GLE	E	12	24	R	-	O	CA	-	7.3



Station	Date	Collect	Tide	Temp	Sal	Strat	ADV	Stat	CL	A1COL	BGCOL
WU021.00	07/08/07	GLE	E	14	30	R	PNH	O	CA	-	<2.0
WU021.00	08/07/07	FP	E	17	30	R	P	O	CA	-	11
WU021.00	09/23/07	FP	H	15	31	R	W	O	CA	-	<2.0
WU022.00	04/09/06	GRTA	H	2	20	R	N	O	CA	3.6	-
WU022.00	07/09/06	GRTA	HF	17.5	20	R	-	C	CA	9.1	-
WU022.00	07/31/06	FP	F	16	22	R	-	O	CA	<3.0	-
WU022.00	08/06/06	GRTA	H	16	22	R	N	O	CA	23	-
WU022.00	09/10/06	GRTA	F	18	28	R	-	O	CA	-	4
WU022.00	09/18/06	FP	HE	15	30	R	-	O	CA	-	18
WU022.00	10/01/06	GRTA	E	12.5	28	R	-	O	CA	-	32
WU022.00	12/05/06	FP	HE	1	20	R	-	O	CA	-	12
WU022.00	02/28/07	FP	E	-3	25	R	-	O	CA	-	<2.0
WU022.00	04/01/07	GLE	F	1	8	R	NHT	C	CA	-	<2.0
WU022.00	05/22/07	EXT	F	18	12	R	-	O	CA	-	6
WU022.00	06/10/07	GLE	E	12	20	R	-	O	CA	-	14
WU022.00	07/08/07	GLE	E	13	28	R	PN	O	CA	-	6
WU022.00	08/07/07	FP	E	17	30	R	P	O	CA	-	52
WU022.00	09/23/07	FP	HF	15	31	R	-	O	CA	-	44
WU023.00	04/09/06	GRTA	H	3	16	R	HN	O	CA	3.6	-
WU023.00	06/04/06	GRTA	LE	10.5	22	R	P	C	CA	460	-
WU023.00	07/09/06	GRTA	HF	16	22	R	-	C	CA	23	-
WU023.00	07/31/06	FP	F	16	16	R	-	O	CA	3.6	-
WU023.00	08/06/06	GRTA	H	17	21	R	NH	O	CA	3.6	-
WU023.00	09/10/06	GRTA	F	18	28	R	-	O	CA	-	4
WU023.00	10/01/06	GRTA	E	11	25	R	HN	O	CA	-	26
WU023.00	12/05/06	FP	H	3	20	R	-	O	CA	-	<2.0
WU023.00	02/28/07	FP	E	-2	28	R	-	O	CA	-	<2.0
WU023.00	04/01/07	KHY	F	2	7	R	NHT	C	CA	-	<2.0
WU023.00	06/10/07	GLE	E	13	20	R	-	O	CA	-	7.3
WU023.00	07/08/07	GLE	E	14	28	R	PNH	O	CA	-	2
WU023.00	08/07/07	FP	E	19	30	R	P	O	CA	-	2
WU023.00	09/23/07	FP	H	15	30	R	-	O	CA	-	<2.0
WU023.00	12/02/07	FP	E	1	21	R	-	O	CA	-	2
WU025.00	04/09/06	GRTA	H	2.5	16	R	HN	O	CA	<3.0	-
WU025.00	06/04/06	GRTA	LE	9	28	R	P	C	CA	210	-
WU025.00	07/09/06	GRTA	HF	19	15	R	-	C	CA	23	-
WU025.00	07/31/06	FP	HF	14	19	R	-	O	CA	23	-
WU025.00	08/06/06	GRTA	H	17.5	19	R	N	O	CA	9.1	-
WU025.00	09/10/06	GRTA	F	19	27	R	-	O	CA	-	6
WU025.00	10/01/06	GRTA	E	12	25	R	N	O	CA	-	24
WU025.00	12/05/06	FP	H	2	25	R	-	O	CA	-	<2.0
WU025.00	02/28/07	FP	E	-1	24	R	-	O	CA	-	<2.0
WU025.00	04/01/07	GLE	F	1	18	R	NHT	C	CA	-	<2.0
WU025.00	05/22/07	EXT	F	18	8	R	-	O	CA	-	8



Station	Date	Collect	Tide	Temp	Sal	Strat	ADV	Stat	CL	A1COL	BGCOL
WU025.00	06/10/07	GLE	E	13	19	R	-	O	CA	-	12
WU025.00	07/08/07	GLE	E	14	28	R	PN	O	CA	-	16
WU025.00	08/07/07	FP	E	15	30	R	P	O	CA	-	14
WU025.00	09/23/07	FP	H	15	30	R	-	O	CA	-	26
WU028.00	04/09/06	GRTA	H	4	20	R	SNM	C	P	3.6	-
WU028.00	05/22/06	FP	HE	10	20	R	P	C	P	9.1	-
WU028.00	06/04/06	GRTA	LE	13	7	R	P	C	P	>1100	-
WU028.00	07/09/06	GRTA	HF	16	22	R	-	C	P	23	-
WU028.00	09/10/06	GRTA	HE	16	30	R	-	C	P	-	8
WU028.00	09/18/06	FP	HE	15	28	R	-	C	P	-	<2.0
WU028.00	10/01/06	GRTA	E	13	28	R	N	C	P	-	30
WU028.00	12/05/06	FP	F	5	26	R	-	C	P	-	4
WU028.00	02/28/07	FP	E	-1	31	R	S	C	P	-	<2.0
WU028.00	04/01/07	KHY	F	2	12	R	-	C	P	-	<2.0
WU028.00	06/10/07	GLE	E	10	26	R	WM	C	P	-	16
WU028.00	07/08/07	GLE	E	13.5	30	R	PN	C	P	-	5.5
WU028.00	08/07/07	FP	LE	18	30	R	P	C	P	-	88
WU028.00	09/23/07	FP	H	15	30	R	-	C	P	-	<2.0
WU028.00	11/26/07	FP	F	6	24	R	-	C	P	-	2
WU028.00	12/02/07	FP	E	1	12	R	-	C	P	-	2
WU029.00	04/09/06	GRTA	H	3	22	R	NH	C	P	<3.0	-
WU029.00	05/22/06	FP	E	10	18	R	P	C	P	3.6	-
WU029.00	06/04/06	GRTA	E	11	4	R	P	C	P	460	-
WU029.00	07/09/06	GRTA	F	16	11	R	-	C	P	80	-
WU029.00	08/06/06	GRTA	HE	16	15	R	N	C	P	93	-
WU029.00	09/10/06	GRTA	HF	17	26	R	-	C	P	-	9.1
WU029.00	10/01/06	GRTA	E	12.5	10	R	-	C	P	-	38
WU029.00	12/05/06	FP	F	-5	8	R	N	C	P	-	8
WU029.00	02/28/07	FP	H	-2	16	R	N	C	P	-	<2.0
WU029.00	05/20/07	SFR	F	9	0	R	P	C	P	-	42
WU029.00	06/10/07	GLE	E	13	24	R	-	C	P	-	20
WU029.00	07/11/07	FP	HF	16	26	R	-	C	P	-	20
WU029.00	08/07/07	FP	HF	30	28	R	P	C	P	-	38
WU029.00	09/23/07	FP	H	15	30	R	-	C	P	-	2
WU029.00	11/26/07	FP	F	5	10	R	-	C	P	-	20
WU029.00	12/06/07	FP	F	1	18	R	-	C	P	-	5.5
WU030.00	04/09/06	GRTA	H	2	5	R	NHS	C	P	3.6	-
WU030.00	05/22/06	FP	E	11	2	R	P	C	P	7.3	-
WU030.00	06/04/06	GRTA	E	11	0	R	P	C	P	1100	-
WU030.00	07/09/06	GRTA	F	17	0	R	-	C	P	460	-
WU030.00	08/06/06	GRTA	HE	16	9	R	N	C	P	93	-
WU030.00	09/10/06	GRTA	HF	17.5	18	R	W	C	P	-	62
WU030.00	10/01/06	GRTA	E	9	0	R	-	C	P	-	110
WU030.00	12/05/06	FP	F	0	0	R	-	C	P	-	18



Station	Date	Collect	Tide	Temp	Sal	Strat	ADV	Stat	CL	A1COL	BGCOL
WU030.00	02/28/07	FP	H	-2	0	R	N	C	P	-	<2.0
WU030.00	05/20/07	SFR	F	9	0	R	P	C	P	-	20
WU030.00	06/10/07	GLE	E	15	0	R	-	C	P	-	106
WU030.00	07/11/07	FP	HF	16	22	R	-	C	P	-	46
WU030.00	08/07/07	FP	F	35	10	R	P	C	P	-	84
WU030.00	09/23/07	FP	HE	15	26	R	-	C	P	-	24
WU030.00	11/26/07	FP	HF	4	0	R	-	C	P	-	8
WU030.00	12/06/07	FP	HF	1	0	R	-	C	P	-	2
WU032.00	04/09/06	GRTA	H	4	25	R	N	O	CR	<3.0	-
WU032.00	05/22/06	FP	E	11	10	R	PNW	O	CR	23	-
WU032.00	06/04/06	GRTA	E	10.5	13	R	P	C	CR	93	-
WU032.00	06/18/06	FP	F	20	4	R	-	O	CR	3.6	-
WU032.00	07/09/06	GRTA	F	16	16	R	-	O	CR	23	-
WU032.00	08/06/06	GRTA	H	16	13	R	WN	O	CR	43	-
WU032.00	09/10/06	GRTA	HF	18	28	R	-	O	CR	-	6
WU032.00	10/01/06	GRTA	E	12.5	30	R	N	O	CR	-	<2.0
WU032.00	11/28/06	FP	F	4	28	R	-	O	CR	-	4
WU032.00	12/05/06	FP	F	-6	18	R	N	O	CR	-	7.3
WU032.00	02/28/07	FP	H	-3	18	R	N	O	CR	-	4
WU032.00	04/01/07	JHE	F	1	8	R	WNT	O	CR	-	<2.0
WU032.00	05/22/07	EXT	F	19	14	R	-	O	CR	-	4
WU032.00	06/10/07	GLE	HE	12	22	R	-	O	CR	-	4
WU032.00	07/08/07	GLE	E	13.5	22	R	PNH	O	CR	-	40
WU032.00	08/07/07	FP	F	34	25	R	P	O	CR	-	14
WU032.00	09/23/07	FP	HE	15	30	R	W	O	CR	-	4
WU032.00	10/24/07	FP	HE	14	26	R	-	O	CR	-	54
WU032.00	11/26/07	FP	HF	5	10	R	-	O	CR	-	20
WU032.00	12/02/07	FP	E	0	12	R	-	O	CR	-	2
WU033.00	04/09/06	GRTA	H	3.5	12	R	HN	C	CR	3.6	-
WU033.00	05/22/06	FP	E	10	5	R	P	O	CR	93	-
WU033.00	06/18/06	FP	HF	20	12	R	-	O	CR	15	-
WU033.00	07/09/06	GRTA	HF	18	19	R	-	O	CR	7.3	-
WU033.00	08/06/06	GRTA	HE	18	17	R	N	O	CR	3.6	-
WU033.00	09/10/06	GRTA	HF	17	28	R	-	O	CR	-	14
WU033.00	10/01/06	GRTA	E	12	26	R	N	O	CR	-	12
WU033.00	11/28/06	FP	F	2	18	R	-	O	CR	-	4
WU033.00	12/05/06	FP	F	-6	10	R	-	O	CR	-	6
WU033.00	02/28/07	FP	H	-3	21	R	-	O	CR	-	<2.0
WU033.00	04/01/07	KHY	F	2	18	R	NT	O	CR	-	2
WU033.00	05/22/07	EXT	F	10	24	R	-	O	CR	-	2
WU033.00	06/10/07	GLE	HE	13	20	R	-	O	CR	-	10
WU033.00	07/08/07	GLE	E	14	27	R	PN	O	CR	-	5.5
WU033.00	08/07/07	FP	F	30	30	R	P	O	CR	-	<2.0
WU033.00	09/23/07	FP	HE	15	28	R	-	O	CR	-	2
WU033.00	10/24/07	FP	HE	13	20	R	-	O	CR	-	29
WU033.00	11/26/07	FP	HF	5	18	R	W	O	CR	-	4



Station	Date	Collect	Tide	Temp	Sal	Strat	ADV	Stat	CL	A1COL	BGCOL
WU033.00	12/02/07	FP	E	0	8	R	-	O	CR	-	4
WU034.00	04/09/06	GRTA	HE	2.5	10	R	NH	O	CR	<3.0	-
WU034.00	05/22/06	FP	E	10	5	R	P	O	CR	43	-
WU034.00	06/18/06	FP	HF	20	15	R	-	O	CR	7.3	-
WU034.00	07/09/06	GRTA	F	16	18	R	-	O	CR	93	-
WU034.00	08/06/06	GRTA	H	16	20	R	N	O	CR	3.6	-
WU034.00	09/10/06	GRTA	HF	17.5	22	R	-	O	CR	-	36
WU034.00	10/10/06	FP	HF	12	25	R	N	O	CR	-	2
WU034.00	11/28/06	FP	F	2	10	R	NW	O	CR	-	6
WU034.00	12/05/06	FP	HF	0	10	R	N	O	CR	-	7.3
WU034.00	02/28/07	FP	H	-4	23	R	N	O	CR	-	<2.0
WU034.00	04/01/07	JHE	F	-1	4	R	WNT	O	CR	-	<2.0
WU034.00	05/22/07	EXT	F	14	18	R	-	O	CR	-	6
WU034.00	06/10/07	GLE	H	11.5	22	R	-	O	CR	-	4
WU034.00	07/08/07	GLE	E	14	28	R	PNH	O	CR	-	7.3
WU034.00	08/07/07	FP	F	28	30	R	P	O	CR	-	8
WU034.00	09/23/07	FP	HE	16	28	R	-	O	CR	-	2
WU034.00	10/24/07	FP	HE	13	19	R	W	O	CR	-	38
WU034.00	11/26/07	FP	HF	5	20	R	W	O	CR	-	2
WU034.00	12/02/07	FP	E	0	6	R	-	O	CR	-	11
WU034.50	04/09/06	GRTA	H	3.5	24	R	-	C	CR	<3.0	-
WU034.50	05/22/06	FP	E	10	12	R	P	O	CR	5.7	-
WU034.50	06/18/06	FP	HF	19	16	R	-	O	CR	240	-
WU034.50	07/09/06	GRTA	HF	16	24	R	-	O	CR	9.1	-
WU034.50	08/06/06	GRTA	HE	17.5	25	R	N	O	CR	7.3	-
WU034.50	09/10/06	GRTA	HF	18	26	R	-	O	CR	-	62
WU034.50	10/01/06	GRTA	E	12.5	30	R	N	O	CR	-	4
WU034.50	11/28/06	FP	F	2	21	R	NW	O	CR	-	<2.0
WU034.50	12/05/06	FP	HF	2	18	R	-	O	CR	-	4
WU034.50	02/28/07	FP	HE	-3	30	R	W	O	CR	-	<2.0
WU034.50	04/01/07	KHY	F	2	6	R	NT	O	CR	-	<2.0
WU034.50	05/22/07	EXT	HF	14	18	R	-	O	CR	-	2
WU034.50	06/10/07	GLE	HE	12	20	R	-	O	CR	-	6
WU034.50	07/08/07	GLE	E	14	30	R	P	O	CR	-	2
WU034.50	08/07/07	FP	E	20	30	R	P	O	CR	-	16
WU034.50	09/23/07	FP	HE	17	30	R	W	O	CR	-	>1600
WU034.50	10/24/07	FP	H	13	26	R	-	O	CR	-	56
WU034.50	11/26/07	FP	HF	6	25	R	-	O	CR	-	<2.0
WU034.50	12/02/07	FP	E	1	14	R	W	O	CR	-	2
WU035.00	04/09/06	GRTA	H	3	14	R	HN	O	CA	<3.0	-
WU035.00	07/09/06	GRTA	HF	16.5	24	R	-	C	CA	3.6	-
WU035.00	07/31/06	FP	HF	17	15	R	-	O	CA	3.6	-
WU035.00	08/06/06	GRTA	H	16.5	24	R	N	O	CA	3.6	-
WU035.00	09/10/06	GRTA	HF	16	28	R	-	O	CA	-	14
WU035.00	09/18/06	FP	HE	15	30	R	-	O	CA	-	<2.0



Station	Date	Collect	Tide	Temp	Sal	Strat	ADV	Stat	CL	A1COL	BGCOL
WU035.00	10/01/06	GRTA	E	12.5	30	R	N	O	CA	-	<2.0
WU035.00	12/05/06	FP	HF	-2	20	R	-	O	CA	-	4
WU035.00	02/28/07	FP	HE	-3	31	R	-	O	CA	-	<2.0
WU035.00	04/01/07	KHY	F	2	20	R	NT	C	CA	-	<2.0
WU035.00	06/10/07	GLE	E	10	28	R	-	O	CA	-	8
WU035.00	07/08/07	GLE	E	14	30	R	PNH	O	CA	-	<2.0
WU035.00	08/07/07	FP	E	18	30	R	P	O	CA	-	2
WU035.00	09/23/07	FP	HE	15	30	R	-	O	CA	-	10
WU035.00	12/02/07	FP	E	0	11	R	-	O	CA	-	6.6
WU036.00	04/09/06	GRTA	H	3	18	R	HN	O	CA	<3.0	-
WU036.00	06/04/06	GRTA	E	10	28	R	P	C	CA	20	-
WU036.00	07/09/06	GRTA	F	17	20	R	-	C	CA	15	-
WU036.00	07/31/06	FP	HF	16	19	R	-	O	CA	9.1	-
WU036.00	08/06/06	GRTA	H	16.5	25	R	NH	O	CA	23	-
WU036.00	09/10/06	GRTA	H	15	26	R	-	O	CA	-	7.3
WU036.00	10/01/06	GRTA	E	12	30	R	HN	O	CA	-	3.6
WU036.00	12/05/06	FP	HF	-1	14	R	-	O	CA	-	6
WU036.00	02/28/07	FP	HE	-4	27	R	N	O	CA	-	<2.0
WU036.00	04/01/07	KHY	F	1	14	R	NHT	C	CA	-	<2.0
WU036.00	05/22/07	EXT	HF	9	26	R	-	O	CA	-	4
WU036.00	06/10/07	GLE	E	12	25	R	-	O	CA	-	6
WU036.00	07/08/07	GLE	E	14	30	R	PNH	O	CA	-	<2.0
WU036.00	08/07/07	FP	F	26	32	R	P	O	CA	-	<2.0
WU036.00	09/23/07	FP	E	15	30	R	-	O	CA	-	13
WU037.00	04/09/06	GRTA	HE	3.5	22	R	NH	O	CA	<3.0	-
WU037.00	06/04/06	GRTA	E	10	28	R	P	C	CA	15	-
WU037.00	07/09/06	GRTA	F	16.5	25	R	-	C	CA	23	-
WU037.00	07/31/06	FP	HF	13	22	R	-	O	CA	9.1	-
WU037.00	08/06/06	GRTA	H	14	26	R	N	O	CA	3.6	-
WU037.00	09/10/06	GRTA	H	17	28	R	W	O	CA	-	10
WU037.00	10/01/06	GRTA	E	12	30	R	W	O	CA	-	10
WU037.00	12/05/06	FP	F	3	25	R	N	O	CA	-	2
WU037.00	02/28/07	FP	HE	-4	28	R	N	O	CA	-	<2.0
WU037.00	04/01/07	KHY	F	1	16	R	NWT	C	CA	-	<2.0
WU037.00	05/22/07	EXT	HF	10	28	R	-	O	CA	-	<2.0
WU037.00	06/10/07	GLE	E	10	26	R	-	O	CA	-	<2.0
WU037.00	07/08/07	GLE	E	14	30	R	PN	O	CA	-	2
WU037.00	08/07/07	FP	F	28	30	R	P	O	CA	-	2
WU037.00	09/23/07	FP	E	15	31	R	-	O	CA	-	10
WU037.50	04/09/06	GRTA	HE	2.5	17	R	NH	O	CA	<3.0	-
WU037.50	06/04/06	GRTA	LE	10	21	R	P	C	CA	150	-
WU037.50	07/09/06	GRTA	HF	15	24	R	-	C	CA	43	-
WU037.50	07/31/06	FP	H	13	24	R	-	O	CA	7.3	-
WU037.50	08/06/06	GRTA	H	15	25	R	N	O	CA	9.1	-



Station	Date	Collect	Tide	Temp	Sal	Strat	ADV	Stat	CL	A1COL	BGCOL
WU037.50	09/10/06	GRTA	H	15.5	29	R	-	O	CA	-	50
WU037.50	10/01/06	GRTA	E	12.5	28	R	-	O	CA	-	<2.0
WU037.50	12/05/06	FP	H	-2	18	R	-	O	CA	-	6
WU037.50	02/28/07	FP	HE	-2	15	R	NW	O	CA	-	<2.0
WU037.50	04/01/07	JHE	F	0	12	R	NT	C	CA	-	<2.0
WU037.50	05/22/07	EXT	HF	9	25	R	-	O	CA	-	4
WU037.50	06/10/07	GLE	E	12	25	R	-	O	CA	-	8
WU037.50	07/08/07	GLE	E	13	30	R	PN	O	CA	-	<2.0
WU037.50	08/07/07	FP	F	25	30	R	P	O	CA	-	2
WU037.50	09/23/07	FP	E	15	31	R	-	O	CA	-	<2.0
WU038.00	04/09/06	GRTA	HE	3	22	R	NH	O	CA	<3.0	-
WU038.00	06/04/06	GRTA	LE	10.5	8	R	P	C	CA	460	-
WU038.00	07/09/06	GRTA	HF	15	26	R	-	C	CA	3.6	-
WU038.00	07/31/06	FP	H	12	26	R	-	O	CA	<3.0	-
WU038.00	08/06/06	GRTA	H	15	26	R	N	O	CA	5.1	-
WU038.00	09/10/06	GRTA	H	15.5	30	R	-	O	CA	-	1380
WU038.00	10/01/06	GRTA	E	12.5	28	R	W	O	CA	-	4
WU038.00	12/05/06	FP	H	-1	20	R	-	O	CA	-	2
WU038.00	02/28/07	FP	HE	-2	32	R	-	O	CA	-	<2.0
WU038.00	04/01/07	JHE	F	0	10	R	WNT	C	CA	-	2
WU038.00	05/22/07	EXT	H	9	25	R	-	O	CA	-	<2.0
WU038.00	06/10/07	GLE	E	11	28	R	-	O	CA	-	<2.0
WU038.00	07/08/07	GLE	E	14	30	R	P	O	CA	-	4
WU038.00	08/07/07	FP	E	18	28	R	P	O	CA	-	29
WU038.00	09/23/07	FP	E	15	31	R	-	O	CA	-	<2.0
WU039.00	02/27/06	FP	F	1	30	R	-	O	A	<3.0	-
WU039.00	07/11/06	LL	F	19	25	R	-	O	A	15	-
WU039.00	08/07/06	JXK	H	20	26	R	-	O	A	3.6	-
WU039.00	09/05/06	JXK	E	18	30	R	-	O	A	-	8
WU039.00	09/12/06	JXK	F	19	30	R	-	O	A	-	<2.0
WU039.00	10/25/06	FP	F	8	22	R	PN	O	A	-	15
WU039.00	01/29/07	FP	HE	-4	30	R	-	O	A	-	<2.0
WU039.00	03/28/07	LL	E	3	8	R	-	O	A	-	2
WU039.00	05/15/07	EXT	H	8	26	R	P	O	A	-	8
WU039.00	07/11/07	FP	HF	15	30	R	-	O	A	-	2
WU039.00	08/29/07	MHE	F	15	32	R	-	O	A	-	<2.0
WU039.00	10/30/07	MHE	LF	7	26	R	P	O	A	-	26
WU040.00	02/27/06	FP	HF	1	30	R	-	O	A	<3.0	-
WU040.00	07/11/06	LL	F	19	27	R	-	O	A	15	-
WU040.00	08/07/06	JXK	H	21	27	R	-	O	A	3.6	-
WU040.00	09/05/06	JXK	E	18	30	R	-	O	A	-	22
WU040.00	09/12/06	JXK	F	19	30	R	-	O	A	-	<2.0
WU040.00	10/25/06	FP	F	8	24	R	P	O	A	-	10



Station	Date	Collect	Tide	Temp	Sal	Strat	ADV	Stat	CL	A1COL	BGCOL
WU040.00	01/29/07	FP	HE	-5	30	R	-	O	A	-	<2.0
WU040.00	03/28/07	LL	E	3	15	R	-	O	A	-	<2.0
WU040.00	05/15/07	EXT	H	8	27	R	P	O	A	-	14
WU040.00	07/11/07	FP	HF	15	30	R	-	O	A	-	<2.0
WU040.00	08/29/07	MHE	F	15	32	R	-	O	A	-	<2.0
WU040.00	10/30/07	MHE	F	7	28	R	P	O	A	-	27
WU041.00	02/27/06	FP	HF	1	30	R	-	O	A	3.6	-
WU041.00	07/11/06	LL	HF	22	27	R	-	O	A	9.1	-
WU041.00	08/07/06	JXK	HE	22	26	R	-	O	A	23	-
WU041.00	09/05/06	JXK	E	20	26	R	-	O	A	-	11
WU041.00	09/12/06	JXK	HF	21	31	R	-	O	A	-	<2.0
WU041.00	10/25/06	FP	HF	7	16	R	PNW	O	A	-	14
WU041.00	01/29/07	FP	E	-5	30	R	-	O	A	-	<2.0
WU041.00	03/28/07	LL	HE	3	12	R	-	O	A	-	2
WU041.00	05/15/07	EXT	HF	9	28	R	PW	O	A	-	4
WU041.00	07/11/07	FP	H	15	30	R	-	O	A	-	9.1
WU041.00	08/29/07	MHE	F	15	32	R	-	O	A	-	25
WU041.00	10/30/07	MHE	HF	10	26	R	P	O	A	-	5.5
WU042.00	02/27/06	FP	HF	1	30	R	-	O	A	<3.0	-
WU042.00	07/11/06	LL	HF	19	28	R	-	O	A	<3.0	-
WU042.00	08/07/06	JXK	HE	21	28	R	-	O	A	15	-
WU042.00	09/05/06	JXK	E	20	30	R	-	O	A	-	4
WU042.00	09/12/06	JXK	F	19	30	R	-	O	A	-	<2.0
WU042.00	10/25/06	FP	F	7	26	R	P	O	A	-	10
WU042.00	01/29/07	FP	E	-4	30	R	-	O	A	-	<2.0
WU042.00	03/28/07	LL	HE	3	17	R	-	O	A	-	13
WU042.00	05/15/07	EXT	HE	9	28	R	P	O	A	-	<2.0
WU042.00	07/11/07	FP	H	14	30	R	-	O	A	-	4
WU042.00	08/29/07	MHE	F	16	32	R	-	O	A	-	4
WU042.00	10/30/07	MHE	HF	10	28	R	P	O	A	-	4
WU042.50	02/27/06	FP	HF	1	26	R	-	O	A	<3.0	-
WU042.50	07/11/06	LL	HF	20	28	R	-	O	A	3.6	-
WU042.50	08/07/06	JXK	HE	21	28	R	-	O	A	7.3	-
WU042.50	09/05/06	JXK	E	19	28	R	-	O	A	-	44
WU042.50	09/12/06	JXK	F	19	30	R	-	O	A	-	<2.0
WU042.50	10/25/06	FP	F	7	22	R	P	O	A	-	46
WU042.50	01/29/07	FP	E	-5	30	R	-	O	A	-	<2.0
WU042.50	03/28/07	LL	HE	3	16	R	-	O	A	-	106
WU042.50	05/15/07	EXT	HE	8	28	R	P	C	P	-	8
WU042.50	07/11/07	FP	H	14	30	R	-	C	P	-	<2.0
WU042.50	08/29/07	MHE	F	15	32	R	-	C	P	-	8
WU042.50	10/30/07	MHE	HF	8	28	R	P	C	P	-	5.5
WU042.70	05/23/07	FP	F	10	28	R	-	C	P	-	<2.0



Station	Date	Collect	Tide	Temp	Sal	Strat	ADV	Stat	CL	A1COL	BGCOL
WU042.70	06/12/07	FP	E	16	28	R	-	C	P	-	9.1
WU042.70	07/11/07	FP	H	14	30	R	-	C	P	-	<2.0
WU042.70	08/29/07	MHE	F	15	32	R	-	C	P	-	6
WU042.70	10/30/07	MHE	F	8	29	R	P	C	P	-	16
WU043.00	02/27/06	FP	HF	0	30	R	N	O	A	<3.0	-
WU043.00	07/11/06	LL	HF	20	28	R	-	O	A	3.6	-
WU043.00	08/07/06	JXK	HE	22	25	R	-	O	A	15	-
WU043.00	09/05/06	JXK	E	19	28	R	-	O	A	-	2
WU043.00	09/12/06	JXK	HF	19	31	R	-	O	A	-	2
WU043.00	10/25/06	FP	HF	6	22	R	PN	O	A	-	16
WU043.00	01/29/07	FP	E	-5	30	R	-	O	A	-	<2.0
WU043.00	03/28/07	LL	HE	3	12	R	-	O	A	-	2
WU043.00	05/15/07	EXT	HF	8	28	R	P	O	A	-	<2.0
WU043.00	07/11/07	FP	H	15	30	R	-	O	A	-	12
WU043.00	08/29/07	MHE	F	15	32	R	-	O	A	-	8
WU043.00	10/30/07	MHE	F	9	28	R	P	O	A	-	6
WU044.00	02/27/06	FP	HF	1	26	R	-	O	A	<3.0	-
WU044.00	07/11/06	LL	HF	20	28	R	-	O	A	75	-
WU044.00	08/07/06	JXK	HE	22	28	R	-	O	A	3.6	-
WU044.00	09/05/06	JXK	E	21	30	R	-	O	A	-	33
WU044.00	09/12/06	JXK	F	19	30	R	-	O	A	-	4
WU044.00	10/25/06	FP	F	7	25	R	P	O	A	-	10
WU044.00	01/29/07	FP	E	-5	30	R	-	O	A	-	<2.0
WU044.00	03/28/07	LL	HE	3	15	R	-	O	A	-	<2.0
WU044.00	05/15/07	EXT	HF	8	28	R	P	O	A	-	<2.0
WU044.00	07/11/07	FP	H	14	30	R	-	O	A	-	4
WU044.00	08/29/07	MHE	HF	15	32	R	-	O	A	-	2
WU044.00	10/30/07	MHE	F	7	28	R	P	O	A	-	12
WU045.00	02/27/06	FP	H	1	30	R	-	O	A	<3.0	-
WU045.00	07/11/06	LL	H	20	28	R	-	O	A	9.1	-
WU045.00	08/07/06	JXK	E	21	29	R	-	O	A	7.3	-
WU045.00	09/05/06	JXK	E	20	29	R	-	O	A	-	2
WU045.00	09/12/06	JXK	F	21	31	R	-	O	A	-	4
WU045.00	10/25/06	FP	F	5	15	R	PN	O	A	-	32
WU045.00	01/29/07	FP	E	-5	30	R	-	O	A	-	<2.0
WU045.00	03/28/07	LL	E	3	12	R	-	O	A	-	<2.0
WU045.00	05/15/07	EXT	H	8	28	R	P	O	A	-	<2.0
WU045.00	07/11/07	FP	HE	15	30	R	-	O	A	-	8
WU045.00	08/29/07	MHE	HF	15	32	R	-	O	A	-	54
WU045.00	10/30/07	MHE	F	9	26	R	P	O	A	-	44
WU045.50	02/27/06	FP	H	0	26	R	-	C	P	<3.0	-
WU045.50	07/11/06	LL	H	21	26	R	-	C	P	23	-
WU045.50	08/07/06	JXK	E	23	5	R	-	C	P	93	-



Station	Date	Collect	Tide	Temp	Sal	Strat	ADV	Stat	CL	A1COL	BGCOL
WU045.50	09/05/06	JXK	E	24	6	R	-	C	P	-	78
WU045.50	09/12/06	JXK	F	20	15	R	-	C	P	-	35
WU045.50	10/25/06	FP	F	5	0	R	PN	C	P	-	6
WU045.50	01/29/07	FP	E	-4	18	R	-	C	P	-	<2.0
WU045.50	03/28/07	LL	E	3	0	R	-	C	P	-	2
WU045.50	05/15/07	EXT	H	8	27	R	P	C	P	-	<2.0
WU045.50	07/11/07	FP	HE	15	28	R	-	C	P	-	11
WU045.50	08/29/07	MHE	HF	15	32	R	-	C	P	-	8
WU045.50	10/30/07	MHE	F	6	0	R	P	C	P	-	6
WU045.70	05/29/07	FP	HF	12	28	R	-	C	P	-	<2.0
WU045.70	07/11/07	FP	HE	15	28	R	-	C	P	-	16
WU045.70	08/29/07	MHE	HF	15	32	R	-	C	P	-	5.5
WU045.70	10/30/07	MHE	F	9	27	R	P	C	P	-	10
WU045.80	02/27/06	FP	H	1	30	R	-	O	A	<3.0	-
WU045.80	07/11/06	LL	H	20	28	R	-	O	A	3.6	-
WU045.80	08/07/06	JXK	E	22	28	R	-	O	A	23	-
WU045.80	09/05/06	JXK	E	21	28	R	-	O	A	-	<2.0
WU045.80	09/12/06	JXK	F	20	30	R	-	O	A	-	33
WU045.80	10/25/06	FP	F	4	18	R	P	O	A	-	22
WU045.80	01/29/07	FP	E	-5	30	R	-	O	A	-	<2.0
WU045.80	03/28/07	LL	E	3	16	R	-	O	A	-	<2.0
WU045.80	05/15/07	EXT	H	8	28	R	P	O	A	-	2
WU045.80	07/11/07	FP	HE	14	30	R	-	O	A	-	2
WU045.80	08/29/07	MHE	HF	14	32	R	-	O	A	-	4
WU045.80	10/30/07	MHE	F	9	28	R	P	O	A	-	20
WU046.00	02/27/06	FP	H	1	30	R	-	O	A	3.6	-
WU046.00	07/11/06	LL	H	19	28	R	-	O	A	3.6	-
WU046.00	08/07/06	JXK	E	22	29	R	-	O	A	9.1	-
WU046.00	09/05/06	JXK	E	20	30	R	-	O	A	-	8
WU046.00	09/12/06	JXK	F	19	31	R	-	O	A	-	4
WU046.00	10/25/06	FP	F	8	25	R	P	O	A	-	10
WU046.00	01/29/07	FP	E	-4	30	R	-	O	A	-	<2.0
WU046.00	03/28/07	LL	E	3	16	R	-	O	A	-	<2.0
WU046.00	05/15/07	EXT	HE	8	28	R	P	C	P	-	<2.0
WU046.00	07/11/07	FP	HE	14	30	R	-	C	P	-	4
WU046.00	08/29/07	MHE	HF	15	32	R	-	C	P	-	<2.0
WU046.00	10/30/07	MHE	F	7	28	R	P	C	P	-	5.5
WU047.00	02/27/06	FP	H	1	30	R	-	O	A	<3.0	-
WU047.00	07/11/06	LL	H	19	28	R	-	O	A	3.6	-
WU047.00	08/07/06	JXK	E	22	28	R	-	O	A	<3.0	-
WU047.00	09/05/06	JXK	E	21	30	R	-	O	A	-	33
WU047.00	09/12/06	JXK	F	19	31	R	-	O	A	-	<2.0
WU047.00	10/25/06	FP	F	8	28	R	P	O	A	-	2



Station	Date	Collect	Tide	Temp	Sal	Strat	ADV	Stat	CL	A1COL	BGCOL
WU047.00	01/29/07	FP	E	-4	30	R	-	O	A	-	<2.0
WU047.00	03/28/07	LL	E	3	20	R	-	O	A	-	<2.0
WU047.00	05/15/07	EXT	HE	8	28	R	P	O	A	-	<2.0
WU047.00	07/11/07	FP	E	15	30	R	-	O	A	-	8
WU047.00	08/29/07	MHE	H	14	32	R	-	O	A	-	<2.0
WU047.00	10/30/07	MHE	F	9	30	R	P	O	A	-	11
WU048.00	02/27/06	FP	HE	1	30	R	N	O	A	3.6	-
WU048.00	07/11/06	LL	H	19	30	R	-	O	A	21	-
WU048.00	08/07/06	JXK	E	24	28	R	-	O	A	240	-
WU048.00	09/06/06	JXK	E	21	25	R	-	O	A	-	68
WU048.00	09/12/06	JXK	F	19	31	R	-	O	A	-	<2.0
WU048.00	10/25/06	FP	F	7	12	R	PN	O	A	-	7.3
WU048.00	01/29/07	FP	E	-4	30	R	N	O	A	-	<2.0
WU048.00	03/28/07	LL	E	3	8	R	-	O	A	-	12
WU048.00	05/15/07	EXT	H	8	24	R	P	O	A	-	86
WU048.00	07/11/07	FP	E	14	30	R	-	O	A	-	8
WU048.00	08/29/07	MHE	H	14	33	R	-	O	A	-	9.1
WU048.00	10/30/07	MHE	F	7	28	R	P	O	A	-	3.6
WU048.50	02/27/06	FP	HE	1	30	R	N	O	A	<3.0	-
WU048.50	07/11/06	LL	HE	19	30	R	-	O	A	3.6	-
WU048.50	08/07/06	JXK	E	21	28	R	-	O	A	9.1	-
WU048.50	09/06/06	JXK	E	20	26	R	-	O	A	-	86
WU048.50	09/12/06	JXK	F	19	28	R	-	O	A	-	<2.0
WU048.50	10/25/06	FP	F	6	2	R	PN	O	A	-	11
WU048.50	01/29/07	FP	E	-4	22	R	N	O	A	-	<2.0
WU048.50	03/28/07	LL	E	3	4	R	-	O	A	-	11
WU048.50	05/15/07	EXT	H	9	27	R	P	O	A	-	4
WU048.50	07/11/07	FP	E	15	32	R	-	O	A	-	4
WU048.50	08/29/07	MHE	H	15	32	R	-	O	A	-	8
WU048.50	10/30/07	MHE	F	9	6	R	P	O	A	-	16
WU048.80	02/27/06	FP	HE	1	30	R	-	C	P	<3.0	-
WU048.80	07/11/06	LL	HE	19	30	R	-	C	P	14	-
WU048.80	08/07/06	JXK	E	21	30	R	-	C	P	3.6	-
WU048.80	09/05/06	JXK	LE	20	30	R	-	C	P	-	7.3
WU048.80	09/12/06	JXK	F	17	32	R	-	C	P	-	<2.0
WU048.80	10/25/06	FP	F	7	30	R	P	C	P	-	<2.0
WU048.80	01/29/07	FP	E	-5	31	R	-	C	P	-	<2.0
WU048.80	03/28/07	LL	E	3	24	R	-	C	P	-	<2.0
WU048.80	05/15/07	EXT	HE	8	28	R	P	C	P	-	2
WU048.80	07/11/07	FP	E	13	32	R	-	C	P	-	<2.0
WU048.80	08/29/07	MHE	H	16	32	R	-	C	P	-	<2.0
WU048.80	10/30/07	MHE	F	9	30	R	P	C	P	-	6



Station	Date	Collect	Tide	Temp	Sal	Strat	ADV	Stat	CL	A1COL	BGCOL
WU050.00	02/27/06	FP	HE	1	30	R	NW	C	P	<3.0	-
WU050.00	07/11/06	LL	HE	19	30	R	-	C	P	1100	-
WU050.00	08/07/06	JXK	E	23	22	R	-	C	P	80	-
WU050.00	09/05/06	JXK	LE	21	25	R	-	C	P	-	46
WU050.00	09/12/06	JXK	F	19	32	R	-	C	P	-	72
WU050.00	10/25/06	FP	F	9	30	R	PN	C	P	-	<2.0
WU050.00	01/29/07	FP	E	-4	32	R	N	C	P	-	<2.0
WU050.00	03/28/07	LL	E	3	10	R	-	C	P	-	6
WU050.00	05/15/07	EXT	HE	9	28	R	P	C	P	-	28
WU050.00	07/11/07	FP	E	15	32	R	-	C	P	-	62
WU050.00	08/29/07	MHE	H	15	32	R	-	C	P	-	<2.0
WU050.00	10/30/07	MHE	F	9	31	R	P	C	P	-	2
WU055.50	04/26/06	FP	HF		31	R	-	C	P	<3.0	-
WU055.50	06/20/06	FP	E	15	26	R	-	C	P	<3.0	-
WU055.50	07/12/06	FP	HF	15	29	R	P	C	P	<3.0	-
WU055.50	10/03/06	FP	E		30	R	-	C	P	-	<2.0
WU055.50	10/17/06	FP	HE	10	32	R	-	C	P	-	<2.0
WU055.50	05/07/07	FP	F	7	28	R	-	C	P	-	<2.0
WU055.50	06/11/07	FP	E	15	28	R	-	C	P	-	<2.0
WU055.50	06/27/07	JB	HE		30	R	-	C	P	-	<2.0
WU055.50	07/30/07	EXT	F	16	32	R	-	C	P	-	<2.0
WU055.50	08/15/07	JB	F	12	32	R	-	C	P	-	<2.0
WU055.50	09/24/07	AJS	E	14	32	R	-	C	P	-	<2.0
WU056.00	04/26/06	FP	E		32	R	-	O	A	<3.0	-
WU056.00	06/20/06	FP	LF	14	27	R	-	O	A	3	-
WU056.00	07/12/06	FP	HE	13	30	R	P	O	A	<3.0	-
WU056.00	09/05/06	FP	E	9	30	R	-	O	A	-	<2.0
WU056.00	10/03/06	FP	LE		31	R	-	O	A	-	<2.0
WU056.00	10/17/06	FP	E	11	32	R	-	O	A	-	<2.0
WU056.00	05/07/07	FP	HF	2	28	R	-	O	A	-	<2.0
WU056.00	06/11/07	FP	L	15	28	R	-	O	A	-	<2.0
WU056.00	06/27/07	JB	LE		30	R	-	O	A	-	<2.0
WU056.00	07/30/07	EXT	HE	18	30	R	-	O	A	-	<2.0
WU056.00	08/15/07	JB	E	12	32	R	-	O	A	-	<2.0
WU056.00	09/24/07	AJS	LF	13	31	R	-	O	A	-	<2.0
WU056.50	04/26/06	FP	HF		31	R	-	C	P	<3.0	-
WU056.50	06/20/06	FP	E	15	26	R	-	C	P	<3.0	-
WU056.50	07/12/06	FP	HF	13	30	R	P	C	P	3.6	-
WU056.50	09/05/06	FP	HE	10	30	R	-	C	P	-	2
WU056.50	10/03/06	FP	E		31	R	-	C	P	-	<2.0
WU056.50	10/17/06	FP	HE	11	32	R	-	C	P	-	<2.0
WU056.50	05/07/07	FP	F	7	28	R	-	C	P	-	<2.0
WU056.50	06/11/07	FP	E	15	28	R	-	C	P	-	<2.0



Station	Date	Collect	Tide	Temp	Sal	Strat	ADV	Stat	CL	A1COL	BGCOL
WU056.50	06/27/07	JB	E		30	R	-	C	P	-	<2.0
WU056.50	07/30/07	EXT	F	16	32	R	-	C	P	-	<2.0
WU056.50	08/15/07	JB	F	13	31	R	-	C	P	-	2
WU056.50	09/24/07	AJS	E	13	32	R	-	C	P	-	<2.0
WU057.00	04/26/06	FP	HF		32	R	-	C	P	<3.0	-
WU057.00	06/20/06	FP	E	15	27	R	-	C	P	9.1	-
WU057.00	07/12/06	FP	HF	15	30	R	P	C	P	14	-
WU057.00	09/05/06	FP	HE	9	30	R	-	C	P	-	<2.0
WU057.00	10/03/06	FP	E		30	R	-	C	P	-	<2.0
WU057.00	10/17/06	FP	HE	11	32	R	-	C	P	-	<2.0
WU057.00	05/07/07	FP	F	7	28	R	-	C	P	-	<2.0
WU057.00	06/11/07	FP	E	15	28	R	-	C	P	-	<2.0
WU057.00	06/27/07	JB	E		32	R	-	C	P	-	<2.0
WU057.00	07/30/07	EXT	F	16	32	R	-	C	P	-	2
WU057.00	08/15/07	JB	F	12	32	R	-	C	P	-	<2.0
WU057.00	09/24/07	AJS	E	12	31	R	-	C	P	-	2
WU058.00	04/26/06	FP	HF		31	R	-	O	A	<3.0	-
WU058.00	06/20/06	FP	E	15	26	R	-	O	A	<3.0	-
WU058.00	07/12/06	FP	HF	14	30	R	P	O	A	<3.0	-
WU058.00	09/05/06	FP	HE	10	31	R	-	O	A	-	58
WU058.00	10/03/06	FP	E		32	R	-	O	A	-	<2.0
WU058.00	10/17/06	FP	HE	10	32	R	-	O	A	-	<2.0
WU058.00	05/07/07	FP	F	7	28	R	-	O	A	-	<2.0
WU058.00	06/11/07	FP	E	15	28	R	-	O	A	-	<2.0
WU058.00	06/27/07	JB	E		31	R	-	O	A	-	<2.0
WU058.00	07/30/07	EXT	F	16	31	R	-	O	A	-	<2.0
WU058.00	08/15/07	JB	F	12	32	R	-	O	A	-	<2.0
WU058.00	09/24/07	AJS	E	13	31	R	-	O	A	-	<2.0
WU059.00	04/26/06	FP	HF		32	R	-	C	P	<3.0	-
WU059.00	06/20/06	FP	E	15	28	R	-	C	P	<3.0	-
WU059.00	07/12/06	FP	HF	15	30	R	P	C	P	<3.0	-
WU059.00	09/05/06	FP	E	10	30	R	-	C	P	-	3.6
WU059.00	10/03/06	FP	E		32	R	-	C	P	-	<2.0
WU059.00	10/17/06	FP	HE	11	32	R	-	C	P	-	<2.0
WU059.00	05/07/07	FP	F	1	28	R	-	C	P	-	<2.0
WU059.00	06/11/07	FP	E	15	28	R	-	C	P	-	<2.0
WU059.00	06/27/07	JB	E		30	R	-	C	P	-	<2.0
WU059.00	07/30/07	EXT	F	16	31	R	-	C	P	-	<2.0
WU059.00	08/15/07	JB	F	12	32	R	-	C	P	-	<2.0
WU059.00	09/24/07	AJS	E	12	31	R	-	C	P	-	<2.0
WU060.00	04/26/06	FP	HF		32	R	-	O	A	<3.0	-
WU060.00	06/20/06	FP	E	12	29	R	-	O	A	9.1	-
WU060.00	07/12/06	FP	HF	14	31	R	P	O	A	<3.0	-



Station	Date	Collect	Tide	Temp	Sal	Strat	ADV	Stat	CL	A1COL	BGCOL
WU060.00	09/05/06	FP	E	10	30	R	-	O	A	-	2
WU060.00	10/03/06	FP	E		32	R	-	O	A	-	<2.0
WU060.00	10/17/06	FP	HE	11	32	R	-	O	A	-	<2.0
WU060.00	05/07/07	FP	F	2	28	R	-	O	A	-	<2.0
WU060.00	06/11/07	FP	E	15	28	R	-	O	A	-	<2.0
WU060.00	06/27/07	JB	E		31	R	-	O	A	-	<2.0
WU060.00	07/30/07	EXT	F	15	31	R	-	O	A	-	<2.0
WU060.00	08/15/07	JB	F	12	32	R	-	O	A	-	<2.0
WU060.00	09/24/07	AJS	E	12	30	R	-	O	A	-	2
WU061.00	04/26/06	FP	HF		32	R	-	O	A	<3.0	-
WU061.00	06/20/06	FP	E	11	29	R	-	O	A	<3.0	-
WU061.00	07/12/06	FP	HF	13	31	R	P	O	A	3.6	-
WU061.00	09/05/06	FP	E	9	30	R	-	O	A	-	<2.0
WU061.00	10/03/06	FP	E		32	R	-	O	A	-	<2.0
WU061.00	10/17/06	FP	HE	10	32	R	-	O	A	-	<2.0
WU061.00	05/07/07	FP	F	2	28	R	-	O	A	-	<2.0
WU061.00	06/11/07	FP	E	15	28	R	-	O	A	-	<2.0
WU061.00	06/27/07	JB	E		31	R	-	O	A	-	<2.0
WU061.00	07/30/07	EXT	F	14	31	R	-	O	A	-	<2.0
WU061.00	08/15/07	JB	F	12	32	R	-	O	A	-	<2.0
WU061.00	09/24/07	AJS	E	13	30	R	-	O	A	-	<2.0