



**SANITARY SURVEY FOR GROWING AREA WJ
Towns of Freeport, Brunswick and Harpswell**

Report Date: 01-07-09

Amy Fitzpatrick

APPROVAL

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Executive Summary

This report was prepared by the Maine Department of Marine Resources (DMR) Public Health Division and conforms to the requirements for a sanitary survey report in accordance with the current edition of the National Shellfish Sanitation Program's (NSSP) Guide for the Control of Molluscan Shellfish Model Ordinance (MO) (<http://www.cfsan.fda.gov/~ear/nss2-toc.html>) 2003 edition. All reports are located in a central file at the DMR Boothbay Harbor facility.

Authority to conduct this examination is granted to the commissioner of the Department of Marine Resources under the Maine State Revised Statutes Title 12 Chapter 607 §6172.1: Commissioner's powers, which states:

"The commissioner may examine the coastal waters and the intertidal zone and adopt rules to close coastal waters or inter-tidal zone areas if the commissioner determines that any marine organisms are or may become contaminated or polluted. The commissioner may adopt or amend rules as the commissioner determines necessary, setting forth standards for closure of contaminated or polluted areas, giving consideration to established state water quality standards, the most recently adopted federal sanitation standards, or other state or federal public health standards, the most recent generally accepted research data and known sources of pollution in any area, in a manner to protect the public health and safety while allowing reasonable use of the State's marine organisms."

This is a sanitary survey report for growing area WJ. The growing area was re-surveyed between 2001 and 2008 and all actual and potential pollution sources were documented in the shoreline survey database. A detailed description of the areas and years surveyed are in this report. Identified problems have been reported to the local codes enforcement and are in remediation or have already been corrected. In August 2007, a small prohibited area was put in place around a malfunctioning septic system on the east side of Flying Point, Freeport. In December 2006, a straight pipe was replaced at the head of Maquoit Bay, Brunswick, and the area was reclassified from prohibited to conditionally approved in July 2007. No licensed overboard discharges (OBDs) were removed in 2007; there are only five discharges remaining in growing area WJ. Four of them are located in a prohibited area on the west side of Potts Point in Harpswell and are not on the Maine Department of Environmental Protection (MDEP) OBD Priority Removal list. One inactive OBD remains in Bunganuc stream on Maquoit Bay, Brunswick within a prohibited area.

In April 2007, Recompense Cove in Freeport was reclassified from approved to restricted due to non-point pollution impacting Station WJ 18 by the drainage of the Little River. Additional sampling stations, WJ 17.5, 17.8, 18.2, 18.6 and 18.9 were created to better determine the extent of the impact, and Station WJ 17 was reactivated. Recompense Cove was recommended for accelerated sampling to facilitate the re-evaluation of the area. Sampling of the streams by the DMR and pollution source sampling at the sample stations after rainfall by the Town of Freeport has resulted in an upgrade in classification. The data has been analyzed and the area will be reclassified from restricted to approved.



Three classification changes will be proposed in this report. Two upward classification proposals will be recommended: a marina conditional area on the east side of Basin Point, Harpswell and Recompense Cove, Freeport. One downgrade in classification is recommended from conditionally approved to conditionally restricted in the Harraseeket River. A second downgrade in classification is recommended in Ash Point Cove. Due to actual and potential pollution sources identified in the shoreline survey and water quality exceeding approved criteria during the open status of the conditionally approved season, a prohibited area and a smaller seasonal conditional area are required. Additional sample stations are recommended in Maquoit Bay in order to determine if the size of the conditionally approved area can be reduced which may result in an enlarged approved area.

Description of Growing Area

Growing Area WJ includes the shores, flats and waters of the towns of Freeport, Brunswick and Harpswell between Staples Point, at the mouth of the Harraseeket River, Freeport to Potts Point at the end of South Harpswell Neck, Harpswell (Figure 1). The upland boundary has been defined as lying inside a line from Staples Point, extending southeast along the shellfish management zone line offshore, and also, extending northwest on Staples Point Road to the intersection of South Freeport Road, then north to the intersection of Old County Road and Route 1, then northeast on Route 1 to the intersection of Upper Mast Landing Road, then southeast to the intersection of Flying Point Road and Lower Flying Point Road, then north to the intersection of Church Street and Pleasant Hill Road, then east to the intersection of Middle Bay Road and Harpswell Neck Road, then south on Harpswell Neck Road to Potts Point, then south to the limits of U.S. jurisdiction.



Figure 1. Growing Area WJ with Active Sampling Stations

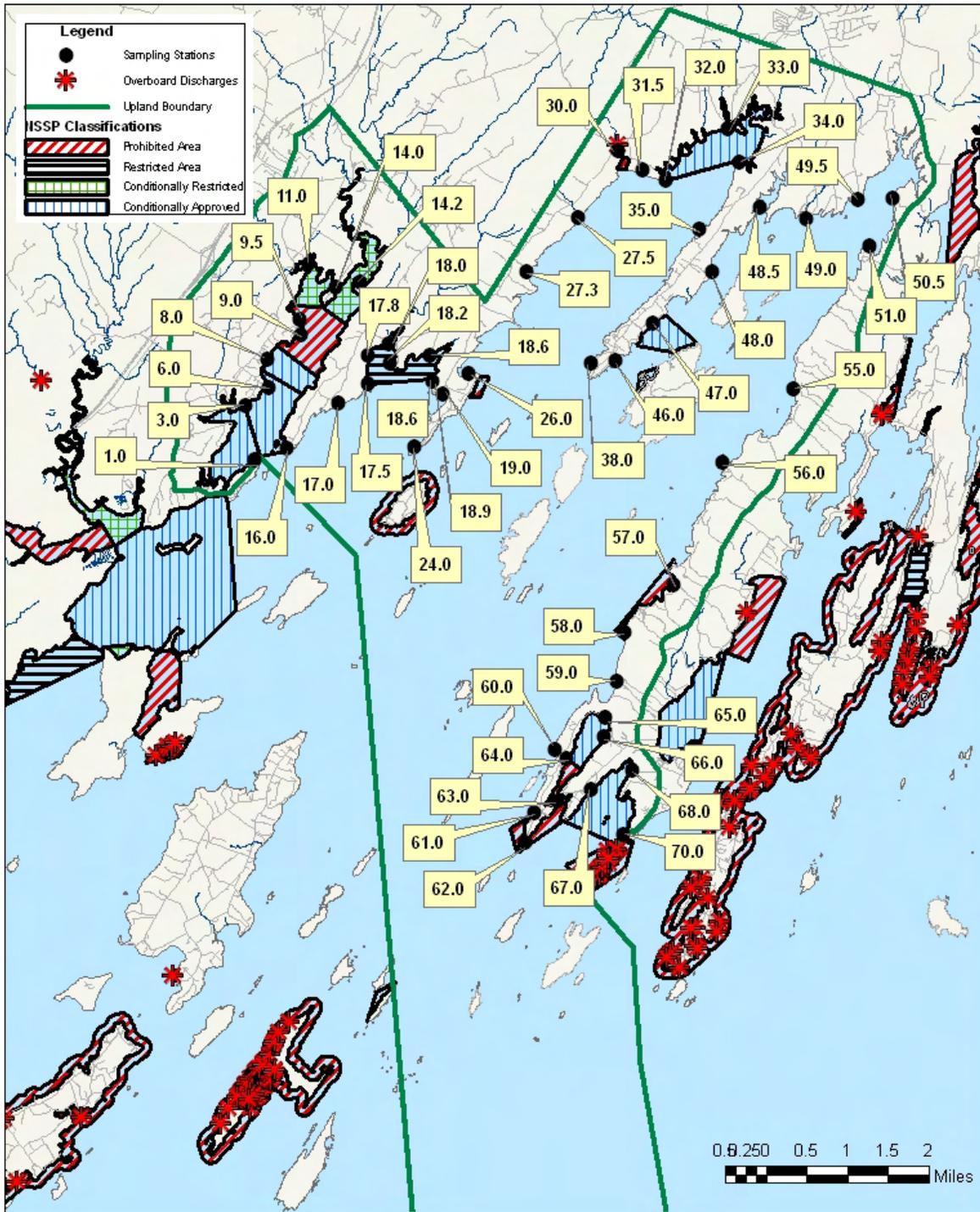


Maine Department of Marine Resources

Growing Area WJ



9/15/08





The towns of Freeport, Brunswick and Harpswell are all located in Cumberland County, approximately 25 miles northeast of the nearest major city of Portland, Maine. Coastal portions of the towns in area WJ are situated on the Harraseeket River, Recompense Cove, Brickyard Cove, Goose Cove, Maquoit Bay and Middle Bay. All of these towns and water bodies lie within the Presumpscot River watershed.

The shoreline is typical of this part of Maine, with rockbound points and shoreline separating shallow coves and a harbor (Harraseeket River). The muddy and gravel bottoms in these coves frequently provide excellent habitat for soft shell clams and mussels. Within Area WJ, the coves which support significant populations of soft shell clams are the Harraseeket River, Recompense Cove, Brickyard Cove, Goose Cove, Maquoit Bay, Middle Bay, Middle Bay Cove, Wilson Cove, Curtis Cove and Peter Cove. Fresh water influence comes from upland streams; Concord Gully Brook, Frost Gully Brook, Kelsey Brook, Little River, Bunganuc Brook and Miller Creek, and other small seasonal brooks and streams. The Harraseeket River is not a river but an embayment.

The 2000 census indicated the town of Freeport had a year-round population of 1,813. The daily population change due to commuting is +199%. Freeport is the number one tourist destination in Maine (both natives and out-of-state visitors) with an average tourist population of 3.5 million annually (City-Data.com 2008). Primary sources of employment in Freeport are accommodation and food service, retail, health care and educational services. Freeport had 42 licensed commercial shellfish harvesters in 2007 and 2008.

The town of Brunswick has a year-round population of 21,172 as reported by the 2000 census. The daytime population change due to commuting is +37.2%. The most common sources of employment are management, administrative, office support, retail, post secondary educators and educational services. Brunswick had 50 licensed commercial shellfish harvesters in 2007 and 49 in 2008.

Residential growth in Brunswick is characterized by an increase of 60% of new housing units being built between 1997 and 2004 (Brunswick Economic Development Corporation 2002). Total new housing units in this time period was 1,154 with 531 in rural areas and 623 in their "growth" area. Development in the 'growth' area was typically larger projects like apartment complexes and subdivisions while single family homes were prevalent in the rural area. A total of 39 subdivisions were approved in the same time period (1997-2004) with total land coverage for these projects of 1,243 acres. There were 543 residential lots created in these projects but more than 37% of the acreage in these projects has been dedicated to open space. Mere Point Village subdivision which borders on the stream that drains into Middle Bay Cove accounts for 16% of the new permits issued during this time period.

The 2000 census reports that the town of Harpswell has a year-round population of 5,239. There is no daytime increase in population due to commuting. The most common sources of employment are fishing, hunting, forestry, office and administrative support, carpentry and bookkeeping. Harpswell's population dramatically increases in the summer months as reported in the town's comprehensive plan. Combining year-round (50% of residences) and seasonal populations (33% of residences) shows that Harpswell grows to a community of 8,000 during the summer season with a peak population of 10,000 during the summer holiday weekends. The number of summer homes increased slightly in the period of 1990-2000 but the town has not experienced growth in transient lodging. Harpswell had 60 licensed commercial shellfish harvesters in 2007 and 44 license holders in 2008.



Land use in the study area is dominated by year-round residential properties. Sections of dense shoreline development are punctuated by large tracts of undeveloped land. Some seasonal properties remain but many of the seasonal properties are being converted to year-round use throughout the area. The heaviest development is found in Freeport along the shores of the Harraseeket River, Frost Gully Brook and Concord Gully Brook. More residential, suburban neighborhoods are found at the head of Maquoit Bay and Middle Bay. The rest of the area is pastoral farmland with few residential homes, farms and conservation lands.

All the waters within WJ are part of the Presumpscot River watershed. Maquoit Bay, Brunswick and Frost Gully/Concord Gully, Freeport are listed on the EPA Impaired Watershed list for bacteria. Frost Gully and Concord Gully, Freeport drains into the Harraseeket River and subsequently, Casco Bay. Frost and Concord have been placed on Maine's 303(d) list for impairments due to bacteria, primarily due to unspecified sources of runoff. A draft Total Maximum Daily Load (TMDL) report was submitted to EPA by the DEP for this area entitled "DRAFT Frost Gully and Concord Gully Bacteria Total Maximum Daily Load (TMDL) Report". The goal of this TMDL assessment is to integrate bacterial sampling results, estimated stream flows and Bacterial Source Tracking results to understand the nature of the impairments. Additionally, this TMDL set water quality targets to assure compliance with Maine's Water Quality Standards and provide a catalyst to restore the streams to meet those standards.

The 118th Legislature enacted "*An Act to Protect the States, Lakes, Rivers, and Coastal Wetlands through a Comprehensive Watershed Protection Program*" which became effective in September 1997 (Public Law 1997 Chapter 519). The law authorizes the Maine Land and Water Resources Council (MLWRC) to create and administer comprehensive watershed protection programs to ensure the development and implementation of locally supported watershed management plans. One of the requirements of the agencies involved is to establish priorities for the purpose of directing resources to the management of the water bodies on the priority list.

The fundamental objective of the NPS Priority Watersheds List is to identify waters to help direct non-point source (NPS) water pollution control efforts. Financial assistance for locally supported groups developing or implementing watershed management plans and activities is made available and administered through the Maine DEP. The Harraseeket River estuary, Freeport and Maquoit Bay, Brunswick and Freeport are listed as priority impaired coastal waters. Frost Gully Stream is listed as a priority impaired stream and listed as a high priority but there is no active local group.

History of Growing Area

The last sanitary survey report for growing area WJ was written in January 2002. The report was a compilation of individual cove, river, island and town reports that were written over the previous 10 years. There was no new shoreline survey, pollution source identification, pollution source assessment or stream sample data in the 2002 report. At that time, the shoreline survey work dated from 1994 to 1999. The report included the most recent water quality data analysis, as well as explanations and supporting data for the existing classifications. Since 2002, an annual review was conducted at the end of 2003, a triennial review at the end of 2004, and annual reviews at the end of 2005 and 2006. These reviews can be found in DMR central files.



After receiving a complaint from a Bustins Island resident (May 24, 2006) regarding improper disposal of outhouse waste, improper grey water disposal and potential malfunctioning septic system, a prohibited area was established around the island (within 500 ft of the shore) on May 25, 2006. The DEP completed the investigation and worked with the island on remediation which was completed in 2007.

History of Growing Area Classification

The historical records of legal notices readily available to the author at the time of the report for growing area WJ are presented below. Additional records can be obtained from the Maine State Archives in Augusta, ME.

October 31, 2000; (Area No. 17); this new rule closes the entire Harraseeket River from its source to its mouth. This closure was enacted because of a malfunction at the local wastewater treatment plant.

November 9, 2000; (Area No. 17); this new rule opens the middle and south end of the Harraseeket River based on proper functioning of the Freeport sewage treatment plant.

December 5, 2000; (Area No. 17); this new rule opens the head of the Harraseeket River and changes the open season of the marina conditional area to December 1 through April 30. The entire river remains conditional on the functioning of the Freeport Sewage Treatment Plant and at all times there will be a closure around the treatment plant outfall.

March 22, 2001; (Area No. 17-B); this new rule closes the conditional area of Maquoit Bay due to rainfall in excess of 1 inch in 24 hours.

March 28, 2001; (Area No. 17-B); this new rule reopens the rainfall conditional area at the head of Maquoit Bay.

April 27, 2001; (Area No. 17); this new rule opens the middle and south end of the Harraseeket River based on proper functioning of the Freeport sewage treatment plant.

June 4, 2001; (Area No. 17-B); this new rule closes the conditional area of Maquoit Bay due to rainfall in excess of 1 inch in 24 hours.

June 12, 2001; (Area No. 17); this new rule enlarges the marina area by moving the northern closure line approximately 75 feet north on the western shore to ensure that the boats at Brewer's Marina are within the marina conditional area.

July 9, 2001; (Area No. 17-B); this new rule reopens the rainfall conditional area at the head of Maquoit Bay.

September 26, 2001; (Area No. 17-B); this new rule closes the conditional area of Maquoit Bay due to rainfall in excess of 1 inch in 24 hours.



October 16, 2001; (Area No. 17); this new rule closes the entire Harraseeket River from its source to its mouth. This closure was enacted because of a malfunction at the local wastewater treatment plant.

October 24, 2001; (Area No. 17-B); this new rule reopens the rainfall conditional area at the head of Maquoit Bay.

October 25, 2001; (Area No. 17); this new rule reopens the conditional area of the Harraseeket River following the repair of a sewage treatment plant malfunction.

November 5, 2001; (Area No. 17-B); This new rule closes the conditional area of Maquoit Bay due to rainfall in excess of 1 inch in 24 hours.

November 21, 2001; (Area No. 17-B); this new rule reopens the rainfall conditional area at the head of Maquoit Bay.

December 31, 2001; (Area No. 17); this new rule closes the entire Harraseeket River from its source to its mouth. This closure was enacted because of a malfunction at the local wastewater treatment plant.

January 2, 2002; (Area No. 17-B); this new rule closes the head of Maquoit Bay and enlarges the rainfall conditional area in Maquoit Bay.

January 9, 2002; (Area No. 17); this new rule reopens the conditional area of the Harraseeket River following the repair of a sewage treatment plant malfunction.

February 11, 2002; (Area No. 17-B); this new rule closes the conditional area of Maquoit Bay due to rainfall in excess of 1 inch in 24 hours.

February 27, 2002; (Area No. 17); this new rule closes the entire Harraseeket River from its source to its mouth. This closure was enacted because of a malfunction at the local wastewater treatment plant.

March 8, 2002; (Area No. 17); this new rule reopens the conditional area of the Harraseeket River following the repair of a sewage treatment plant malfunction.

April 19, 2002; (Area No. 17-B); this new rule reopens the rainfall conditional area in Maquoit Bay.

May 14, 2002; (Area No. 17-B); this new rule closes the conditional area of Maquoit Bay due to rainfall in excess of 1 inch in 24 hours.

May 20, 2002; (Area No. 17); this new rule closes the Harraseeket River due to a broken sewer line.

May 22, 2002; (Area No. 17-B); this new rule reopens the rainfall conditional area in Maquoit Bay.

May 30, 2002; (Area No. 17); this new rule reopens the conditional area of the Harraseeket River following the repair of a sewer line.



June 12, 2002; (Area No. 17-B); this new rule closes the conditional area of Maquoit Bay due to rainfall in excess of 1 inch in 24 hours.

June 26, 2002; (Area No. 17-B); this new rule reopens the rainfall conditional area in Maquoit Bay.

August 21, 2002; (Area No. 17); this new rule closes the Harraseeket River due to a malfunction at the Freeport sewage treatment plant.

August 28, 2002; (Area No. 17); this new rule reopens the conditional area of the Harraseeket River following the repair of a sewage treatment plant malfunction.

September 16, 2002; (Area No. 17-B); This new rule closes the conditional area of Maquoit Bay due to rainfall in excess of 1 inch in 24 hours.

October 17, 2002; (Area No. 18-C); the new regulation reduces the closure on Birch Island, Harpswell and enlarges the conditional marina area around Paul's Marina, Brunswick.

October 31, 2002; (Area No. 17-B); this new rule reopens the rainfall conditional area in Maquoit Bay.

November 6, 2002; (Area No. 17-B); this new rule closes the conditional area of Maquoit Bay due to rainfall in excess of 1 inch in 24 hours.

December 2, 2002; (Area No. 17-B); this new rule reopens the rainfall conditional area in Maquoit Bay.

December 16, 2002; (Area No 17-B); this new rule closes the conditional area of Maquoit Bay due to rainfall in excess of 1 inch in 24 hours.

December 19, 2002; (Area No. 17); this new rule closes the Harraseeket River due to a malfunction at the Freeport sewage treatment plant.

January 13, 2003; (Area No. 18-J); the new regulation closes shore around Simpson's Point.

January 29, 2003; (Area No. 17); this new rule enlarges the prohibited area around the Freeport Sewage Treatment Plant outfall and reopens the conditional area following a sewage treatment plant malfunction.

March 24, 2003; (Area No. 17); this new rule reduces the prohibited area around the Freeport Sewage Treatment Plant outfall.

March 28, 2003; (Area No. 17-B); this new rule reopens the rainfall conditional area in Maquoit Bay.

May 27, 2003; (Area No. 17); this new rule closes the Harraseeket River due to a malfunction at the Freeport sewage treatment plant.



May 27, 2003; (Area No. 17-B); This new rule closes the conditional area of Maquoit Bay due to rainfall in excess of 1 inch in 24 hours.

June 10, 2003; (Area No. 17); this new rule reopens the conditional area of the Harraseeket River following the repair of a sewage treatment plant malfunction .

June 10, 2003; (Area No. 17-B); this new rule reopens the rainfall conditional area in Maquoit Bay.

June 16, 2003; (Area No. 17); this new rule closes the Harraseeket River due to an overflow at the Freeport sewage treatment plant.

June 23, 2003; (Area No 17-B); This new rule closes the conditional area of Maquoit Bay due to rainfall in excess of 1 inch in 24 hours.

July 9, 2003; (Area No. 17-B); This new rule reopens the rainfall conditional area in Maquoit Bay.

July 14, 2003; (Area No. 17); this new rule reopens the conditional area of the Harraseeket River following the repair of a sewage treatment plant malfunction.

September 4, 2003; (Area No. 17-B); This new rule closes the conditional area of Maquoit Bay due to rainfall in excess of 1 inch in 24 hours.

January 29, 2004; (Area No. 17-E); The Commissioner of the Maine Department of Marine Resources promulgates the emergency DMR Regulation 95.03 QQ, Closed Area No. 17-E, Basin, Ash and Stover Coves, Harpswell. This new regulation describes the three seasonal closures at Basin, Ash and Stover Coves, which were previously described in Closed Area No. 18. This is an administrative change.

January 29, 2004; (Area No. 17-F); The Commissioner of the Maine Department of Marine Resources promulgates the emergency DMR Regulation 95.03 UU, Closed Area No. 17-F, Potts Harbor, Harpswell. This new regulation describes the two closures at Basin Point and one on the west side of Potts Point, which were previously described in Closed Area No. 18. This is an administrative change.

February 3, 2004; (Area No 17-B); this new rule changes Maquoit Bay to a seasonal conditional area that is open from April 15 through August 31 for shellfish harvesting. The head of Maquoit Bay will now be included in the seasonal conditional area.

September 28, 2004; (Area No. 17); this new rule closes the Harraseeket River due to a malfunction at the Freeport sewage treatment plant.

October 12, 2004; (Area No. 17); this new rule reopens the conditional area of the Harraseeket River following the repair of a sewage treatment plant malfunction.

April 6, 2005; (Area No. 17); this new rule closes Winslow Park and the Harraseeket River due to elevated fecal coliform and virus levels in shellfish.



April 22, 2005; (Area No. 17); this new rule reopens the conditional area of the Harraseeket River following a flood closure.

August 23, 2005; (Area No. 17); this new regulation closes the upper Harraseeket River, west of Bartol Island due to a fuel/oil spill.

September 1, 2005; (Area No. 17-D); The Commissioner of the Maine Department of Marine Resources repeals the emergency DMR Regulation 95.03 PP, Closed Area No. 17-D, Bustins Island, Freeport, promulgated on December 29, 1994.

September 13, 2005; (Area No. 17); this new regulation reopens the upper Harraseeket River, west of Bartol Island after the cleanup of an oil spill.

October 13, 2005; (Area No. 17); this new regulation closes the Harraseeket River due to a sewage pump station overflow during heavy rainfall.

November 17, 2005; (Area No. 17); this new regulation reopens the Harraseeket River.

December 27, 2005; (Area No. 17); this new regulation closes the Harraseeket River due to a sewage bypass at the plant during a heavy rainfall and snow melt event.

February 16, 2006; (Area No. 17); this new regulation reopens the Harraseeket River. In case of a malfunction at the Freeport Sewage Treatment Plant, the Harraseeket River and its tributaries will be closed.

April 14, 2006; (Area No. 17-B); This new rule reclassifies the head of Maquoit Bay as restricted and changes the shape of the seasonal conditional area that is open from April 15 through August 31. Bunganuc Landing remains classified prohibited.

May 3, 2006; (Area No. 17); This new regulation changes the classification of the northeast corner of the Harraseeket River to restricted due to non-point pollution. In case of a malfunction at the Freeport Sewage Treatment Plant, the Harraseeket River and its tributaries will be closed.

May 3, 2006; (Area No. 17-B); this new rule enlarges the seasonal conditional area (Maquoit Bay) and extends the open season to January 1 through August 31.

May 3, 2006; (Area No. 18-J); the new rule closes the east shore of Merepoint Neck down to Paul's Marina.

May 25, 2006; (Area 17-D); Department personnel have determined that the island (Bustins Island) is impacted by non-point pollution from improper sewage disposal.

September 8, 2006; (Area No. 17-X); The Commissioner of the Maine Department of Marine Resources repeals DMR Regulations: 95.03 N, Closed Area No. 18-C, Mere Point Neck,

Brunswick and Birch Island, Harpswell, promulgated on October 17, 2002; 95.03 J, Closed Area No. 18-J, Middle Bay, Brunswick, promulgated on May 3, 2006, and replaces them with a new rule. This new rule administratively moves the areas previously described in Closed Areas No. 17-B, 18-C and 18-J and places them in this notice (Closed Area No. 16).



September 8, 2006; (Area No. 17-B); The Commissioner of the Maine Department of Marine Resources repeals the emergency DMR Regulations 95.03 W, Closed Area No. 17-B, Maquoit Bay, Brunswick and Freeport, promulgated on May 3, 2006; 95.03 QQ, Closed Area No. 17-E, Basin, Ash and Stover Coves, Harpswell, promulgated on May 17, 2006; 95.03 UU, Closed Area No. 17-F, Potts Harbor, Harpswell, promulgated on January 29, 2004; 95.03 ZZ, Closed Area No. 17-G, Harpswell Sound, Harpswell, promulgated on May 17, 2006; 95.03 R, Closed Area No. 18-I, Harpswell Fuel Depot, Harpswell, promulgated on April 22, 1994, and replaces them with a new rule. This new rule administratively combines the areas previously described in Closed Areas 17-E, 17-F, 17-G, 18-I, and part of 18-H, and places them in this notice (the other parts of 18-H can be found in Closed Areas No. 17-A and 17-C). The areas previously described in Closed Area 17-B have been administratively moved to Closed Area No. 17-X.

November 6, 2006; Repeals DMR Regulations 95.03 I, Closed Area No. 17, Harraseeket River, Freeport, promulgated on May 3, 2006; and 95.03 PP, Closed Area No. 17-D, Bustins Island, Freeport, promulgated on May 25, 2006, and replaces them with a new rule. This new rule administratively combines the areas previously described in Closed Areas No. 17 and 17-D and places them in this legal notice (DMR Regulation 95.03 F, Closed Area No. 15, Harraseeket River and Bustins Island (Freeport)).

November 6, 2006; (Area No. 16); The Commissioner of the Maine Department of Marine Resources repeals DMR Regulation 95.03 Z, Closed Area No. 17-X, Maquoit Bay and Middle Bay (Freeport, Brunswick, and Harpswell), promulgated on September 8, 2006, and replaces it with a new rule. This new rule administratively changes the legal title and regulation number of this closure area.

December 20, 2006; (Area No. 16); this new rule reclassifies Middle Bay from prohibited to approved.

April 6, 2007; (Area No. 15); this new rule closes the conditionally restricted and conditionally approved areas of the Harraseeket River due to a malfunction at the Freeport Wastewater Treatment Plant.

April 23, 2007; (Area No. 15); this new rule changes the classification of Recompense Cove to restricted due to non-point pollution.

May 4, 2007; (Area No. 15); this new rule reopens the conditional areas that were closed because of a sewage spill, and reclassifies the north end of the Harraseeket River as restricted.

June 19, 2007; (Area No. 15); this new rule closes the Harraseeket River because of a sewage spill.

July 10, 2007; (Area No. 16); this new rule reclassifies upper Maquoit Bay as a Conditionally Approved area which is closed from September 1 – March 31 AND reclassifies the rest of Maquoit Bay as approved.

July 11, 2007; (Area No. 15); this new rule reopens the conditional areas in the Harraseeket River that were closed because of a sewage spill.

August 6, 2007; (Area No. 16); this new rule closes a portion of the east side of Flying Point, Freeport, due to a malfunctioning septic system.



August 13, 2007; (Area No. 15); this new rule enlarges the conditional area in the middle of the Harraseeket River as a result of the final dye study report.

August 14, 2007; (Area No. 15); this new rule amends the boundary description for the conditional area in the middle of the Harraseeket River.

September 27, 2007; (Area No. 17-B); This new rule postpones the seasonal opening of the Conditionally Approved area in Basin Cove, Harpswell due to failing water quality.

November 26, 2007; (Area No. 17-B); this new rule reclassifies the Basin Cove seasonal conditional area to be in the open status from December 1 through April 30.

February 15, 2008; (Area No. 15); this amendment closes all of the Conditional areas in the Harraseeket River, due to a sewage treatment plant malfunction.

March 6, 2008; (Area No. 17-B); this amendment reclassifies the prohibited area on the lower west side of Basin Point to approved for shellfish harvesting.

March 12, 2008; (Area No. 15); this amendment opens all of the Conditional areas in the Harraseeket River.

May 15, 2008; (Area No. 16); this amendment repeals the Maquoit Bay prohibited area on Flying Point, following the replacement of a malfunctioning septic system.

July 2, 2008; (Area No. 15); this amendment creates a prohibited area around a grey water pipe and a suspected malfunctioning septic system on Indian Island in Recompense Cove.

Current Classifications

Shellfish growing area WJ has areas classified as:

Approved (24 stations)

Conditionally Approved

Harraseeket River, Freeport (4 stations) (Marina Season and WWTP condition)
Maquoit Bay, Brunswick (2 stations) (Seasonal Variation in Water Quality)
Merepoint, Brunswick (1 station) (Marina Season)
Basin Cove, Harpswell (3 stations) (Seasonal Variation in Water Quality)
Ash Cove, Harpswell (3 stations) (Seasonal Variation in Water Quality)

Conditionally Restricted

Harraseeket River, Freeport (3 stations) (Non-point pollution & WWTP condition)

Restricted

Recompense Cove, Freeport (5 stations)

Prohibited

Harraseeket River, Freeport (2 stations) (WWTP outfall)



Maquoit Bay, Brunswick (1 stations) (Non-point pollution)
Navy Fuel Depot, Harpswell (2 stations) (Possible Lead Contamination)
Basin Point, Harpswell (2 stations) (Needs Marina Survey Information)

Please visit the DMR website to view Legal Notices:

Area No. 15, Harraseeket River, Recompense Cove and Bustins Island (Freeport)
Area No. 16, Maquoit Bay and Middle Bay (Freeport, Brunswick, and Harpswell)
Area No. 17-B, Harpswell Neck (Harpswell).

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

Current Management Plan(s)

There are management plans for six conditional areas in WJ:

- Harraseeket River Wastewater Treatment Plant conditional area
- Harraseeket River marina conditional area, closed May 1 to November 30
- Maquoit Bay seasonal area, closed September 1 to March 31
- Merepoint marina conditional area, closed April 16 to October 31
- Basin Cove seasonal conditional area, closed May 1 to November 30
- Ash Cove seasonal area, closed May 1 to September 30

Copies of the management plans can be found in the central files.

Current Review of Management Plan(s)

Harraseeket River WWTP Conditionally Approved and Conditionally Restricted Areas

In 2007, there were two closures due to treatment plant malfunctions. The conditional area closed on April 6 and reopened on May 4; however, the management plan was not followed appropriately. The notification protocols in the conditional area management plan were not followed appropriately. The conditional area closed again on June 19 and reopened on July 11, following the management plan requirements. Water and shellfish samples were tested prior to the reopening and met approved standards. A complete management plan review can be found in Appendix A.

Harraseeket River Seasonal Marina Conditionally Approved Area

In 2007, the seasonal marina conditionally approved area in the Harraseeket River, Freeport, closed on May 1 and reopened on December 1. The area was visited on 11/28/07 to confirm there were fewer than 10 boats with heads remaining in the water, and a review of the water quality showed that the area continued to meet approved standards for the open season. It was also visited on 5/1/07 to confirm there were fewer than 10 boats with heads not yet in the water. A complete management plan review can be found in Appendix B.

Maquoit Bay Seasonal Conditionally Approved Area

In 2007, the seasonal conditional area opened on April 1 and closed on August 30. The seasonal water quality was reviewed prior to reopening and water quality at Stations WJ 32 and 33 continued to meet approved standards for the open season. A complete management plan review can be found in Appendix C.



Merepoint Neck- Paul's Seasonal Marina Conditionally Approved Area

In 2007, the seasonal marina conditionally approved area at Merepoint Neck, Brunswick, closed on April 16 and reopened on November 1. The area was visited on 10/25/07 to confirm there were fewer than 10 boats with heads remaining in the water, and a review of the water quality showed that the area continued to meet approved standards for the open season. It was also visited on 4/26/07 to confirm there were fewer than 10 boats with heads not yet in the water. A complete management plan review can be found in Appendix D.

Basin Cove Seasonal Conditionally Approved Area

In 2007, the seasonal conditional area closed on May 1 and reopened on December 1. The seasonal water quality was reviewed prior to reopening and water quality at Stations WJ 64, 65 and 66 continued to meet approved standards for the open season. A complete management plan review can be found in Appendix E.

Ash Cove Seasonal Conditionally Approved Area

In 2007, the seasonal conditional area closed on May 1 and reopened on October 1. The seasonal water quality was reviewed prior to reopening and water quality at Stations WJ 67, 68 and 70 continued to meet approved standards for the open season. A complete management plan review can be found in Appendix F.

Pollution Source Survey

The first critical control point in a successful shellfish sanitation program (preventing food borne illness associated with shellfish consumption) is identifying areas that have good sanitary quality. One component of a successful sanitary survey and subsequent proper classification of the growing area is the identification and evaluation of pollution sources which do or may impact the growing area. The identification and evaluation of pollution sources is known as the shoreline survey. The information obtained by conducting a thorough shoreline survey is valuable in determining, evaluating and documenting the location and direct or indirect impact of actual and potential pollution sources. Sources of bacteria include septic systems, overboard discharges, municipal and industrial discharges of wastewater, illegal sewage discharge from boats and polluted stormwater runoff.

A study conducted in Maquoit Bay by Horsley & Whitten (1996) determined that fecal bacterial contamination was high in groundwater seeps along the shores of Flying Point Neck and Merepoint Neck. They determined from their study that the two principal sources of contamination in Maquoit Bay were agriculture (manure spreading on hay fields) and residential sources (malfunctioning septic systems and domestic pets).

The Growing Area WJ shoreline survey was conducted by the DMR, DEP, the Town of Brunswick and the Town of Freeport from 2001 through 2008. Parcel-based tax maps from the towns of Freeport, Brunswick and Harpswell were used to assign a unique identifier to each lot in the survey area. Basic information on each property (land use, ownership, address, seasonality, etc.) was documented from town information. Vacant lots were recorded for entry into the database in case of future development. In accordance with the DMR Growing Area Standard Operating Procedure (SOP) all properties within 500 feet of the shore or other water conduits were surveyed.



Each shoreline property underwent an on-site inspection, including an evaluation of shore-side development, steady or intermittent streams, and any other issues that might be of concern. Owners, if present, were asked to provide information about their septic system including age, routine maintenance details and description of any problems they had experienced. Information was recorded in the inspector's notes, and will be presented in this report if indicative of an actual or potential problem.

All potential bacterial pollution sources (pipes, standing or flowing water sources) in Freeport and Brunswick were documented and sampled as part of the shoreline survey. A few streams were sampled in Harpswell. Dwellings within 500 feet of the growing area were visually evaluated for malfunctioning septic systems, discharging pipes, outhouses and other potential pollution sources. Water samples were collected in sterile "Whirl-Pak" bags and maintained in a cooler at <10 degrees Celsius until delivery to the Boothbay Harbor Water Quality Laboratory for fecal coliform and E. coli analysis. The results of these analyses are presented later in this report.

The Harraseeket River was surveyed in August 2005 and the remainder in September of 2006. Recompense Cove, Freeport was surveyed in September 2006. Flying Point, Freeport was surveyed in June 2007. The Freeport portion of Maquoit Bay was surveyed by DEP in September 2006. The Brunswick portion of Maquoit Bay and the western side of Mere Point Neck were surveyed by DEP from August to October 2006. The eastern side of Mere Point Neck (Merepoint Bay) was surveyed in July 2006. The northwest side of Middle Bay, Harpswell was surveyed in August 2001. The west side of Harpswell Neck (near the Old Navy Fuel Depot) was surveyed in October 2001. Basin Point and Basin Cove were surveyed in September and July of 2005, respectively. A follow up survey of Basin Cove was conducted in June 2007. Ash Point Cove was surveyed in June 2008. The Freeport Islands were surveyed in June and July 2008. DEP surveyed Bustins Island in 2007. Birch Island and Gallows Island in Harpswell were surveyed in 2002. The following Harpswell islands were surveyed in 2004: Bar, Eagle, Little Mark, Little Birch, Horse, Upper Flag, Haskell, Whaleboat, Little Whaleboat, The Goslings, Lower Goose, Upper Goose, Shelter, Little Birch, Little Iron, Scrag, White and Crow. Great Mark Island, Harpswell was surveyed in 2005.

Identification and Evaluation of Pollution Sources

Domestic Waste

There is one municipal wastewater treatment facility in growing area WJ. The towns of Freeport and Brunswick have storm water collection systems. Buildings in parts of Freeport and Brunswick are connected to the town sewer system but many of the buildings in this growing area have private waste disposal systems. The individual septic systems are the principal form of residential wastewater treatment in Freeport, Brunswick and Harpswell. Many of the systems were installed before the plumbing code was updated in 1974 and may provide little or no treatment. Malfunctioning septic systems may cause sewage to back up in the home, break out at the surface, run off in surface water, or seep undetected into groundwater or cracks in the bedrock. Septic systems malfunction due to inadequate maintenance, overloading or poor design and construction (e.g. septic systems installed before the plumbing code revision may



meet current public health standards because they are sited in areas with poor soil conditions and shallow depth to bedrock). There are 4 active overboard discharges (OBDs) on the western shore of Potts Harbor, Harpswell. In some cases, buildings still utilize outhouses for a disposal system. Several new potential or actual pollution sources were identified as a result of the shoreline survey inspections.

The northwest side of Harpswell Neck was surveyed in 2001. The survey involved visiting 168 properties and potential problems were identified. At map 8, lot 70 there were horses and manure piles near a stream. When the property was re-visited in 2005, the horses were no longer on the property. An addendum to the sanitary survey was written and Wilson Cove, Harpswell was reclassified from prohibited to approved. A second documented potential problem was noted at map 9, lot 45 which is an inverted wood channel over gravel septic system but no problem was noted at the time of the survey. Birch Island, Harpswell (between Merepoint Bay and Middle Bay) was surveyed in 2002. Of the 20 properties visited, one older septic system was identified near the island landing but no problem was noted. Potts Harbor, Harpswell and the other Middle Bay islands were surveyed in 2004; of the 42 properties surveyed, no problems were noted.

In 2005 the southwest side of Harpswell Neck and Basin Cove, Harpswell were surveyed; a total of 177 properties were inspected. One malfunctioning septic system was found on the northeast side of Basin Cove and a new system was installed. Two potential pollution problems were identified during the survey. An old iron pipe to shore with an unknown septic system was located and reported to the Harpswell codes enforcement officer for follow up as there were no records about the system on file with the town. The second problem was a septic system break out and was reported to the Harpswell codes enforcement officer. The codes enforcement officer recommended having the septic tank pumped and adding a layer of clay to the steep side of the leach field to cap the break out. The repair was completed in 2006 and has resolved the problem as reported by the codes enforcement officer.

Additional potential problems were noted in the 2005 Basin Cove, Harpswell survey. A house located on the north side of the right of way, leading down to station WJ 66, had a septic system that was overloaded, but not breaking out. The fourth house south of the right of way had a holding tank, which may not have been pumped out as frequently as required, but this could not be documented. It wasn't until the P90 score at Station WJ66 no longer met approved standards for the open season that it became apparent that these potential pollution sources were having an impact on water quality in the area. A third potential source of pollution was the right of way itself, since it was steeply sloped, eroded, and conveyed storm water from King Moody Road and Basin Cove Road directly down to station WJ66. A follow-up shoreline survey of the area in October 2007, noted that the overloaded septic system at 44 Basin Cove Road was replaced with a new system in August 2006. In August 2007, the right of way was filled in and seeded with grass to slow down and channel the storm water runoff along a hedgerow for filtration. As of November 2007, the house with the holding tank is no longer occupied and is reported by the town as scheduled to be demolished.

In June of 2007 during another survey of Basin Cove, a septic field break out was noted. A local excavator was called and patched the break in the field. The Harpswell codes enforcement officer inspected the repair. During a sample run in the same area on April 17, 2008, a breakout at a septic mound was noted and referred to the Harpswell codes enforcement officer. The homeowner is getting a site evaluation. The breakout is between 80-100 feet from Basin Cove and is right on the prohibited/conditionally approved classification boundary. The problem



at this lot is an actual indirect pollution source. The conditionally approved area is in the closed status from May 1 – November 30. If the problem is not fixed by the December 1 open status date, the area will remain in the closed status.

Winslow Park and the Harraseeket River, Freeport were surveyed in 2006; 252 properties were inspected and one malfunctioning septic system was found. The malfunction was located at Mast Landing and the system was replaced in 2007. The survey also identified two properties where horses and sheep are being kept; more details on those properties can be found in the Wildlife and Domestic Animals section of this report.

The DEP surveyed 222 properties in Maquoit Bay, Freeport and Brunswick in 2006. A straight pipe was located at the head of the bay near station WJ 33. It was repaired with an aeration system and approved by the Brunswick codes enforcement officer.

After receiving a complaint from a Bustins Island, Freeport resident (May 24, 2006) regarding improper disposal of outhouse waste, improper grey water disposal and potential malfunctioning septic systems; a prohibited area was put around the island (within 500 ft of the shore) on May 25, 2006. The DEP completed the shoreline survey investigation of 151 houses and facilitated the removal of two grey water discharges. They did not identify any other actual or potential pollution sources. The survey and remediation of the illegal grey water discharges were completed in 2007.

Recompense Cove and Flying Point, Freeport were surveyed in 2007. Of the 186 properties visited, one malfunctioning septic system was found at 104 Maquoit Drive on the east side of Flying Point. A prohibited area was put in place on August 6, 2007 until the septic system was replaced in 2008. The prohibited area was repealed on May 15, 2008.

Ash Point Cove, Harpswell was surveyed in June 2008. Forty-eight properties were surveyed and there were 4 properties that were referred to the Harpswell codes enforcement officer. One property has a malfunctioning septic system which is near a gully that flows to Ash Point Cove, this is an actual indirect pollution source. The second problem is an illegal sink discharge and an unknown septic system. This is an actual indirect pollution source. The third property noted has an illegal grey water discharge directly to the shore and an unknown septic system. This is an actual direct pollution source. The fourth noted problem is an illegal washing machine discharge to a culvert which goes near the shore which is an actual direct pollution source. All four of the problems in Ash Point Cove must be ameliorated prior to the seasonal conditional area opening on October 1.

During a survey of Merepoint Neck and Maquoit Bay in July 2006 a failing septic system was noted in Brunswick. The malfunction was reported to the codes enforcement officer and a new system was installed in December of 2006. A system with a pump station and an unknown pipe in a gully at map 32, lot 11 was documented as a potential indirect pollution source and required monitoring. Several questionable systems were found and tested by the DEP and the Town of Brunswick and were determined to not be a problem.

The west side of the Harraseeket River was surveyed and an illegal sink drain to the ground was discovered and reported to the Freeport codes enforcement for follow up. The sink discharge is an actual indirect pollution source. Another property had an overflowing cesspool. The owner had the septic tank pumped and the problem was rectified. The owner will keep the tank pumped routinely but the property will have to be monitored. The cesspool is an actual



indirect pollution source which would impact Recompense Cove. The property was visited on September 7, 2007 and no problem was noted.

The Freeport islands were surveyed in June 2008. One property was referred to the codes enforcement for follow up on June 19, 2008. There were three black hoses extending from the building down over the rocks and into the water. A prohibited area was put around this actual and direct pollution source on July 2, 2008. The Freeport codes enforcement officer met with the homeowner and on July 29, 2008, reported the following information to the DMR: the property has two fresh water washing stations, for cleaning mud off boots; these stations are located as you leave the mainland. There is a salt water intake and drainage line running to and from the shed, to supply water for clams and any fish being kept; there is no contamination to this water, such as soap. There is a full bathroom and a kitchen sink. These fixtures drain into a grinder pump which discharges into a subsurface disposal area, similar to a seepage pit, installed in the mid-1950's; there is no indication of any failure with this pit. Water is turned on at the cabin in April and turned off in October. Visits during the season to the cabin are infrequent and of short duration. The codes enforcement officer did not find any violations of any kind to the subsurface waste disposal rules and found everything to be in good order. Based on this information, the prohibited area around the island can be repealed.

Most of the actual and potential pollution sources identified in the shoreline survey are in approved or conditionally approved areas. Prohibited areas have been placed around actual direct and actual indirect pollution sources; identification of actual pollution sources in conditional areas will require that such conditional areas remain in the closed status until the identified problems have been remediated. Potential pollution sources identified during the shoreline survey will continue to be monitored through water sampling, reconnaissance during sample runs, and follow-up work with the Maine DEP and the towns of Freeport, Brunswick and Harpswell. The ME DEP was contacted following the completion of the shoreline survey activity and accompanied ME DMR staff members and town staff members to a number of sites identified as actual or potential pollution sources. The site visits confirmed several pollution sources and helped to verify other sites as either actual or potential pollution sources (Table 1; Figures 2, 3 and 4).

Table 1. Potential and Actual Pollution Sources Located in Growing Area WJ

Pollution Source number	Pollution Description
PS 1 (A/D)	Freeport Sewage Treatment Plant outfall
PS 2 (A/D)	OBD 4895 (Potts Harbor, Harpswell)
PS 3 (A/D)	OBD 1406 (Potts Harbor, Harpswell)
PS 4 (A/D)	OBD 2117 (Potts Harbor, Harpswell)
PS 5 (A/D)	OBD 1693 (Potts Harbor, Harpswell)
PS 6 (A/D)	illegal grey water discharge directly to the shore and an unknown septic system (Ash Point Cove, Harpswell)
PS 7 (A/D)	Malfunctioning septic; follow up needed (Ash Point Cove, Harpswell)
PS 8 (A/D)	An old iron pipe to shore with an unknown septic system (Harpswell)
PS 9 (P/D)	OBD 4004; inactive (Bunganuc Creek, Maquoit Bay, Brunswick)
PS 10 (P/D)	a breakout at a septic mound (Basin Cove, Harpswell)
PS 11 (A/I)	illegal sink discharge and an unknown septic system, (Ash Point Cove, Harpswell)
PS 12(A/I)	A system with a pump station, horse farm and an unknown pipe in a gully



Pollution Source number	Pollution Description
	(Brunswick)
PS 13 (A/I)	Cesspool overflow potential – requires monitoring; (Recompense Cove, Freeport)
PS 14 (P/I)	illegal sink drain to the ground; (Freeport) – corrected, but requires monitoring
PS 15 (P/I)	Paul’s Marina experimental subsurface waste disposal of boat washwater
PS 16 (A/D)	illegal washing machine discharge to a culvert (Ash Point Cove, Harpswell)
PS 17 (P/I)	Mere Point Colony Subsurface Wastewater System

A/D = Actual Direct Pollution Source; P/D = Potential Direct Pollution Source
 P/I = Potential Indirect Pollution Source; A/I = Actual Indirect Pollution Source



Figure 2. Growing Area WJ Pollution Source - Freeport

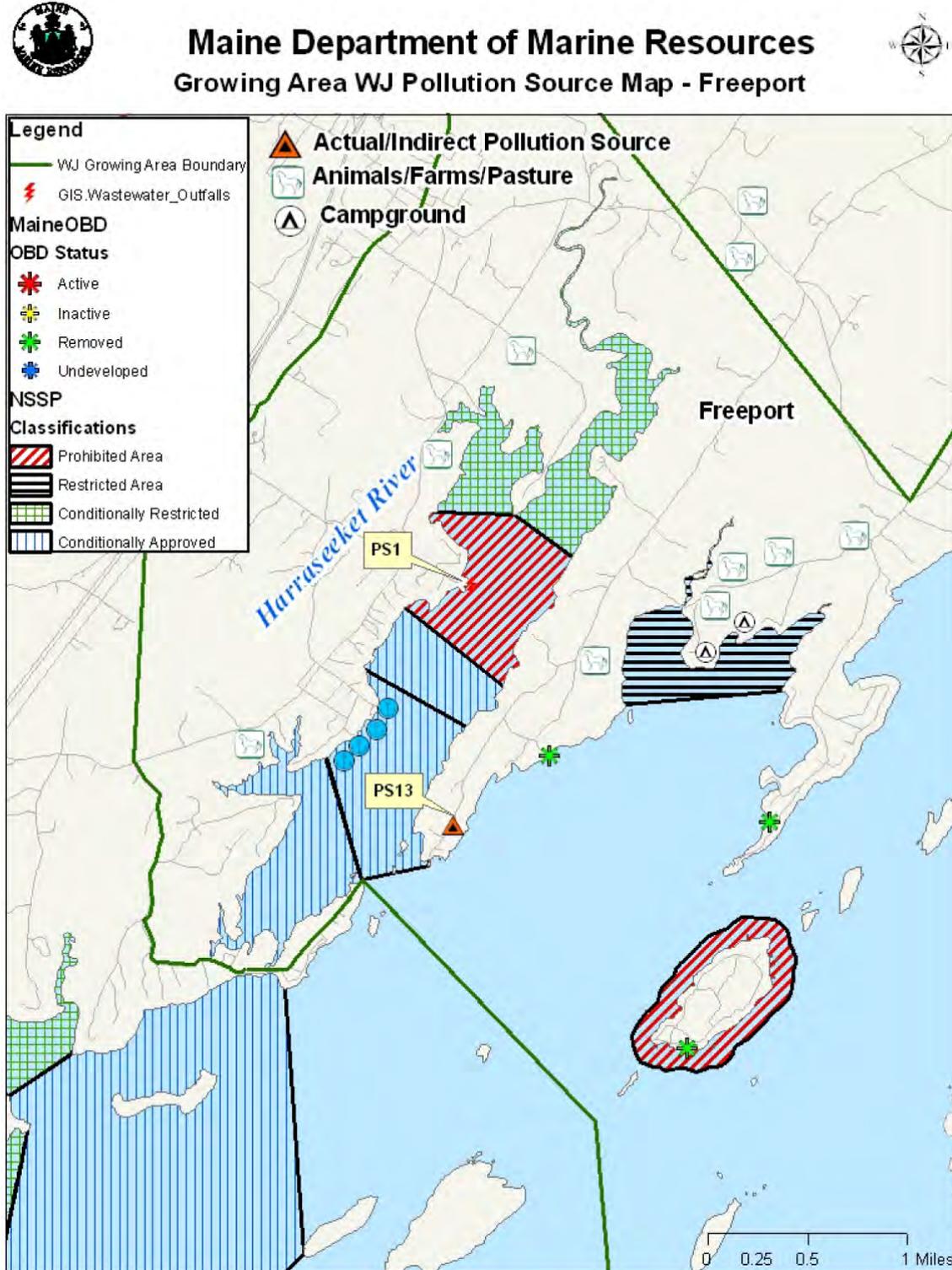




Figure 3. Growing Area WJ Pollution Source – Brunswick/Harpswell



Maine Department of Marine Resources Growing Area WJ Pollution Source Map - Brunswick/Harpswell

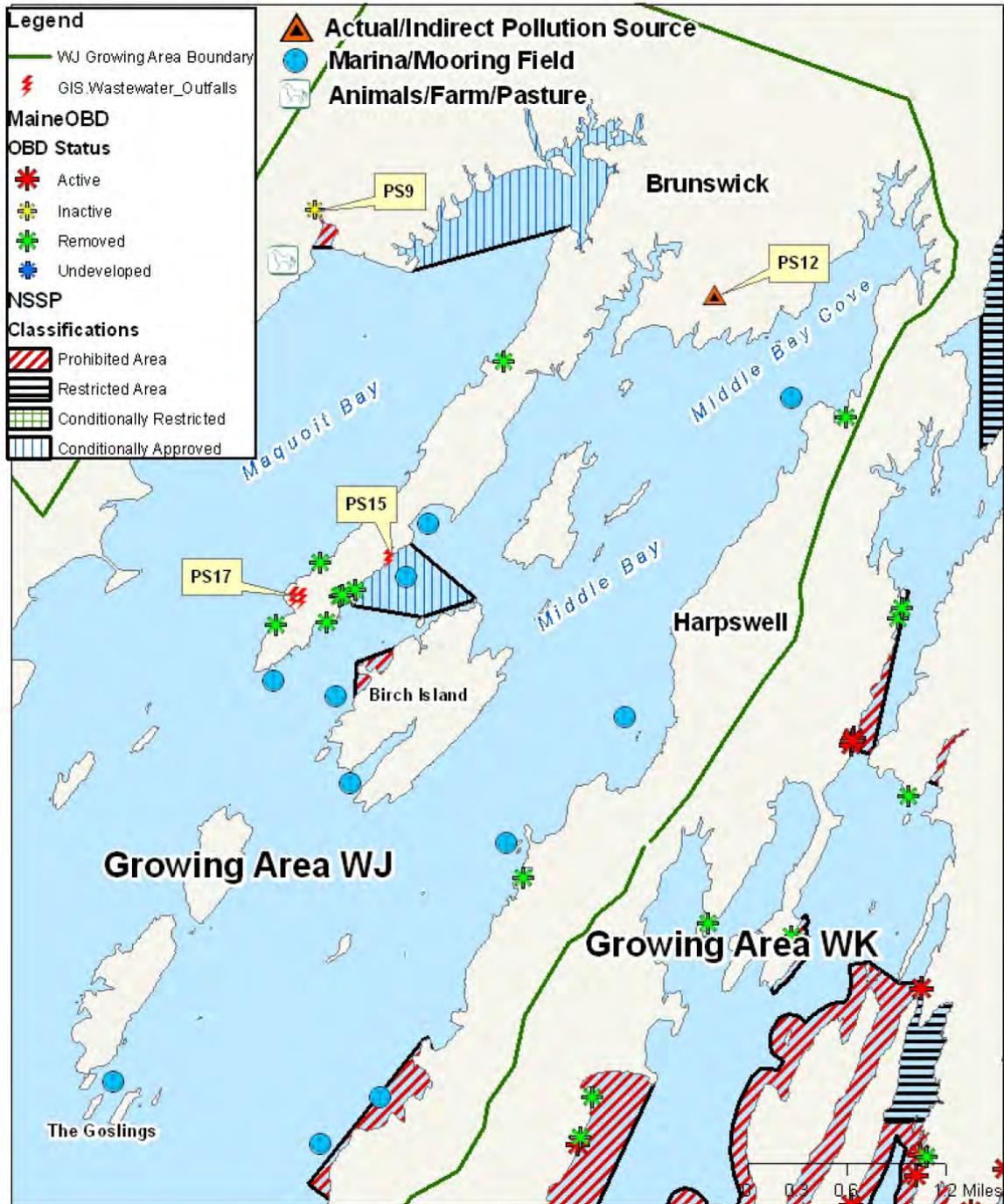
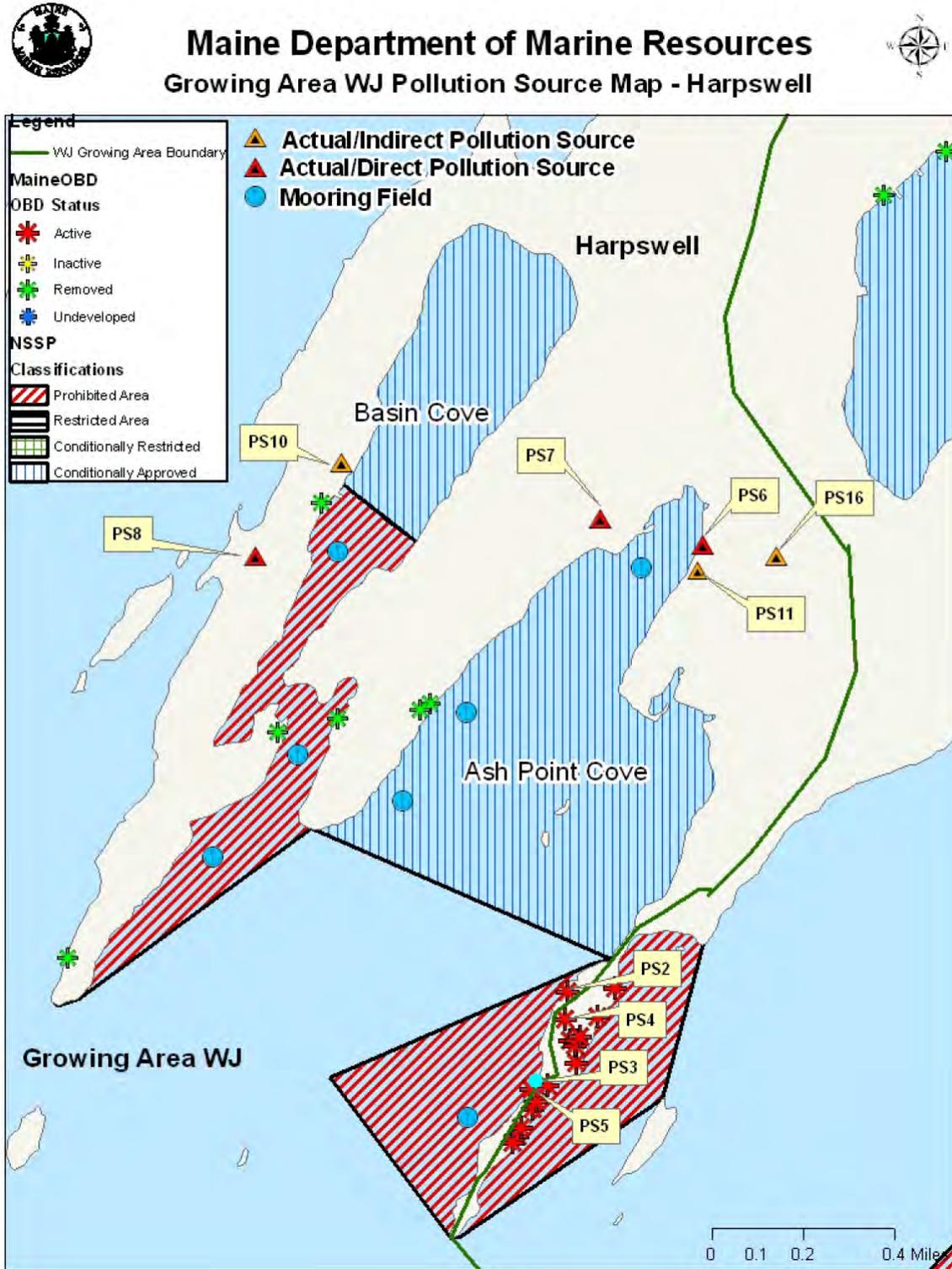




Figure 4. Growing Area WJ Pollution Source – Harpswell





Overboard Discharges

An overboard discharge (OBD) is the discharge of wastewater from residential, commercial, and publicly owned facilities to Maine's streams, rivers lakes, and the ocean. Commercial and residential discharges of sanitary waste have been regulated since the mid-1970's when most direct discharges of untreated waste were banned. Between 1974 and 1987 most of the "straight pipes" were connected to publicly-owned treatment works or replaced with standard septic systems. Overboard discharge treatment systems were installed for those facilities that were unable to connect to publicly-owned treatment works or unable to install a septic system because of poor soil conditions or small lot sizes.

All overboard discharge systems include a process to clarify the wastewater then disinfect it prior to discharge. If they are not properly maintained or if they malfunction, they have the potential to discharge the harmful bacteria and other pathogens directly into the water. The wastewater from most OBD facilities receives secondary treatment before being disinfected and discharged. There are two general types of treatment systems; mechanical package plants and sand filters. Sand filter systems consist of a septic tank and a sand filter. When you flush a toilet or wash the dishes, the wastewater is first contained in a septic tank where most of the solids settle out and are partially digested by microbes. The wastewater flows from the septic tank into a sand filter, consisting of distribution pipes, layers of stone and filter sand, and collection pipes within a plastic liner. The wastewater is biologically treated as it filters down through the sand, collected and discharged to a disinfection unit. Mechanical package plants consist of a tank where waste is broken up, mixed and aerated. Wastes are digested by naturally occurring bacteria. The aerated treated water is held in a calm condition for a time while the solids settle to the bottom. The clarified water is pumped off the top and through a disinfection unit. DEP inspectors will look for a tag on the treatment unit identifying the service contractor and the last date of service. All mechanical systems require power, so it is important that power is supplied to the unit and that it is turned on. Mechanical treatment systems must have an operating alarm on a separate electrical circuit so that the alarm will activate if the treatment unit malfunctions.

Both systems discharge treated wastewater to a disinfection unit. There are two types of disinfection units, UV and chlorinators (most common). In a chlorinator, the treated water contacts chlorine tablets and remains in a tank for at least 20 minutes where bacteria and other pathogens are killed. The treated and disinfected water is discharged from the disinfection unit to below the low water mark of the receiving waterbody (the ocean, a river, or a stream) via an outfall pipe.



The DEP standard license conditions for OBDs of less than 2,000 gallons per day are shown in Table 2. The licensing conditions for OBDs of more than 2,000 gallons per day are shown in Table 3.

Table 2. OBD license conditions for less than 2,000 gallons per day

Effluent Characteristic	Discharge Limitations	
	Monthly <u>Average</u>	Daily <u>Maximum</u>
Flow		as licensed
5-Day Biochemical Oxygen Demand (BOD)	30 mg/L	50 mg/L
Total Suspended Solids (TSS)	30 mg/L	50 mg/L
Settleable Solids		0.1 ml/L
Fecal coliform Bacteria	15col/100ml	
pH	The pH of the effluent shall not be less than 6.0 or greater than 8.5	

Table courtesy of Maine DEP

Table 3. OBD license conditions for less than 2,000 gallons per day

Effluent Characteristic	Discharge Limitations					
	Monthly <u>Average</u>			Daily <u>Maximum</u>		
Water Classification	SB/SC	B	C	SB/SC	B	C
Flow	As licensed					
5-Day Biochemical Oxygen Demand (BOD)	30 mg/L			50 mg/L		
Total Suspended Solids (TSS)	30 mg/L			50 mg/L		
Settleable Solids	report only			0.1 ml/L		
<input type="checkbox"/> Fecal coliform Bacteria per 100ml. or <input type="checkbox"/> Eschericia coli Bacteria per 100ml.	15col /100ml	64col /100ml	142 col /100ml.	50 col /100ml.	427 col /100ml.	949 col /100ml.
Residual Chlorine	chlor: 1.0 mg/L dechlor: 0.1 mg/L					
pH	The pH of the effluent shall not be less than 6.0 or greater than 8.5 at any time					

Table courtesy of Maine DEP

There is one inactive OBD in Bunganuc Creek, Brunswick; the OBD is within a prohibited area. Since 1992, 18 OBDs have been removed within growing area WJ (Table 4).

Table 4. OBD Removals in Growing Area WJ 1992-2007

TOWN	OBD#	RECEIVING WATER	REMOVED
Brunswick	1549	Merepoint Bay	1994
	3280		
	1020		
	3570	Maquoit Bay	1992
	1642		
2516			
Freeport	0992	Casco Bay	1996
	3558		
	3887		
Harpwell	2988	Basin Cove	1999
	2340		



TOWN	OBD#	RECEIVING WATER	REMOVED
	1022		2001
	2939		2003
	2177	Middle Bay	2002
	3264		1993
	2124		
	1618	Ash Point Cove	1993
	1876		

There are four active overboard discharges and one inactive overboard discharge in Growing Area WJ (Figure 4 and Table 5). The inactive discharge is located in the Bunganuc Landing 12 acre prohibited area by station WJ 30 (Figure 3). The four active discharges are located in the Potts Point 75 acre prohibited area. A dilution calculation for the four active discharges requires a closure of 0.24 acres off Potts Point. The Maine DEP inspects all overboard discharges annually to ensure that they are being properly maintained. OBDs 1693, 2117 and 4895 had no inspection violations over the past 10 inspection. OBD 1406 had one violation, occurring on June 28, 2004, when there was no chlorine present in the chlorine contact chamber at the time of the inspection. Since the violation, DEP has reported that the problem was corrected by June 29, 2004.

DEP reports that there are no subsurface waster disposal alternatives for OBDs 1406 (determined May 4, 2007), 1693 (determined November 17, 2007) and 4895 (determined January 14, 2008). It is unknown whether or not there is a subsurface waste disposal alternative for OBD 2117. The shoreline is bold, rocky terrain which does not allow for subsurface waste disposal options; for this reason, the area will remain prohibited.

Table 5. Active Licensed Overboard Discharges in Growing Area WJ

OBD #	Location	Acres for Dilution
1406	Potts Harbor	0.07
1693	Potts Harbor	0.07
2117	Potts Harbor	0.05
4895	Potts Harbor	0.05

Treatment Plants

There is one treatment plant and two NPDES licensed subsurface waste disposal systems in growing area WJ. One of the subsurface waste disposal systems is an experimental treated boat wash water subsurface waste discharge permit which is described in the marina section of this report. The Freeport WWTP is a secondary treatment plant constructed in 1976, located on the western shore of the Harraseeket River estuary, approximately 1.5 miles (2.4 kilometers) upstream of the estuary's mouth on Casco Bay. The facility has a design flow of 750,000 gpd. The outfall is a single underground pipe extending out into the Harraseeket River estuary approximately 300 feet (91 meters) ending with three multiple port diffuser forks. There is approximately 10 feet (3 meters) of water over the diffusers at low tide as determined by field crews during a dye study performed in 2004 by using the boat echo sounder.



Disinfection in the chlorine contact chamber is achieved with liquid sodium hypochlorite and sodium bisulfite for dechlorination. Chlorine and dechlorination injection pumps are flow proportioned, automatic with continuous signals from the effluent flow meter. Under normal flow operating condition, the average contact time through the chlorine contact chamber is two hours. The chlorine residual limits in the NPDES permitted discharge is 0.1ppm. Fecal coliform testing on the dechlorinated effluent is performed twice a week on site using the membrane filtration method.

The plant is staffed Monday-Friday, 6am-5pm, and checked every morning for 1-2 hours on the weekends. Plant operators are on-call 24 hrs/day in the event of a problem or alarm at the plant. Alarms are triggered by loss of power, abnormally high flows, and changes in chlorine residual, and are tied into the police station dispatch. The police dispatcher notifies the plant operator on-call.

Storm water has been separated from the sewage collection system through pipe replacement over the years. There is still some infiltration from old clay pipes in town and from sump pumps. There are no combined sewer overflows as well as no bypass capability at the plant. There are ten pump stations in town with no overflow pipes. All pump stations have dual pumps, plus four stations have standby power. All pump stations have telemetry alarms for power failure and high water.

The size of the prohibited, conditionally restricted, and conditionally approved areas in the Harraseeket River were determined by the 2004 Freeport Dye Study. The complete dye study can be found in the central files.

In December 1997, the Town of Brunswick submitted an application to the Department to install, operate and maintain a sub-surface wastewater disposal system serving 34 residential lots, 21 seasonal, 13 year-round, on the Mere Point Peninsula in the Town of Brunswick. The Mere Point Subsurface Waste Water Disposal System is a community system serving a total of 34 residential lots; 21 seasonal and 13 year-round residences in the Mere Point Community. Sanitary waste water is treated by nine (9) subsurface waste water disposal systems. Total system design capacity is 11,000 gallons per day. Wastewater generated prior to that date was treated by individual septic systems that had a history of malfunctions and inadequately treated wastewater disposal.

On March 3, 1998 the DEP issued WDL #W008015-58-A-N which authorized the Town of Brunswick to discharge 11,000 gallons per day of wastewater to the ground water via a community subsurface system (Mere Point Colony Subsurface Wastewater System). WDL #W008015-58-A-N expired on March 3, 2003. On June 11, 2003 the DEP issued WDL #W008015-5L-B-R which again authorized the licensee to discharge 11,000 gallons per day of waste water to the groundwater via a community subsurface system. Currently, the permit is up for renewal and is in the comment period. One potential major change being considered by the licensee is to add an additional user to the system. The licensee is considering several options in order to accommodate the additional flows.

Currently, nine subsurface systems treat the sanitary waste water via 750- to 2,000-gallon septic tanks and nine individual leach fields. Effluent from the septic tanks is conveyed to the subsurface systems via 13 pump stations. In some systems, septic tank effluent is filtered via sand filters and the filtrate is then conveyed to the pump station and leach field. The nine



subsurface systems are collectively designed to accommodate a daily maximum total flow of 11,160 gallons. Weekly flow data collected during the summer of 2007 indicated an average daily flow of 4,570 gallons, or 43% of system capacity. A peak daily system flow was estimated to be 6,179 gallons, or 56% of design capacity.

Four of the residential entities discharge to a common pump station which then discharges to a common 8,000-gallon holding tank. The tank is pumped out as needed, typically weekly, and its contents disposed of at the Brunswick Sewer District's Waste Water Treatment Plant. The licensee has indicated a major potential change to the system involving the extension of one pumping station force main approximately 1,000 linear feet to the distribution box for disposal to "Field #2," thereby bypassing the 8,000-gallon holding tank. This project will involve adding two additional users to this system. The licensee noted that this change to the system was anticipated during the design and construction of Field #2.

The licensee indicates the possibility, at peak flow, that the disposal field experienced higher than design flow over the previous two years. Except for the summer of 2007, all of the licensee's peak data use was based on one reading per month. The licensee further states that the weekly readings for 2007 showed no exceedences of the daily design capacity for any of the systems and that a disposal field assessment by Albert Frick and Associates, Inc., noted the disposal fields were in "excellent condition" and the systems exhibited very little or no organic mat build-up and/or wastewater ponding.

The collection system consists of 4-inch and 6-inch ductile iron gravity sewers, pump stations, and 2-inch force mains. The wastewater is collected through the gravity sewers to pump stations where the waste water is pumped to the subsurface disposal systems. There are approximately 1,300 linear feet of ductile iron sewer systems, 5,500 linear feet of force main, 11 duplex pump stations and 2 simplex pump stations. There are no known combined sewer overflow points in the system. The treatment facility is not authorized to accept septage. "Septage" shall mean any waste; refuse, effluent; sludge or other materials removed from a septic tank, cesspool, vault privy or similar source which concentrates wastes or to which chemicals have been added. The licensee pumps septage from the subsurface system septic tanks if the scum and sludge layers combined are equal to or greater than one-third of the tank volume.

Stormwater

Stormwater runoff is generated from land surfaces and impervious areas including paved streets, parking lots, and building rooftops, during rainfall and snow melting events. This runoff can contain pollutants in quantities that can adversely affect water quality. Stormwater pollution is caused by the daily activities of people within the watershed. Rain and snowmelt water run off streets, lawns, farms, and construction and industrial sites and pick up fertilizers, dirt, pesticides, oil and grease, and many other pollutants on the way to our rivers, lakes, and coastal waters. Stormwater runoff is a contributor to coastal water pollution, often termed "non-point source pollution".

The U.S. EPA promulgated Phase I of the stormwater management program in 1990 under the authority of the Clean Water Act. Under this program, permitting is required through the National Pollution Discharge Elimination System (NPDES). The Phase I program covered three categories of discharges: (1) "medium" and "large" Municipal Separate Storm Sewer Systems



(MS4s) generally serving populations over 100,000, (2) construction activity disturbing 5 acres of land or greater and (3) ten categories of industrial activity.

Phase II of the stormwater management program is the next step in the EPA's effort to preserve, protect, and improve the Nation's surface water resources from polluted storm water runoff. The Phase II program expands the Phase I program to include all urbanized areas and smaller construction sites. Although it is a federal program, the Phase II Stormwater permit is issued and regulated by the Maine DEP (Chapter 500 and 502). Under the MS4 regulations, a municipality must implement the following six Minimum Control Measures: (1) Public education and outreach, (2) Public participation, (3) Illicit discharge detection and elimination, (4) Construction site storm water runoff control, (5) Post-construction stormwater management, and (6) Pollution prevention/good housekeeping. The permit requires the Town to develop a draft Stormwater Management Plan by September 3, 2003 that will establish measurable goals for each of the Minimum Control Measures. The Town will also need to document the implementation of the Plan, and provide annual reports to the Maine DEP. The only town within the WJ boundary regulated by the Phase II permit requirements is Freeport.

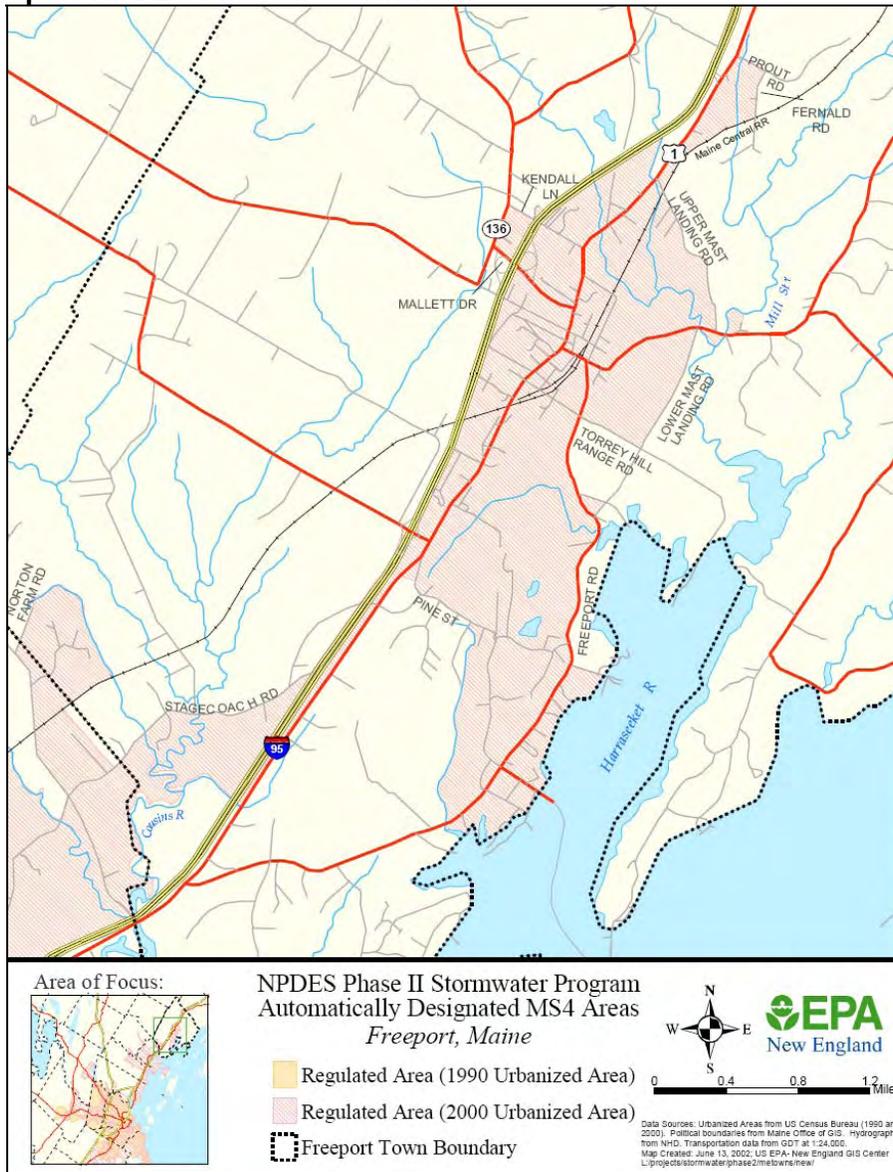
Maine DEP reports that there is a relationship between the percent impervious area of a watershed, and the water quality of the waterbody to which the watershed drains. In Maine, no streams with greater than 10% imperviousness that have been evaluated for attainment of aquatic life standards have met federal Clean Water Act standards. Two means of identifying "at risk" streams are by using monitoring data, when available, and by using the imperviousness of the watershed as an indicator. In broad terms, a stream is considered at risk if it is not currently meeting standards, or is at risk of degradation based upon the percent of its watershed that is impervious. Most urban streams do not meet the highest standards. A stream is considered "impaired" if it is not meeting one or more of the water quality standards under the federal Clean Water Act.

"Imperviousness" refers to the area of roads, parking lots, sidewalks, rooftops, and other impermeable areas in the watershed. The percentage of the watershed that is impervious can be used as an indicator to measure the impact of land development on aquatic systems. Maine DEP has studied numerous streams in Maine in order to determine whether the effectiveness of the impervious cover indicator. No streams with watersheds of over 10% imperviousness, which have been examined in Maine, have been found to meet Class B federal Clean Water Act standards. In other words, all have shown detrimental impact to the aquatic community of the stream. Growth in watersheds below 10% can be expected to result in detrimental impacts on streams as imperviousness approaches 10%, unless steps are taken to control the quantity and quality impacts from stormwater runoff.

In Freeport, only the designated "urbanized area" is formally regulated under the Phase II Stormwater program (Figure 5). Permit requirements are only enforceable in the regulated area but are encouraged throughout the entire town. Freeport also has two urban impaired stream watersheds listed in Chapter 502 Stormwater Management Rules; Concord Gully Brook and Frost Gully Brook both of which drain into the upper western branch of the Harraseeket River as illustrated in Figure 7. Figure 3 illustrates Concord Gully Brook's imperviousness in the 10-15% range; above the 10% range which can be expected to have detrimental impacts on water quality from stormwater runoff. In the same figure, Frost Gully Brook violates attainment status due to urban effects with violations of bacteria and dissolved oxygen standards. Additional information on the results of the bacterial Total Maximum Daily Load (TMDL) report are discussed in the streams section of this report.



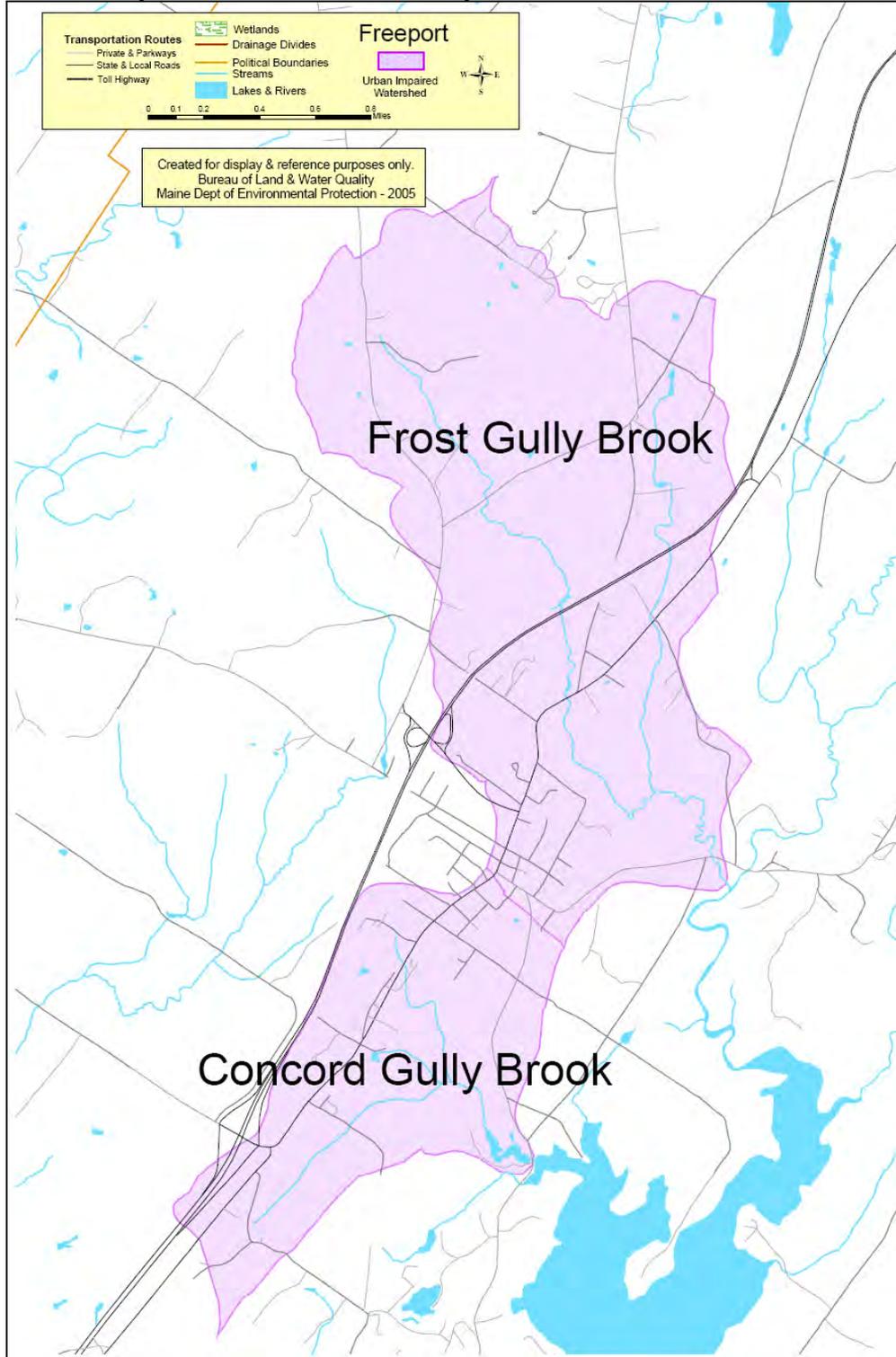
Figure 5. Freeport NPDES Phase II Stormwater



Map courtesy of Town of Freeport

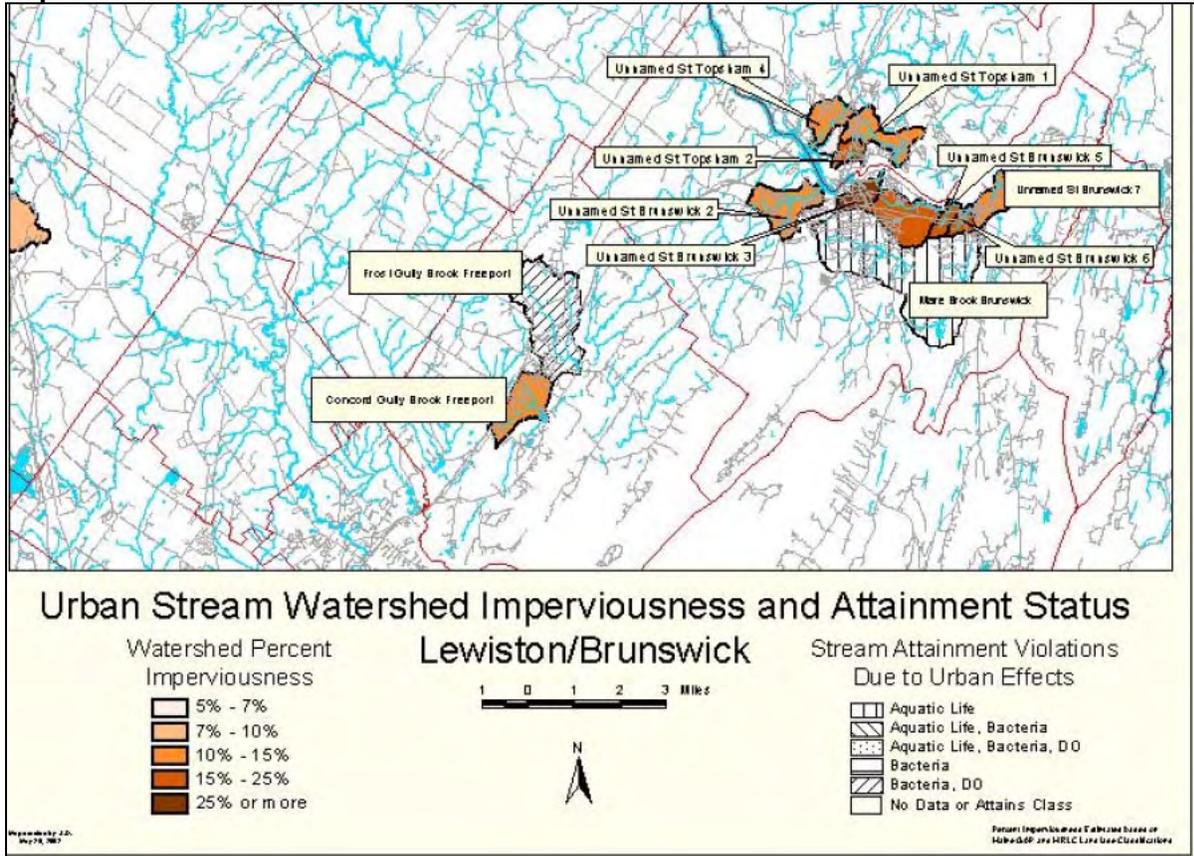


Figure 6. Frost Gully Brook and Concord Gully Brook Watershed



Map courtesy of Maine DEP

Figure 7. Frost Gully Brook and Concord Gully Brook, Freeport Attainment Status and Imperviousness



Map courtesy of Maine DEP

The other two towns within the WJ boundary are Brunswick and Harpswell; these towns are not designated under the Phase II Stormwater permit or MS4 regulations. Harpswell has no stormwater collection system. According to Ferwerda et. al., the northern portion of the town of Harpswell's soil in WJ is comprised of a Dixfield – Colonel-Lyman-Brayton soil mix. The soil in the southern portion of Harpswell in area WJ is a mix of Lyman-Tunbridge-Dixfield. The mix in the northern part of Harpswell, which is similar to the Brunswick soil composition consists of very deep, moderate to poorly drained coarse loamy to coarse sandy soils with moderate permeability. Depth to bedrock is in the range of 10-20 inches and the slope ranges from 0 – 80 percent. The soil mix composition in the southern portion of Harpswell consists of deep (10-40 inches to bedrock), moderate to excessive drained soils. The slope range is 3-80 percent. Stormwater in these areas would percolate moderately to quickly depending on soil depth above the bedrock layer on steep slopes to the coastal waters.

Brunswick has a stormwater collection system and there are two areas of concern within the WJ boundary; four catch basins in the Bunganuc Stream area (Figure 8) and 7 catch basins in the Wharton Point area of Maquoit Bay (Figure 9).



Figure 8. Catch Basins in Bunganuc Area of Brunswick

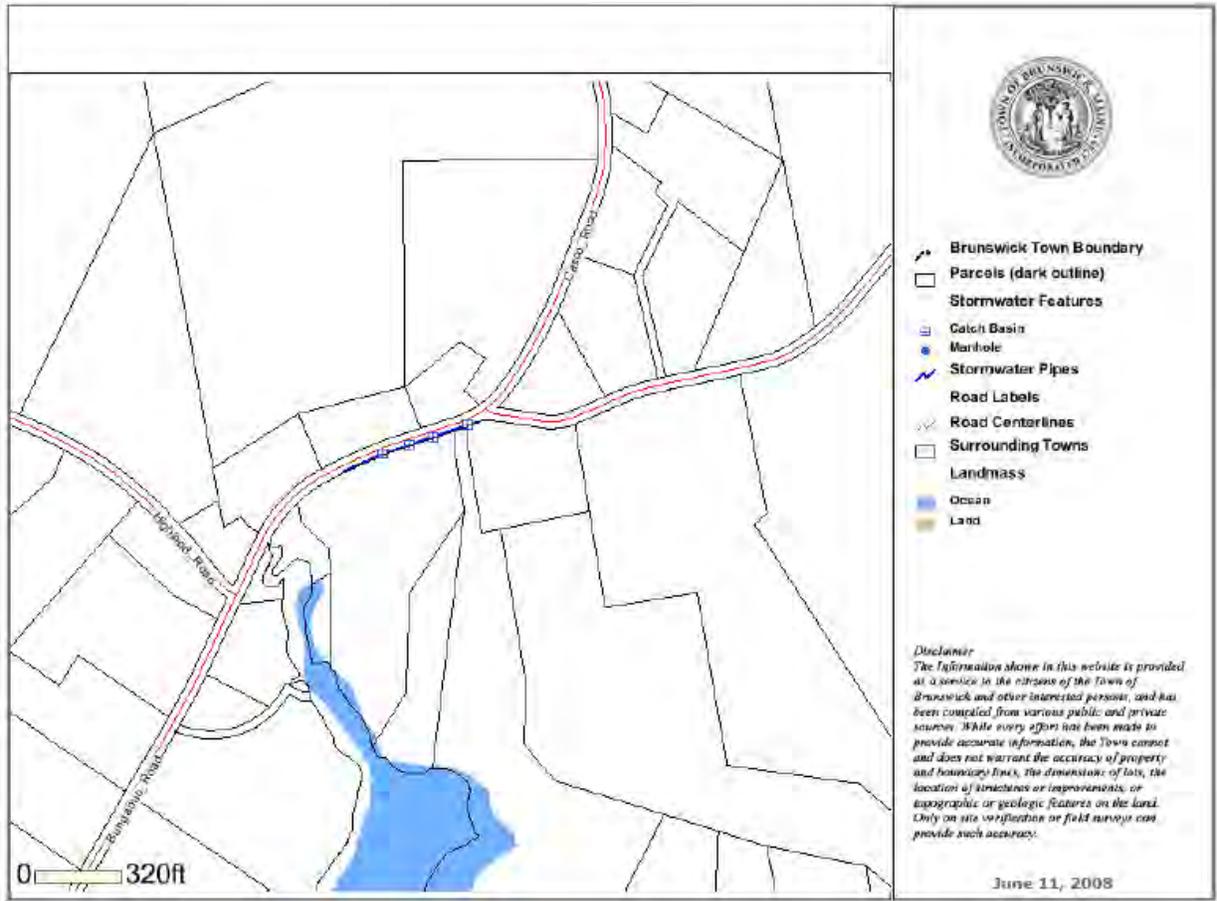


Figure 9. Catch Basins at Wharton Point area of Maquoit Bay, Brunswick

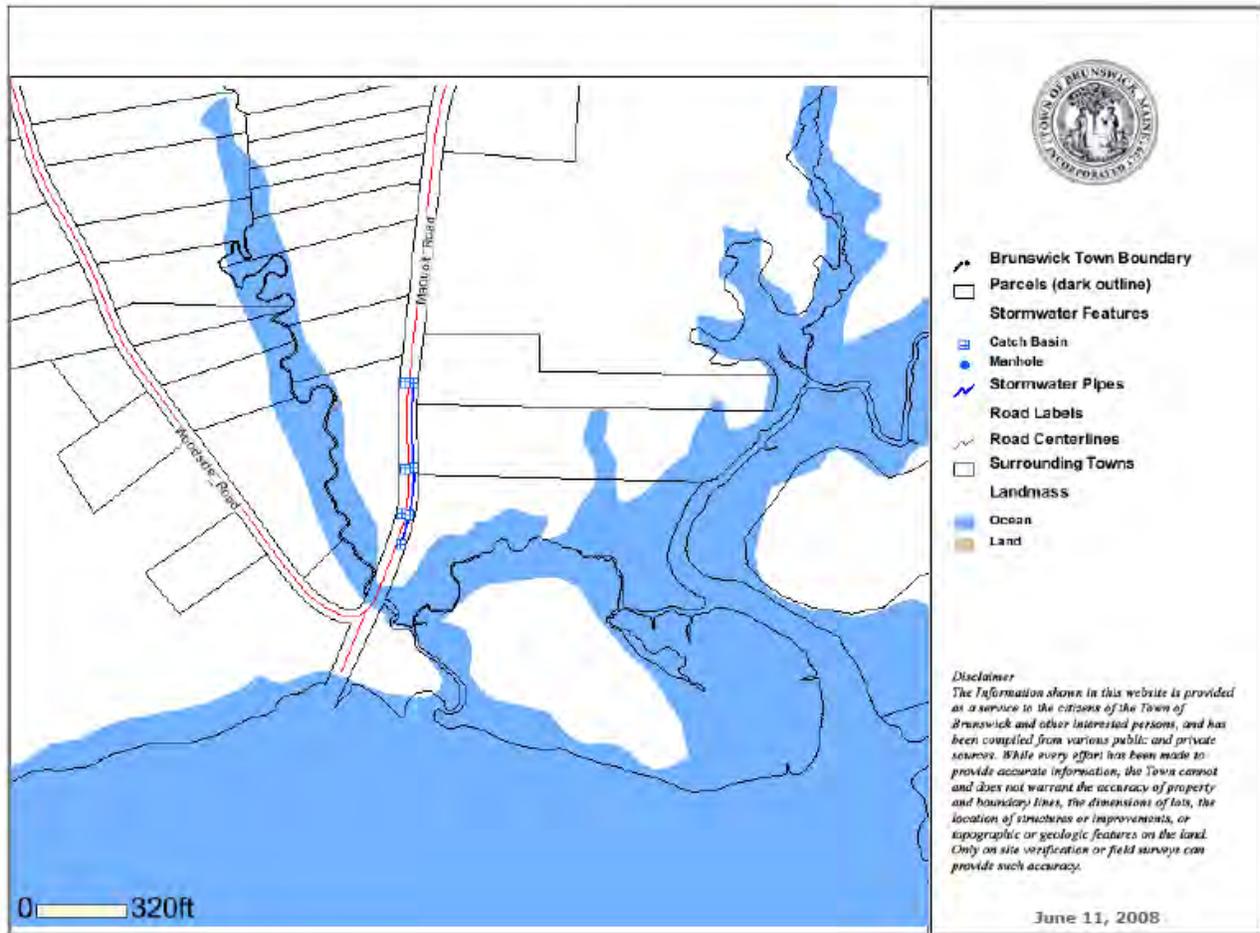


Figure 8 and 9 courtesy of Town of Brunswick

The Town of Brunswick's Public Works Engineer reports that the catch basins on Casco Road and on Maquoit Road were put in place to control stormwater runoff. Prior to installation, stormwater runoff was eroding the roads which are relatively flat with steep ditches on each side at the bottom of steep banks. Installing the catch basins and controlling the rate of flow in the area has improved the erosion problem. At both sites stormwater piping ends in the ditches along the road well away from the shore or any conduit to the shore. The installation has not increased any stormwater in the area but rather has been installed to control the rate of runoff. The catch basins are cleaned out every year in the late spring/early summer time period. Vacuum trucks are used and the material removed from the catch basins is taken to a landfill or the sewage treatment plant.

Agricultural Waste

As part of this sanitary survey, agricultural activities and waste were evaluated; activities included animal farms, concentrations of animals at non-commercial farms, slaughterhouses, feed lots, educational facilities, individual property owners' pets, kennels, vegetable and fruit farms, and landscaping businesses. Growing area WJ has miles of pastoral farmland that is



used for grazing, hay production and commercial vegetable and farms that provide landscape materials.

The Wolfe Neck Farm, located at the head of Recompense Cove, is a 626 acres educational facility and uses best management practices to prevent animal wastes from running off into the cove. The Wolfe Neck Farm is one of 150 farms that lease fields to Pineland Farms, who coordinates the production of natural beef and provides educational opportunities. There are varying numbers of cows in the fields, changing weekly, and rotating through the various fields during the summer months. Cows are kept in the barn area on Burnett Road year round. MDMR met with the farm manager on June 15, 2007 to encourage best management practices and request the relocation of water and feed troughs to keep cows out of low areas. The farm not only moved the troughs, but also moved the manure pad back into the woods and away from the drainage gully that is monitored by Station WJ 18.6. On November 12, 2007, MDMR received a letter from the farm manager outlining six improvements:

- 1) Contracted to update the farm's nutrient management plan
- 2) Moved water troughs and mineral feeders away from drainage areas
- 3) Not stockpiling manure in the fields for the past two years (All manure has been kept at NRCS designed and approved concrete manure holding areas and spread on nutrient deficient fields to minimize runoff)
- 4) Fenced waterways and drainages that feed into the Little River to keep cattle away
- 5) Not overgrazing or overstocking fields, so there is higher vegetation for filtering
- 6) Resealed the outhouse storage tanks at Recompense Shore Campground to prevent leakage.

Mitchell Ledge Farm is located about 2 miles from downtown Freeport and is one of Freeport's largest working farms raising Belted Galloway cattle. The farm is 185 acres of pasture and hay fields, woodlands and stream wetlands. Kelsey Brook flows through the farm. In addition to farming cattle, extensive timber management occurs on the property. Each year sustainable tree harvesting projects take place. The location and activities on the farm would make this a potential indirect source of pollution into the upper Harraseeket River.

Tripping Gnome Farm, LLC was established in 2003 on a 30 acre parcel on Lupine Lane, Freeport. It is an alpaca farm with a herd of 60 alpacas in residence (23 June 2008). The fenced paddocks are set back from Kelsey Brook (>300ft) and there is a natural buffer. Manure is in the fields stacked in multiple piles around the property. They are not sited in low lying areas or in wet spots on the property. The manure piles are on flat areas and appeared to meet the recommended set back requirements of the Maine Department of Agriculture for Perennial Waterbodies of 300' when the water feature is down slope. Kelsey Brook is the closest perennial stream to the farm and drains to the Upper Harraseeket River. There is an indirect potential for impact of the manure after heavy rainfall or times when there is high runoff due to rapid snow melt or sustained rainfall.

Crystal Spring Farm comprises 322 acres of fields and forest located less than two miles from downtown Brunswick on both sides of Pleasant Hill Road. It is located in the drainage that terminates in Maquoit Bay. It was once a dairy farm and is now a community farm and Katahdin Hairsheep farm (since 2005). There are 2.5 miles of hiking and cross country ski trails on the property. In a May 2008 newsletter the Crystal Spring Farm reported that they had a very successful lambing season which yielded 76 lambs from 42 ewes. They do not use pesticides or herbicides on their pastures and utilize rotational grazing techniques. They also use their



fields for hay production. The location of the farm would make this a potential indirect source of pollution into Maquoit Bay.

Wildlife and Domestic Animals

The Mast Landing Sanctuary is a 167 acres bird and wildlife preserve located in Freeport, near Mill Stream; this facility is owned and managed by the Maine Audubon Society. The property has approximately 1500 feet of shore frontage at the head of the Harraseeket River. The facility is operated year-round, with peak visitor usage in June through September. This area is monitored by Station WJ 14.2. In Brunswick, migratory birds, resting over the winter months in Maquoit Bay, may have a seasonal impact on water quality at station WJ 33, which is classified conditionally approved and closed for harvesting from September 1 through March 31.

Domestic animals can be found at a number of locations in Growing Area WJ. There are two locations where horses and sheep are kept as pets. One property, located 500 feet from the head of Staples Cove in the Harraseeket River, has three horses. However, water quality at the head of Staples Cove, monitored by station WJ 1 meets the approved standard, and a sample taken from the stream that runs through the property had a score of 43 fc/100 ml. These scores indicate little or no impact of the horses on water quality at this location. Another property located north of station WJ 9.5, keeps six sheep, more than 100 feet from shore. The property and its drainage are near the boundary line of the prohibited and conditionally restricted areas.

Industrial Activity

Commissioned in 1954, the U.S. Navy Fuel Depot operated throughout the Cold War to supply fuel to the Brunswick Naval Air Station. In 1991, the Navy determined that it would be more economical to truck in fuel from Searsport and, on March 31, 1992, officially shut down the facility. The 1995 Defense Authorization Act authorized the conveyance of the property to the Town of Harpswell which renamed it the George J. Mitchell Field.

Mitchell Field is a 119.3-acre coastal site with deep-water pier and dock including 2,630 feet of shoreline on Middle Bay in Harpswell. The site is accessible by road from State-highway 123 (1410 Harpswell Neck Road). On-site there are approximately a dozen buildings of 1950's era vintage and a water storage tank with a 100,000-gallon capacity. Paved roads lead from the highway access point to the waterfront. Approximately 40 acres are heavily wooded, the remainder of the property is open space. The property remains undeveloped and is listed with the Maine DEP as a Formerly Utilized Defense Site (FUD) with the unique identifier of D01ME0498 and a listing number assigned by DEP of REM01490. The DEP Bureau of Remediation and Waste Management has the site listed under the programs; Uncontrolled Sites, Federal Facilities and Brownfields with the status for all three listed as "in review" which means that DEP staff members are currently reviewing information related to ultimate resolution of issues at the site.

The Army Corps of Engineers (ACE) has been authorized by the Department of Defense (DOD) to "reduce, in a timely and cost effective manner, the risk to human health and the environment resulting from past DOD activities at formerly used properties". By definition, military property closed and transferred prior to 1984 are FUDS. The FUD listing gives the property a



“categorical exclusion” from remediation if the site is to be used for such things as a cemetery or Armed Forces recruiting; any other development opportunities on the property must include remediation.

The area is sandy bottomed with ledge and boulders interspersed in the intertidal zone. The area begins at the north end of Curtis Cove and runs to the unnamed point immediately north of the wharf. The Maine DEP conducted toxics monitoring in 1988 on mussels in the area (Figure 1). Maine DEP reported that mussels were rare, possibly because this is a high-energy area exposed to southwest winds and a long unprotected fetch. The mussels were tested for cadmium, chromium, copper, lead, mercury, nickel, zinc and iron and concentrations were within the normal range.

Figure 10. Maine DEP sample site for metals at decommissioned U.S. Navy Fuel Depot

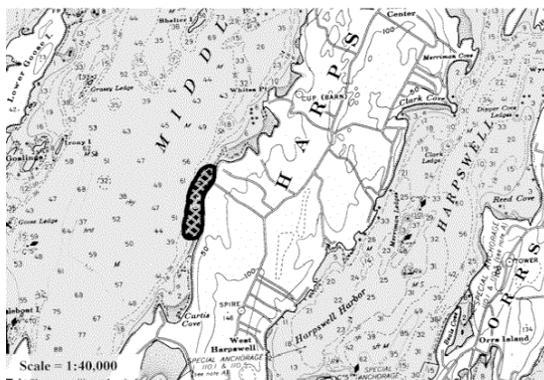


Chart courtesy of Maine DEP

There is a privately owned airstrip, Farr Field Airport located just south of Birchmere Lane in South Harpswell on Harpswell Neck on Middle Bay. The runway is 1900 x 100 ft and no other services are offered. There is no fuel, no tower and no repair facility located at this airstrip.

Marinas

Under the NSSP, any shellfish growing area within the confines of a marina proper or mooring field is presumed to be contaminated for some period of time. Therefore, no growing area within the marina proper can be classified approved. The classifications available for marina areas are conditionally approved, conditionally restricted and prohibited. The microbiological and chemical contamination associated with marinas and marina facilities may result in the contamination of shellfish and sediments in the adjacent areas. The NSSP has developed a set of evaluation criteria to be used in determining if the shellfish growing areas adjacent to marinas and mooring fields are affected by contamination associated with sewage.

The NSSP defines ‘marinas’ as an area that has 10 or more boats with heads. Each mooring field and marina in the growing area must be evaluated. Marina performance standards must be assessed annually utilizing the DMR developed evaluation form and a review of existing performance standards for those marinas that are in conditionally approved and conditionally restricted areas. The sanitary survey and triennial reviews require a marina inspection. A marina or mooring field that is in a conditional area must be inspected (and documented) prior to the area closing and opening to assure that the conditions of the management plan are met.



Marina closure zone calculations are completed using the information from the inspection to input into a DMR model which was developed using the NSSP volumetric calculations. s

The marina community in Maine only operates for a portion of the year due to adverse winter weather conditions. The management of marinas in Maine allows for shellfish growing areas to be available to harvesters for at least a portion of the year, to direct market harvest, by utilizing conditional area management plans.

There are two No Discharge Areas (NDAs) in Maine; Casco Bay and the Harraseeket River in Freeport. Casco Bay is administered by DEP and the Harraseeket River is administered by the Town of Freeport. Additional details on both NDAs will be discussed in this section; the Casco Bay NDA under this heading and the Harraseeket River NDA under the Freeport section.

DEP's process for identifying areas and meeting application requirements for requesting the approval of NDAs from the federal EPA was established in Public Law 1999, chapter 655, An Act to Rid Maine's Waters of Ocean Vessel Sewage. The law was effective August 11, 2000. DEP submitted and had EPA accept an application to designate Casco Bay as a NDA which has been in effect since July 2006. The area included in the no discharge designation includes all contiguous waters north and east of Cape Elizabeth Light in Cape Elizabeth, to a point at Bald Point in Phippsburg. The area also includes the navigable reaches of the Fore River, Presumpscot River, Royal River, Cousins River, Harraseeket River, and the New Meadows River. Maquoit Bay, Merepoint Bay and Middle Bay are included in this NDA.

Currently, the DEP is working with a stakeholder group to develop and implement education and outreach. NDA signage is being posted in the summer of 2008. Compliance is normally managed two ways. First, the State, marina operators, local authorities, and environmental groups all work together to educate boaters on the impacts of improperly managed sewage. Cooperation and voluntary compliance is key. Boaters themselves are the best advocates for NDA compliance. Second, the State works with the Coast Guard (who may delegate enforcement authority), State law enforcement, and local harbor masters on local strategies appropriate for the area.

The DEP has been authorized by the U.S. Fish and Wildlife Service to administer the Pump-out Grant Program, part of the recently re-authorized Clean Vessel Act. The purpose of the Clean Vessel Act is to reduce the pollution from recreational vessels by providing a safe and legal method for disposing of human sanitary waste. Improperly disposed waste from malfunctioning or non-existent marine sanitation devices (MSDs) often causes serious water quality problems throughout Maine. Through the Maine Coastal Pump-out Grant Program, DEP hopes to better: define the number of boats with installed MSDs, determine whether the average MSDs are operable and whether they are actually used; determine why they are not used; and eliminate the barriers to proper MSD use. The goals are to provide adequate holding tank pump-out locations along the entire coast, further improving accessibility to pump-out facilities by locating mobile pump-out vessels in strategic locations along the coast, and educating the boating public on the importance of responsible sanitary waste management. There are currently 6 pump out stations in area WJ; one of the six is a pump out boat which is operated by the Friends of Casco Bay.



Freeport

The Town of Freeport Coastal Waters Ordinance was updated on June 5, 2007 to include Chapter 31, Article V, (3.)(h)(i), which states that all boaters granted a mooring assignment within Freeport must provide the following:

A signed consent from the applicant attached to the application allowing the Harbormaster, at any time the boat is occupied, to board and inspect any tanks, valves, pumps and lines, including but not limited to, "Y" valves and electric systems such as Electra San, to insure such tanks, valves, systems, etc. are not set in a position that would allow the discharge of sanitary wastes into a Freeport anchorage.

The Freeport Harbormaster inspects all vessels that come into port and vessels while in port to assure that the No Discharge Zone is enforced. The harbormaster also must, under the ordinance, maintain a file on each mooring, listing the date of the last inspection and the name of the person who performed the inspection. Any boat owner anchoring in Freeport harbor (Harraseeket River) under the ordinance [Article V. (15)(b)] (b); "must provide a signed consent allowing the Harbormaster, at any time the boat is occupied, to board and inspect any tanks, valves, pumps and lines, including, but not limited to "Y" valves and electric systems such as Electra San, to insure such tanks, valves, systems, etc. are not set in a position that would allow the discharge of sanitary wastes into a Freeport anchorage."

Due to the efforts of the Freeport Harbormaster the marina conditional area in the Harraseeket River is provided as a security for the potential for contamination from fuel and oil contaminants which may result from the marina proper. The harbormaster provides any information requested by the department and contacts the department if there are any problems.

From an interview with the harbormaster June 10, 2008 and the marina owners at Strout's Marina and Brewer's Marina on June 6, 2008, it was determined that the harbormaster manages all of the moorings and slips in the Harraseeket River. There are 365 moorings and 210 slips. According to the harbormaster, 100 boats on moorings have heads and 60 boats at slips have heads. A marina calculation, which can be found in the central files, shows that 206 acres are needed to dilute the potential pollution from 160 boats with heads. Assuming that only 75% of the boats are being used at any given time, the closed area around the boats should be 155 acres. The conditionally approved area around the marina is 251 acres and is closed when the boats are in the water from May 1 through November 30.

The Harraseeket Yacht Club (HYC) has an extensive float and dinghy tie system, a wharf and a clubhouse. HYC has one guest mooring that will not take a vessel larger than 30ft. Anchoring is not permitted and moorings can be obtained through Brewer's South Freeport Marine.

Strouts Point Wharf Company is in South Freeport. The company offers full repair services, marine travel lift, dock store/chandlery, overnight dockage, moorings and gas/diesel. The newly upgraded (post 2004) dock system is held in place with a special mooring system and is designed for year round use. The dock system is Maine's first year-round dock system. Freeport Town Wharf has limited docking space for day use. They do provide spaces for dinghy tie up for commercial fishermen.



Brewers South Freeport Marine is a full service yacht yard with the amenities of a marina. The marina features floating docks which provide water and electric to 110 seasonal slips. The 15 seasonal moorings and 8 average available transient slips are serviced by a courtesy launch. There is 14' of water at the docks at mean low water. There is a gas/diesel fuel dock and a sewage pump out available. There are on site heads and showers, laundry, ships store, sail loft and canvas shop. Brewer's is a full service repair facility for all types of boats. They are equipped with a travel lift, trailer and crane.

Falls Point Marine is at Porter's Landing (also known locally as Dunning Boat Yard) in the northwest corner of the Harraseeket River. Falls Point Marine builds and services custom docks and piers. They have both land and water side crane capabilities. Their crane barge delivers and installs moorings and carries freight to the Casco Bay islands. Falls Point Marine sells, installs and services all types of moorings and has diving services. They do not offer fueling services at the facility.

Dunning's Boat Yard is at the same physical location as Falls Point Marine but it is a public boat launch only. There are no amenities except for short term parking. Porter's Landing is a public dock which is only available at high tide at the end of Cove Road, Freeport. There is limited short term parking and no other amenities. Winslow Park at Stockbridge Point is a public boat launch which is only available at high tide. There is handicapped access, short term parking and long term parking with the permission of the park.

Brunswick

From an interview with the marina owner on June 9, 2008, Paul's Marina, located on the east side of Merepoint Neck, provides moorings for a number of recreational and work boats during the summer months. Services provided by the marina include gasoline, marine hardware and supplies, parking, pump-out barge that is emptied by a septage truck, portapotties, snack bar, launching, and electricity and water to the dock. The marina operates from April 1 to October 1, with the peak usage from June 15 to September 15. They have 140 moorings and no slips. They have dockage for dinghies and skiffs, but the depth of water near shore precludes having any large craft at the dock during low tide. Of the 140 boats on moorings, 56 of them, or 40%, have heads. The marina calculation, which can be found in the central files, shows that 81 acres is needed to dilute potential pollution from 56 boats with heads. Assuming that only 75% of the boats are being used at any given time, the closed area needs to be 61 acres. The conditionally approved area around the marina is 117 acres and is closed when the boats are in the water from April 15 through October 31.

Paul's Marina also has an experimental waste discharge permit under the DEP (W008209-88-A-N) for a subsurface discharge of treated boat wash water to groundwater which was issued in 2004 and will be up for renewal in 2009. The estimated daily volume of the discharge is 450 gallons per day (gpd) from mid-August until mid-November. The wash water will receive treatment from an experimental treatment system consisting of two layers of filter fabric, meeting particular specifications, sandwiching a minimum 12" layer of coarsely ground limestone. The treatment system will be built into the ground underneath the boat wash down area in a manner to completely capture all wash water. The wash water will flow through the in-situ treatment system and be discharged into the groundwater.



The discharge currently receives treatment through a collection system and with hay bales filtration. The wash water is collected in the wash down area and flows through the hay bales to remove the particulates before being discharge to the ground. The proposed system incorporates elements that have been demonstrated by the DEP to remove 94-98% of the pollutants in typical boat wash water. As designed, the proposed system will reduce pollutants in the wash water to below drinking water standards. Therefore, the treatment system, as proposed, constitutes Best Practicable Treatment. This experimental subsurface groundwater discharge is a potential indirect pollution source.

Cleaning of engines or engine areas, or use of the collection and treatment system for uses other than originally intended, is prohibited. Cleaning of engines, engine rooms, or other areas on boats that may contain significant amounts of oils or fuels shall not be conducted in the wash down area unless the wash water from that process is captured separately and disposed of properly.

Smith Boatyard is a boat repair facility. They have a launch ramp and Brownell trailer.

The Mere Point Yacht Club and the Sea Point Land Company are located at the end of Mere Point and are a part of a private residential community. The Brunswick Harbor Master visited the property the week of July 7, 2008 and reported that there was one boat in the water and only 7 moorings.

Brunswick has the following boat launch/landings in growing area WJ:

- Barnes Landing - Old Pennellville Rd: Carry-in/Carry-out - half tide only.
- Simpson Point Landing - Simpson Pt. Road: Trailer Facility - half tide only.
- Wharton Point Landing - Maquoit Road: Trailer Facility - half tide only.

The Town of Brunswick has a new harbormaster that started work in 2007. He is currently in the process of developing a harbor management plan which will include the identification and documentation of every boat moored in the Town, the location, type, owner, head/no head, etc.

Harpswell

Dolphin Marina is located on the east side of Basin Point. From an interview with the owner, the marina operates from April 1 through November 30 with a peak season from June through September. They have 120 moorings and 15 slips, according to the Harpswell Harbormaster and 90, or 75%, have heads. The marina provides fuel and a portapotty on shore. There is no pump out facility, but boat owners are given information about calling for the Friends of Casco Bay pump out boat. The marina calculation, which can be found in the central files, indicates that 105 acres are needed to dilute potential pollution from 90 boats. Assuming that only 75% of the boats are being used at any given time, the closed area needs to be 79 acres. The area around the marina is 121 acres and is currently classified prohibited. It can be classified as conditionally approved and only closed from April 15 through October 30, based on past observations made during random sampling runs and shoreline surveys. A recommendation for an upgrade in classification can be found in the appendices.

Harpswell has several large mooring areas in the growing area and docks with fuel stations. The fuel stations will be documented and assessed for the next triennial evaluation.



Recreational Areas

The concern for actual or potential pollution from recreational areas is because many of them allow dogs and some having bathroom facilities. In and of themselves, they aren't a pollution source but activities at the recreational areas may contribute to water quality problems by placing added pressure on the watershed. For instance, they may contribute to erosion (trails, building footbridges, etc.), dog waste not picked up may accumulate and wash off after rainfall, new trails may be put into areas that didn't have human activity before and they may put added pressure on wildlife to congregate in other places where we may see water quality decline, etc. The mere presence of humans/dogs doesn't necessarily mean there is an actual pollution source, but it is a potential pollution source.

Wolfe Neck State Park is located on the western side of Recompense Cove. This a day use park with picnic tables, bathrooms (in ground septic system), and wooded hiking trails. Pets are permitted on leash and waste pickup is requested on signs. The park is home for numerous deer and raccoons and other common Maine wildlife. This area is monitored by Station WJ 17.5. At the head of Recompense Cove, is the Wolfe Neck Farm campground, which has 115 camp sites and three cottages along the shore of the cove. The campground provides outhouses near the sites, and there is also a shower building with flush toilets and laundry facilities located on the Burnett Road. This building has an approved in ground septic system located more than 500 feet from shore. New sampling stations, WJ 18.2 and 18.6, are located along the campground shore.

In 2007, the Freeport Land Trust purchased two conservation easements from Mitchell Ledge Farm to protect 130 acres of scenic pastures, hay fields, woodlands, streams and wetlands from future development or subdivision. The easements granted by the farm owners will also allow the Freeport Land Trust to create trails for public access through woods around farm fields and across Kelsey Brook, which runs through the property. The Land Trust has secured trail easements from abutting property owners that will soon, once the trail is created, make it possible to walk through the woods from Mitchell Ledge Farm to the Trust's Calderwood property on Maquoit Bay. One recommendation for the trail is to build four simple cedar bog bridges and a 3/16 foot simple deck bridge in order for the trail to cross Kelsey Brook.

Crystal Spring Farm was detailed in the agricultural section of this report. It has 2.5 miles of hiking and cross country ski trails on the property.

The Captain Alfred Skolfield Nature Preserve is an 11-acre preserve owned and maintained by the Brunswick – Topsham Land Trust and is located on Harpswell Neck between Middle Bay and Harpswell coves, just north of the Brunswick-Harpswell town line. The salt marsh and mudflats of Middle Bay Cove attract many resident and migrating waterfowl and several species of migrating shorebirds. This preserve also has trails for public use.

Skolfield Shores Preserve in Harpswell consists of 19 acres with 4,400 ft. of shoreline overlooking Middle Bay Cove, and has trails for public use. Two trail loops wind through forest habitat and provide views of the cove, the saltwater marsh separating Brunswick and Harpswell, and the fields of Merruconeagan Farm; a side trail leads down to the shore. The Harpswell Heritage Land Trust reports that the Preserve contains valuable habitat for many Maine species



of birds, fish and trees. The U.S. Fish and Wildlife Service predicts that the preserve provides habitat for 40 of the 64 declining species of migratory birds, anadromous fish and federally endangered or threatened species in the Gulf of Maine including, horseshoe crab, northern harrier, short-eared owl, bald eagle, roseate tern, osprey, American black duck, sanderling and meadowlark. The marshland around the preserve is especially valuable as a feeding and staging area during migration for shore and wading birds. There is public access to marked trails but is only open from dusk to dawn. No motor vehicles or bicycles are allowed. Dogs are allowed on a leash.

The 17-acre Charles Norton Easement in Harpswell is part of a 20-acre mix of forest and wetland running from the Harpswell Neck Road to 360 feet of shorefront on Wilson's Cove on Middle Bay. A 3-acre developed area near the shore is not included in the easement. A one-half mile trail leads from the small parking lot next to the Harpswell Neck Road to a cliff at the shore of Wilson's Cove. The cliff offers a scenic outlook onto Middle Bay. There is public access for pedestrian use only from dawn to dusk. Dogs are allowed on a leash only.

The Birch Island South Preserve, Harpswell is a wooded 43 acre parcel, on the southern part of the island, was acquired by the Harpswell Heritage Land Trust in 1988. Largely an interior property, it has some 1000 feet of shore frontage along Duck Cove on the east and very limited shorefront on Mere Point Bay to the west, and shorefront on a small cove at the extreme southern end. The Preserve remains in a substantially undisturbed natural state and is an active nesting area for osprey and other sea and shore birds, and the habitat of diverse indigenous flora and fauna. Public access is limited to members of the Birch Island South Association and the Birch Island Corporation or with written permission from the Harpswell Heritage Land Trust. No dogs are allowed.

The Nature Conservancy owns and manages 143 acres of Upper Goose Island as wildlife habitat. The island is closed to the public from March 15th to August 15th to protect its value as a bird-nesting site.

The Whaleboat Island Easement is a 120-acre island that is relatively low and flat, with most of it at an elevation of less than 40 feet. The island is about 1.5 miles long, and only 500 feet wide at its narrowest point. The center region of the island is low field and shrub land while the two ends are forested with higher elevations and rockier soil. It is the largest undeveloped island in Casco Bay. The northern half is completely wooded with a great variety of flora and fauna. The property is owned by Maine Coast Heritage Trust with an easement for the northern half of the island for the Harpswell Heritage Land Trust. There is public access to the island.

About 3 miles off the coast of Harpswell is Eagle Island State Historic Site which receives about 6,000 visitors each season who tour the summer home of North Pole Explorer Admiral Robert Peary. The island is void of any mechanical devices. The island is open daily from June 15 through Labor Day. The island is equipped with a pier and a hiking trail.

Streams

NOTE: 2007 was the first year that streams in growing area WJ were sampled as part of any review. Only streams that were easily accessible and flowing on the sampling day were sampled. This was a baseline assessment and additional stream assessment needs to be done in 2008.



Streams are a source of fresh water in Growing Area WJ in addition to snowmelt, overland runoff after rainfall and direct precipitation. Streams carry stormwater, snowmelt and groundwater into the coastal estuaries. Feces deposited on land can release pathogens into surface waters which are then carried to shellfish areas via runoff. Many freshwater streams empty into shellfish harvesting areas where fecal bacteria and viruses accumulate in sediments and can subsequently be re-suspended into the water column and therefore, filtered by the shellfish through respiration and feeding activities.

DMR stream sample results for 2007 and rainfall which occurred the day of sampling and within 72 hours of the sample date are presented. Rainfall data is from the Wolfe's Neck weather station available from:

<http://www.wunderground.com/weatherstation/WXDailyHistory.asp?ID=KMEFREEP1>.

Freeport

The Harraseeket River is a harbor embayment fed by Concord Gully Brook, Frost Gully Brook and Kelsey Brook. Little River is another major stream that flows into Recompense Cove. Many other small streams and seasonal or intermittent streams flow into Casco Bay in Freeport.

Frost Gully Brook and Concord Gully Brook are of particular concern in this area. The Frost Gully Brook watershed encompasses 9.8 square miles and the Concord Gully Brook watershed encompasses 2.9 square miles. Both streams flow adjacent to each other and empty into upper northwest Harraseeket River at Porter's Landing and Mast Landing, respectively. Frost Gully Brook, that drains the northern portion of Freeport's downtown area, runs into Mill Brook in the vicinity of Mast Landing and empties into Pettingill Cove. Both streams flow through a rural mix of forests and residential development and eventually flow through more urban, impervious areas including an interstate highway, retail/office complexes and parking lots. The DEP conducted a Bacteria Total Maximum Daily Load (TMDL) study and issued a report in June 2007 which states that both streams are relatively undeveloped in the riparian areas and have buffers that generally exceed 250 feet. Few houses or structures are visible along the stream banks and local walking trails exist along the lower portions of both streams. Both streams drain the village of Freeport and are affected by stormwater runoff (see Stormwater section of this report for more detail).

Both streams exceed Maine's standards for their respective water quality classifications as defined by the EPA and the Clean Water Act and are impaired by bacteria. Bacteria levels in Concord Gully and Frost Gully were monitored in the past through at least three separate studies, Gerber (1989), Metcalf and Eddy (1992), and a study conducted by the Cumberland County Soil and Water Conservation District (Guay, 2002). Measured fecal coliform levels from these studies ranged from 400 to 30,000 in Frost Gully Brook and exceeded 800 in Concord Gully Brook. In 2003 additional water quality parameters were collected in the impaired streams and the results are included in the Bacteria TMDL report (Evers, 2007). No point sources of pollution were identified during the TMDL study.

Maine DEP collaborated with the Jackson Estuarine Laboratory, at the University of New Hampshire, Durham, to identify the origin of bacterial contamination in stormwater and base flow using genetic fingerprinting or ribotyping technology (Jones, 2003). The goal of the ribotyping project was to establish the relationship between high levels of bacteria in the streams and potential sources of bacteria in the watershed. The results are in a report entitled, 'Ribotyping of *Escherichia coli* to Identify Sources of Fecal Contamination in Freeport, ME'



(Jones, 2003). Water samples were collected in Concord Gully and Frost Gully from July to November, 2002 on dates characterized by wet weather conditions. The source species for *E. coli* isolates from water samples were determined by comparison to a source species database made up of ribopatterns for *E. coli* isolates from host species found in the study area.

E. coli concentrations were relatively high (>64/100ml) in all water samples used for ribotyping studies. The range of concentrations in grab samples was 35-7060 *E. coli*/100ml, and in composite samples from the first flush runoff from 4400-17,200/100ml. All of the presumptive *E. coli* isolates yielded acceptable ribotype DNA patterns, and of the 291 isolate ribotyped, source species were identified for 174 isolates, or 60% of the total using the large regional database. Overall, the most significant source species identified was geese, followed by dogs, foxes, humans and seagulls, with low levels of identification for 15 other source species. Birds and pets, particularly geese and dogs, were the most commonly identified types of sources under the conditions of most concern: high runoff conditions, first flush samples and in samples with the highest (>427CFU/100ml) *E. coli* concentrations. Isolates from human sources were not commonly identified, but were slightly more prevalent in Frost Gully Brook. Wild animals, particularly foxes and deer, were consistently identified as sources in both areas, while livestock sources were rarely identified.

Pettingill Cove is located at the northern end of the Harraseeket River and receives freshwater input from two primary sources, Kelsey Brook to the northeast and Mill Brook to the northwest. Mill Brook drains a large area north of Mast Landing between Pleasant Hill Road and I-95. Frost Gully Brook, that drains the northern portion of Freeport's downtown area, runs into Mill Brook in the vicinity of Mast Landing. Kelsey Brook drains a large predominantly rural and agricultural area east of Pleasant Hill Road.

In addition to the TMDL study conducted by the DEP, the Casco Bay Estuary Partnership (CBEP) sponsored a study in 1999 and 2000 to study productive shellfish areas for non-point source pollution impacts. Field data and water sample collection by MER Assessment Corporation (MER) and fecal coliform analyses performed by the Maine Department of Marine Resources (DMR) water quality laboratory in Boothbay Harbor, Maine, were carried out in accordance with a Quality Assurance Project Plan (QAPP) submitted to and approved by the Environmental Protection Agency.

Sampling stations were established on Mill Brook and Frost Gully, respectively, just north of Pleasant Hill Road at Mast Landing; a Freeport sewage pumping station is located adjacent to one station. A second station was located on Kelsey Brook just below the culvert crossing beneath Flying Point Road. Sampling results for all three stations yielded geometric mean and 90th percentile MPN values well above the NSSP limits for approved standards, all with very high maximum (Table 6). As observed elsewhere, elevated levels of fecal coliform were generally associated with rain events, but high levels were also found at ML5 during dry weather. The blue highlighted dates indicate those with precipitation during the 24 hours before sample collection was moderate to heavy (>0.35"). The yellow highlighted dates indicate those sample dates with dry or very dry conditions in the 24 hours prior to sample collection. Cells with blanks or dashes (-) mean that a sample was not collected.



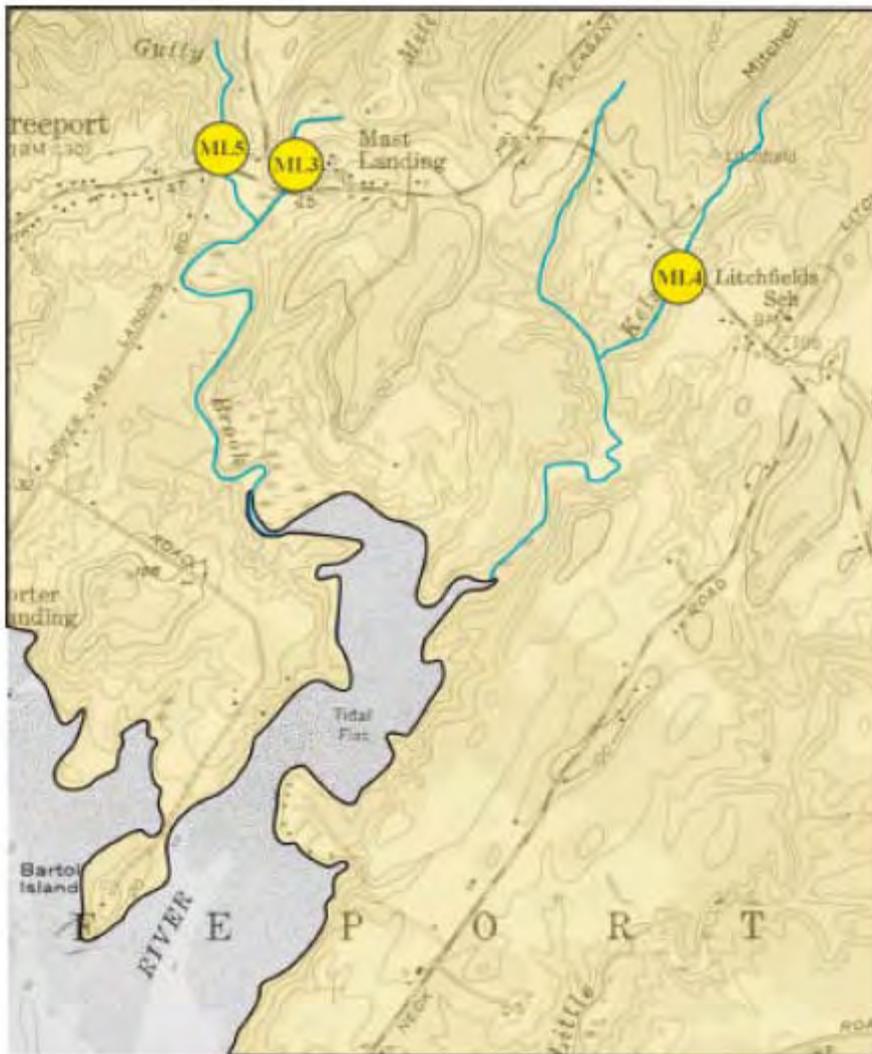
Table 6. Non-Point Source A-1 Fecal Coliform MPN Analysis Mast Landing/Kelsey Brook, Pettingill Cove, Freeport

Mast Landing/Kelsey Brook

Station	1999		2000		09/11	Geo Mean	Mean	Max	S.D.	90th
	07/20	06/29	07/25	07/28						
ML 3	460	23	43	1100	43	116.6	333.8	1100.0	416.8	815.3
ML 4	240	240	23	1100	23	127.4	325.2	1100.0	399.4	873.2
ML 5		23	43	150	1101	113.0	329.3	1101.0	448.2	749.1

Data courtesy of Normandeau Associates, Inc./Casco Bay Estuary Partnership

Figure 11. Non-Point Source A-1 Fecal Coliform MPN Analysis Mast Landing/Kelsey Brook, Pettingill Cove, Freeport CBEP Sample Station Locations



Map courtesy of Normandeau Associates, Inc./Casco Bay Estuary Partnership



In view of the magnitude of the fecal coliform levels found in the study samples and the size and complexity of the watersheds draining into Pettingill Cove, the CBEP decided to direct efforts elsewhere and the site was dropped from the study at the end of 2000.

The DMR sampled the same sites ML3, ML4 and ML5 in 2007 but were labeled 13, 15 and 12 respectively (Figure 12). Additionally, an intermittent stream/culvert was sampled as site 14 that was not sampled during the CBEP study. The four streams were sampled on June 5, June 24 and July 15, 2007. Sampling results for the 4 streams (Table 7.) confirm the continued presence of high sample scores which were identified in the DEP and CBEP studies. Elevated fecal coliform levels were found after rainfall (June 5 and July 15, 2007) and during periods of dry to very dry conditions (June 24, 2007). Potential sources of pollution on Kelsey Brook are farms, increased impervious surfaces due to subdivisions and increased recreational uses. Frost Gully Brook, which merges with Mill Stream before it drains into Pettingill Cove, is detailed in this section as impaired due to high bacteria counts due to a number of identified sources. Sample station 15 is located on Lupine Lane in Freeport where there is an alpaca farm.

Figure 12. DMR Stream Sample Location Map for Pettingill Cove Area

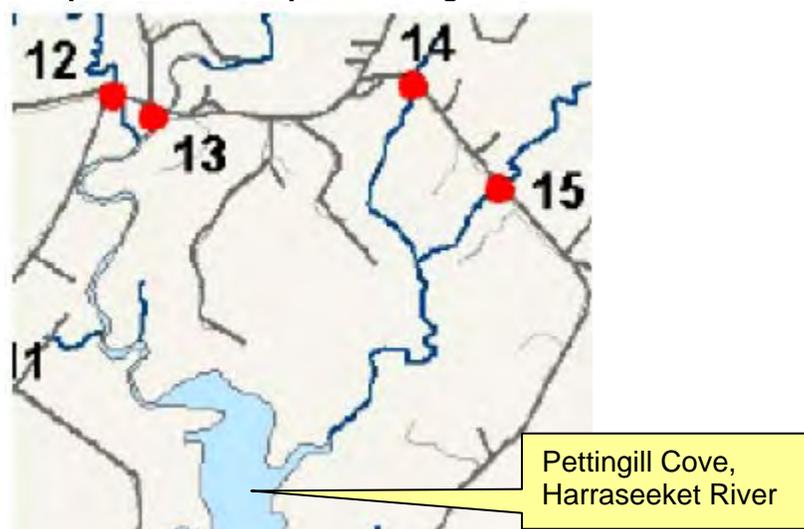


Table 7. DMR Stream Sample Results for Pettingill Cove Area 2007

Sample Date	Site	CFU/100ml	Rain on Sample Day	Rain 24hours	Rain 48hours	Rain 72hours
6/5/07	12	1700	0.24"	1.51"	0.24"	0.13"
	13	1700				
	14	68				
	15	1700				
6/24/07	12	8	0"	0"	0.04"	0"
	13	33				
	14	-				
	15	220				
7/15/07	12	72	0.46"	0.01"	0"	0.02"
	13	180				



Sample Date	Site	CFU/100ml	Rain on Sample Day	Rain 24hours	Rain 48hours	Rain 72hours
	14	-				
	15	-				

* Note: “-“ = sample not collected

The DMR sampled three sites in the Concord Gully Brook area which drains into the Harraseeket River at Porter Landing; sample sites 9 (pond at Porter’s Landing), 10 (Salt Brook at Porter’s Landing) and 11 (pond at Bartol Island) (Figure 13). The three streams were sampled on June 5, June 24 and July 15, 2007. Sampling results for the three streams (Table 8.) confirm the presence of high sample scores which were identified in the DEP TMDL study discussed earlier in this section. Elevated fecal coliform levels were found after rainfall (June 5 and July 15, 2007) and during periods of dry to very dry conditions (June 24, 2007).

Figure 13. DMR Stream Sample Location Map for Porter Landing Area

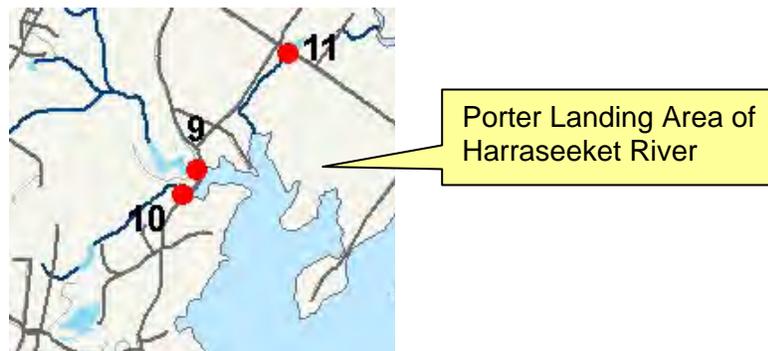


Table 8. DMR Stream Sample Results for Porter Landing Area 2007

Sample Date	Site	CFU/100ml	Rain on Sample Day	Rain 24hours	Rain 48hours	Rain 72hours
6/5/07	9	1700	0.24”	1.51”	0.24”	0.13”
	10	1500				
	11	1700				
6/24/07	9	13	0”	0”	0.04”	0”
	10	42				
	11	12				
7/15/07	9	15	0.46”	0.01”	0”	0.02”
	10	160				
	11	3.6				

The stream that enters Spar Cove, DMR site 8, on the western shore of the Harraseeket was sampled on the same dates that the other streams were sampled in the area. Elevated fecal coliform levels were found after rainfall (June 5 and July 15, 2007) and during periods of dry to very dry conditions (June 24, 2007) as illustrated in Table 6. An additional intermittent stream (which was not sampled) flows through a pasture which has cows fenced across the stream on the eastern side of South Freeport Rd. and <5 feet from the stream on both sides of the stream. A drive through survey conducted on June 23, 2008 documented the presence of 18 cows. The drive through survey also noted a few miles of pasture between Staples Point Rd and Hay Boat



Point Rd which comprises the shoreline of Spar Cove. The presence of cows in the pasture is evidence of potential indirect fecal contamination and may account for the elevated fecal scores after rainfall and during dry periods. Figure 14 illustrates the locations of the pastures, streams and the location of the cows. Figure 15 illustrates the location of the DMR stream sample site 8 and the location of the cows.

Table 9. DMR Stream Sample Results for Spar Cove Area 2007

Sample Date	Site	CFU/100ml	Rain on Sample Day	Rain 24hours	Rain 48hours	Rain 72hours
6/5/07	8	1500	0.24"	1.51"	0.24"	0.13"
6/24/07	8	38	0"	0"	0.04"	0"
7/15/07	8	130	0.46"	0.01"	0"	0.02"

Figure 14. Spar Cove Area of Harraseeket River

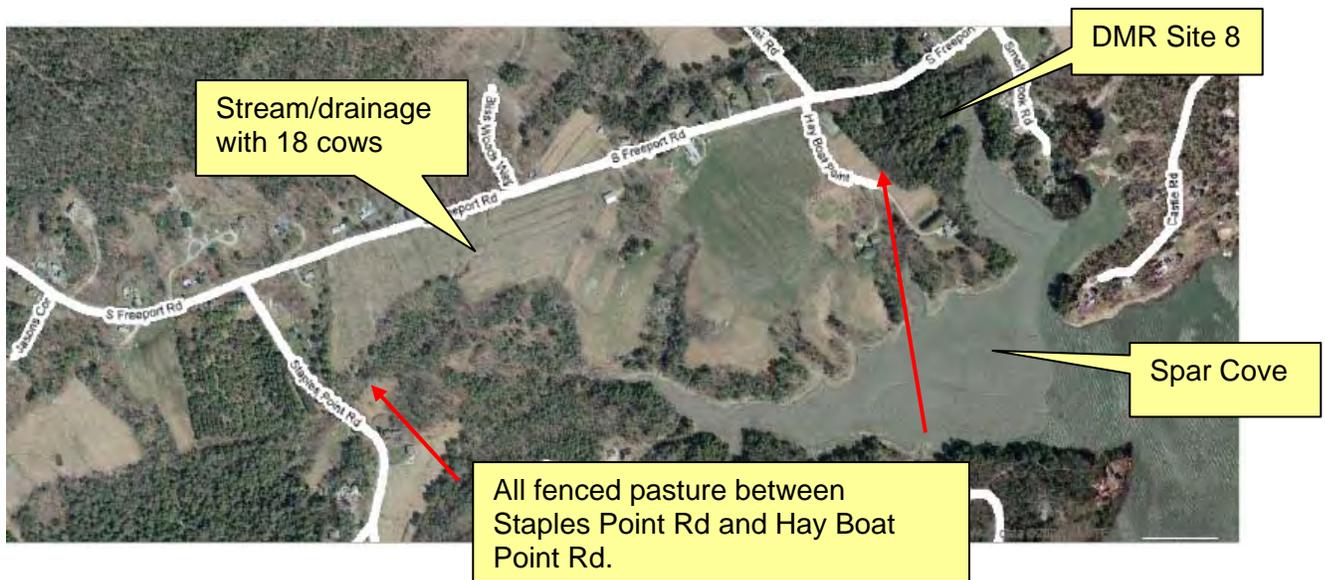


Figure 15. DMR Stream Sample in Spar Cove Area of Harraseeket River





DMR sample sites 17 (Little River Lane), 18 (Burnett Rd, western gully), 19 (Little River at Burnett Rd bridge), 20 (campground bridge) and 22 (Little River at Flying Point Rd) are all perennial or intermittent streams that impact Little River (which flows into Recompense Cove) or Recompense Cove directly. During the drive through survey on June 23, 2008, many pastures were noted along Burnett Road. See the Pollution Source maps for pasture and herd locations. The pastures (and cows) were not excluded from wet, low lying areas that drain to streams along Burnett Road which flow into Recompense Cove. Elevated fecal coliform levels were found after rainfall at all stations (June 5, 2007). The intermittent streams were not running during periods of dry to very dry conditions (June 24 and July 15, 2007) as illustrated in Table 10 below. Stream site 22 had elevated fecal coliform scores during dry periods and after rainfall. The presence of cows in the low lying areas which drain to Little River and Recompense Cove along Burnett Road, in addition to upland commercial farms on Little River and increased impervious surfaces are having a potential direct and often an actual direct impact on water quality in Little River.

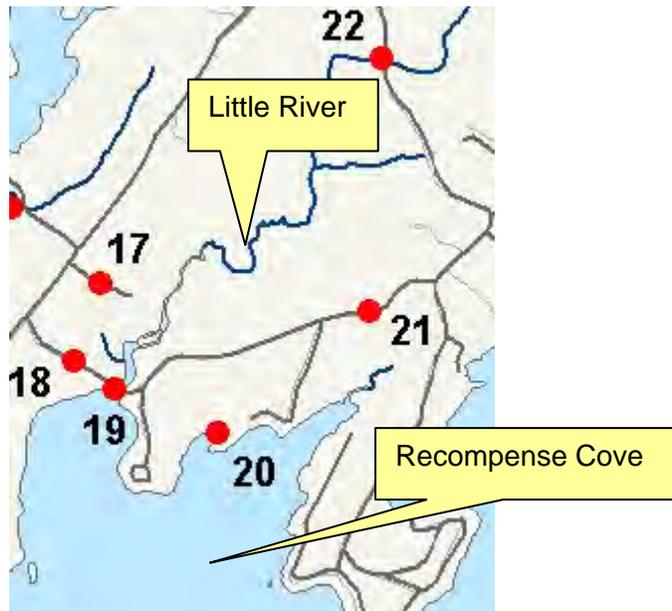
Table 10. DMR Stream Sample Results for Recompense Cove/Little River Area 2007

Sample Date	Site	CFU/100ml	Rain on Sample Day	Rain 24hours	Rain 48hours	Rain 72hours
5/14/07	22	78	0"	0"	0"	0.35"
6/5/07	17	120	0.24"	1.51"	0.24"	0.13"
	18	1700				
	19	1700				
	20	1700				
	21	1700				
	22	1700				
6/24/07	17	1.9	0"	0"	0.04"	0"
	18	-				
	19	1.9				
	20	-				
	22	-				
7/15/07	17	7.3	0.46"	0.01"	0"	0.02"
	18	-				
	19	2				
	20	-				
	22	-				

* Note: "-" = sample not collected



Figure 16. DMR Stream Sample Location Map for Recompense Cove/Little River Area



Brunswick

Maquoit Bay, Merepoint Bay and Middle Bay Cove are embayments fed by Bunganuc Stream and Miller Creek. Many other small streams and seasonal or intermittent streams flow into Casco Bay in Brunswick.

The Casco Bay Estuary Partnership (CBEP) sponsored a study in 1999, 2000 and 2001 to study productive shellfish areas for non-point source pollution impacts. The areas that were selected in Brunswick were Bunganuc Stream, Maquoit Bay and Middle Bay Cove. The information and data analysis will be presented in that order; a synopsis of the CBEP findings and then results of additional DMR sampling and shoreline survey.

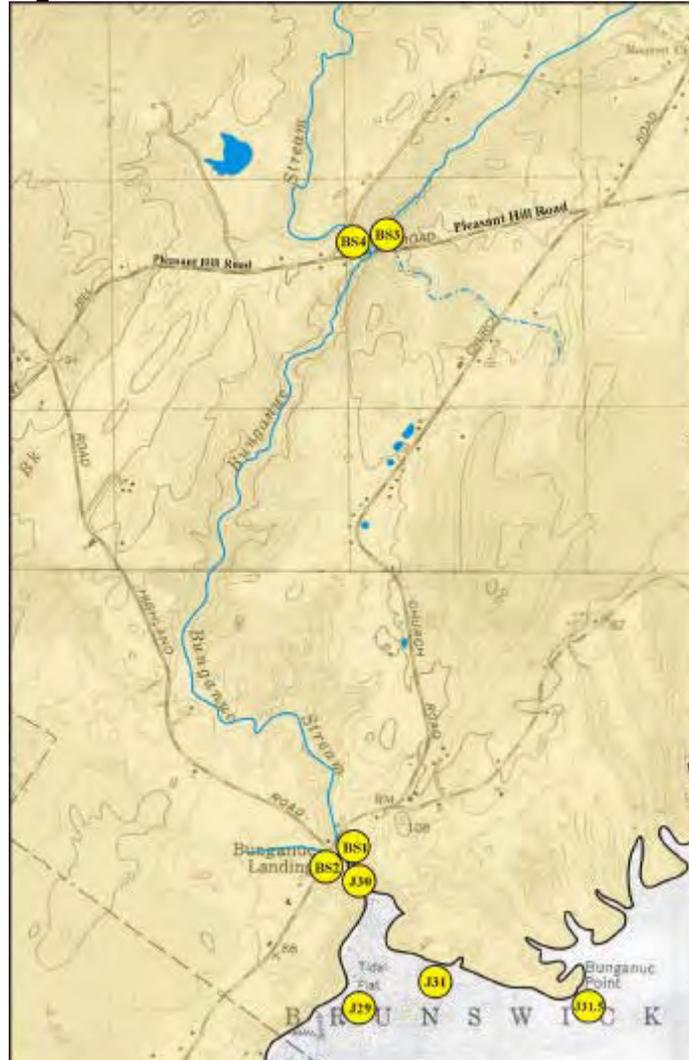
Bunganuc Stream

Bunganuc Stream drains a large watershed in the western section of Brunswick. Land use in the area is characterized as low density residential, undeveloped forest and a substantial amount of open pasture which is used for grazing animals and hay production. The DEP listed Bunganuc Stream with the EPA in 1998 as a stream which did not meet attainment due to bacteria and required a TMDL. The TMDL work is reportedly being conducted from 2003-2008.

The CBEP project established sampling stations at several strategic points along Bunganuc Stream (Figures 17). In addition to the freshwater sampling stations, water samples were also collected at least once during the study at adjacent DMR monitoring stations WJ29, WJ30, WJ31, and WJ31.5. WJ 31 was an active station at the time of the study, there is no documentation of when it was deactivated and no data in the DMR database.



Figure 17. Non-Point Source A-1 Fecal Coliform MPN Analysis CBEP Stream Sample Location Map for Bunganuc Stream Area



Map courtesy of Normandeau Associates, Inc./Casco Bay Estuary Partnership

Consistent with other CBEP study sites where freshwater sources were sampled, fecal coliform bacteria levels consistently increased during or immediately following precipitation events of moderate to heavy rainfall (Table 11). However, elevated bacteria levels were also found at nearly all study stations on at least one dry period sampling period. Fecal coliform bacteria levels rarely dropped below 23 MPN, even during dry periods, indicating a chronic low level of contamination. The blue highlighted dates indicate those with precipitation during the 24 hours before sample collection was moderate to heavy (>0.35”). The yellow highlighted dates indicate those sample dates with dry or very dry conditions in the 24 hours prior to sample collection. Cells with blanks or dashes (-) mean that a sample was not collected.



Table 11. Non-Point Source A-1 Fecal Coliform MPN Analysis Bunganuc Stream, Brunswick

Bunganuc Stream																
Station	1999		2000				2001									
	07/20	08/09	06/28	07/25	07/26	07/28	09/11	06/02	06/04	06/05	06/12	06/18	07/15	07/24	08/15	08/29
BS 1	460	240	3.6	43		240	43	1100	43	43	460	93	460	43	15	23
BS 2								1100	240	150	240	93	43			
BS 3								1101		23	240	1100	240	43	240	43
BS 4								1100		20	460	240	93	240	43	93
J 29	2.9	3.6														
J 30	7.3	15			2.9						460		1101	93	3.6	3.6
J 31	2.9	9.1			2.9											
J 31.5		2.9														

Data courtesy of Normandeau Associates, Inc./Casco Bay Estuary Partnership

DMR monitoring station WJ30, located immediately below the mouth of Bunganuc stream to marine waters, also yielded MPN values exceeding the NSSP limits for approved classification. It is important to note that, during low water, water passing DMR station WJ30 is essentially undiluted Bunganuc stream water, since the area drains completely at low tide. A review of the conductivity/salinity and fecal coliform bacteria MPN results for each date station WJ30 was sampled shows that elevated MPN values coincide with low salinities and, with a sole exception on July 24, 2001, low MPN values are consistently found in association with high salinities. Data from DMR monitoring results at WJ30 show a similar association between elevated MPN levels and lower salinity. With the exception of one sample taken in September 2001 at 25 ppt and an exceptionally high temperature of 32°C that yielded an MPN of 1200, all MPN values >43 recorded between 1999 and 2001 were associated with salinities below 20 ppt, suggesting that the elevated MPN values found at WJ30 may represent the bacterial condition of Bunganuc stream rather than the marine waters over the growing area during most of the tide cycle. This is direct evidence that Bunganuc stream waters directly affect the shellfish growing area in the vicinity of station WJ30 at low water. Test results were well with the NSSP limits of approved criteria at stations WJ29 and WJ31, both of which are beyond the direct and immediate influence of Bunganuc stream. The close but slightly more elevated results at J31.5 may be an indication of an additional, intermittent source of bacteria affecting the immediate vicinity of the station.

The chronic contamination observed at station PS1 could be taken as an indication of a human source, specifically a malfunctioning domestic wastewater treatment system. The study results, particularly the elevated fecal coliform bacteria levels associated with rain events, suggest runoff as a more likely source of the contamination. As previously mentioned, the watershed contains several farms and pastures, the latter fertilized with manure (pers. comm. Steve Walker, Town of Brunswick). Furthermore, as observed during a walking survey of the upper watershed area, the forested area of Bunganuc stream provides habitat to a diverse and abundant wildlife population. The size of the watershed combined with the wide spectrum of possible sources of coliform bacteria contamination, of both human and non-human origin, makes it difficult, if not impossible, to definitively identify specific sources.

DMR collected stream samples in the Bunganuc stream watershed area on August 13, 2007 and September 12, 2007. DMR sample site 2 is located at Bunganuc Rd gully by Oak Ridge



Rd, Brunswick, site 3 at the end of Oak Ridge Rd and site 4 on Bunganuc Rd by Woodside Rd (Figure 18). Sample results show that elevated fecal scores on August 13, 2007 were found during dry or very dry conditions (Table 12). Samples collected during moderate to extremely wet conditions also show elevated fecal scores. The presence of pastures, grazing animals and wildlife in the watershed which drain to Bunganuc stream and ultimately into Maquoit Bay are having a potential direct and an actual direct impact (after rainfall) on water quality in Bunganuc stream.

Figure 18. DMR Stream Sample Sites for Bunganuc Stream Area

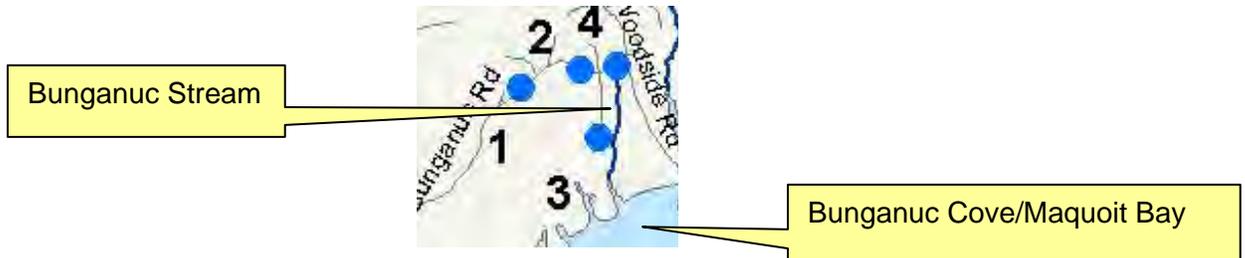


Table 12. DMR Stream Sample Results for Bunganuc Stream Area 2007

Sample Date	Site	CFU/100ml	Rain on Sample Day	Rain 24hours	Rain 48hours	Rain 72hours
8/13/07	1	1700	0.22"	0"	0"	0"
	2	-				
	3	-				
	4	360				
9/12/07	1	68	0"	1.55"	0.30"	0.14"
	2	780				
	3	-				
	4	124				

* Note: "-" = sample not collected

Maquoit Bay

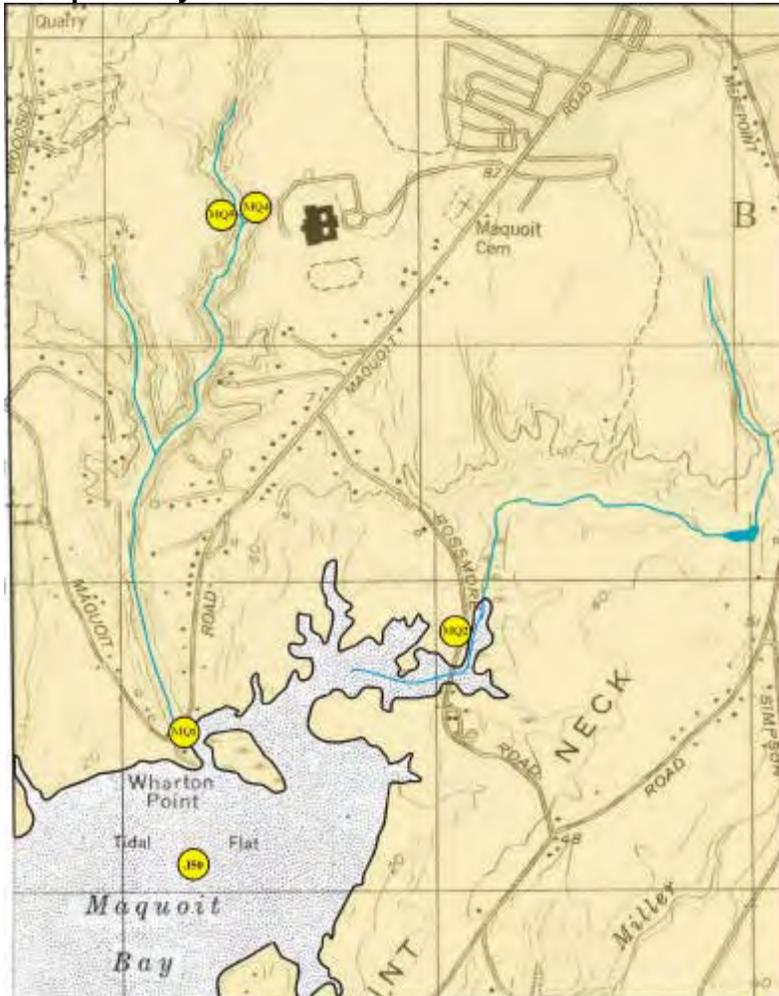
The upper part of Maquoit Bay has had many classification changes as a result of persistent fecal coliform bacteria contamination in the area. Two major drainages flow into the upper bay area. One enters from the northwest through a culvert under Maquoit Road and drains an area known as the Great Gulch. The second enters at the northeast through a culvert under the Rossmore Road and drains a predominantly wooded area with very limited development; a pond exists approximately midway along the drainage.

The CBEP project conducted from 1999-2001 established sampling stations at several strategic points in the Maquoit Bay drainage area. Sampling station MQ1 and MQ2 were located at the Maquoit Road and Rossmore Road, respectively (Figure 19). Stations MQ4 and MQ5 were established further up the Great Gulch, behind the Brunswick High School athletic fields, in 2001, as efforts were reduced in other study areas; station MQ4 was located on the primary flow of the western branch, MQ5 on the smaller flow from the northeast. DMR monitoring station



WJ33 was sampled on three occasions, but the station had to be dropped in 2000 due to hold time constraints and difficulties matching available processing times with tide stages.

Figure 19. Non-Point Source A-1 Fecal Coliform MPN Analysis CBEP Stream Sample Location Map for Maquoit Bay Area



Map courtesy of Normandeau Associates, Inc./Casco Bay Estuary Partnership

NSSP geometric mean and 90th percentile MPN limits for approved criteria were exceeded at MQ1, MQ2 and MQ4 (Table 13). MQ5 yielded consistently low values well below the NSSP approved criteria limits, as did DMR station WJ33, based on the limited sampling at the station. The long-term DMR sampling at WJ33 for the 1999 through 2001 study period yielded a geometric mean MPN value just below the NSSP limit of 14, but the 90th percentile MPN value was substantially higher than the limit of 49 MPN. Cells with blanks or dashes (-) mean that a sample was not collected.



Table 13. Non-Point Source A-1 Fecal Coliform MPN Analysis Maquoit Bay, Brunswick

Maquoit Bay															
Station	1999		2000				2001								
	07/20	08/09	06/28	07/25	07/26	07/28	09/11	06/02	06/04	06/05	06/18	07/15	07/24	08/15	08/29
MQ 1	240	460	23	43		93	1101	1100	9.1	15	43	23	240	9.1	93
MQ 2	23		23	460		120	93		93						
MQ 4								1100	43	93	23	9.1	2.9	9.1	
MQ 5									15	3.6	3.6	2.9	7.3	3.6	
J 33	2.9	3.6			2.9										

Data courtesy of Normandeau Associates, Inc./Casco Bay Estuary Partnership

Similar to another stream in Growing Area WK, fecal coliform bacteria MPN varied widely over sampling dates at stations MQ1, MQ2 and MQ4. MPN values above 93 were only seen on five of the fourteen occasions MQ1 was sampled, only twice of six samplings at MQ2, and only once at MQ4. Again, as in the other streams, rainfall events consistently resulted in elevated MPN values at these three stations, although the magnitude of MPN varied widely from one rainfall event to another. Additionally, spikes in MPN were also observed independently at these stations at one time or another during dry periods, as on July 25, 2000, September 11, 2000 and July 24, 2001. This pattern of fluctuating fecal coliform concentrations, irrespective of rainfall, indicates episodic rather than chronically high levels of contamination. The blue highlighted dates indicate those with precipitation during the 24 hours before sample collection was moderate to heavy (>0.35"). The yellow highlighted dates indicate those sample dates with dry or very dry conditions in the 24 hours prior to sample collection.

The inconsistent relationship between the upstream MQ4 station and the downstream MQ1 station further confounds the effort to determine the origin of contamination. Following the major rain event of June 20, 2001 when 3.17 inches of precipitation fell, both stations yielded MPN values of 1100 suggesting a close relationship between the two. However, on June 18, 2001 following a smaller, yet nevertheless substantial rain event of 1.03 inches, MPN levels were substantially lower at 93 and 43, respectively. Several weeks later during a dry period the downstream MQ1 station yielded an MPN of 240 while the upstream MQ4 station yielded a comparatively low MPN of 9.1, suggesting little relationship between the two stations and the presence of a source either between the stations or a source "downstream" of MQ1 from which bacteria are carried upstream with the tide. As a further complication, MPN values at both stations dropped to very low levels during the dry period around August 15, 2001, further suggesting intermittent, episodic contamination.

The temperature data taken during sampling generally yielded little out of the ordinary. However, it is noteworthy that the water temperature at MQ4 was considerably and consistently lower than at all surrounding freshwater and marine stations. For example, the water temperature at station BS4 on Bunganuc Stream, which is primarily surface flow over its entire length, varied between 16.0°C and 24.9°C between June 15, 2001 and August 29, 2001. Water temperature during the same sample period at MQ4 varied between 10.5°C and 13.5°C, indicating that flow at MQ4 is predominantly or entirely, groundwater discharge. This is not surprising since the adjacent area soils are sand and gravel. Depending on the transit time and distance, this groundwater could potentially carry bacteria from sources beyond the immediate area making a determination of source more difficult.



Based on these results and observations, it appears that no chronic source of elevated bacterial contamination affects the area. The most elevated levels appear to be associated with rainfall events suggesting runoff and groundwater as primary contributors.

DMR collected stream samples in the Maquoit Bay area on August 13, 2007 and September 12, 2007. Sample site 5 is located at the marsh stream at Maquoit Rd. and site 6 is located at the Rossmore Rd culvert (Figure 20). Results of those samples and rainfall which occurred the day of sampling and within 72 hours of the sample date are included in Table 14. Sample results show that elevated fecal scores on August 13, 2007 were found during dry or very dry conditions. Samples collected during moderate to extremely wet conditions also show elevated fecal scores. The presences of pastures, grazing animals and wildlife in the watershed which drains to Maquoit Bay are having a potential direct and often an actual direct impact on water quality in Bunganuc Stream.

Table 14. DMR Stream Sample Results for Maquoit Bay Area 2007

Sample Date	Site	CFU/100ml	Rain on Sample Day	Rain 24hours	Rain 48hours	Rain 72hours
8/13/07	5	130	0.22"	0"	0"	0"
	6	42				
9/12/07	5	320	0"	1.55"	0.30"	0.14"
	6	1700				

Figure 20. DMR Stream Sample Sites for Maquoit Bay Area



Merepoint Bay and Middle Bay Cove

DMR collected samples in Miller Creek which empties into Merepoint Bay in Brunswick on August 13, 2007 and September 12, 2007. The sample site location is 7 and the sample point was at the Simpson’s Point Road culvert (Figure 21). The DMR also collected samples in Middle Bay Cove at the culvert on Middle Bay Rd, Brunswick on September 12, 2007. Results of those samples and rainfall which occurred the day of sampling and within 72 hours of the sample date are included in Table 15. Sample results show that elevated fecal scores on

August 13, 2007 at station 7 were found during dry or very dry conditions; no sample was collected at station 9 on that day. Samples collected during moderate to extremely wet conditions also show elevated fecal scores. Land use in the area is characterized as very low density residential, large tracts of undeveloped forest and pasture which is used for hay. Additional sampling must be done in the area to determine the loading on Merepoint Bay. Based on the limited sampling at this station, the data would suggest that Miller Creek, with its fecal load during dry and wet weather has an actual direct impact on water quality in Merepoint



Bay. There is an additional potential stream sample site, sample station 8 on the map that was not sampled in 2007. The site is located at Tidal Run Lane, Brunswick.

Figure 21. DMR Stream Sample Sites for Merepoint Bay Area



Table 15. DMR Stream Sample Results for Merepoint Bay Area 2007

Sample Date	Site	CFU/100ml	Rain on Sample Day	Rain 24hours	Rain 48hours	Rain 72hours
8/13/07	7	132	0.22"	0"	0"	0"
9/12/07	7	1700	0"	1.55"	0.30"	0.14"
	9	500				

Middle Bay Cove

Upper Middle Bay Cove was classified approved in 1993. In early 1994, the area was reclassified to prohibited due to elevated fecal coliform levels in the vicinity of sample station WJ49.5; the source of this pollution was the presence of a malfunctioning septic system. The malfunctioning system was repaired by 1999 and, based on the results of subsequent sampling and the absence of any other identifiable potential source of contamination, the area was reclassified to approved in late 1999. Since the area was upgraded from prohibited to approved, a stream study being conducted by the CBEP was reduced in 2000 and the site was dropped from the study early in 2001 to allow efforts to be focused elsewhere.

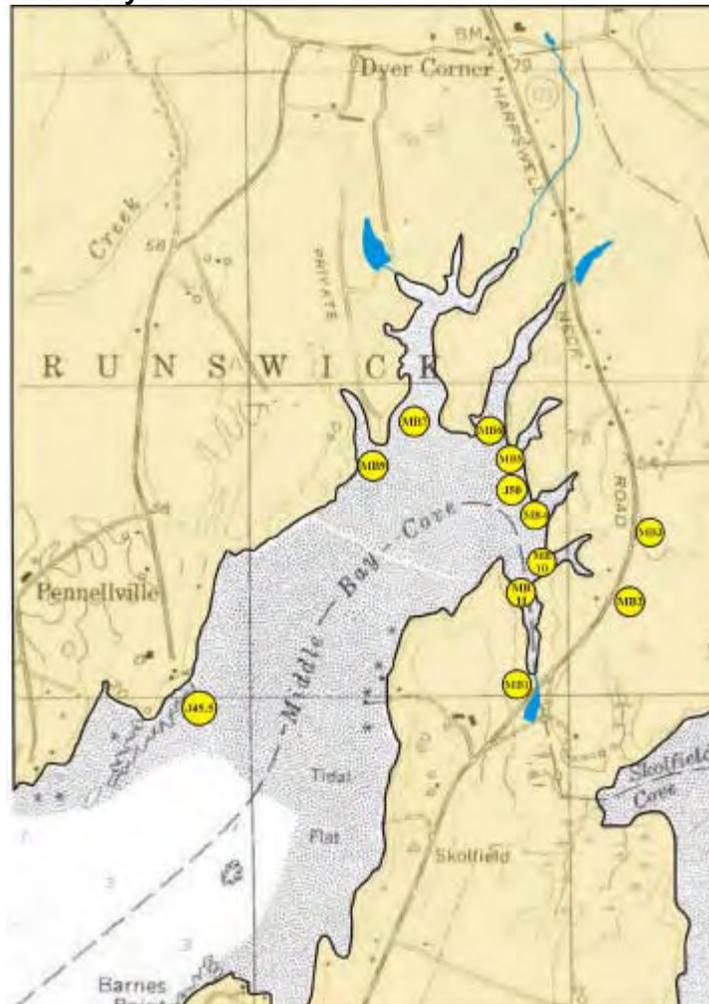
The head of Middle Bay Cove is deeply convoluted with numerous finger-like projections cutting into the surrounding shoreline, each representing a separate drainage, all but one carrying strictly intermittent runoff flow (Figure 22). The surrounding area is generally open land with limited residential development. Several of the fields surrounding the cove are hayed annually and several pastures within the immediate watershed are used to graze livestock. Additionally, the area at the head of the cove is heavily forested and provides wildlife habitat, particularly for a resident herd of deer routinely seen on the marsh banks during early morning sampling runs.

The CBEP stream sampling project conducted from 1999-2000 established ten sampling stations at several strategic points in the Middle Bay Cove drainage area. Three stations, MB1, MB2, and MB3 were located along Route 123 to measure fecal coliform contributions from adjacent drainages, the first two from two paddocks holding a llama, several sheep, a donkey, and horses, and the third from a pond often frequented by ducks. Stations MB4 through MB11 were located in marine waters over the shellfish growing area at the entrance to each of the



major drainages where runoff flow enters the cove. Additionally, DMR monitoring stations WJ49.5 and WJ50 were also sampled on three rain event dates (Figure 22).

Figure 22. Non-Point Source A-1 Fecal Coliform MPN Analysis CBEP Stream Sample Location Map for Middle Bay Cove Area



Map courtesy of Normandeau Associates, Inc./Casco Bay Estuary Partnership

Predictably, stations MB1, MB2 and MB3 routinely yielded elevated fecal coliform MPN values, irrespective of rainfall, with geometric mean and 90th percentile values well above NSSP approved criteria limits. Stations MB9 and MB10 yielded geometric mean or 90th percentile values that exceeded the NSSP approved criteria limits; both of these stations are affected by livestock, MB9 by cattle grazing a field along the Pennellville Road on the western shore, MB10 by drainage from the paddock along Route 123 on the eastern shore. Station MB11 was located at the opening of the drainage of the pond and hayfields on the eastern shore, just downstream of MB1. Station MB7 was located at the head of the cove adjacent to the marsh where deer were routinely seen standing along the immediate shore. The blue highlighted dates indicate those with precipitation during the 24 hours before sample collection was moderate to heavy (>0.35"). The yellow highlighted dates indicate those sample dates with dry or very dry conditions in the 24 hours prior to sample collection (Table 16).



Table 16. Non-Point Source A-1 Fecal Coliform MPN Analysis Middle Bay Cove, Brunswick

Middle Bay Cove

Station	1999				Xtr.	2000			
	07/07	07/20	08/09	08/09		05/21	06/28	07/25	07/28
MB 1	240		43		2.9	15	3.6	240	
MB 2	1101		7.3		43	240		9.1	93
MB 3	240		23		3.6	1100		240	
MB 4	3.6	2.9	240						
MB 5	9.1	2.9	43						
MB 6	2.9	2.9	43		3.6	2.9	2.9	23	43
MB 7	23	2.9	43						
MB 9			43	23					
MB10	2.9	3.6	93						
MB 11	23	2.9	43						

Data courtesy of Normandeau Associates, Inc./Casco Bay Estuary Partnership

Both the study and routine DMR monitoring results for DMR stations WJ49.5 and WJ50 showed geometric mean and 90th percentile values well below NSSP limits for approved classification. Although numerous potential sources of livestock and terrestrial and avian wildlife fecal coliform bacteria were routinely observed around the cove, no specific potential human sources were found.

DMR collected a stream sample in the Middle Bay Cove area at a culvert on Middle Bay Road on September 12, 2007. The sample result was 500CFU/100ml after rainfall which occurred the day of sampling and within 72 hours of the sample. No rainfall was recorded the day of the sample collection; 1.55" was reported in the 24 hours before the sample day, 0.30" 48 hours prior and 0.14" in the 72 hours prior to sample collection. No analysis can be made on a single sample. None of the CBEP sample sites match that of the DMR sample site which does not allow for any historical data comparison.

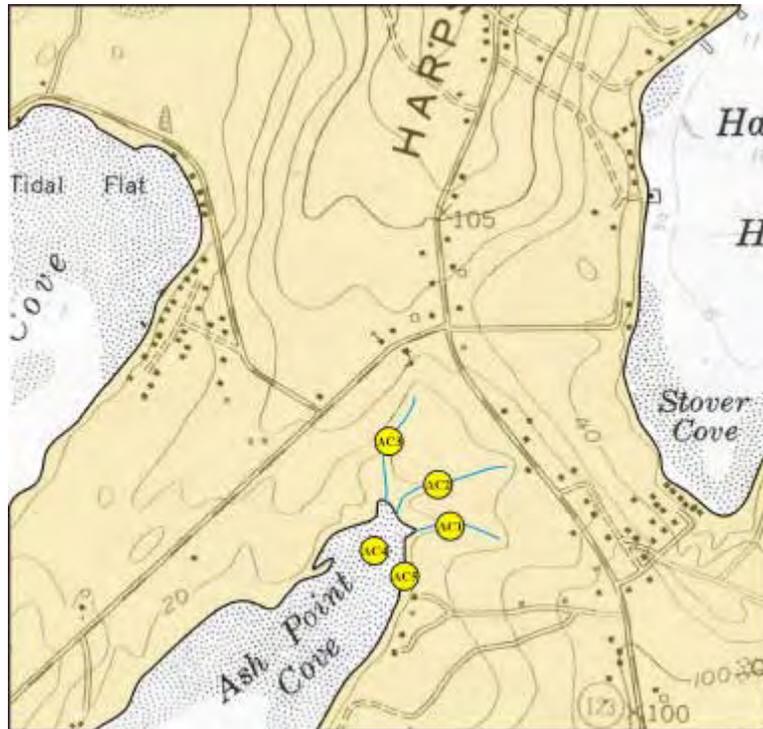
Harpswell

The only Harpswell stream samples collected in area WH in 2007 were at Sunset Cove by Station WJ 57, which is classified prohibited. See Growing Area WK 2007 Sanitary Survey Report for other Harpswell stream samples.

Ash Point Cove was opened to seasonal winter harvesting from September 16 through May 14 of each year, beginning in 1999. At the suggestion of DMR, the CBEP "Clam Team" requested that sampling be carried out in the cove to provide stream fecal coliform data beginning in 2000. Fresh water enters Ash Point Cove through three relatively small drainages at the north of the cove (Figure 23). Sampling stations were located on each of these flows near their entry point into the cove, but above head of tide. Flow through station AC1 runs adjacent to the Ash Point Cove residential development area; flows through stations AC2 and AC3 drain primarily wooded areas, the latter playing fields behind the West Harpswell Elementary School. Station AC4 was located within the cove in proximity to DMR station WJ68. Station AC5 was used only once to test effluent from a drainage ditch entering the cove along the eastern shore that was subsequently diverted away from the shoreline.



Figure 23. Non-Point Source A-1 Fecal Coliform MPN Analysis CBEP Stream Sample Location Map for Ash Point Cove Area



Map courtesy of Normandeau Associates, Inc./Casco Bay Estuary Partnership

The fecal coliform levels at stations AC1 and AC2 both exceed the NSSP approved criteria limits, as did the one-time-only sampling at AC5. Stations AC1 and AC2 exceed the limits as a result of the unusually high fecal coliform MPN found on July 25, 2000 (Table 12). These high MPN levels were found during dry weather when stream flow was very low and such high levels were never found during or following rainfall events. These stream flows appear to have negligible effect on the cove as indicated by the results of study station AC4 and DMR monitoring station WJ68, both of which meet the NSSP criteria for approved classification during the seasonal open status.

Table 17. Non-Point Source A-1 Fecal Coliform MPN Analysis Middle Bay Cove, Brunswick

Ash Point Cove		2000			2001		
Station	05/21	06/29	07/25	09/11	06/03	06/06	06/13
AC 1	2.9		460		23	3.6	43
AC 2	2.9		240		93	15	43
AC 3	3.0		2.9	7.3	43	3.6	
AC 4	3.6	2.9		2.9	43	9.1	15
AC 5					93		

DMR received a complaint from a resident on the Sunset Cove community that there was a strong odor of sewage coming from or near a stream flowing through the property on July 3,



2007 . DMR sampled the stream at different locations on October 23, October 26 and November 6, 2007. Results of the samples are in Table 18 below. Rainfall amounts for October 23 and October 26 are available from:

<http://www.wunderground.com/weatherstation/WXDailyHistory.asp?ID=KMEHARPS2&day=3&year=2007&month=11> Rainfall amounts were not recorded at the Cundy's Harbor, Harpswell site for November 2007. The rainfall data for November 2007 are available from:
<http://www.wunderground.com/weatherstation/WXDailyHistory.asp?ID=KMEFREEP1&day=3&year=2007&month=11>.

Table 18. Non-Point Source MF Fecal Coliform Analysis Sunset Cove Stream, Harpswell 2007

Date	Location	CFU/100ml	Flow Rate gal/min	Rain on Sample Day	Rain 24hours	Rain 48 hours	Rain 72hours
10/23/07	Gingers Rd culvert	70	5	0"	0"	0"	0"
	Bottom of stream	660	5				
10/29/07	Gingers Rd culvert	84	15	0"	0"	0"	0"
	Pipe in side of gully; almost halfway down	22	5				
	Halfway down stream; below pipe	820	15				
11/6/07	Gingers Rd culvert	132	100	1.02"	0"	0.01"	0.67"
	Old, crushed, small culvert on Gingers Rd	1700	10				
	One quarter way down stream	136	100				
	Halfway down stream; just above pipe	240	100				
	Pipe in side of gully; almost halfway down	1.9	20				
	Bottom of stream	160	100				



The Sunset Cove/Ginger Road stream sample results show that elevated fecal scores were found during dry to very dry conditions. Samples collected during moderate to extremely wet conditions also show elevated fecal scores. The pipe effluent which is the stream bank halfway between Ginger Road and the shoreline does not show elevated fecal coliform levels during dry periods or wet periods, suggesting that the pipe in the bank is not the contributor to the fecal pollution. The Gingers Road culvert shows evidence of elevated fecal coliform scores during dry periods and wet periods. The old Gingers Road culvert was only sampled once on November 6, 2007 and showed highly elevated fecal coliform scores. No additional investigatory work was completed after the stream and culvert sampling.

Conclusions and Recommendations

Overall, streams in growing area WJ show elevated fecal coliform scores during very dry and dry conditions. The data shows highly elevated scores after rainfall in the range of 68-1700CFU/100ml. In all cases, the drainage areas are large and complex with multiple land uses that all contribute to contamination in the streams. Runoff conditions after rainfall are the largest contributor to pollutant loading of fecal coliform contamination in the growing areas. The NSSP does not distinguish between human and non-human fecal coliform contributors and while no definitive malfunctioning septic systems have been indentified, agricultural and wildlife sources play an important role as being potentially, the largest contributor of fecal contamination in the area.

A recommendation for work prior to the next triennial report which is due in 2010 is to conduct additional work on determining the impact of the streams out into the coves and bays after rainfall. Specifically:

- Ash Point Cove where station WJ67.0 and WJ68.0 have high fecal coliform scores, 1100CFU/100ml and 460CFU/100ml respectively, within the open status data set that are related to rainfall; and
- The Sunset Cove/Ginger Road investigation should continue in order to try and determine what is contributing to the elevated fecal coliform scores at the old Ginger Road culvert and the Ginger Road culvert. Additional sampling of the stream and sampling into the cove to determine the impact of the stream must be conducted. A sample station should be established in the area to monitor the effects of the stream on the growing area. The results of the study will be shared with the Harpswell codes enforcement officer.
- Upper Maquoit, Middle and Merepoint Bays.
- Spar Cove and Recompense Cove in Freeport.

An additional recommendation is to continue rainfall studies in the areas, including stream sampling in conjunction with water quality monitoring stations to try and refine the rainfall threshold which would adversely impact the water quality monitoring stations. This work would contribute to a determination of a rainfall conditional area reclassification.



Hydrographic and Meteorological Characteristics

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 (WJ). 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. Examples of hydrographic factors that must be evaluated are tidal amplitude and type, water circulation patterns, and the amount of fresh water. These factors, along with water depths and stratification caused by density (salinity and temperature) differences, and wastewater and other waste flow rates are used to determine dilution, and time of transport.

The Casco Bay Estuary Partnership (CBEP) commissioned a study to model water circulation in Casco Bay. The model, developed by Pearce, Pettigrew and Gong of the University of Maine characterizes what influences Casco Bay hydrodynamics and patterns of water circulation in Casco Bay. A discussion of the findings is in the Tides, Currents and Wind section below. Additionally, a CBEP commissioned study conducted by Horsley & Witten, Inc. (1996) reports that the flushing time of Maquoit Bay is an average of three to six days and ranges from five to fifteen days. The volume of Maquoit Bay is estimated at 12.5 billion gallons based on a 5 square mile area and a mean water depth of 12 feet.

Tides, Currents and Wind

Water circulation in Casco Bay is dominated by tides. The tidal range in Casco Bay is nine feet. Tides are caused by the gravitational effects of the moon and sun on the ocean; other influences are heavy rainfall, low barometric pressure and strong onshore winds which will increase tides. Tide levels fluctuate during the month based on the positions of the sun, moon and earth. These fluctuations and the speed and direction of the tidal currents constantly change during a tidal cycle. Tidal currents have the greatest energy when water is pushed in and out of bays and channels during the highest and lowest tide levels. Growing area WJ is subject to a semidiurnal tidal cycle with two high tides and two low tides per day. The tidal cycle is 12 hours and 25 minutes long, so that high and low tides are 50 minutes later each day.

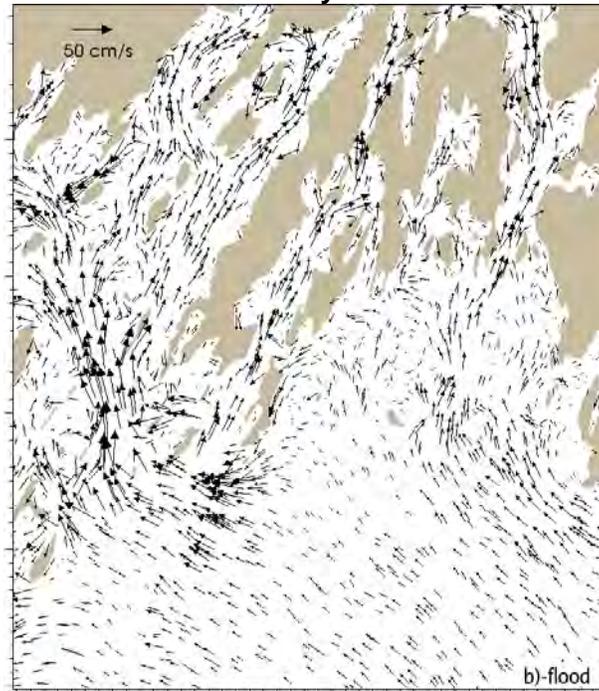
The CBEP and a study by True and Manning describe the circulation in Casco Bay as predominantly counterclockwise in direction. The greatest input of ocean water in eastern Casco Bay is through Broad Sound (just east of Great Chebeague Island) where the circulation pushes water into Middle Bay, Maquoit Bay and circulates in a westerly direction down to where it exits Casco Bay through Portland Channel. Broad Sound is the deepest channel in Casco Bay where colder, more saline water enters the inner Bay. When there is no wind and only tidal force on the currents, there is equal input from all channels into the inner bay from Casco Bay. The tidal flow shows little variation in direction with depth.

The True and Manning study further illustrated that circulation of the waters with Casco Bay can be affected by offshore winds, fresh water runoff from the Kennebec/Androscoggin River



(especially in the spring) and the Western Maine Coastal Current (WMCC), depending on its location. The water in Middle Bay and Maquoit Bay is piled against the western shore which contributes to a southwesterly flow along the Yarmouth and Falmouth shores. There is a complex circulation pattern in Middle Bay and Maquoit Bay. In Middle Bay, the water piles up on the western shore and flows southwesterly out of the Bay where some of it turns clockwise and flows into the center of Maquoit Bay. The water flowing out of Middle Bay is replaced with water coming in from offshore through Broad Sound. The offshore water enters Middle Bay east of Birch and White Islands where it splits to create a counterclockwise current on the west side of the Bay and a clockwise current on the east side. Similarly, the water from Middle Bay that goes into the center of Maquoit Bay sets up a pair of clockwise/counterclockwise eddies (Figures 24 and 25). In the True and Manning model, whether the wind was from the northeast or the southwest, there is a strong surface flow all along the west shore of Maquoit Bay, Middle Bay and from Maquoit Bay to Cape Elizabeth.

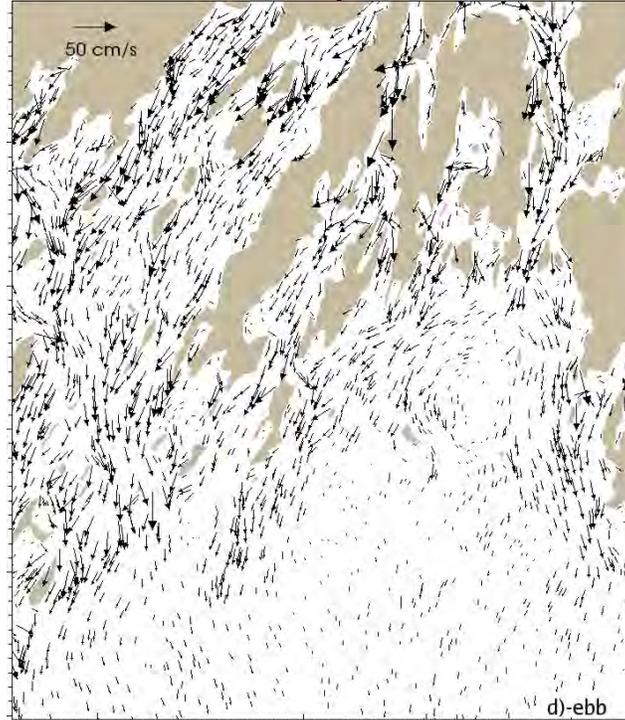
Figure 24. Tidal Currents in Eastern Casco Bay on Flood Tide



Map courtesy of True and Manning (n.d.)



Figure 25. Tidal Currents in Eastern Casco Bay on Ebb Tide



Map courtesy of True and Manning (n.d.)

Fecal coliform levels were analyzed for station WJ 1, 3, 6, 8, 9, 9.5, 11, 14, 14.2 and 16 (Harraseeket River) in context of tidal stage in order to determine if tidal stage has an impact on elevated fecal coliform levels. Overall, over the past five years, a total of 490 samples were collected from the ten stations; 49 percent of samples were collected on a flooding tide and 51 percent were collected on an ebbing tide (Table 19). Among the ten stations examined, 27 samples collected on an ebbing tide exceeded the approved standard (11 percent of total samples collected on an ebb tide), in comparison to 30 samples collected on a flood tide (12 percent of total samples collected on a flood tide). The similarity in the number of samples exceeding approved standard between the two tidal stages suggests that tide does not have an effect on fecal coliform scores in the Harraseeket River.



Table 19. Tide stages associated with samples collected at Harraseeket River stations from 2003-2007

Tide	Tide Stage	WJ1		WJ3		WJ6		WJ8		WJ9	
		N	# samples exceeding approved standard	N	# samples exceeding approved standard	N	# samples exceeding approved standard	N	# samples exceeding approved standard	N	# samples exceeding approved standard
Ebb	L	1	0	1	0	1	1	0	0	0	0
	LE	1	0	0	0	2	0	0	0	1	0
	E	12	0	14	1	14	1	14	2	16	2
	HE	12	0	10	1	15	1	11	0	10	2
Flood	F	8	1	7	0	7	3	8	0	8	1
	H	9	0	12	0	7	2	9	1	9	0
	HF	12	1	12	2	10	0	10	0	11	1
	LF	1	0	0	0	1	0	0	0	2	2
Tide	Tide Stage	WJ9.5		WJ11		WJ14		WJ14.2		WJ16	
		N	# samples exceeding approved standard	N	# samples exceeding approved standard	N	# samples exceeding approved standard	N	# samples exceeding approved standard	N	# samples exceeding approved standard
Ebb	L	0	0	0	0	0	0	0	0	2	0
	LE	0	0	1	0	2	0	2	1	1	0
	E	3	1	12	2	12	2	7	1	11	0
	HE	6	3	14	3	13	1	12	2	5	0
Flood	F	7	0	6	1	5	0	3	1	1	0
	H	4	0	12	1	13	1	12	1	3	0
	HF	5	1	10	3	8	3	10	2	7	0
	LF	0	0	1	1	1	1	0	0	1	0



Fecal coliform levels were analyzed for station WJ 17, 17.5, 17.8, 18, 18.2, 18.6, 18.9, 17.8 and 19 (Recompense Cove, Freeport) in context of tidal stage in order to determine if tidal stage has an impact on elevated fecal coliform levels. Overall, over the past five years, a total of 150 samples were collected from the nine stations; 63 percent of samples were collected on a flooding tide and 37 percent were collected on an ebbing tide (Table 20). Among the nine stations examined, 7 samples collected on an ebbing tide exceeded the approved standard (13 percent of total samples collected on an ebb tide), in comparison to 5 samples collected on a flood tide (5 percent of total samples collected on a flood tide). It is hard to draw any conclusions from the tidal impact assessment, because stations WJ 18 and 19 are the only stations that have been actively sampled over the past 5 years; stations 17, 17.5, 17.8, 18.2, 18.6 and 18.9 are new stations , established in 2007 and have had only a limited number of samples collected. Given the limited data pool for a majority of the stations, the similarity in the number of samples exceeding approved standard between the two tidal stages suggests that tide does not have a significant effect on fecal coliform scores in Recompense Cove.



Table 20. Tide stages associated with samples collected in Recompense Cove, Freeport stations from 2003-2007

Tide	Tide Stage	WJ17		WJ17.5		WJ17.8		WJ18		WJ18.2	
		N	# samples exceeding approved standard	N	# samples exceeding approved standard	N	# samples exceeding approved standard	N	# samples exceeding approved standard	N	# samples exceeding approved standard
Ebb	L	0	0	0	0	0	0	0	0	0	0
	LE	0	0	1	0	0	0	0	0	0	0
	E	0	0	0	2	0	0	11	1	1	0
	HE	1	0	3	1	2	0	5	1	4	0
Flood	F	3	0	1	0	0	0	3	1	1	0
	H	3	0	2	0	5	1	10	1	2	0
	HF	4	0	4	0	4	0	8	0	4	0
	LF	0	0	0	0	0	0	0	0	0	0
Tide	Tide Stage	WJ18.6		WJ18.9		WJ19					
		N	# samples exceeding approved standard	N	# samples exceeding approved standard	N	# samples exceeding approved standard	N	# samples exceeding approved standard	N	# samples exceeding approved standard
Ebb	L	0	0	0	0	0	0				
	LE	0	0	1	0	0	0				
	E	1	0	0	0	11	2				
	HE	3	0	3	0	6	0				
Flood	F	1	0	1	0	2	0				
	H	2	0	3	0	7	1				
	HF	4	0	3	0	8	0				
	LF	0	0	0	0	1	0				



Fecal coliform levels were analyzed for station WJ 30, 31.5, 32, 33 and 34 (Maquoit Bay, Brunswick) in context of tidal stage in order to determine if tidal stage has an impact on elevated fecal coliform levels. Overall, over the past five years, a total of 211 samples were collected from the five stations; 58 percent of samples were collected on a flooding tide and 42 percent were collected on an ebbing tide (Table 21). Among the ten stations examined, 11 samples collected on an ebbing tide exceeded the approved standard (12 percent of total samples collected on an ebb tide), in comparison to 9 samples collected on a flood tide (7 percent of total samples collected on a flood tide). The similarity in the number of samples exceeding approved standard between the two tidal stages suggests that tide does not have a significant effect on fecal coliform scores in Maquoit Bay, Brunswick.

The same analysis was performed for stations WJ 63, 64, 65 and 66 (Basin Cove, Harpswell) in context of tidal stage in order to determine if tidal stage has an impact on elevated fecal coliform levels. Overall, over the past five years, a total of 141 samples were collected from the four stations; 54 percent of samples were collected on a flooding tide and 46 percent were collected on an ebbing tide (Table 21). Among the four stations examined, 6 samples collected on an ebbing tide exceeded the approved standard (9 percent of total samples collected on an ebb tide), in comparison to 10 samples collected on a flood tide (13 percent of total samples collected on a flood tide). The similarity in the number of samples exceeding approved standard between the two tidal stages suggests that tide does not have a significant effect on fecal coliform scores in Basin Cove, Harpswell.

Station 68 was analyzed in context of tidal stage in order to determine if tidal stage has an impact on elevated fecal coliform levels in Ash Point Cove, Harpswell. Overall, over the past five years, a total of 36 samples were collected from the station; 64 percent of samples were collected on a flooding tide and 36 percent were collected on an ebbing tide (Table 21). Among the four stations examined, 2 samples collected on an ebbing tide exceeded the approved standard (15 percent of total samples collected on an ebb tide), in comparison to 2 samples collected on a flood tide (9 percent of total samples collected on a flood tide). The similarity in the number of samples exceeding approved standard between the two tidal stages suggests that tide does not have a significant effect on fecal coliform scores in Ash Point Cove, Harpswell.



Table 21. Tide stages associated with samples collected in Maquoit Bay, Brunswick and Basin and Ash Point Coves, Harpswell stations from 2003-2007

Tide	Tide Stage	WJ30		WJ31.5		WJ32		WJ33		WJ34	
		N	# samples exceeding approved standard	N	# samples exceeding approved standard	N	# samples exceeding approved standard	N	# samples exceeding approved standard	N	# samples exceeding approved standard
Ebb	L	0	0	0	0	0	0	0	0	0	0
	LE	1	0	1	0	1	0	2	0	0	0
	E	11	3	10	0	11	1	11	1	11	0
	HE	7	2	8	2	7	1	5	1	4	0
Flood	F	10	0	11	0	12	0	14	3	11	1
	H	6	1	5	0	6	0	8	2	8	2
	HF	6	0	7	0	6	0	5	0	7	0
	LF	0	0	0	0	0	0	0	0	0	0
Tide	Tide Stage	WJ63		WJ64		WJ65		WJ66		WJ68	
		N	# samples exceeding approved standard	N	# samples exceeding approved standard	N	# samples exceeding approved standard	N	# samples exceeding approved standard	N	# samples exceeding approved standard
Ebb	L	1	0	0	0	0	0	0	0	0	0
	LE	2	0	3	0	0	0	0	0	0	0
	E	10	2	8	0	6	0	7	1	4	0
	HE	8	0	6	0	7	2	7	1	9	2
Flood	F	7	2	9	2	5	2	9	1	13	2
	H	3	0	4	0	4	0	4	0	5	0
	HF	6	1	6	0	9	1	9	1	5	0
	LF	0	0	1	0	0	0	0	0	0	0



Precipitation

The annual average precipitation in growing area WJ is 48.03 inches. Rainfall is fairly evenly distributed throughout the year. The wettest month of the year is November with an average rainfall of 4.87 Inches. Rainfall is monitored at the Freeport Sewage Treatment Plant and at the Brunswick Naval Air Station and the recorded data is kept in the central files. The most frequent rain events occur during the periods of mid - April to June and late September through November. July and August are typically dry periods with little rainfall except for thunderstorm activity. Much of the precipitation from December through mid-April comes as snow, which may affect runoff rates in spring depending on the depth of the snow pack. Rainfalls in excess of 2 inches in a 24 hour period may occur once or twice a year. These rainfalls often result in a statewide flood closure, and shellfish areas are sampled before reopening.

Within the past 5 years, rainfall corresponding to sample collection dates (excluding flood sampling) ranged from 0 inches to 3.5 inches in a 72 hour period. A rainfall analysis (total amount within 72 hours of collection) was completed on all sample station in area WJ (Appendix O). The following stations had elevated scores (>14 FC or CFU/100ml) with no rain (0 inches), little rain (0.001-0.25 inches) and some rain (0.26" and above): WJ8, 9, 9.5, 11, 14, 14.2, 16, 18, 19, 24, 26, 27.5, 30, 31.5, 32, 33, 34, 35, 38, 46, 47, 48, 49, 51, 55, 56, 57, 58, 59, 60, 63, 64, 65, 66, 67, 68 and 70. Station 18 showed high scores in both dry and wet conditions between 2003 and 2006, until best farming practices on a farm adjacent to the sampling station were implemented; since then the station has not received elevated scores. Stations that showed little or no rainfall impact include WJ 27.3, 61 and 62. There are six new stations (WJ 17, 17.5, 17.8 18.2, 18.6 and 18.9) that have been collected only eleven times by the end of the 2007 review year, with rain ranging from 0 to 2.75 inches/72 hour period; stations 18.2 and 18.9 do not have any score >14CFU/100ml but stations 17, 17.5, 17,8 and 18.6 each have one or two scores >14CFU/100m with as little as 0.001-0.25 inches of rain within 72 hours of sample collection. Stations 48.5 and 50.5 have been collected 12 times over two years (2006 -2007) covering a rainfall range from 0 to 1.25/72 hours (48.5) and 0 to 2.00/72hours (50.5) with no scores >14CFU/100ml.

Station 33 had elevated fecal coliform scores in both dry and wet conditions until and after a straight pipe that was identified and replaced with a subsurface waste system in December of 2006. Since the remediation, there have been two elevated scores in the 1.01 – 1.25" range; a 38CFU/100ml on September 11, 2007 and a 520CFU/100ml on September 12, 2007. There have been four other sample collections in the >1.01" – 2.75" range and no elevated fecal coliform scores on those sample days since 2006.

Sample stations that have had elevated scores after rainfall within 72 hours of sample collection in the range of 0.51-3.5 inches include WJ 1, 3, 6, 8, 9, 9.5, 11, 14, 14.2, 18, 19, 24, 26, 27.5, 30, 31.5, 32, 33, 34, 35, 38, 46 (on 240 FC/100ml in 2003), 47 (one 23 FC/100ml in 2003), 48, 49, 49.5, 51, 55, 56 (one 24CFU/100ML in 2007), 57 (one 460FC/100ml in 2005), 58, 59, 60 (one 32CFU/100ml in 2007), 62, 63, 64, 66, 67, 68, and 70. Fifty-six percent (29 of 51 stations) of stations had elevated fecal coliform levels when rainfall within 72 hours of sample collection >2.00". Fifty-five percent (28 of 51 stations) were elevated when rainfall within 72 hours of sample collection met or exceeded 1.5". Many of the elevated fecal coliform scores which would be captured in sample collections when rainfall meets or exceeds 2" in within 24 hours of sample collection will not make it into the data set as the DMR issues flood closures and the



systematic random sampling is canceled. However, flood closures are not implemented when cumulative rainfall meets or exceeds 2” in 72 hours which is the data set that was analyzed in this instance. There are many stations that may meet the requirements for conditionally approved areas based on rainfall as evidenced by the number of stations and elevated fecal coliform scores at >0.5”. If the department is adequately staffed and funded in the future additional work could be done to determine whether areas would meet the requirements for conditional areas based on rainfall.

Annual rainfall for the town of Brunswick is presented in Table 22 (www.wunderground.com). Years 2005 and 2006 were among the wettest on record. The excessive rainfall during these years resulted in seven flood closures that included all of area WJ in 2005 and two in 2006. There was one flood closure in 2001, none in 2002 or 2003, two in 2004 and two in 2007. Stations 6, 24, 33 and 56 are the flood stations for this area. After flood closures, area WJ is not re-opened until each of their scores meet approved criteria.

Table 22. Annual Precipitation at Brunswick, Maine www.wunderground.com Station

Year	Total Rainfall	Total Snow
2001	49.45”	90”
2002	48.11”	58”
2003	46.24”	61”
2004	40.99”	10”
2005	79.51”	16”
2006	65.99”	30”
2007	46.93”	50”

Winds

Prevailing winds for the period August 2007 through present are from the west southwest and south southeast as reported at the Gulf of Maine Ocean Observing System buoy in Casco Bay (C02) and in Lower Harpswell Sound (D02) (Figure 26 and 27). Periods of wind from the west and west northwest were recorded in August of 2007. Weekly average wind speed recorded in the same time period show 12-17 mph from late October 2007 through April 2008 and 6-11mph the rest of the year. Wind data specific to each sampling site has been collected since the spring of 2005. While the database now has two years of data, it is not yet adequate to determine whether wind has an impact on sample scores.

Figure 26. GoMOOS Wind Direction Weekly Average August 2007 - 2008

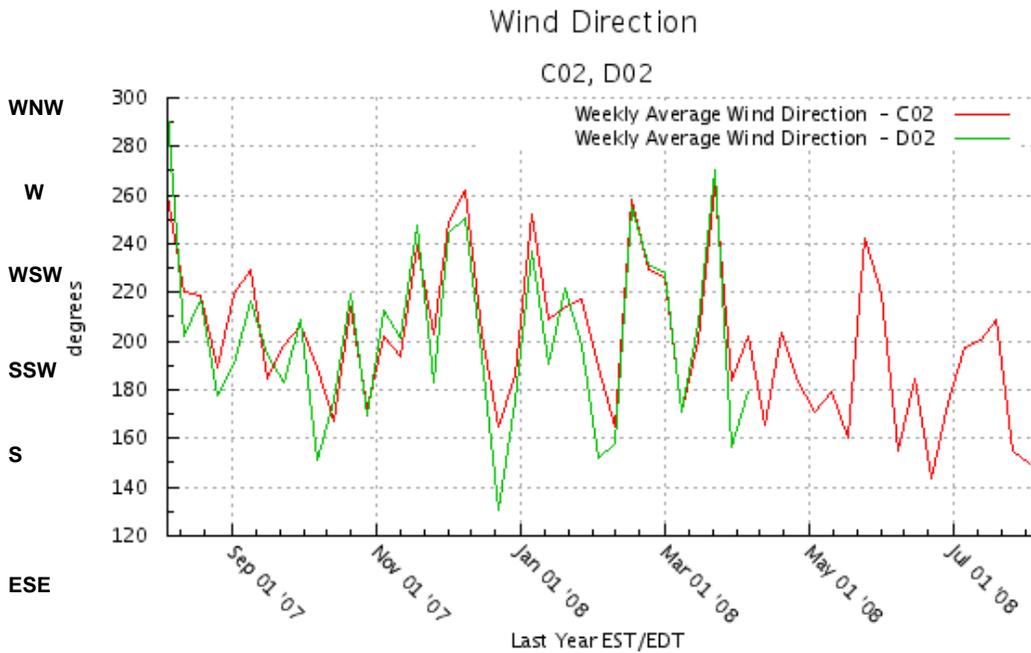
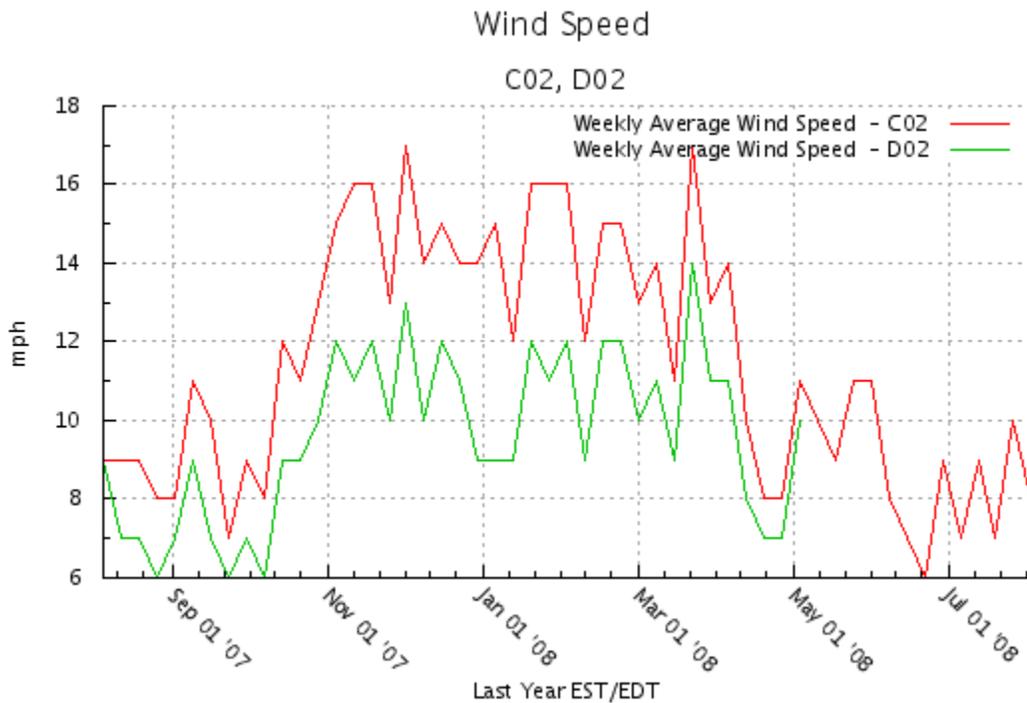


Figure 27. GoMOOS Wind Speed Weekly Average August 2007 - 2008



River Discharges

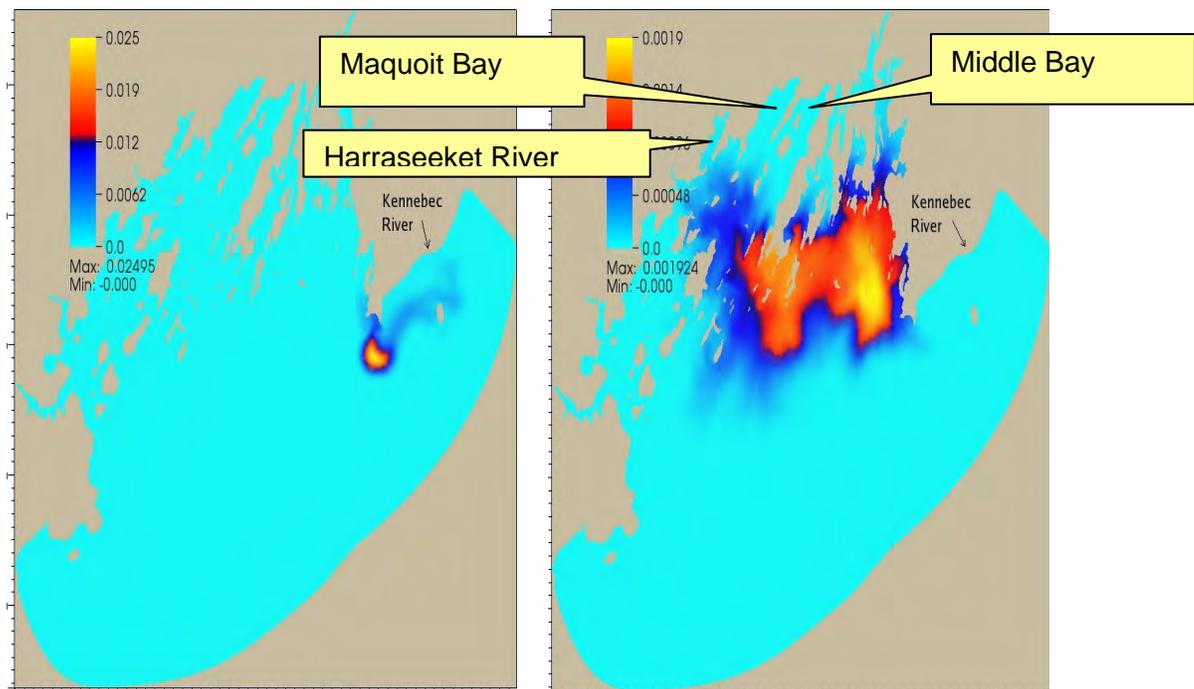
All of growing area WJ is in the Presumpscot River Watershed. The Presumpscot River starts at Sebago Lake and flows 27 miles through the towns of Windham, Gorham, Westbrook,



Falmouth and Portland. The area of the watershed is 648 square miles and it is one of the largest freshwater inputs to Casco Bay. The river discharges into Casco Bay in the town of Falmouth. The hydrographic information, presented in an earlier section of this report, show circulation patterns in eastern Casco Bay are not as impacted by Presumpscot River discharge water as they are from the Kennebec River. The Kennebec River discharges in the far eastern boundary of Casco Bay in Phippsburg. The Kennebec River watershed drains 5,870 square miles and flows through the towns and cities of Skowhegan, Waterville, Augusta, Gardiner and Bath. The Kennebec discharges nearly 6 billion U.S. gallons per day at an average of 9,000 cubic feet per second. There are three river gauging stations on the Kennebec; two of the gauges are impacted by tidal flow. The Presumpscot River has one gauging station and the average flow is 925 cubic feet per second.

In the True and Manning study, the Kennebec River's influence on eastern Casco Bay is most prevalent in the spring when runoff averages in March-April are 843 m³/s. A simulation of a point source at the mouth of the Kennebec at Cape Small, Phippsburg is shown in Figure 2; the model was run without considering wind or the tidal pumping in the Kennebec River itself. The modeled point source, after eight days in the presence of prevailing winds, which circulates around to the western shore of Harpswell Neck (Middle Bay) and enters the New Meadows River, are also shown in figure 28. The color gradient in the figure represents the amount of Kennebec River water in the area, with orange to red showing higher concentrations, and blue to light blue showing lower concentrations.

Figure 28. True and Manning Kennebec River Effluent Model, Western Casco Bay



Fresh water drains into the Harraseeket River from the following streams: Mill Stream, Allen Range Brook, Frost Gully Brook, Kelsey Brook, the brooks into Porter's Landing, and the brook into Spar Cove. The river, which is actually an embayment, is about 3700 feet wide at its widest point. The main portion of the Harraseeket is 3.75 miles long. It drains out through a channel at Stockbridge Point into Casco Bay.



The Little River in Recompense Cove is a brook that originates in Brunswick and flows through Freeport. It widens near the mouth where it becomes a tidal estuary inlet. This “river” is only a few feet deep at low tide and currents are the ebb and flood of the tide. The flow will increase after rainfall and during snow melt in the spring.

Discussion of Hydrographic and Meteorological Characteristics

Tides and winds have the greatest impact on water circulation patterns in growing area WJ. The tides and winds determine the strength and velocity of currents. The circulation pattern in growing area WJ is counterclockwise on a flooding tide with open ocean water coming in through Broad Sound. The counterclockwise circulation pattern is maintained on an ebbing tide. The Kennebec River (Kennebec) influences the water quality and adds to fresh water intrusion into western Casco Bay, even into Maquoit and Middle Bays especially during higher flow periods and during times of onshore winds. The Kennebec discharging at Cape Small, Phippsburg can impact as far as the mouth of the Harraseeket River, Freeport and Maquoit and Middle Bays, Brunswick in an eight day timeframe.

In reviewing the True and Manning model (Figures 28), sample stations WJ 60 through WJ 70, located at Ash Point and Basin Point in Harpswell would be most influenced by the Kennebec River effluent. In reviewing the 2003-2007 tabulated data for stations WJ 60 through 70, the highest recorded scores occur on September and October with a few single instances in January, November and August. Sample results, rainfall in the previous 72 hours and monthly average river discharge in cubic feet per second are displayed in Table 23. Based on this preliminary analysis, it does reflect that scores are generally lower with lower river discharge (except for station WJ65), meaning that the Kennebec River effluent is having an adverse impact on water quality; however rainfall may be having an adverse impact also.

Table 23. Ash Point and Basin Point, Harpswell Stations Compared with Rainfall (in inches) and Kennebec River Discharge

Sample Date	Station	FC/100ml	Rain on sample day	Rain within 24 hours	Rain within 48 hours	Rain within 72 hours	Kennebec and Adroscoggin River Gauge Monthly Ave. CFS
09/24/03	63.0	93	0"	0.34"	0"	0"	7,150
	64.0	9.1					
	65.0	240					
	66.0	23					
	67.0	43					
	68.0	93					
10/29/03	70.0	63	1.56"	0.03"	1.48"	0.06"	25,700
	63.0	93					
	64.0	460					
	65.0	150					
	66.0	460					
	67.0	1100					
	68.0	240					
70.0	31						



Sample Date	Station	FC/100ml	Rain on sample day	Rain within 24 hours	Rain within 48 hours	Rain within 72 hours	Kennebec and Adroscoggin River Gauge Monthly Ave. CFS
11/16/05	63.0	<3.0	0.50"	0.38"	0.02"	0"	40,700
	64.0	<3.0					
	65.0	43					
	66.0	240					
	67.0	43					
	68.0	460					
	70.0	<3.0					

Water Quality Review

All water samples were collected following a systematic random sampling strategy (SRS); water quality data collected in 2007 is presented in Appendix G. The sampling schedule is established in January each year beginning in 2006. The program requires the collection of 30 samples over a period of five or less years to establish the initial classification for each station. Maintenance of a station's classification is accomplished by collecting a minimum of six samples annually from all sampling stations not classified as prohibited. Many stations are sampled more frequently, either because of their classification status, or to provide water quality data under differing environmental conditions. The most recent (SRS and extra samples) 30 samples are used to calculate the geometric mean and the P90 to determine the initial classification. This analysis is repeated annually to confirm that each station's water quality continues to meet the standards of its classification.

Table 24 lists all active approved, restricted and prohibited stations in growing area WJ, with their respective geomean and P90 calculations for 2007. Please refer to Appendix H for a key to interpreting the headers on the columns of Table 24. The approved and restricted standards for each station are also displayed in this table. These standards will fluctuate yearly as a result of the DMR transition from a most probable number (MPN) fecal coliform test method to a membrane filtration (MF) method and are dependent on the number of sample analyzed by MPN versus 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 I.

Table 24. Geomean and P90-Year Round Data Analysis for Approved, Restricted and Prohibited Stations in Growing Area WJ 2003-2007

STATION	CLASS	COUNT	MFCNT	GEO_MEAN	SDV	MAX	P90	APPD_STD	RESTR_STD
WJ009.00	P	30	19	9.2	0.89	1200	125.3	37	204
WJ009.50	new	25	20	7.5	0.79	660	77.3	34	184
WJ016.00	A	30	9	3.5	0.3	43	8.5	43	250
WJ017.00	new	11	11	3.2	0.43	25	11.6		
WJ017.50	new	11	11	4.2	0.5	76	18.8		
WJ017.80	new	11	11	5	0.42	33	17.5		



STATION	CLASS	COUNT	MFCNT	GEO_MEAN	SDV	MAX	P90	APPD_STD	RESTR_STD
WJ018.00	R	30	15	5.2	0.63	460	33.4	39	221
WJ018.20	new	12	12	3	0.25	11	6.3		
WJ018.60	new	11	11	2.8	0.33	22	7.6		
WJ018.90	new	11	11	2.5	0.28	13	5.8		
WJ019.00	A	30	14	3.3	0.35	43	9.4	40	226
WJ024.00	A	30	8	4.9	0.58	240	27.3	43	255
WJ026.00	A	30	8	4	0.45	150	15.1	43	255
WJ027.30	new	16	10	3.1	0.33	40	8.2	37	205
WJ027.50	A	30	10	3.8	0.43	240	13.5	42	245
WJ030.00	P	30	10	7.7	0.63	1200	49.7	42	245
WJ031.50	A	30	10	3.8	0.49	460	15.9	42	245
WJ034.00	A	30	11	4.6	0.53	1100	22.1	41	240
WJ035.00	A	30	10	3.7	0.32	43	9.6	42	245
WJ038.00	A	30	10	3.7	0.48	460	15.5	42	245
WJ046.00	A	30	8	3.7	0.43	240	13.4	43	255
WJ048.00	A	30	8	5.6	0.68	1100	41.2	43	255
WJ048.50	new	12	10	2.6	0.27	10	5.8	33	180
WJ049.00	A	30	9	5.1	0.59	240	28.8	43	250
WJ049.50	A	30	8	4.9	0.52	240	22.7	43	255
WJ050.50	new	12	8	2.5	0.2	9.1	4.5	36	200
WJ051.00	A	30	8	4	0.36	93	11.7	43	255
WJ055.00	A	30	9	4.7	0.57	1200	25.7	43	250
WJ056.00	A	30	9	4.2	0.43	240	14.6	43	250
WJ057.00	P	30	8	4.2	0.48	460	17.3	43	255
WJ058.00	P	30	8	7.2	0.61	240	43.8	43	255
WJ059.00	A	30	8	4.9	0.56	440	25.5	43	255
WJ060.00	A	30	8	3.6	0.3	32	8.7	43	255
WJ061.00	A	30	8	2.9	0.16	9.1	4.7	43	255
WJ062.00	P	30	12	4.1	0.35	25	11.3	41	235
WJ063.00	P	30	12	4.2	0.49	360	17.5	41	235

All active water quality stations continue to meet the NSSP classification criteria currently assigned to them with the exception of WJ8, WJ18, WJ62, WJ63, WJ67, WJ68 and WJ70. Stations that are recommended for upward classification are highlighted green, stations recommended for downgrades in classification area highlighted yellow and new stations that do not have the minimum 30 data points are highlighted gray. WJ8 is classified conditionally approved, but does not meet approved standards in the open status; it currently meets restricted standards. Station WJ18 is currently classified restricted, but meets approved standards. Stations WJ 62 and 63 are prohibited but meet approved standards. There is a marina located between stations WJ 62 and 63 and later in the document a proposal for a marina conditional area will be presented. Stations WJ 64, 65, 66, 67, 68 and 70 are all classified conditionally approved based on season. Currently, these areas are being sampled year round in order to determine if they meet approved standards year round. The areas have been reviewed through their conditional area management plan reviews and changes in classification are being proposed where applicable. The discussion of these proposed changes can be found in the appendices at the end of the report.



In the Harraseeket River there are conditionally approved areas and conditionally restricted areas. The entire river is conditional on the proper functioning of the wastewater treatment plant (WWTP). A section of the river is conditionally approved based on a marina season with a closed status from May 1 through November 30. The WWTP conditionally approved area (stations WJ 1 through WJ 6) met approved standards when the river was in the open status (Table 25). Station WJ8 does not meet approved standards in the open status and is highlighted in yellow. In the Harraseeket River wastewater treatment plant conditionally restricted area, stations WJ 11 - 14.2, met restricted standards when in the open status, as seen in Table 25 below. In order to determine if an expanded data set would yield different results, the data are analyzed including all open status data from 2000-2007 at station WJ8 (Table 26). Using the expanded data set, the station still does not meet approved standards

Table 25. Geomean and P90- Open Status WWTP Conditional Area Stations 2003-2007

STATION	CLASS	COUNT	MFCNT	GEO_MEAN	SDV	MAX	P90	APPD_STD	RESTR_STD
WJ001.00	CA	30	17	4.5	0.48	93	18.4	38	212
WJ003.00	CA	30	16	4.5	0.45	56	16.8	38	217
WJ006.00	CA	30	10	4.6	0.41	43	15.5	42	245
WJ008.00	CA	23	17	6.4	0.74	1700	58	35	191
WJ011.00	CR	30	17	7	0.73	460	59.7	38	212
WJ014.00	CR	30	16	6.7	0.68	580	49.6	38	217
WJ014.20	CR	30	15	7.3	0.64	460	48.7	39	221

Table 26. Geomean and P90- Open Status WWTP Conditional Area Station WJ8 2000-2007

STATION	CLASS	COUNT	MFCNT	GEO_MEAN	SDV	MAX	P90	APPD_STD	RESTR_STD
WJ008.00	CA	30	17	5.6	0.66	1700	39.2	38	212

Station WJ8 no longer meets approved standards, but meets the restricted standards. A rainfall analysis (Appendix O) revealed high fecal coliform scores when there was with no rain (0 inches in 72 hours), little rain (0.001-0.25 inches in 72 hours) and rain (0.26" and above). The area south of the WWTP prohibited area must be classified restricted down to the next approved station which is station WJ6. A station on the Wolfe's Neck shore should be established to monitor the boundary line on the opposite shore.

The Harraseeket River marina conditional area is monitored by station WJ6. Stations WJ1, WJ3 and WJ16 are boundary stations. The marina area is in the open status (as long as there is no malfunction at the WWTP) from December 1 through April 30. All stations met approved standards during the open status (Table 27).

Table 27. Geomean and P90- Open Status (Dec 1 – April 30) Marina Conditional Area Stations 2003-2007

STATION	CLASS	COUNT	MFCNT	GEO_MEAN	SDV	MAX	P90	APPD_STD	RESTR_STD
WJ001.00	CA	21	6	4.2	0.4	93	13.8	43	252
WJ003.00	CA	22	6	4.1	0.37	93	12.4	43	254
WJ006.00	CA	22	5	4.7	0.44	43	17.6	44	261
WJ016.00	A	5	2	3.4	0.37	15	10.4	41	235

Maquoit Bay, Brunswick has a seasonal conditionally approved area which is in the open status from April 1 through August 31. The area is monitored by WJ32 and WJ33. Analyzing a subset



of the 2003-2007 data used for classification, in the open status, WJ33 meets approved standards (Table 28).

Table 28. Geomean and P90- Open Status Maquoit Bay Conditional Area Stations 2003-2007

STATION	CLASS	COUNT	MFCNT	GEO_MEAN	SDV	MAX	P90	APPD_STD	RESTR_STD
WJ032.00	CA	27	6	3.7	0.34	43	10.1	44	262
WJ033.00	CA	28	6	5.7	0.66	1100	39.3	44	263

* Note: the maximum score of 1100 at Station WJ 33 occurred in 2004 prior to the removal of a straight pipe at the head of the cove.

It is a recommendation of this report that an additional sample station be located across the bay, north of the WJ32 and WJ34 boundary line. Information from these stations will be used to determine if the boundary line for the seasonal conditional area can be moved north of the current position. The P90 trends for station WJ33 are as follows: for 2004 – 2007: 70.2, 59.6, 69.0 and 49.6. Overall water quality at station WJ33 has shown a slight improvement in the past year, but has remained steady for the past four years.

The marina conditionally approved area on the eastern shore of Merepoint Neck at Paul's Marina is monitored by sample station WJ47. The conditionally approved area is in the open status from November 1 through April 14. Station WJ47 meets approved criteria for the open status (Table 29).

Table 29. Geomean and P90- Open Status Paul's Marina Conditional Area Station 2003-2007

STATION	CLASS	COUNT	MFCNT	GEO_MEAN	SDV	MAX	P90	APPD_STD	RESTR_STD
WJ047.00	CA	24	8	3.0	0.27	43	6.8	42	245

A portion of Basin Cove, Harpswell is classified conditionally approved with an open season of December 1 through April 30. The area is monitored by stations WJ64, 65 and 66. All three stations meet approved standards for the open period (Table 30). A shoreline survey was conducted in the Basin Cove area in 2008 and no actual or potential pollution sources were identified. Additional data analysis for this area, using the most recent 30 data points, and including data ranging from 2000 to 2007 shows that the three conditional stations in Basin Cove still meets approved standards for the open season (Table 31).

Table 30. Geomean and P90- Open Status Basin Cove Conditional Area Stations 2003-2007

STATION	CLASS	COUNT	MFCNT	GEO_MEAN	SDV	MAX	P90	APPD_STD	RESTR_STD
WJ064.00	CA	20	5	3.3	0.22	9.1	6.3	44	258
WJ065.00	CA	20	5	3.5	0.35	43	9.8	44	258
WJ066.00	CA	20	5	4.3	0.39	43	13.9	44	258

Table 31. Geomean and P90- Open Status Basin Cove Conditional Area Stations 2003-2007

STATION	CLASS	COUNT	MFCNT	GEO_MEAN	SDV	MAX	P90	APPD_STD	RESTR_STD
WJ064.00	CA	30	5	3.7	0.31	43	9.3	45	271
WJ065.00	CA	30	5	3.3	0.29	43	7.7	45	271
WJ066.00	CA	30	5	4.4	0.36	43	12.7	45	271

There is a seasonal conditionally approved area in Ash Point Cove, Harpswell. The open season is October 1 through April 30 and the area is monitored by stations WJ67, 68 and 70. Sample collection prior to 2006 was limited to six to eight times per year, with no samples



collected in May, June, July or August (closed status). In 2006, eight samples were collected with coverage for seven months; the area was not sampled in March, May, August, November and December. In 2007, ten samples were collected with coverage in more months; July and November were the only months with no sample data. In reviewing the data (2003-2007), at station WJ 67, there were four samples collected in the open status which exceeded 31CFU/100ml (40-1100 CFU/100ml). Precipitation was noted as an adversity on three of the four dates, and wildlife was noted as an adversity on the fourth date. Using the same data set period, station WJ68, had three samples which exceeded 31CFU/100ml (43-460 CFU/100ml); precipitation was noted as an adversity on two of the sample dates. Station WJ70 has had no scores exceeding the 31CFU/100ml standard in the open status. Due to the elevated sample scores in the open status, the area does not meet the criteria for a seasonal conditional area and the area classification must be downgraded. According to the Harpswell harbormasters 2007 mooring maps, there are 38 boats moored in the area. The 2008 shoreline survey did not note any actual or potential pollution sources at station WJ67; but noted several actual and potential pollution sources in the upper part of the cove, closer to station WJ68. A further discussion on the proposed classification change can be found in the appendices at the end of this report.

All water sampling stations active for the entire review year in shellfish growing area WJ were sampled six times during the 2007 sampling season (Table 32). No stations were added or deactivated in 2007. A complete set of tabulated data can be found in Appendix G.

Table 32. 2007 Sample Count

Station	STATUS		CLASS	COMMENTS	Sample Run
	CLOSED	OPEN			
WJ001.00	1	11	CA		6V
WJ003.00	1	11	CA		
WJ006.00	3	8	CA		
WJ008.00	1	11	CA		
WJ009.00	12		P		
WJ009.50	12		new		
WJ011.00	1	11	CR		
WJ014.00	1	11	CR		
WJ014.20	1	10	CR		
WJ016.00		6	A		6V
WJ017.00		7	new		
WJ017.50		8	new		
WJ017.80		8	new		
WJ018.00		10	R		
WJ018.20		9	new		
WJ018.60		8	new		
WJ018.90		8	new		
WJ019.00		9	A		
WJ024.00		6	A		
WJ026.00		6	A		8V
WJ027.30		7	new		
WJ027.50		8	A		
WJ029.00		8	A		
WJ030.00	8		P		



Station	STATUS		CLASS	COMMENTS	Sample Run
	CLOSED	OPEN			
WJ031.50		8	A		
WJ032.00	2	7	CA		
WJ033.00	8	1	CA	Reclassified from CP to OCA 8/1/07 and then closed for the season 8/30/07	
WJ034.00	1	8	A		
WJ035.00		8	A		
WJ036.00		8	A		
WJ038.00	5	3	A	Reclassified from CCA to OA 8/1/07	
WJ046.00		6	A		
WJ047.00	6	6	CA		
WJ048.00	1	5	A	Reclassified from CP to OA 4/1/05	
WJ048.50	1	5	new	Reclassified from CP to OA 4/1/05	
WJ049.00	1	5	A	Reclassified from CP to OA 4/1/05	
WJ049.50		6	A		
WJ050.50		6	new		
WJ051.00		6	A		
WJ055.00		7	A		
WJ056.00		7	A		
WJ057.00	6		P		
WJ058.00	6		P		
WJ059.00		6	A		
WJ060.00		6	A		
WJ061.00	6		P		
WJ062.00	10		P		
WJ063.00	10		P		
WJ064.00	4	6	CA		
WJ065.00	3	7	CA		
WJ066.00	3	7	CA		
WJ067.00	3	7	CA		
WJ068.00	3	7	CA		
WJ070.00	3	7	CA		

Water Quality Discussion and Recommendations

All active water quality stations continue to meet the NSSP classification criteria currently assigned to them with the exception of stations WJ8, J18, WJ62, WJ63, WJ67, WJ68 and WJ70. WJ8 is classified conditionally approved, but does not meet approved standards during the open status; this station currently meets restricted standards. Station WJ18 is currently classified restricted but meets approved standards. Stations WJ 62 and 63 are prohibited but meet approved standards. There is a marina between stations WJ 62 and 63 and later in the document a proposal for a marina conditional area will be presented. Stations WJ 64, 65, 66, 67, 68 and 70 are all classified conditionally approved in seasonal areas. Stations WJ67 – 70 monitor water quality in the Ash Point Cove area and due to the elevated sample scores in the



open status, the area does not meet the criteria for a seasonal conditional area and the area classification must be downgraded. The Basin Cove area is being sampled year round in order to determine if it meets approved standards year round. All the conditional areas have been reviewed through their conditional area management plan reviews and changes in classification are being proposed where applicable. The discussion of these proposed changes can be found in the appendixes at the end of the report.

Due to active participation from the towns and local shellfish committees, any identified pollution or potential pollution sources are acted upon quickly. Towns have also participated in performing studies to determine the fate and transport of pollution in the areas and conducted rainfall studies in areas after non-point pollution remediation efforts have taken place.

Based on the current review of water quality data, it is recommended that additional boat sampling stations be placed in Maquoit Bay; to be located north of the current conditionally approved line and south of station WJ 33, in order to determine if the conditionally approved line can be moved north of its current location. It is also recommended that additional boat sampling stations be placed in Recompense Cove north of the current restricted area line and across the cove, in order to assess the potential impact of Little River on the cove. Investigatory samples should be collected after rainfall in various amounts and durations, over several days, in conjunction with the established water quality monitoring stations. Additional rainfall data should also be collected in the Harraseeket River and should continue in the Recompense Cove area. Sample collection should be targeting rain events with greater than 1.5 inches of accumulation within 24 hours of sample collection. Sampling should continue daily for up to five days after the rainfall event has ended. Finally, additional monitoring stations should be established in Spar Cove, Staples Cove, and on the Wolf's Neck shore on the Harraseeket River.

In addition to marine sample collection, additional stream samples should be collected in area WJ in the future. A stream sampling plan should be established to target various environmental conditions (example: dry and wet weather). These samples should be collected annually, as resources permit, across all seasons unless a seasonal component can be identified and repeated. Stream water quality data should be presented in the next triennial report for area WJ, due at the end of 2010. Specific streams that are recommended for additional evaluation are outlined in the conclusion section of the "Stream" section of this report.



References

Foster, J. (2008) [personal interview] cited 17 June 2008.

George J. Mitchell Field – Harpswell, ME Waymark [Internet]. [place unknown]. Groundspeak, Inc., 2008 . [cited 18 June 2008]. Available from:
<http://www.waymarking.com/waymarks/WM38HW>

Maine Department of Environmental Protection [Internet]. [Augusta, (ME)]. State of Maine, Department of Environmental Protection, c2005. [cited 18 June 2008]. Available from:
<http://www.maine.gov/dep/blwq/docmonitoring/toxics/cbhwnp.htm>
<http://www.maine.gov/dep/blwq/docmonitoring/toxics/cbhwnp.htm>

Freeport Economic Development Corporation [Internet]. [Freeport, (ME)]. Freeport Economic Development Corporation, no copyright date. [cited 19 June 2008]. Available from:
<http://www.freeportecon.com/index.html>

City-Data.Com [Internet]. [place unknown]. Advameg, Inc, c2003-2008. [cited 26 June 2008]. Available from: <http://www.city-data.com/city/Brunswick-Maine.html>

City-Data.Com [Internet]. [place unknown]. Advameg, Inc, c2003-2008. [cited 26 June 2008]. Available from: <http://www.city-data.com/city/Freeport-Maine.html>

City-Data.Com [Internet]. [place unknown]. Advameg, Inc, c2003-2008. [cited 26 June 2008]. Available from: <http://www.city-data.com/city/Harpswell-Maine.html>

Harpswell, Maine [Internet]. [Harpswell, (ME)]. Harpswell, Maine, no copyright date. [updated 20 June 2008, cited 27 June 2008] Available from:
<http://www.harpswell.maine.gov/vertical/Sites/%7B3F690C92-5208-4D62-BAFB-2559293F6CAE%7D/uploads/%7B72E57D9D-D245-4C75-BFEB-E5B184C43058%7D.PDF>

Agriculture News [Internet]. [Augusta, ME]. State of Maine, Department of Agriculture, c2005. [cited 20 June 2008]. Available from:
<http://maine.gov/tools/whatsnew/index.php?topic=AgTODAYNewsletter&id=44195&v=ArticleMaine>

Natural Resources Conservation Service [Internet]. [place unknown]. United States Department of Agriculture, no copyright date. [cited 20 June 2008]. Available from:
<http://www.me.nrcs.usda.gov/news/2007FRPP1.html>

Mitchell Ledge Farm [Internet]. [Freeport, (ME)]. Mitchell Ledge Farm, copyright. [cited 20 June 2008]. Available from: <http://www.mitchellledgefarm.com/index.htm>
<http://www.mitchellledgefarm.com/index.htm>

Whitten Properties [Internet]. [place unknown]. Whitten Properties, c2005. [cited 20 June 2008] Available from: <http://www.davidwhitten.com/maine-green-homes/>



Climate Change and Sustainability [Internet]. [place unknown]. Climate Change and Sustainability, Blethen Maine Newspapers, c2007. [updated 5 November 2007, cited 20 June 2008]. Available from: <http://tchgetting2zero.blogspot.com/2007/11/subdivision-where-leed-is-standard.html>

Expanding and Sustaining the Shellfisheries of Casco Bay – Phase II and III Casco Bay Estuary Project Report [Internet]. [Portland, (ME)]. Casco Bay Estuary Partnership, no copyright date. [cited 20 June 2008] Available from: <http://www.cascobay.usm.maine.edu/publications.html>

DRAFT Frost Gully and Concord Gully Bacteria Total Maximum Daily Load (TMDL) Report [Internet]. [Augusta, (ME)]. Maine Department of Environmental Protection, c2005. [cited 19 June 2008] Available from: <http://www.maine.gov/dep/blwq/comment.htm>

New England Forestry Foundation [Internet]. [Littleton, (MA)]. New England Forestry Foundation, c2008. [cited 23 June 2008]. Available from: <http://www.newenglandforestry.org/forestry/forestdetail.asp?id=113>

Brett Davis Realtors [Internet]. [Yarmouth, (ME)]. Brett Davis Realtors, no copyright date. [cited 23 June 2008] Available from: <http://www.brettdavisrealtors.com/>

Shoreland Farm [Internet]. [Portland, (ME)] Keller Williams Realty, c2008. [cited 23 June 2008] Available from: <http://shorelandfarmfreeport.com/index.php>

Tripping Gnome Farms, LLC [Internet]. [Freeport, (ME)]. Tripping Gnome Farms, LLC, c2006. [cited 23 June 2008] Available from: <http://www.trippinggnomefarm.com/about.html>

Maine Alpaca Association [Internet]. [Waldoboro, (ME)]. Maine Alpaca Association, no copyright date. [cited 23 June 2008] Available from: <http://www.mainealpaca farms.com/SnapShot/TrippingGnome.shtml>

Brunswick Economic Development Corporation [Internet]. [Brunswick, (ME)]. Brunswick Economic Development Corporation, no copyright date. [cited 26 June 2008]. Available from: <http://www.brunswickbiz.org/index.htm>

Weather Underground [Internet]. [place unknown]. The Weather Underground, Inc., c2008. [updated Rapid Fire, cited 30 June 2008]. Available from: <http://www.wunderground.com/cgi-bin/findweather/getForecast?query=Freeport%2C+ME>

Maine Department of Environmental Protection [Internet]. [Augusta, (ME)]. State of Maine, Department of Environmental Protection, c2005. [cited 1 July 2008]. Available from: <http://mainegov-images.informe.org/dep/blwq/docmonitoring/303d981.pdf>

Airport Data.Com [Internet]. [place unknown]. Airport Data.Com, c2004-2008. [cited 3 July 2008]. Available from: <http://www.airport-data.com/airport/ME33/>

U.S. Environmental Protection Agency Region 1 – New England [Internet]. [place unknown]. U.S. Environmental Protection Agency, no copyright date. [updated 24 February 2006, cited 3



July 2008]. Available from:

<http://yosemite.epa.gov/opa/admpress.nsf/6d651d23f5a91b768525735900400c28/8160566c21021ba2852571b1007856ca!OpenDocument>

DEP Fact Sheet No Discharge Areas in Maine [Internet]. [Augusta, (ME)]. Maine Department of Environmental Protection, c2005. [cited 3 July 2008]. Available from: <http://mainegov-images.informe.org/dep/blwq/topic/vessel/nda/ndafactsheet.pdf>

Bureau of Land and Water Quality No Discharge Areas [Internet]. [Augusta, (ME)]. Maine Department of Environmental Protection, c2005. [cited 3 July 2008]. Available from: <http://www.maine.gov/dep/blwq/topic/vessel/nda/index.htm>

Strouts Point Wharf Company [Internet]. [South Freeport, (ME)]. Strouts Point Wharf Company, c2007. [updated April 2007, cited 3 July 2008]. Available from: <http://www.stroutspoint.com/index.php>

Harraseeket Yacht Club [Internet]. [South Freeport, (ME)]. Harraseeket Yacht Club, no copyright date. [cited 3 July 2008] Available from: <http://www.hyc.cc/intro-mission.html>

Brewer South Freeport Marine [Internet]. [South Freeport, (ME)]. Brewer South Freeport Marine, no copyright date. [cited 3 July 2008]. Available from: <http://www.byy.com/South%20Freeport/visit.cfm>

Falls Point Marine Waterfront Resources for Casco Bay and Beyond [Internet]. [place unknown] Falls Point Marine Waterfront Resources for Casco Bay and Beyond, no copyright date. [cited 3 July 2008]. Available from: <http://www.fallspoint.com/index.html>

Maine Port Authority Dunning's Boat Yard [Internet] [place unknown] Maine Port Authority, no copyright date. [cited 3 July 2008]. Available from: <http://www.maineports.com/mpa/detail.asp?county=Greater+Portland+%26+Casco+Bay&city=all&submit2=Begin+Search&ID=24>

Maine Port Authority Porter's Landing [Internet]. [place unknown] Maine Port Authority, no copyright date. [cited 3 July 2008]. Available from: <http://www.maineports.com/mpa/detail.asp?county=Greater+Portland+%26+Casco+Bay&city=all&submit2=Begin+Search&ID=422>

Maine Port Authority Winslow Park (Stockbridge Point) [Internet] [place unknown] Maine Port Authority, no copyright date. [cited 3 July 2008]. Available from: <http://www.maineports.com/mpa/detail.asp?county=Greater+Portland+%26+Casco+Bay&offset=25&city=all&submit2=Begin+Search&ID=425>

DEP Issue Profile Overboard Discharges [Internet]. [Augusta, (ME)]. Maine Department of Environmental Protection, c2005. [cited 30 July 2008]. Available from: <http://www.maine.gov/dep/blwq/docstand/OBD/ip-obd.pdf>

Appendix A – Maine Department Of Environmental Protection Standard License Conditions for Overboard Discharges of Less than 2,000 Gallons Per Day [Internet]. [Augusta, (ME)]. Maine



Department of Environmental Protection, c2005. [cited 30 July 2008]. Available from:
<http://www.maine.gov/dep/blwq/docstand/OBD/scsmall.pdf>

Appendix A – Maine Department Of Environmental Protection Standard License Conditions for Overboard Discharges of More than 2,000 Gallons Per Day [Internet]. [Augusta, (ME)]. Maine Department of Environmental Protection, c2005. [cited 30 July 2008]. Available from:
<http://www.maine.gov/dep/blwq/docstand/OBD/sclarge.pdf>

Demarest, Michael. 30 July 2008. OBD question [personal email] Accessed 30 July 2008.

Crystal Spring Farm Preserve [Internet]. [place unknown] Brunswick – Topsham Land Trust, no copyright date. [cited 30 July 2008]. Available from: <http://www.btlit.org/preserves/csfp.shtml>

Sheep at Crystal Spring Community Farm [Internet]. [place unknown] Crystal Spring CSA, no copyright date. [cited 30 July 2008]. Available from: <http://crystalspringcsa.com/sheep-at-crystal-spring>

Casco Bay Estuary Project. (1996). *Casco Bay Plan*. Portland, ME; Author

Captain Alfred Skolfield Nature Preserve. [Internet]. [place unknown]. Brunswick-Topsham Land Trust, no copyright date. [cited 31 July 2008]. Available from:
<http://www.btlit.org/preserves/skolfield.shtml>

Skolfield Shores Preserve. [Internet]. [place unknown]. Harpswell Heritage Land Trust, no copyright date. [cited 31 July 2008]. Available from:
<http://www.harpswelllandtrust.org/conserved/skolfield.shtml>

Charles Norton Easement. [Internet]. [place unknown]. Harpswell Heritage Land Trust, no copyright date. [cited 31 July 2008]. Available from:
<http://www.harpswelllandtrust.org/conserved/CharlesNortonEasement.shtml>

Birch Island South Preserve. [Internet]. [place unknown]. Harpswell Heritage Land Trust, no copyright date. [cited 31 July 2008]. Available from:
<http://www.harpswelllandtrust.org/conserved/birch.shtml>

Upper Goose Island. [Internet]. [place unknown]. Harpswell Heritage Land Trust, no copyright date. [cited 31 July 2008]. Available from:
<http://www.harpswelllandtrust.org/conserved/UpperGoose.shtml>

Whaleboat Island Easement. [Internet]. [place unknown]. Harpswell Heritage Land Trust, no copyright date. [cited 31 July 2008]. Available from:
<http://www.harpswelllandtrust.org/conserved/WhaleboatIsland.shtml>

Eagle Island State Historic Site. [Internet]. [Augusta, (ME)]. State of Maine Department of Conservation, c2004. [cited 1 August 2008]. Available from: http://www.maine.gov/cqi-bin/doc/parks/find_name.pl

True, E. & Manning, J. (n.d.). *Modeling Wind and Tidal Circulation in Casco Bay, Maine: a preliminary study*. Retrieved August 1, 2008, from: <http://www2.norwich.edu/true/CascoBay1.pdf>



GoMOOS. [Internet]. [Portland, (ME)]. Gulf of Maine Ocean Observing System, c2002-2008. [cited 4 August 2008]. Available from: <http://www.gomoos.org/>

Horsley & Whitten Inc. Environmental Services (January 1996). *Identification and Evaluation of Nutrient and Bacterial Loadings to Maquoit Bay, Brunswick and Freeport, Maine*. Barnstable, MA: Author.

<http://www.pubmedcentral.nih.gov/pagerender.fcgi?artid=186920&pageindex=1#page>

<http://adsabs.harvard.edu/abs/1991EnMan..15..659V>



Appendix A. Annual Review of Management Plan- Harraseeket River WWTP Area

The Harraseeket River has conditionally approved and conditionally restricted areas. The entire river is classified conditional on the proper functioning of the wastewater treatment plant (WWTP). A section of the river is conditionally approved based on a presence of a marina, with a seasonal closed status between May 1 and November 30. A discussion on this area is evaluated in Appendix B.

Compliance with Management Plan

In 2007, there were two closures due to treatment plant malfunctions. The conditional area closed on April 6 and reopened on May 4, and it closed again on June 19 and reopened on July 11. Water and shellfish samples were tested prior to the reopening and met approved standards (Tables 1 and 2).

Table 1. Harraseeket River Reopening Water and Clam Samples Collected 5/1/07

Station	Class	Type	Score
WJ 1.0	CA	Water	1.9
WJ 3.0	CA	Water	1.9
WJ 8.0	CA	Water	1.9
		Clam	45
WJ 11.0	CR	Water	2
WJ 14.0	CR	Water	1.9
WJ 14.2	CR	Water	2

Table 2. Harraseeket River Reopening Water and Clam Samples Collected 7/8/07

Station	Class	Type	Score
WJ 1	CA	Water	1.9
WJ 3	CA	Water	1.9
WJ 8	CA	Water	1.9
		Clam	17
WJ 11	CR	Water	9.1
WJ 14	CR	Water	1.9
WJ 14.2	CR	Water	4

Adequacy of Reporting and Cooperation of Involved Persons

There is an emergency response plan with the Freeport Wastewater Treatment Plant. When there was a plant failure on June 19, plant personnel carried out the emergency response plan and the conditional area closed appropriately.

The closure that occurred on April 6 did not follow the management plan appropriately. An investigation by the DMR and the Freeport Municipal Shellfish Warden revealed that plant personnel discovered that they had bypassed unchlorinated wastewater at 5:30 am on April 5, 2007, in the amount of 250 gal/min for one hour. The Freeport Municipal Shellfish Warden implemented the closure, and was heading out onto the flats to enforce the closure.



The plant operator reported to DMR that the power had gone out just after midnight on Thursday morning (April 5, 2007), but the back up generators came on. Plant personnel were present and they reported to the plant manger on April 6, 2007 that wastewater was receiving primary treatment and being chlorinated on April 5, 2007 and there was no loss of solids. Plant personnel called the Freeport Dispatch on April 5, 2007 to report the power failure and to ask when it was going to be restored. During that call to dispatch, the plant personnel making the phone call requested to be connected to the Freeport Municipal Shellfish Warden's voice mail to leave a message. At that time, they did not tell the dispatcher that there was a malfunction requiring a closure of the Harraseeket River. The Freeport Municipal Shellfish Officer was not on duty on April 5, 2007. Plant personnel may have thought that a closure was not necessary on April 5, 2007, since the plant was still chlorinating. However, on the morning of April 6, 2007, the back up generator shut down when it ran out of propane, and for two hours the plant bypassed 250 gal/min of unchlorinated effluent, according to the plant manager. Immediately after receiving these reports from the Freeport Plant Manager and the Municipal Shellfish Warden, DMR prepared the legal notice for the closure and the municipal shellfish warden and the marine patrol enforced the closure on the flats. The DMR amended the legal notice to close the conditionally approved and conditionally restricted areas on April 6, 2007.

In this instance, the emergency response plan was not carried out appropriately. Plant personnel should have reported the problem and closed the flats on April 5, 2007, but they may not have realized that a closure was needed, since chlorination continued. They did notify the shellfish warden when chlorination was suspended on April 6, 2007, and the shellfish warden notified DMR.

Compliance with Approved Growing Area Criteria

The WWTP conditionally approved area, conditionally all conditionally approved stations, except station WJ 8, met the approved standards when the river was in the open status (Table 3). Station WJ8 (highlighted in yellow) did not meet approved standards in the open status. All conditionally restricted stations met their NSSP classification standard when in the open status.

Table 3. Geomean and P90 Score, Open Status WWTP Conditional Area Stations 2003-2007

STATION	CLASS	COUNT	MFCNT	GEO_MEAN	SDV	MAX	P90	APPD_STD	RESTR_STD
WJ001.00	CA	30	17	4.5	0.48	93	18.4	38	212
WJ003.00	CA	30	16	4.5	0.45	56	16.8	38	217
WJ006.00	CA	30	10	4.6	0.41	43	15.5	42	245
WJ008.00	CA	23	17	6.4	0.74	1700	58	35	191
WJ011.00	CR	30	17	7	0.73	460	59.7	38	212
WJ014.00	CR	30	16	6.7	0.68	580	49.6	38	217
WJ014.20	CR	30	15	7.3	0.64	460	48.7	39	221

Field inspection of critical pollution sources

The potential for pollution in the Harraseeket River area comes from the improper functioning of the Freeport Wastewater Treatment Plant. The outfall pipe from the Freeport WWTP, located in the middle of the Harraseeket River, is the primary pollution source requiring a conditional area. The plant is reviewed each year and continues to operate as licensed with a reporting



mechanism in place for malfunctions. A treatment plant review was completed on June 25, 2008. Updates to the treatment plant since 1995 include updating the dewatering section with a centrifuge in 2000, upgrading the Porter Landing pump station pumps, controls and generator and replacing 300ft of sewer lines on Depot and Mill streets.

Water sampling compliance history

All conditional stations were collected monthly when in the open status. Water quality results can be found in the 2007 Sanitary Survey Report for Growing Area WJ.

Analysis and Recommendations

DMR and Freeport Wastewater Treatment Plant Staff shall evaluate the Harraseeket River Management Plan on an annual basis. At the time of the annual review, the parties involved in the proper management of the Harraseeket River conditional area shall sign and date the management plan in order to indicate their acceptance of the conditions stated therein. The management plan must be amended so that marine patrol is notified first in order to enforce the closure of the conditional areas. A review of discharge monitoring reports and consultation on plant compliance with DEP must occur annually.

The area monitored by sample station WJ8 must be reclassified to conditionally restricted, as this area no longer meets the approved standards while in the open status. A new sample station to monitor the boundary line should be established at the Wolfe's Neck side of the river.



Appendix B. Annual Review of Management Plan-Harraseeket River Marina Area

A portion of Growing Area WJ, Harraseeket River, is classified as conditionally approved based in the presence of marinas in this section of the growing area. Specifically, the classification is based on the presence or absence of 10 or more boats with heads moored at the Harraseeket Yacht Club, Strout's Point Wharf, Brewer's Marine and South Freeport town docks, which may discharge waste into the Harraseeket River. Strouts Marina, Brewers Marina and the Freeport Yacht Club operate at the town docks. The Freeport harbormaster oversees all slips and mooring operations. The conditional area, monitored by station WJ 6, was classified conditionally approved in August 2002. DMR evaluated the Harraseeket River data, made observations of the marinas, and interviewed the marina owners with regard to usage in December 2001, and made the assessment that fewer than 10 boats are in the area from November 15 through May 1. Water quality met approved standards from December 1 through April 30.

Compliance with Management Plan

In 2007, the seasonal conditional area closed on May 1 and reopened on December 1. The area was visited by MDMR on November 28, 2007, and there were fewer than 10 boats with heads in the area. It was also visited on May 1, 2007 to confirm there were fewer than 10 boats with heads not yet in the water. The seasonal closure is enforced by the DMR Marine Patrol and the local Shellfish Warden. Cooperation between the involved parties has been excellent.

Adequacy of Reporting and Cooperation of Involved Persons

This management plan requires seasonal checks on boat activity at the marina. These checks are performed prior to the reopening of the area and at the time of closure.

Compliance with Approved Growing Area Criteria

The annual review of the conditionally approved station, WJ 6, shows that water quality met approved standards during the open period. The geometric mean on the most recent 26 samples collected during the open season was 4.5 and the P90 was 14.1 with an approved standard of 48.

Field Inspection of Critical Pollution Sources

The potential for pollution in the South Freeport area comes from boats with heads that are moored in the river. Visual observations are made of the Harraseeket River at the end of April and in the middle of November to ensure that there are fewer than 10 boats with heads in South Freeport.

Water Sampling Compliance History

Station WJ 6 was collected 6 times when in the open status in 2007. The results can be found in the 2007 Sanitary Survey Report for Growing Area WJ.



Analysis and Recommendations

It is DMR policy to observe marina areas before reopening to ensure compliance with approved standards. The Harraseeket River was observed on November 28, 2007 for the reopening on December 1, 2007; fewer than 10 boats with heads were in the water. The Harraseeket River is, by town ordinance, a No Discharge Zone (NDZ). The NDZ is enforced by the town harbormaster. A reporting mechanism should be developed between the town harbormaster and the DMR, in order to obtain information regarding the number of inspections and level of compliance with the NDZ.



Appendix C. Annual Review of Management Plan- Maquoit Bay Seasonal Area

The Maquoit Bay area has a history of water quality problems attributed to a variety of factors. Prior to December 2001, the area had been classified as conditionally approved based on rainfall of 1 or more inches within a 24 hour period. The head of Maquoit Bay (north of a line from a landing at Wharton Point to Pulsifer Point) was classified as prohibited in a legal notice dated July 9, 2003. The remainder of Maquoit Bay (with the exception of Bunganuc Creek) was classified conditionally approved based on rainfall of 1 or more inches within a 24 hour period. In January 2004, the conditional area management plan was reclassified from conditionally approved based on rainfall to seasonally conditionally approved, based on the presence of migratory bird populations, with an open status from April 15 through August 31. During this classification change, the entire Maquoit Bay, with the exception of the prohibited area in Bunganuc Creek, was included in the conditional area. An addendum to the sanitary survey report was submitted in September 2005, to recommend that the stations at the head of the bay be reclassified to prohibited, as they no longer met the criteria for approved status. This addendum also noted that rainfall did impact the sample scores in the area. However, since there were no identified sources of pollution in this area, the head of Maquoit Bay was downgraded to restricted, rather than prohibited classification. In 2006, an additional portion of Maquoit Bay, located between Flying Point, Freeport and Merepoint, Brunswick, was reclassified as restricted due to degrading water quality; the cause of the water quality degradation was unknown. In a legal notice dated May 3, 2006, the seasonal conditional area was expanded to include all of the Merepoint Neck shore; the open status of the area was extended from April 15 to August 31, to January 1 to August 31.

In 2006, the town of Brunswick and the Maine DEP conducted a shoreline survey and located a straight pipe on a property located near station WJ33. The pipe was replaced with an approved in-ground system in December 2006; this construction was confirmed to the DMR by the Brunswick Marine Warden on January 3, 2007. Station WJ 33 is located at a public boat launch which is used frequently for launching and loading boats, as well as a dog walking area. While no other obvious sources of pollution were found in the area, the town has installed dog waste bag dispensers. Water quality at station WJ33 continues to meet restricted standards even with the remediated straight pipe and dog waste control efforts. It is not clear what is contributing to elevated fecal coliform levels at station WJ 33.

Currently, Maquoit Bay is a conditionally approved area based on seasonal variation in water quality, with an open status from April 1 through August 31. Maquoit Bay, monitored by Stations WJ 32 and 33, was reclassified from restricted to conditionally approved based on seasonal variation in water quality on July 10, 2007 with the remaining portion reclassified from conditionally approved to approved. DMR evaluated the Maquoit Bay data in an *Addendum to the Sanitary Survey for Growing Area WJ; Maquoit Bay, Brunswick* in July 2007 which is available online at:

http://www.maine.gov/dmr/rm/public_health/G_A_reports/wjmaquoit_bay_addendum2007.pdf.



Compliance with Management Plan

Maquoit Bay, Brunswick has a seasonal conditionally approved area which is in the open status from April 1 through August 31. The area is monitored by WJ32 and WJ33. Analysis of a subset of the 2003-2007 data in the open status showed that the two stations met approved standards (Table 1).

Table 1. Geomean and P90 scores, Open Status, Maquoit Bay Conditional Area Stations, 2003-2007

STATION	CLASS	COUNT	MFCNT	GEO_MEAN	SDV	MAX	P90	APPD_STD	RESTR_STD
WJ032.00	CA	27	6	3.7	0.34	43	10.1	44	262
WJ033.00	CA	28	6	5.7	0.66	1100*	39.3	44	263

* Note: the maximum score of 1100 at Station WJ 33 occurred in 2004 prior to the removal of a straight pipe at the head of the cove.

Adequacy of Reporting and Cooperation of Involved Persons

This management plan does not require reporting, but does require a data analysis prior to the reopening of the seasonal conditional area.

Compliance with Approved Growing Area Criteria

The annual review of the water quality in Table 35 shows that stations WJ 32 and 33 meet approved standards during the open status time period.

Field Inspection of Critical Pollution Sources

The potential for pollution in Maquoit Bay is non-point in origin during the fall and winter months. Visual observations are made throughout the year during the course of random sampling and shoreline surveying.

Water Sampling Compliance History

All stations were sampled 6 times when in the open status in 2007. The results of all sampling can be found in the 2007 Sanitary Survey Report for Growing Area WJ.

Analysis and Recommendations

It is DMR policy to review water quality prior to reopening a seasonal area to ensure compliance with approved standards. Based on the current water quality review, it is recommended that additional sample station be established across Maquoit Bay, north of the boundary line between WJ32 and WJ34. Water quality data from these new stations will be used to determine if the boundary line for the seasonal conditional area can be moved north of its current position. The P90 trends for station WJ33 are as follows: from 2004 -2007: 70.2, 59.6, 69.0 and 49.6. Overall water quality at station WJ33 has shown a slight improvement in the past year, but has remained steady for the past four years. The additional boat stations across the bay should be sampled on the systematic random sample schedule as assigned to other stations in the area.



Appendix D. Annual Review of Management Plan- Merepoint Marina Area

A portion of Growing Area WJ, Paul's Marina at Merepoint Neck, is conditionally approved based on the presence or absence of 10 or more boats with heads at the marina, which may discharge into Middle Bay. Paul's Marina, monitored by station WJ 47, was classified conditionally approved in January 1995. DMR evaluated the data, made observations of the marina, interviewed the marina owner with regard to usage in December 1994, and made the assessment that fewer than 10 boats are in the cove from October 15 through April 15. Water quality met approved standards from November 1 through April 15.

Compliance with Management Plan

In 2007, the seasonal conditional area closed on April 15 and reopened on November 1. The area was visited by MDMR on October 25, 2007 and there were fewer than 10 boats with heads in the area. It was also visited on April 26, 2007 to confirm there were fewer than 10 boats with heads not yet in the water. The seasonal closure is enforced by DMR Marine Patrol and the local Shellfish Warden. Cooperation between the involved parties has been excellent.

Adequacy of Reporting and Cooperation of Involved Persons

This management plan requires seasonal checks on boat activity at the marina. These checks are performed prior to the reopening of the area and at the time of closure to ensure the proper open shellfish season.

Compliance with Approved Growing Area Criteria

At Paul's Marina, the conditionally approved station WJ 47 met approved standards during the open season. The geometric mean on the most recent 30 samples collected during the open season was 3.1 and the P90 score was 6.3, with an approved standard of 43.

Field inspection of critical pollution sources

The potential for pollution at Paul's Marina comes from boats with heads that are moored at the marina. Visual observations are made of the area at the end of October and prior to the closure on April 15 to ensure that there are fewer than 10 boats with heads in the area.

Water sampling compliance history

Station WJ 47 was collected 6 times when in the open status. The results can be found in the 2007 Sanitary Survey Report for Growing Area WJ.

Analysis-Recommendations

It is the DMR policy to observe marina areas before closing and reopening to ensure compliance with the management plan. Paul's Marina was observed at the end of October for the reopening on November 1. Fewer than 10 boats with heads were in the water.



Appendix E. Annual Review of Management Plan- Basin Cove Seasonal Area

In December 2000, Basin Cove was classified conditionally approved based on season with an open status from October 1 through April 30, because water quality during the summer did not meet approved standards. Many of the houses located in this area were occupied only during the summer season, creating a substantial increase in shore usage from May through September. Also, many of these seasonal dwellings had older septic systems. In July 2005, the shoreline survey identified two questionable septic situations on Basin Cove Road. One property, located on the north side of the right-of-way, near station WJ 66, had a septic system that was overloaded, though it was not breaking out. Another house, located south of the right-of-way, had a holding tank, which may not have been pumped out as frequently as required. A third potential source of pollution was the right of way itself, since it was steeply sloped, eroded, and conveyed storm water from King Moody Road and Basin Cove Road directly down to station WJ66. When the P90 score at station WJ66 no longer met approved standards during the open season, it became apparent that these potential pollution sources were having an actual and negative impact on water quality in the area.

On September 27, 2007, DMR regulation 95.03 Y, Closed Area No. 17-B, Harpswell Neck, Harpswell was promulgated to delay the seasonal opening of the Basin Cove conditionally approved area because the annual review revealed that station WJ 66 did not meet approved standards for the open season (October 1 through April 30). An analysis of the data, including data collected through September 2007, revealed that this station still did not meet approved standards during the open season. It was determined that the area should remain closed for further evaluation to determine if this area can continue to be managed as a conditional area. Currently, Basin Cove is classified as conditionally approved, due to seasonal variation in water quality, with an open season from December 1 through April 30.

A follow-up shoreline survey of this area was conducted in October 2007. The survey noted that the overloaded septic system located on Basin Cove Road was replaced with a new system in August 2006. In August 2007, the right of way was filled in and seeded with grass to decrease the flow rates of storm water run-off and channel it to through hedgerow for filtration. The survey also reported that as of November 2007, the house with the holding tank was no longer occupied and was scheduled to be demolished.

Compliance with Management Plan

In 2007, the seasonal conditional area closed on May 1 and reopened on December 1. The seasonal water quality was reviewed prior to reopening and water quality at Stations WJ 64, 65 and 66 continued to meet approved standards for the open season.

Adequacy of Reporting and Cooperation of Involved Persons

This management plan does not require reporting, but does require a data analysis prior to the reopening of the seasonal conditional area.



Compliance with Approved Growing Area Criteria

A portion of Basin Cove, Harpswell is classified conditionally approved with an open season of December 1 through April 30. The area is monitored by stations WJ64, 65 and 66. All three stations meet approved standards during open status (Table 1). A shoreline survey was conducted in the Basin Cove area in 2008 and no actual or potential pollution sources were identified.

Table 1. Geomean and P90 Scores, Open Status (December 1 – April 30), 2003-2007

STATION	CLASS	COUNT	MFCNT	GEO_MEAN	SDV	MAX	P90	APPD_STD	RESTR_STD
WJ064.00	CA	20	5	3.3	0.22	9.1	6.3	44	258
WJ065.00	CA	20	5	3.5	0.35	43	9.8	44	258
WJ066.00	CA	20	5	4.3	0.39	43	13.9	44	258

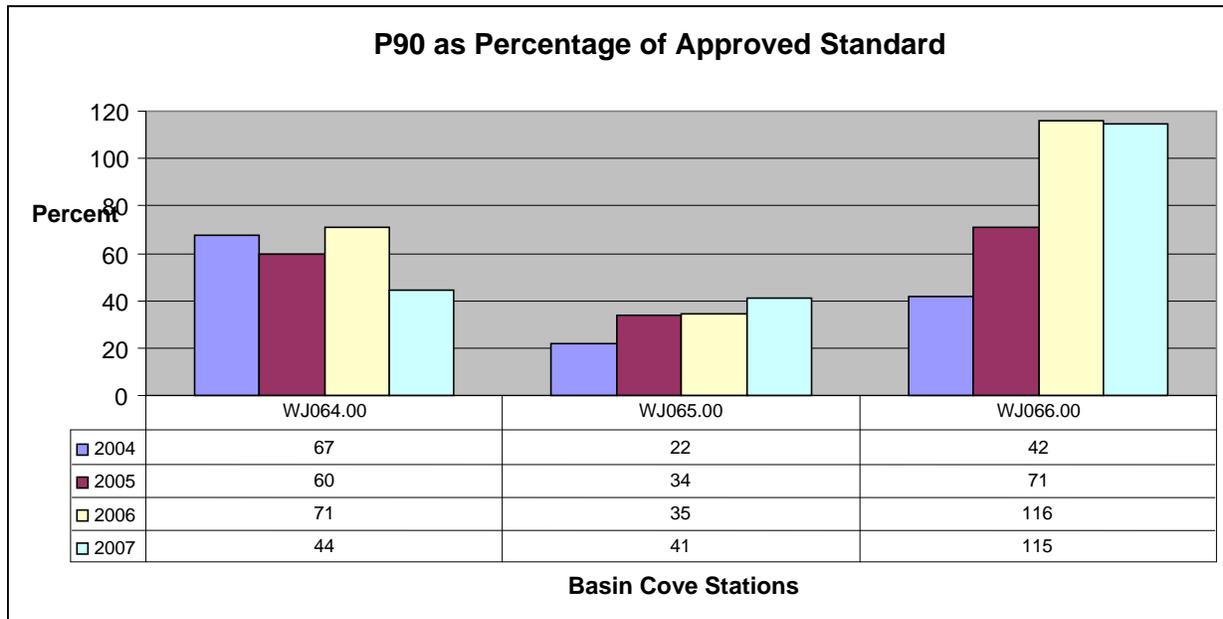
The P90 scores and applicable standards during the open season for the past four years are displayed in Table 2; trends in scores over the past four years are presented in Figure 1. Stations with scores surpassing the 100 percent mark are no longer meeting the approved standard. Scores at station WJ 66 have been increasing over the past three years, and no longer meet the approved standard as seen in the yellow highlighted area in Table 2. The conditional area was reevaluated in September 2007 and the rule was amended on November 27, 2007 to change the open status from October 1-April 30 to December 1 – April 30. Scores at station WJ 64 and 65 have remained relatively stable and show a marked improvement with the change in the open status time period.

Table 2. P90 Scores and Approved Standard, 2004 - 2007

Station	2004		2005		2006		2007	
	P90	APPD_STD	P90	APPD_STD	P90	APPD_STD	P90	APPD_STD
WJ064.00	33.0	49	30.7	49	21.9	48	6.3	44
WJ065.00	10.8	49	17.2	49	16.3	48	9.8	44
WJ066.00	20.6	49	36.3	49	58.7	48	13.9	44



Figure 1. P90 Scores (as percent of approved standard) at Basin Cove Stations, 2004-2007



The maximum fecal coliform scores that occurred each month from 2001 to 2007 are shown in Table 3. This table shows that the high scores of 460, 240 and 680 (the scores that have caused this station to exceed the P90 standard) occurred in October and November.

Table 3. Maximum Fecal Coliform Scores by Month and Year for Station WJ 66

Month	Year						
	2001	2002	2003	2004	2005	2006	2007
January				<3	<3	<3	<2
February	7.3	<3			<3	3.6	
March	<3	<3	<3	9.1	15		14
April	3.6	9.1	<3	<3	23	<3	2
May	<3						<2
June						3.6	
August						<3	<2
September	9.1		23	<3		13	<2
October	3.6	<3	460	3.6		680	<2
November	11	<3	3.6	3.6	240		<2
December	23	<3	3.6	43	<3		<2
Max of FC	23	9.1	460	43	240	680	14

A rainfall analysis was completed for all sample stations in area WJ (Appendix O). Stations 64, 65 and 66 have elevated scores after rainfall within 72 hours of sample collection. Station 64 had elevated fecal coliform scores when rainfall within 72 hours of sample collection >2.01". Station 65 had elevated fecal coliform scores when rainfall within 72 hours of sample collection >0.26". Station 66 had elevated fecal coliform scores when rainfall within 72 hours of sample collection >0.50".



The data from 2007 indicates that there may be some improvements in water quality in months when the area has been in the closed status. However, when the water quality data at station WJ66 was plotted out by months (Table 7), it showed that no samples were collected during the summer months of June, July and August from 2001 through 2005. Since the area was seasonally open from October through April, between 2001 and 2005, it was only sampled from October through April. In 2006, following the implementation of the systematic random sampling strategy, sampling was scheduled randomly from January through December. At present time, there are not enough data points to determine if water quality has improved in the time period when it was historically poor. Until enough data have been collected throughout all months of the year, this open season for this conditionally approved area will remain from December through April.

Table 7. Number of Samples Collected by Month for WJ66 2001 through 2007

Month	Year							Grand Total
	2001	2002	2003	2004	2005	2006	2007	
January				1	1	1	1	4
February	1	1			1	1		4
March	1	1	1	1	1		2	7
April	1	1	1	1	1	1	1	7
May	1						1	2
June						1		1
July							1	1
August						1	1	2
September	1		1	1		1	1	5
October	1	1	1	1		1	1	6
November	1	1	1	1	1			5
December	1	1	1	1	1		1	5
Grand Total	8	6	6	7	6	7	10	48

Field Inspection of Critical Pollution Sources

The potential for pollution in Basin Cove comes from increased shore usage (swimming, walking pets, etc.) and the influx of summer residents to their seasonal homes. Visual observations are made throughout the year during the course of random sampling and shoreline surveying.

Water Sampling Compliance History

All conditional stations were collected 6 times when in the open status.

Analysis and Recommendations

It is DMR policy to review water quality prior to reopening a seasonal area to ensure compliance with approved standards. Water quality does not meet approved standards from October through April, because of the high scores collected in October and November in past years. Shoreline survey results confirm that there are no longer any known actual or potential pollution sources in Basin Cove. The potential problems that were identified in 2005 have been



eliminated. The high fall scores, collected after heavy rainfalls, may have been associated with the potential pollution problems. Fecal coliform scores in 2007 indicate that conditions may be improving at station WJ66. However, few data points exist for this area during the closed status, limiting the opportunity for year-round water quality analysis. Currently, water quality does meet approved standards from December through April and it is appropriate for the classification of Basin Cove to be conditionally approved with an open season of December 1 through April 30.

It is recommended that more samples be collected during the summer months and in the fall months, and especially after rainfall events. Water quality should be reviewed, again, prior to the reopening in December 2008.



Appendix F. Annual Review of Management Plan- Ash Cove Seasonal Area

There is a seasonal conditionally approved area in Ash Point Cove, Harpswell. The open season is October 1 through April 30 and the area is monitored by stations WJ67, 68 and 70. Sample collection prior to 2006 was limited to six to eight times per year, with no samples collected in May, June, July or August (closed status). In 2006, eight samples were collected with coverage for seven months; the area was not sampled in March, May, August, November and December. In 2007, ten samples were collected with coverage in more months; July and November were the only months with no sample data. In reviewing the data (2003-2007), at station WJ 67, there were four samples collected in the open status which exceeded 31CFU/100ml (40-1100 CFU/100ml). Precipitation was noted as an adversity on three of the four dates, and wildlife was noted as an adversity on the fourth date. Using the same data set period, station WJ68, had three samples which exceeded 31CFU/100ml (43-460 CFU/100ml); precipitation was noted as an adversity on two of the sample dates. Station WJ70 has had no scores exceeding the 31CFU/100ml standard in the open status.

Table1. Number of Samples by Month at Station WJ67

Month	Year							Grand Total
	2001	2002	2003	2004	2005	2006	2007	
January				1	1	1	1	4
February	1	1		1	1	1	1	6
March	1		1	1	1		1	5
April	1	1	1	1	1	1	1	7
May	1						1	2
June						1	1	2
July						1		1
August						1	1	2
September	1		1	1		1	1	5
October	1	1	1	1		1	1	6
November	1	1	1	1	1			5
December	1	2	1	1	1		1	7
Grand Total	8	6	6	8	6	8	10	52

Due to the elevated sample scores in the open status, the area does not meet the criteria for a seasonal conditional area and the area classification must be downgraded. According to the Harpswell harbormasters 2007 mooring maps, there are 38 boats moored in the area. The 2008 shoreline survey did not note any actual or potential pollution sources at station WJ67; but noted several actual and potential pollution sources in the upper part of the cove, closer to station WJ68.

Compliance with Management Plan

In 2007, the seasonal conditional area closed on May 1 and reopened on October 1. The seasonal water quality was reviewed prior to reopening and water quality at Stations WJ 67, 68



and 70 continued to meet approved standards for the open season. However, due to elevated sample scores in the open status, the area does not meet the criteria for a seasonal conditional area.

Adequacy of Reporting and Cooperation of Involved Persons

This management plan does not require reporting, but does require a data analysis prior to the reopening of the seasonal conditional area.

Compliance with Approved Growing Area Criteria

In Ash Cove, conditionally approved stations, WJ 68 and 70, met approved standards during the open season (Table 2). Station WJ67 did not meet approved standards for the open season.

Table 2. Geomean and P90 Scores, Open Status (October 1 – April 30), 2003-2007

STATION	CLASS	COUNT	MFCNT	GEO_MEAN	SDV	MAX	P90	APPD_STD	RESTR_STD
WJ067.00	CA	28	7	5.9	0.69	1100	45.6	44	258
WJ068.00	CA	27	7	6.1	0.62	460	38.5	44	256
WJ070.00	CA	28	7	3.3	0.27	31	7.4	44	258

A rainfall analysis was completed for all sample stations in area WJ (Appendix O.). Stations 67 and 68 have elevated scores after rainfall within 72 hours of sample collection. Station 67 and 68 had elevated fecal coliform scores when rainfall within 72 hours of sample collection >0.26". Station 70 shows little or no impact from rainfall.

Field inspection of critical pollution sources

Ash Point Cove, Harpswell was surveyed in June 2008. Forty-eight properties were surveyed and there were 4 properties that were referred to the Harpswell codes enforcement officer. One property had a malfunctioning septic system; this property was located near a gully that flows to Ash Point Cove. The second identified problem was an illegal sink discharge. The third property noted as having a problem, had an illegal grey water discharge directly to the shore. The fourth noted problem was an illegal washing machine discharge to a culvert which drained near the shore. Due to the presence of these actual direct pollution sources, the area in upper Ash Point Cove must be classified prohibited. The remaining area can remain classified as conditionally approved. Problems in Ash Point Cove must be ameliorated prior to the seasonal conditional area opening on October 1.

The potential for pollution in Ash Cove comes from increased shore usage (swimming, walking dogs, etc.) and the influx of summer residents to their seasonal homes. There are also 38 boats moored in the area. The 2008 shoreline survey did not note any actual or potential pollution sources at station WJ67, however there are two mooring fields in the area. There are four actual or potential pollution sources in the upper part of the cove, in the vicinity of station WJ68.

Water sampling compliance history

All conditional stations were collected 6 times when in the open status. The results of all sampling can be found in the 2007 Sanitary Survey Report for Growing Area WJ.



Analysis and Recommendations

It is DMR policy to review water quality prior to reopening a seasonal area to ensure compliance with approved standards. In 2007, the seasonal conditional area closed on May 1 and reopened on October 1. The seasonal water quality was reviewed prior to reopening and water quality at stations WJ 67, 68 and 70 continued to meet approved standards for the open season. In reviewing the data (2003-2007), there were four samples which exceeded 31CFU/100ml (40-1100) collected in the open status at station WJ 67. Precipitation was noted as an adversity on three of the four dates, wildlife was noted on the fourth date. At station WJ68, for the same data set, there were three samples which exceeded 31CFU/100ml (43-460) collected in the open status, precipitation was noted as an adversity on two of the sample dates. No samples at station WJ70 exceeded the 31CFU/100ml standard in the open status. Due to elevated sample scores in the open status, the area does not meet the criteria for a seasonal conditional area.

There are four actual and potential pollution sources in the upper part of the cove closer to WJ68. Due to the presence of these pollution sources, the upper area will be classified prohibited until the pollution is remediated. The lower portion will be classified restricted.

It is recommended that more samples be collected during the late summer months and in the fall months after rainfall. Stream samples should be collected at the streams that were sampled in the CBEP study presented in the Stream section of this report; 2 sets under wet conditions and 2 under dry conditions. Water quality should be reviewed, again, after the pollution sources have been taken care of and the additional investigatory sampling has been completed for the next triennial report which is due in 2010. It is recommended that two new sample stations be placed as boundary stations at the prohibited/restricted line. A dilution calculation for the one malfunctioning septic system and the unknown system (600 GPD) will determine the placement of the boundary line including the enforceability of the line by the marine patrol. A dilution calculation (which can be found in the DMR central files) shows that 61 acres are needed to dilute the actual pollution source to the approved standard. A restricted area will be placed south of the prohibited line, and extend to the current conditionally approved line.



Appendix G. Water Quality Data Collected in 2007, Growing Area WJ

Station	Date	Collector	Tide	Temp	Sal	Strat	ADV	Stat	CL	MFCOL	WIND
WJ001.00	1/8/2007	EXT	F	4	26	R	P	O	CA	10	CL
WJ001.00	2/6/2007	EXT	HF	-3	32	R	-	O	CA	<2.0	NW
WJ001.00	3/5/2007	EXT	HF	-4	31	R	-	O	CA	<2.0	SW
WJ001.00	4/3/2007	JB	HF	2	30	R	-	O	CA	<2.0	CL
WJ001.00	5/1/2007	TKF	HF	5	26	R	-	C	CA	<2.0	NW
WJ001.00	6/10/2007	TKF	HF	9	28	R	-	O	CA	2	CL
WJ001.00	7/24/2007	EXT	E	17	30	R	-	O	CA	<2.0	CL
WJ001.00	8/14/2007	TKF	HF	20	32	R	P	O	CA	<2.0	NW
WJ001.00	8/28/2007	TKF	E	21	32	E	H	O	CA	6	SW
WJ001.00	9/11/2007	TKF	H	13	31	R	P	O	CA	2	CL
WJ001.00	10/10/2007	TKF	H	11	32	R	PW	O	CA	<2.0	CL
WJ001.00	10/30/2007	LL	LF	7	30	E	-	O	CA	18	NW
WJ001.00	11/13/2007	TKF	H	7	30	R	P	O	CA	<2.0	N
WJ001.00	12/5/2007	TKF	HE	-8	30	R	W	O	CA	2	CL
WJ003.00	1/8/2007	EXT	F	4	30	R	P	O	CA	12	CL
WJ003.00	2/6/2007	EXT	H	-2	32	R	-	O	CA	<2.0	W
WJ003.00	3/5/2007	EXT	HF	-2	32	R	-	O	CA	<2.0	SW
WJ003.00	4/3/2007	JB	HF	2	30	R	-	O	CA	<2.0	E
WJ003.00	5/1/2007	TKF	HF	8	26	R	-	C	CA	<2.0	W
WJ003.00	6/10/2007	TKF	HF	9	28	R	M	O	CA	2	CL
WJ003.00	7/24/2007	EXT	E	17	30	R	-	O	CA	2	CL
WJ003.00	8/14/2007	TKF	F	16	32	R	PB	O	CA	3.6	SE
WJ003.00	8/28/2007	TKF	E	19	30	E	H	O	CA	<2.0	SW
WJ003.00	9/11/2007	TKF	H	12	31	R	PH	O	CA	<2.0	NE
WJ003.00	10/10/2007	TKF	H	10	32	R	HPM	O	CA	<2.0	S
WJ003.00	11/13/2007	TKF	H	7	30	R	PB	O	CA	<2.0	N
WJ003.00	12/5/2007	TKF	HE	-5	32	R	W	O	CA	4	CL
WJ006.00	1/8/2007	EXT	F	4	30	R	P	O	CA	35	CL
WJ006.00	3/5/2007	EXT	HF	0	32	R	-	O	CA	2	SW
WJ006.00	4/3/2007	JB	HF	2	30	R	B	O	CA	<2.0	E
WJ006.00	5/1/2007	TKF	F	12	26	R	-	C	CA	<2.0	NW
WJ006.00	6/6/2007	TKF	F	18	28	R	P	O	CA	40	NW
WJ006.00	7/23/2007	TKF	LE	18	30	R	M	O	CA	5.5	NE
WJ006.00	8/14/2007	TKF	HE	24	32	R	PB	O	CA	2	NE
WJ006.00	8/28/2007	TKF	E	19	30	E	B	C	CA	10	SW
WJ006.00	9/11/2007	TKF	HE		31	R	PM	C	CA	8	NE
WJ006.00	10/10/2007	TKF	HE	10	31	R	HPM	C	CA	7.3	CL
WJ006.00	10/30/2007	LL	LF	10	30	E	-	O	CA	4	CL
WJ006.00	11/13/2007	TKF	HE	8	30	R	PB	O	CA	2	-
WJ006.00	12/5/2007	TKF	E	-3	30	R	M	O	CA	3.6	CL
WJ008.00	1/8/2007	EXT	F	4	30	R	P	O	CA	4	CL



Station	Date	Collector	Tide	Temp	Sal	Strat	ADV	Stat	CL	MFCOL	WIND
WJ008.00	2/6/2007	EXT	H	-2	32	R	-	O	CA	<2.0	CL
WJ008.00	3/5/2007	EXT	HF	-3	30	R	-	O	CA	<2.0	SW
WJ008.00	4/3/2007	JB	HF	2	26	R	N	O	CA	<2.0	E
WJ008.00	5/1/2007	TKF	F	5	25	R	-	C	CA	<2.0	NW
WJ008.00	6/10/2007	TKF	F	8	28	R	M	O	CA	2	CL
WJ008.00	7/24/2007	EXT	E	17	30	R	-	O	CA	6	CL
WJ008.00	8/14/2007	TKF	F	18	31	R	PB	O	CA	4	NE
WJ008.00	8/28/2007	TKF	E	21	30	E	-	O	CA	29	SW
WJ008.00	9/11/2007	TKF	H	15	31	R	P	O	CA	5.5	NE
WJ008.00	10/10/2007	TKF	H	12	31	R	P	O	CA	<2.0	S
WJ008.00	11/13/2007	TKF	H	9	31	R	P	O	CA	<2.0	NW
WJ008.00	12/5/2007	TKF	E	-5	30	R	W	O	CA	<2.0	CL
WJ009.00	1/8/2007	EXT	F	4	30	R	P	C	P	4	CL
WJ009.00	2/6/2007	EXT	H	-2	32	R	-	C	P	<2.0	W
WJ009.00	3/5/2007	EXT	HF	-1	23	R	-	C	P	<2.0	SW
WJ009.00	4/3/2007	JB	HF	2	28	R	-	C	P	<2.0	E
WJ009.00	5/1/2007	TKF	F	2	26	R	-	C	P	4	NW
WJ009.00	6/6/2007	TKF	LF	15	22	R	P	C	P	160	N
WJ009.00	7/8/2007	TKF	F	15	30	E	P	C	P	12	CL
WJ009.00	7/23/2007	TKF	LE	21	30	R	M	C	P	<2.0	E
WJ009.00	8/14/2007	TKF	F	19	31	R	P	C	P	<2.0	NE
WJ009.00	8/28/2007	TKF	E	21	30	E	-	C	P	540	SW
WJ009.00	9/11/2007	TKF	H	15	31	R	P	C	P	<2.0	NE
WJ009.00	10/10/2007	TKF	H	11	32	R	NPM	C	P	<2.0	S
WJ009.00	10/30/2007	LL	F	9	30	E	-	C	P	8	CL
WJ009.00	11/13/2007	TKF	H	8	30	R	P	C	P	2	NW
WJ009.00	12/5/2007	TKF	HE	-5	30	R	-	C	P	<2.0	CL
WJ009.50	1/8/2007	EXT	HF	4	22	R	P	C	P	92	CL
WJ009.50	2/6/2007	EXT	H	-2	32	R	-	C	P	<2.0	W
WJ009.50	3/5/2007	EXT	HF	-3	32	R	-	C	P	3.6	CL
WJ009.50	4/3/2007	JB	HF	2	26	R	N	C	P	<2.0	E
WJ009.50	5/1/2007	TKF	F	7	16	R	-	C	P	<2.0	N
WJ009.50	6/10/2007	TKF	F	8	27	R	-	C	P	10	CL
WJ009.50	7/8/2007	TKF	HF	13	30	E	P	C	P	18	CL
WJ009.50	7/24/2007	EXT	E	17	30	R	-	C	P	<2.0	CL
WJ009.50	8/14/2007	TKF	F	17	31	R	P	C	P	<2.0	NW
WJ009.50	8/28/2007	TKF	E	22	30	E	-	C	P	2	SW
WJ009.50	9/11/2007	TKF	H	14	31	R	P	C	P	2	NE
WJ009.50	10/10/2007	TKF	H	11	32	R	P	C	P	<2.0	S
WJ009.50	10/30/2007	LL	F	10	28	E	-	C	P	6	NW
WJ009.50	11/13/2007	TKF	H	10	30	R	P	C	P	<2.0	NW
WJ009.50	12/5/2007	TKF	HE	-5	30	R	W	C	P	<2.0	CL
WJ011.00	1/8/2007	EXT	HF	3	22	R	P	O	CA	35	CL



Station	Date	Collector	Tide	Temp	Sal	Strat	ADV	Stat	CL	MFCOL	WIND
WJ011.00	2/6/2007	EXT	HE	-2	32	R	-	O	CA	<2.0	W
WJ011.00	3/5/2007	EXT	H	-3	21	R	-	O	CA	<2.0	SW
WJ011.00	4/3/2007	JB	H	2.5	28	R	N	O	CA	<2.0	E
WJ011.00	5/1/2007	TKF	F	8	24	R	-	C	CA	2	N
WJ011.00	6/10/2007	TKF	F	9	27	R	-	O	CR	<2.0	CL
WJ011.00	7/24/2007	EXT	E	17	28	R	-	O	CR	4	CL
WJ011.00	8/14/2007	TKF	F	17	31	R	P	O	CR	6	NW
WJ011.00	8/28/2007	TKF	E	23	30	E	-	O	CR	8	SW
WJ011.00	9/11/2007	TKF	H	15	31	R	P	O	CR	5.5	NE
WJ011.00	10/10/2007	TKF	H	12	32	R	PW	O	CR	5.5	CL
WJ011.00	10/30/2007	LL	HF	10	30	E	-	O	CR	<2.0	NW
WJ011.00	11/13/2007	TKF	H	9	30	R	P	O	CR	<2.0	N
WJ011.00	12/5/2007	TKF	HE	-1	30	R	W	O	CR	<2.0	CL
WJ014.00	1/8/2007	EXT	HF	4	26	R	P	O	CA	24	CL
WJ014.00	2/6/2007	EXT	HE	-3	31	R	-	O	CA	<2.0	CL
WJ014.00	3/5/2007	EXT	H	-3	25	R	-	O	CA	<2.0	W
WJ014.00	4/3/2007	JB	H	3	26	R	N	O	CA	<2.0	E
WJ014.00	5/1/2007	TKF	F	10	26	R	-	C	CA	<2.0	N
WJ014.00	6/10/2007	TKF	F	10	28	R	-	O	CR	8	CL
WJ014.00	7/25/2007	JB	E	16	30	R	-	O	CR	<2.0	CL
WJ014.00	8/14/2007	TKF	F	20	31	R	P	O	CR	6	N
WJ014.00	8/28/2007	TKF	HE	21	30	E	-	O	CR	13	SW
WJ014.00	9/11/2007	TKF	H	14	30	R	P	O	CR	<2.0	NE
WJ014.00	10/10/2007	TKF	H	12	30	R	P	O	CR	4	CL
WJ014.00	11/13/2007	TKF	H	5	30	R	P	O	CR	2	NW
WJ014.00	12/5/2007	TKF	HE	-4	30	R	W	O	CR	<2.0	CL
WJ014.20	1/8/2007	EXT	HF	4	8	R	P	O	CR	106	CL
WJ014.20	3/5/2007	EXT	H	-2	28	R	-	O	CR	<2.0	CL
WJ014.20	4/3/2007	JB	H	3	17	R	N	O	CR	2	E
WJ014.20	5/1/2007	TKF	HF	8	24	R	-	C	CR	2	N
WJ014.20	6/10/2007	TKF	HF	8	26	R	-	O	CR	<2.0	CL
WJ014.20	7/8/2007	TKF	HF	14	30	E	P	C	CR	4	CL
WJ014.20	7/30/2007	JB	HF	21	29	R	-	O	CR	5.5	CL
WJ014.20	8/14/2007	TKF	F	20	30	R	P	O	CR	10	NE
WJ014.20	8/28/2007	TKF	HE	22	30	E	H	O	CR	20	SW
WJ014.20	9/11/2007	TKF	HE	17	30	R	P	O	CR	8	CL
WJ014.20	10/10/2007	TKF	H	14	31	R	PH	O	CR	<2.0	CL
WJ014.20	11/13/2007	TKF	H	8	30	R	P	O	CR	<2.0	NW
WJ014.20	12/5/2007	TKF	HE	-4	30	R	W	O	CR	<2.0	CL
WJ016.00	2/6/2007	EXT	HE	-3	32	R	-	O	A	<2.0	W
WJ016.00	4/3/2007	JB	HE	3	30	R	-	O	A	<2.0	E
WJ016.00	5/1/2007	TKF	H	10	26	R	-	O	A	<2.0	NW
WJ016.00	7/23/2007	TKF	L	17	30	R	-	O	A	<2.0	E



Station	Date	Collector	Tide	Temp	Sal	Strat	ADV	Stat	CL	MFCOL	WIND
WJ016.00	8/28/2007	TKF	HE	19	32	E	H	O	A	<2.0	SW
WJ016.00	9/11/2007	TKF	HF	12	32	R	PH	O	A	<2.0	E
WJ016.00	10/30/2007	LL	F	10	30	E	-	O	A	2	NW
WJ016.00	11/13/2007	TKF	HF	6	30	R	PH	O	A	7.3	NW
WJ017.00	5/1/2007	TKF	H	8	26	R	-	O	A	<2.0	N
WJ017.00	6/6/2007	TKF	F	18	28	R	P	O	A	25	N
WJ017.00	7/8/2007	TKF	H	15	30	E	P	O	A	<2.0	CL
WJ017.00	7/19/2007	TKF	H	17	30	E	N	O	A	2	N
WJ017.00	7/23/2007	TKF	F	20	31	R	-	O	A	<2.0	NE
WJ017.00	8/14/2007	TKF	HF	20	32	R	PH	O	A	<2.0	NE
WJ017.00	8/28/2007	TKF	HE	23	32	E	H	O	A	2	SW
WJ017.00	9/11/2007	TKF	HF	14	32	R	P	O	A	<2.0	CL
WJ017.00	10/10/2007	TKF	HF	12	32	R	P	O	A	<2.0	S
WJ017.00	10/30/2007	LL	F	10	30	E	-	O	A	4	CL
WJ017.00	11/13/2007	TKF	HF	5	30	R	PH	O	A	20	CL
WJ017.50	5/1/2007	TKF	H	6	26	R	-	O	A	<2.0	N
WJ017.50	6/6/2007	TKF	F	20	28	R	P	O	A	6	N
WJ017.50	7/8/2007	TKF	HE	15	30	E	P	O	A	6	CL
WJ017.50	7/19/2007	TKF	HE	18	30	E	N	O	A	<2.0	N
WJ017.50	7/24/2007	EXT	LE	18	30	R	-	O	A	<2.0	SE
WJ017.50	8/14/2007	TKF	HF	15	32	R	PH	O	A	<2.0	N
WJ017.50	8/28/2007	TKF	H	19	32	E	H	O	A	4	S
WJ017.50	9/11/2007	TKF	HF	17	31	R	P	O	A	2	CL
WJ017.50	10/10/2007	TKF	HF	12	32	R	PW	O	A	2	S
WJ017.50	11/13/2007	TKF	HF	8	31	R	P	O	A	12	W
WJ017.50	12/5/2007	TKF	HE	0	30	R	W	O	A	76	CL
WJ017.80	5/1/2007	TKF	H	10	26	R	-	O	R	6	N
WJ017.80	6/10/2007	TKF	H	13	28	R	-	O	R	2	CL
WJ017.80	7/8/2007	TKF	HE	16	30	E	P	O	R	<2.0	CL
WJ017.80	7/19/2007	TKF	HE	17	30	E	N	O	R	12	N
WJ017.80	7/30/2007	JB	H	22	32	R	-	O	R	13	S
WJ017.80	8/14/2007	TKF	HF	20	31	R	P	O	R	<2.0	NE
WJ017.80	8/28/2007	TKF	H	23	32	E	W	O	R	<2.0	S
WJ017.80	9/11/2007	TKF	HF	15	30	R	P	O	R	3.6	CL
WJ017.80	10/10/2007	TKF	HF	12	32	R	PW	O	R	8	S
WJ017.80	11/13/2007	TKF	HF	5	30	R	P	O	R	4	N
WJ017.80	12/5/2007	TKF	H	-6	30	R	W	O	R	33	N
WJ018.00	2/6/2007	EXT	E	-3	32	R	-	O	A	<2.0	W
WJ018.00	4/3/2007	JB	HE	4	28	R	N	O	A	<2.0	CL
WJ018.00	5/1/2007	TKF	H	6	26	R	-	O	A	2	N
WJ018.00	6/10/2007	TKF	H	13	28	R	-	O	R	6	CL
WJ018.00	7/8/2007	TKF	HE	16	30	E	P	O	R	2	CL



Station	Date	Collector	Tide	Temp	Sal	Strat	ADV	Stat	CL	MFCOL	WIND
WJ018.00	7/19/2007	TKF	HE	17	30	E	N	O	R	<2.0	N
WJ018.00	7/30/2007	JB	H	24	30	R	-	O	R	4	S
WJ018.00	8/14/2007	TKF	HF	19	31	R	P	O	R	<2.0	NE
WJ018.00	8/28/2007	TKF	H	20	32	E	W	O	R	<2.0	S
WJ018.00	9/11/2007	TKF	HF	15	31	R	P	O	R	3.6	CL
WJ018.00	10/10/2007	TKF	HF	11	32	R	PNW	O	R	2	S
WJ018.00	10/30/2007	LL	F	9	27	E	-	O	R	<2.0	NW
WJ018.00	11/13/2007	TKF	HF	6	30	R	P	O	R	<2.0	CL
WJ018.00	12/5/2007	TKF	H	-7	30	R	W	O	R	12	N
WJ018.20	4/3/2007	JB	HE	3	30	R	-	O	A	<2.0	CL
WJ018.20	5/1/2007	TKF	HE	10	26	R	-	O	A	2	N
WJ018.20	6/10/2007	TKF	H	12	28	R	-	O	R	2	CL
WJ018.20	7/8/2007	TKF	HE	16	30	E	P	O	R	<2.0	CL
WJ018.20	7/19/2007	TKF	HE	18	31	E	HN	O	R	<2.0	N
WJ018.20	7/24/2007	JB	E	18	30	R	-	O	R	4	SW
WJ018.20	8/14/2007	TKF	HF	22	31	R	PH	O	R	2	NE
WJ018.20	8/28/2007	TKF	HF	22	32	E	H	O	R	11	S
WJ018.20	9/11/2007	TKF	HF	14	32	R	PH	O	R	4	E
WJ018.20	10/10/2007	TKF	HF	11	32	R	HPW	O	R	2	S
WJ018.20	11/13/2007	TKF	F	5	30	R	PH	O	R	4	CL
WJ018.20	12/5/2007	TKF	H	-6	30	R	W	O	R	6	N
WJ018.60	5/1/2007	TKF	HE	8	26	R	-	O	R	5.5	N
WJ018.60	6/10/2007	TKF	H	13	28	R	-	O	R	<2.0	CL
WJ018.60	7/8/2007	TKF	HE	15	30	E	P	O	R	<2.0	CL
WJ018.60	7/19/2007	TKF	HE	16	31	E	HN	O	R	<2.0	NE
WJ018.60	7/25/2007	JB	E	18	31	R	-	O	R	22	SW
WJ018.60	8/14/2007	TKF	HF	21	31	R	PH	O	R	<2.0	NE
WJ018.60	8/28/2007	TKF	HF	23	32	E	H	O	R	3.6	SE
WJ018.60	9/11/2007	TKF	HF	15	32	R	PH	O	R	2	E
WJ018.60	10/10/2007	TKF	HF	10	32	R	HPW	O	R	<2.0	S
WJ018.60	11/13/2007	TKF	F	4	30	R	PH	O	R	<2.0	CL
WJ018.60	12/5/2007	TKF	H	-7	30	R	W	O	R	2	CL
WJ018.90	5/1/2007	TKF	HE	7	26	R	-	O	A	6	N
WJ018.90	6/10/2007	TKF	H	12	28	R	-	O	R	<2.0	CL
WJ018.90	7/8/2007	TKF	HE	16	30	E	P	O	R	2	CL
WJ018.90	7/19/2007	TKF	HE	16	31	E	HN	O	R	<2.0	NE
WJ018.90	7/24/2007	JB	LE	18	32	R	-	O	R	13	SW
WJ018.90	8/14/2007	TKF	H	19	31	R	PH	O	R	<2.0	NE
WJ018.90	8/28/2007	TKF	HF	21	30	E	-	O	R	<2.0	CL
WJ018.90	9/11/2007	TKF	HF	14	31	R	PH	O	R	<2.0	E
WJ018.90	10/10/2007	TKF	HF	12	32	R	PW	O	R	<2.0	CL
WJ018.90	11/13/2007	TKF	F	10	30	R	PH	O	R	<2.0	CL
WJ018.90	12/5/2007	TKF	H	-5	30	R	W	O	R	2	CL



Station	Date	Collector	Tide	Temp	Sal	Strat	ADV	Stat	CL	MFCOL	WIND
WJ019.00	4/3/2007	JB	HE	3	30	R	-	O	A	<2.0	CL
WJ019.00	5/1/2007	TKF	HE	8	26	R	-	O	A	2	N
WJ019.00	5/14/2007	LL	E	13	30	R	-	O	A	<2.0	CL
WJ019.00	7/8/2007	TKF	HE	15	30	E	P	O	A	<2.0	CL
WJ019.00	7/19/2007	TKF	HE	17	30	E	HN	O	A	2	NE
WJ019.00	7/30/2007	JB	H	22	30	R	-	O	A	10	S
WJ019.00	8/14/2007	TKF	H	19	31	R	PH	O	A	2	NE
WJ019.00	8/28/2007	TKF	HF	25	30	E	H	O	A	2	CL
WJ019.00	9/11/2007	TKF	HF	13	31	R	PH	O	A	2	E
WJ019.00	10/10/2007	TKF	HF	10	32	R	PW	O	A	4	CL
WJ019.00	11/13/2007	TKF	F	8	30	R	PH	O	A	<2.0	CL
WJ019.00	12/5/2007	TKF	H	-3	30	R	W	O	A	2	CL
WJ024.00	2/6/2007	EXT	E	-3	32	R	-	O	A	<2.0	NW
WJ024.00	4/3/2007	JB	E	2	30	R	-	O	A	<2.0	E
WJ024.00	5/1/2007	TKF	HE	7	26	R	-	O	A	<2.0	N
WJ024.00	7/24/2007	JB	L	17	31	R	-	O	A	<2.0	SE
WJ024.00	8/28/2007	TKF	HF	21	32	E	H	O	A	10	E
WJ024.00	9/11/2007	TKF	F	15	32	R	PH	O	A	<2.0	E
WJ024.00	11/13/2007	TKF	F	3	30	R	PH	O	A	2	CL
WJ026.00	2/6/2007	EXT	E	-3	28	R	-	O	A	<2.0	W
WJ026.00	4/3/2007	JB	E	2	30	R	-	O	A	<2.0	E
WJ026.00	5/1/2007	TKF	HE	8	26	R	-	O	A	<2.0	N
WJ026.00	7/25/2007	JB	E	18	31	R	-	O	A	2	CL
WJ026.00	8/28/2007	TKF	F	20	32	E	H	O	A	6	E
WJ026.00	9/11/2007	TKF	F	14	31	R	P	O	A	<2.0	E
WJ026.00	11/13/2007	TKF	F	4	31	R	PWH	O	A	2	W
WJ027.30	4/3/2007	DD	F	5	14	R	PT	O	CA	4	E
WJ027.30	4/26/2007	LL	E	8	28	R	-	O	CA	<2.0	CL
WJ027.30	5/29/2007	DD	E	18	29	R	-	O	CA	<2.0	NW
WJ027.30	6/13/2007	DD	HE	16	30	R	-	O	CA	6	-
WJ027.30	7/24/2007	DD	E	18	29	R	-	O	CA	<2.0	-
WJ027.30	8/8/2007	DD	HE	18	30	R	P	O	A	<2.0	N
WJ027.30	9/12/2007	MHE	H	15	32	E	-	O	A	40	SW
WJ027.30	11/14/2007	DD	HF	8	32	R	-	O	A	<2.0	SE
WJ027.50	4/3/2007	DD	F	5	21	R	PT	O	CA	2	E
WJ027.50	4/26/2007	LL	E	8	28	R	-	O	CA	<2.0	CL
WJ027.50	5/29/2007	DD	E	19	29	R	-	O	CA	2	NW
WJ027.50	6/13/2007	DD	HE	16	30	R	-	O	CA	6	-
WJ027.50	7/24/2007	DD	E	18	30	R	-	O	CA	<2.0	-
WJ027.50	8/8/2007	DD	HE	19	30	R	P	O	A	4	N
WJ027.50	9/11/2007	DD	HE	17	32	R	P	O	A	6	NE



Station	Date	Collector	Tide	Temp	Sal	Strat	ADV	Stat	CL	MFCOL	WIND
WJ027.50	11/14/2007	DD	HF	8	32	R	-	O	A	2	S
WJ030.00	4/3/2007	DD	E	5	0	R	PT	C	P	6	E
WJ030.00	4/26/2007	LL	HE	8	21	R	-	C	P	10	CL
WJ030.00	5/29/2007	DD	E	19	28	R	-	C	P	4	NW
WJ030.00	6/13/2007	DD	HE	81	20	R	-	C	P	18	-
WJ030.00	7/24/2007	DD	E	20	29	R	-	C	P	5.5	-
WJ030.00	8/8/2007	DD	HE	17	24	R	P	C	P	240	N
WJ030.00	9/11/2007	DD	HE	19	32	R	P	C	P	16	NE
WJ030.00	11/14/2007	DD	HF	9	26	R	W	C	P	4	S
WJ031.50	4/3/2007	DD	HE	5	30	R	PT	O	CA	6	E
WJ031.50	4/26/2007	LL	HE	9	15	R	-	O	CA	<2.0	CL
WJ031.50	5/29/2007	DD	E	19	29	R	-	O	CA	<2.0	NW
WJ031.50	6/13/2007	DD	HE	17	30	R	-	O	CA	<2.0	-
WJ031.50	7/24/2007	DD	E	20	30	R	-	O	CA	<2.0	-
WJ031.50	8/8/2007	DD	HE	18	30	R	P	O	A	52	N
WJ031.50	9/11/2007	DD	HE	19	32	R	P	O	A	2	NE
WJ031.50	11/14/2007	DD	HF	9	31	R	W	O	A	2	S
WJ032.00	4/3/2007	DD	HE	6	30	R	PT	O	CA	4	E
WJ032.00	4/26/2007	LL	HE	9	29	R	-	O	CA	<2.0	CL
WJ032.00	5/29/2007	DD	E	20	29	R	W	O	CA	<2.0	NW
WJ032.00	6/13/2007	DD	HE	16	30	R	-	O	CA	20	-
WJ032.00	7/24/2007	DD	E	20	30	R	-	O	CA	<2.0	-
WJ032.00	8/8/2007	DD	H	18	30	R	P	O	CA	<2.0	N
WJ032.00	9/11/2007	DD	HE	19	32	R	WP	C	CA	2	NE
WJ032.00	11/14/2007	DD	HF	9	30	R	W	C	CA	5.5	S
WJ032.00	12/17/2007	EXT	F	-6	31	R	-	O	CA	<2.0	NW
WJ033.00	4/3/2007	DD	F	4	30	R	PT	C	P	2	E
WJ033.00	4/26/2007	LL	HE	8	27	R	-	C	P	<2.0	CL
WJ033.00	5/29/2007	DD	E	19	28	R	-	C	P	<2.0	NW
WJ033.00	6/13/2007	DD	E	16	29	R	-	C	P	10	-
WJ033.00	7/24/2007	DD	E	21	30	R	-	C	P	<2.0	-
WJ033.00	8/8/2007	DD	H	18	30	R	P	O	CA	10	N
WJ033.00	9/11/2007	DD	HE	20	31	R	P	C	CA	38	NE
WJ033.00	9/12/2007	MHE	F	17	22	E	-	C	CA	520	SW
WJ033.00	11/14/2007	DD	HF	8	30	R	-	C	CA	6	SE
WJ033.00	12/26/2007	LL	HE	-2	21	R	PT	C	CA	6	CL
WJ034.00	4/3/2007	DD	HF	4	30	R	PT	O	CA	<2.0	E
WJ034.00	4/26/2007	LL	E	9	28	R	-	O	CA	<2.0	CL
WJ034.00	5/29/2007	DD	HE	19	29	R	-	O	CA	<2.0	NW
WJ034.00	6/13/2007	DD	E	15	30	R	-	O	CA	6	-
WJ034.00	7/24/2007	DD	E	20	30	R	-	O	CA	2	-
WJ034.00	8/8/2007	DD	H	18	30	R	P	O	A	12	N



Station	Date	Collector	Tide	Temp	Sal	Strat	ADV	Stat	CL	MFCOL	WIND
WJ034.00	9/11/2007	DD	HE	18	31	R	P	O	A	<2.0	NE
WJ034.00	11/14/2007	DD	HF	9	31	R	-	O	A	<2.0	S
WJ034.00	12/26/2007	LL	E	-2	27	R	PT	C	A	6	CL
WJ035.00	4/3/2007	DD	H	4	31	R	PT	O	CA	<2.0	E
WJ035.00	4/26/2007	LL	E	9	29	R	-	O	CA	<2.0	CL
WJ035.00	5/29/2007	DD	HE	18	29	R	-	O	CA	2	NW
WJ035.00	6/13/2007	DD	E	16	29	R	-	O	CA	7.3	-
WJ035.00	7/24/2007	DD	E	20	32	R	-	O	CA	<2.0	-
WJ035.00	8/8/2007	DD	HE	18	30	R	P	O	A	<2.0	N
WJ035.00	9/11/2007	DD	HE	19	32	R	P	O	A	2	NE
WJ035.00	11/14/2007	DD	HF	8	30	R	-	O	A	<2.0	S
WJ038.00	2/6/2007	AJS	HF		31	R	-	C	CA	<2.0	SW
WJ038.00	4/3/2007	DD	H	4	30	R	PT	C	CA	<2.0	E
WJ038.00	5/29/2007	DD	HE	16	28	R	-	C	CA	<2.0	NW
WJ038.00	6/13/2007	DD	HE	15	30	R	-	C	CA	<2.0	-
WJ038.00	7/24/2007	DD	E	18	31	R	-	C	CA	<2.0	-
WJ038.00	8/8/2007	DD	HE	17	30	R	P	O	A	<2.0	N
WJ038.00	9/11/2007	DD	HE	17	32	R	P	O	A	<2.0	NE
WJ038.00	11/14/2007	DD	HF	9	32	R	-	O	A	<2.0	SE
WJ046.00	2/6/2007	AJS	HF		32	R	-	O	A	<2.0	SW
WJ046.00	4/3/2007	DD	H	4	31	R	PT	O	A	<2.0	E
WJ046.00	5/29/2007	DD	HE	16	28	R	-	O	A	<2.0	NW
WJ046.00	7/24/2007	DD	E	18	31	R	-	O	A	2	-
WJ046.00	9/11/2007	DD	HE	18	32	R	P	O	A	4	NE
WJ046.00	11/14/2007	DD	HF	9	32	R	-	O	A	<2.0	S
WJ047.00	1/9/2007	EXT	F	4	29	R	-	O	CA	<2.0	SW
WJ047.00	2/6/2007	AJS	HF		32	R	-	O	CA	<2.0	CL
WJ047.00	4/3/2007	DD	H	4	32	R	PT	O	CA	<2.0	E
WJ047.00	4/26/2007	LL	E	8	28	R	-	C	CA	2	CL
WJ047.00	5/29/2007	DD	HE	15	29	R	-	C	CA	4	NW
WJ047.00	6/13/2007	DD	HE	16	30	R	-	C	CA	14	-
WJ047.00	7/24/2007	DD	E	18	32	R	B	C	CA	2	-
WJ047.00	8/8/2007	DD	HE	19	30	R	P	C	CA	6	N
WJ047.00	9/11/2007	DD	H	18	32	R	BP	C	CA	<2.0	NE
WJ047.00	11/14/2007	DD	HF	8	32	R	-	O	CA	<2.0	S
WJ047.00	11/28/2007	LL	HE	5	30	R	P	O	CA	3.6	NE
WJ047.00	12/17/2007	EXT	L	-5	32	R	-	O	CA	<2.0	SW
WJ048.00	2/6/2007	AJS	HF		32	R	-	C	P	1.6	CL
WJ048.00	4/3/2007	DD	H	4	28	R	PT	O	A	2	E
WJ048.00	5/29/2007	DD	HE	17	30	R	-	O	A	<2.0	NW
WJ048.00	7/24/2007	DD	E	18	31	R	-	O	A	<2.0	-



Station	Date	Collector	Tide	Temp	Sal	Strat	ADV	Stat	CL	MFCOL	WIND
WJ048.00	9/11/2007	DD	H	19	32	R	P	O	A	6	NE
WJ048.00	11/14/2007	DD	F	8	32	R	-	O	A	<2.0	S
WJ048.50	2/6/2007	AJS	H		32	R	-	C	P	<2.0	CL
WJ048.50	4/3/2007	DD	H	5	28	R	PT	O	A	<2.0	E
WJ048.50	5/29/2007	DD	HE	18	28	R	-	O	A	<2.0	NW
WJ048.50	7/24/2007	DD	E	18	31	R	-	O	A	<2.0	-
WJ048.50	9/11/2007	DD	H	18	32	R	P	O	A	10	NE
WJ048.50	11/14/2007	DD	F	8	32	R	-	O	A	<2.0	S
WJ049.00	2/6/2007	AJS	H		32	R	-	C	P	<2.0	SW
WJ049.00	4/3/2007	DD	HE	5	32	R	PT	O	A	<2.0	E
WJ049.00	5/29/2007	DD	HE	18	30	R	-	O	A	<2.0	NW
WJ049.00	7/24/2007	DD	E	18	31	R	-	O	A	<2.0	-
WJ049.00	9/11/2007	DD	H	19	32	R	P	O	A	120	NE
WJ049.00	9/12/2007	MHE	F	14	30	E	-	O	A	154	SW
WJ049.00	11/14/2007	DD	F	8	32	R	-	O	A	2	S
WJ049.50	2/6/2007	AJS	H		32	R	-	O	A	<2.0	SW
WJ049.50	4/3/2007	DD	HE	6	30	R	PT	O	A	4	E
WJ049.50	6/13/2007	DD	HE	14	30	R	-	O	A	5.5	-
WJ049.50	7/24/2007	DD	E	18	32	R	-	O	A	<2.0	-
WJ049.50	9/11/2007	DD	H	19	32	R	P	O	A	3.6	NE
WJ049.50	11/14/2007	DD	F	8	34	R	-	O	A	<2.0	S
WJ050.50	2/6/2007	AJS	H		32	R	-	O	A	<2.0	SW
WJ050.50	4/3/2007	DD	HE	6	30	R	PT	O	A	9.1	E
WJ050.50	5/29/2007	DD	H	18	29	R	-	O	A	2	NW
WJ050.50	7/24/2007	DD	E	18	31	R	-	O	A	<2.0	-
WJ050.50	9/11/2007	DD	H	18	32	R	P	O	A	2	NE
WJ050.50	11/14/2007	DD	F	9	32	R	-	O	A	<2.0	S
WJ051.00	1/10/2007	LL	L	2	28	R	P	O	A	<2.0	NW
WJ051.00	3/27/2007	GBR	HF	4	28	R	-	O	A	3.6	-
WJ051.00	5/2/2007	RMC	F	9	26	R	-	O	A	<2.0	CL
WJ051.00	6/20/2007	RMC	E	10	30	R	-	O	A	6	CL
WJ051.00	8/15/2007	RMC	F	15	31	R	-	O	A	24	E
WJ051.00	10/10/2007	GBR	E	12	32	R	-	O	A	4	CL
WJ055.00	1/10/2007	LL	L	3	28	R	P	O	A	<2.0	NW
WJ055.00	3/27/2007	GBR	HF	4	30	R	-	O	A	<2.0	-
WJ055.00	5/2/2007	RMC	F	9	21	R	W	O	A	<2.0	CL
WJ055.00	6/20/2007	RMC	E	10	30	R	-	O	A	6	CL
WJ055.00	6/25/2007	GBR	HE	14	30	R	-	O	A	2	CL
WJ055.00	8/15/2007	RMC	LF	15	30	R	-	O	A	4	E
WJ055.00	10/10/2007	GBR	E	12	32	R	-	O	A	6	CL



Station	Date	Collector	Tide	Temp	Sal	Strat	ADV	Stat	CL	MFCOL	WIND
WJ056.00	1/10/2007	LL	LF	3	30	R	P	O	A	<2.0	NW
WJ056.00	3/27/2007	GBR	F	4	30	R	-	O	A	12	-
WJ056.00	5/2/2007	RMC	F	9	26	R	-	O	A	<2.0	CL
WJ056.00	6/20/2007	RMC	E	10	30	R	-	O	A	24	CL
WJ056.00	6/25/2007	GBR	HE	15	30	R	-	O	A	<2.0	CL
WJ056.00	8/15/2007	RMC	LF	15	30	R	-	O	A	12	E
WJ056.00	10/10/2007	GBR	E	12	31	R	-	O	A	2	CL
WJ057.00	1/10/2007	LL	LF	3	12	R	P	C	P	2	NW
WJ057.00	3/12/2007	GBR	LF	4	20	R	-	C	P	<2.0	-
WJ057.00	5/2/2007	RMC	F	9	26	R	-	C	P	2	CL
WJ057.00	6/20/2007	RMC	E	10	30	R	-	C	P	<2.0	CL
WJ057.00	8/15/2007	RMC	LF	15	30	R	-	C	P	<2.0	E
WJ057.00	10/10/2007	GBR	E	14	32	R	-	C	P	22	CL
WJ058.00	1/10/2007	LL	LF	3	30	R	P	C	P	<2.0	NW
WJ058.00	3/12/2007	GBR	L	4	28	R	-	C	P	<2.0	-
WJ058.00	5/2/2007	RMC	F	10	28	R	-	C	P	8	CL
WJ058.00	6/20/2007	RMC	LE	10	31	R	-	C	P	58	CL
WJ058.00	8/15/2007	RMC	F	15	30	R	-	C	P	66	E
WJ058.00	10/10/2007	GBR	E	14	31	R	W	C	P	2	CL
WJ059.00	1/10/2007	LL	LF	3	30	R	P	O	A	<2.0	NW
WJ059.00	3/12/2007	GBR	L	4	32	R	-	O	A	<2.0	-
WJ059.00	5/2/2007	RMC	HF	9	28	R	-	O	A	<2.0	CL
WJ059.00	6/20/2007	RMC	LE	10	30	R	-	O	A	70	CL
WJ059.00	8/15/2007	RMC	F	15	30	R	-	O	A	<2.0	E
WJ059.00	10/10/2007	GBR	E	12	32	R	-	O	A	2	CL
WJ060.00	1/10/2007	LL	LF	3	30	R	P	O	A	<2.0	NW
WJ060.00	3/12/2007	GBR	E	4	30	R	-	O	A	<2.0	-
WJ060.00	5/2/2007	RMC	HF	10	28	R	-	O	A	<2.0	CL
WJ060.00	6/20/2007	RMC	LE	10	32	R	-	O	A	32	CL
WJ060.00	8/15/2007	RMC	F	15	30	R	-	O	A	2	E
WJ060.00	10/10/2007	GBR	E	12	32	R	-	O	A	14	CL
WJ061.00	1/10/2007	LL	F	3	30	R	P	C	P	<2.0	NW
WJ061.00	3/12/2007	GBR	E	4	32	R	-	C	P	<2.0	-
WJ061.00	5/2/2007	RMC	HF	10	28	R	W	C	P	<2.0	CL
WJ061.00	6/20/2007	RMC	LE	10	30	R	-	C	P	<2.0	CL
WJ061.00	8/15/2007	RMC	F	15	30	R	-	C	P	<2.0	E
WJ061.00	10/10/2007	GBR	E	14	32	R	-	C	P	<2.0	CL
WJ062.00	1/10/2007	LL	F	5	32	R	P	C	P	<2.0	NW
WJ062.00	2/12/2007	GBR	E	0	33	R	-	C	P	<2.0	S
WJ062.00	3/12/2007	GBR	E	4	32	R	-	C	P	<2.0	-



Station	Date	Collector	Tide	Temp	Sal	Strat	ADV	Stat	CL	MFCOL	WIND
WJ062.00	4/11/2007	RMC	E	5	32	R	-	C	P	<2.0	CL
WJ062.00	5/2/2007	RMC	HF	9	28	R	-	C	P	25	S
WJ062.00	6/20/2007	RMC	LE	10	30	R	-	C	P	17.5	CL
WJ062.00	8/15/2007	RMC	F	15	30	R	-	C	P	4	E
WJ062.00	9/24/2007	GBR	E	12	31	R	-	C	P	4	-
WJ062.00	10/10/2007	GBR	E	14	32	R	-	C	P	16	CL
WJ062.00	12/5/2007	GBR	E	5	30	R	-	C	P	<2.0	CL
WJ063.00	1/10/2007	LL	F	5	32	R	PW	C	P	<2.0	NW
WJ063.00	2/12/2007	GBR	E	0	32	R	-	C	P	6	S
WJ063.00	3/12/2007	GBR	E	4	32	R	-	C	P	<2.0	-
WJ063.00	4/11/2007	RMC	E	3	31	R	-	C	P	<2.0	CL
WJ063.00	5/2/2007	RMC	HF	8	28	R	-	C	P	<2.0	S
WJ063.00	6/20/2007	RMC	LE	10	30	R	-	C	P	2	CL
WJ063.00	8/15/2007	RMC	F	15	31	R	-	C	P	2	E
WJ063.00	9/24/2007	GBR	E	12	32	R	-	C	P	33	CL
WJ063.00	10/10/2007	GBR	E	12	32	R	-	C	P	6	CL
WJ063.00	12/5/2007	GBR	E	5	30	R	-	C	P	2	CL
WJ064.00	1/10/2007	LL	F	5	30	R	P	O	CA	6	NW
WJ064.00	2/12/2007	GBR	E	0	33	R	-	O	CA	<2.0	S
WJ064.00	3/12/2007	GBR	E	4	32	R	-	O	CA	<2.0	-
WJ064.00	4/11/2007	RMC	E	4	30	R	-	O	CA	<2.0	CL
WJ064.00	5/2/2007	RMC	HF	9	28	R	-	O	CA	<2.0	S
WJ064.00	6/20/2007	RMC	LE	10	30	R	-	C	CA	4	CL
WJ064.00	8/15/2007	RMC	F	15	30	R	-	C	CA	<2.0	E
WJ064.00	9/24/2007	GBR	E	12	32	R	-	C	CA	<2.0	CL
WJ064.00	10/10/2007	GBR	E	12	31	R	-	C	CA	27	CL
WJ064.00	12/5/2007	GBR	E	3	30	R	-	O	CA	<2.0	CL
WJ065.00	1/10/2007	LL	F	5	31	R	P	O	CA	<2.0	NW
WJ065.00	3/12/2007	GBR	HF	4	23	R	-	O	CA	27	-
WJ065.00	3/27/2007	GBR	F	4	30	R	-	O	CA	2	-
WJ065.00	4/11/2007	RMC	E	5	32	R	-	O	CA	<2.0	CL
WJ065.00	5/2/2007	RMC	HF	10	26	R	-	O	CA	<2.0	S
WJ065.00	7/24/2007	JB	E	15	30	R	-	O	CA	8	CL
WJ065.00	8/15/2007	RMC	F	15	30	R	-	C	CA	2	E
WJ065.00	9/24/2007	GBR	E	12	32	R	-	C	CA	20	-
WJ065.00	10/10/2007	GBR	E	12	32	R	-	C	CA	18	CL
WJ065.00	12/5/2007	GBR	E	0	26	R	-	O	CA	<2.0	CL
WJ066.00	1/10/2007	LL	F	5	30	R	P	O	CA	<2.0	NW
WJ066.00	3/12/2007	GBR	HF	4	30	R	-	O	CA	14	-
WJ066.00	3/27/2007	GBR	F	4	30	R	-	O	CA	<2.0	-
WJ066.00	4/11/2007	RMC	E	2	28	R	-	O	CA	2	CL
WJ066.00	5/2/2007	RMC	HF	10	28	R	-	O	CA	<2.0	S



Station	Date	Collector	Tide	Temp	Sal	Strat	ADV	Stat	CL	MFCOL	WIND
WJ066.00	7/24/2007	JB	E	15	31	R	-	O	CA	6	CL
WJ066.00	8/15/2007	RMC	H	15	30	R	-	C	CA	<2.0	E
WJ066.00	9/24/2007	GBR	E	12	32	R	-	C	CA	<2.0	-
WJ066.00	10/10/2007	GBR	E	12	32	R	-	C	CA	<2.0	CL
WJ066.00	12/5/2007	GBR	E	1	30	R	-	O	CA	<2.0	CL
WJ067.00	1/10/2007	LL	F	5	30	R	P	O	CA	<2.0	NW
WJ067.00	2/12/2007	GBR	LE	0	32	R	-	O	CA	<2.0	S
WJ067.00	3/12/2007	GBR	LE	4	32	R	-	O	CA	<2.0	-
WJ067.00	4/11/2007	RMC	E	4	30	R	-	O	CA	3.6	CL
WJ067.00	5/2/2007	RMC	HF	10	28	R	-	O	CA	4	S
WJ067.00	6/20/2007	RMC	L	10	30	R	-	C	CA	4	CL
WJ067.00	8/15/2007	RMC	F	15	31	R	-	C	CA	3.6	E
WJ067.00	9/24/2007	GBR	E	14	32	R	-	C	CA	15	-
WJ067.00	10/10/2007	GBR	E	14	32	R	-	O	CA	3.6	CL
WJ067.00	12/5/2007	GBR	E	1	30	R	W	O	CA	<2.0	CL
WJ068.00	1/10/2007	LL	F	5	12	R	P	O	CA	4	NW
WJ068.00	3/27/2007	GBR	F	4	26	R	-	O	CA	15	-
WJ068.00	4/23/2007	LL	F	18	23	R	-	O	CA	<2.0	S
WJ068.00	5/2/2007	RMC	H	10	28	R	-	O	CA	<2.0	S
WJ068.00	6/25/2007	GBR	E	16	30	R	-	C	CA	<2.0	CL
WJ068.00	8/15/2007	RMC	F	15	30	R	-	C	CA	27	E
WJ068.00	9/24/2007	GBR	F	18	32	R	-	C	CA	<2.0	CL
WJ068.00	10/29/2007	LL	F	7	30	R	-	O	CA	2	W
WJ068.00	11/28/2007	LL	HE	5	32	R	P	O	CA	2	NE
WJ068.00	12/5/2007	GBR	E	1	30	R	W	O	CA	<2.0	CL
WJ070.00	1/10/2007	LL	F	5	30	R	P	O	CA	<2.0	NW
WJ070.00	2/12/2007	GBR	LE	0	32	R	-	O	CA	<2.0	S
WJ070.00	3/12/2007	GBR	LE	4	32	R	-	O	CA	<2.0	-
WJ070.00	4/11/2007	RMC	E	2	30	R	-	O	CA	2	SE
WJ070.00	5/2/2007	RMC	H	9	28	R	W	O	CA	<2.0	S
WJ070.00	6/20/2007	RMC	L	10	30	R	-	C	CA	8	CL
WJ070.00	8/15/2007	RMC	F	15	30	R	-	C	CA	11	E
WJ070.00	9/24/2007	GBR	E	16	32	R	-	C	CA	2	CL
WJ070.00	10/10/2007	GBR	E	12	32	R	-	O	CA	<2.0	CL
WJ070.00	12/5/2007	GBR	E	1	30	R	-	O	CA	<2.0	CL



Appendix H. 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 I. 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, DMR 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 J. Data Analysis and Recommendation for Classification Change – Basin Point Marina Area

The eastern shore of Basin Point, Harpswell has been classified prohibited due to the presence of boats and lack of shoreline survey information. A shoreline survey was conducted in 2005 and no actual pollution sources were identified. Dolphin Marina, a large marina is located on the eastern shore of Basin Point. Based on the information provided by the marina operator, the marina operates from April 1 through November 30, with a peak season from June through September. According to the Harpswell harbormaster, it has 120 moorings and 15 slips; 90 boats (75% of total) have heads. The marina provides fuel and a port-a-potty on shore. There is no pump out facility, but boat owners are given information about pump-out services provided by the Friends of Casco Bay pump out boat. The DMR's marina dilution calculation indicates that 105 acres are needed to dilute potential pollution from 90 boats to the approved standard. Assuming that only 75% of the boats are being used at any given time, the required closed area is reduced to 79 acres. The current closure area around Dolphin marina is 121 acres and is currently classified prohibited. Based on past field observations, shoreline survey information, and water quality results, this area can be reclassified to conditionally approved, with an open season from November 1 to April 14. April 15 through October 31.

The Dolphin marina area is monitored by stations WJ 62, 63 and 64; all three stations met the approved standards, with year-round P90 scores of 11.3, 17.5 and 10.1, for the three stations, respectively. Data analysis, using water quality scores from 2000 to 2007, with an open status of November 1 through April 14, yields P90 scores of 7.1, 9.4 and 15.6, for the three stations, respectively.

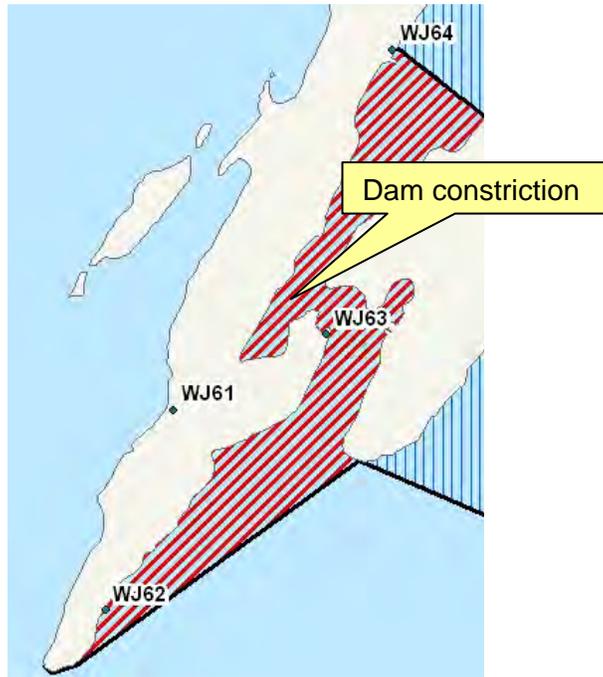
Figure 1 shows the area proposed for a marina conditional area. Just north and west of station WJ63 there are the remains of an old mill dam which limits the size and timing of boats entering the inner Basin Cove area.

Conclusion:

At this time, the prohibited area on eastern side of Basin Point, Harpswell can be classified as conditionally approved, with an open status running from November 1 through April 14. The closed status, running from April 15 to October 30, will cover the months when there are 10 or more boats with heads in the area. There are no direct pollution sources that were identified in the most recent shoreline survey.



Figure 30. Lower Basin Cove Proposed Marina Area





Appendix K. Data Analysis and Recommendation for Classification Change – Recompense Cove, Freeport

Recompense Cove in Freeport was reclassified from approved to restricted on April 23, 2007, due to water quality not meeting approved standards. The latest shoreline survey in this area was completed in 2006. Water quality has improved at the monitoring station, WJ 18 and currently meets the approved standard. The following data analysis will provide evidence to support a recommendation that the area can be upgraded to approved classification.

The data analysis in the 2006 annual review showed that station WJ18 had a geometric mean of 9.3 and a P90 score of 67.6, and did not meet approved standards. The latest survey for the area had not identified any actual and direct pollution sources in the area, but did identify a potential non-point pollution source, as run-off from the nearby Wolfe Neck farm. Six additional water quality monitoring stations (WJ17, 17.5, 17.8, 18.2, 18.6 and 18.9) were established in this area and approved for accelerated sampling. By the end of 2007, these new stations had been sampled 11 times.

DMR and the local shellfish industry met with the Wolfe Neck Farm manager on June 15, 2007, to encourage the farm to employ best management practices; a request for relocation of water and feed troughs in order to keep cows out of low areas south of Burnett Road was made on the same date. The farm moved the troughs, as well as the manure pad further into the woods and away from the drainage gully, which is currently monitored by station WJ 18.6. On November 12, 2007, MDMR received a letter from the farm manager outlining six improvements:

1. Contracted to update the farm's nutrient management plan
2. Moved water troughs and mineral feeders away from drainage areas
3. Not stockpiling manure in the fields for the past two years (All manure has been kept at NRCS designed and approved concrete manure holding areas and spread on nutrient deficient fields to minimize runoff)
4. Fenced waterways and drainages that feed into the Little River to keep cattle away
5. Not overgrazing or overstocking fields, so there is higher vegetation for filtering
6. Resealed the outhouse storage tanks at Recompense Shore Campground to prevent leakage

In 2007, samples from streams draining into recompense cove have been collected by DMR (refer to the stream section of this report). Additional samples targeting rain events were collected at stations WJ17.5 through WJ19, by the town of Freeport. On June 5, 2007, after 2.12 inches of rainfall had fallen within 72 hours prior to sample collection, Recompense Cove stream samples showed elevated scores, with the lowest score of 120CFU/100ml and the highest score of 1700CFU/100ml. A random sample run at stations WJ17 and 17.5 on June 6, 2007 and at stations WJ17.8, 18, 18.2, 18.6 and 18.9 on June 10, 2007, showed a varying scores, ranging from <2.0 to 25 CFU/100ml. All stations met approved standard criteria at the end of 2007.

Since water quality in Recompense Cove appeared to be impacted by local insults or overland runoff as a result of precipitation, an assessment on the impact of rainfall on fecal coliform scores at station WJ 18 was completed. Overall, 37 samples were collected between 2003 and 2007 at station WJ18. Of these samples, five (13.5%) had results above the approved standard. Station 18 was impacted with no rain and rain from 2003 to 2006 until best farming practices were implemented. (A rainfall analysis was completed for all sample stations in area



WJ (Appendix O)). Station 19 had 3 of 35 (8.5%) sample scores >14CFU/100m when rainfall within 72 hours of sample collection was 0.001-1.00". Stations 17, 17.5, 17.8 18.2, 18.6 and 18.9 have only been collected eleven time over one year (2007) so little rainfall correlation can be made at this time. However, stations 17, 17.5, 17.8 and 18.6 all had at least one sample score >14CFU/100ml in the data set. Stations 18.2 and 18.9 had no sample scores >14CFU/100ml in the data set.

In 2008, the Town of Freeport collected samples for 4 days at following 1.52 inches of rain (within a 72 hour period), at stations WJ17.5 through WJ 19 (Table 2). On the 5th day, additional station samples were collected as part of a random sampling run (light blue highlighted scores). All sample results met the approved standards.

Table 2. Fecal Coliform Scores vs. Rainfall at Stations Recompense Cove Stations (WJ17.5 – 19) from July 25-29, 2008

Sample Date	Site	CFU/100ml	Rain on Sample Day	Rain 24hours	Rain 48hours	Rain 72hours
7/25/08	17.5	12	0.06"	1.28"	0.17"	0.01"
	17.8	14				
	18.0	8				
	18.2	20				
	18.6	2				
	18.9	2				
	19.0	8				
7/26/08	17.5	4	0"	0.06"	1.28"	0.17"
	17.8	10				
	18.0	12				
	18.2	4				
	18.6	<2.0				
	18.9	<2.0				
	19.0	<2.0				
7/27/08	17.5	6	0.14"	0"	0.06"	1.28"
	17.8	6				
	18.0	4				
	18.2	14				
	18.6	<2.0				
	18.9	4				
	19.0	2				
7/28/08	17.5	4	0"	0.14"	0"	0.06"
	17.8	6				
	18.0	8				
	18.2	2				
	18.6	4				
	18.9	2				
	19.0	6				
7/29/08	17.5	2	0"	0"	0.14"	0"
	17.8	10				
	18.0	6				
	18.2	<2.0				



Sample Date	Site	CFU/100ml	Rain on Sample Day	Rain 24hours	Rain 48hours	Rain 72hours
	18.6	<2.0				
	18.9	2.0				
	19.0	8				

Conclusion:

At this time, the restricted area in Recompense Cove, Freeport can be classified as approved. No direct pollution sources were identified in the last shoreline survey. The non-point source pollution from the fenced-in livestock has been remediated by implementing better fencing practices at the farm. The potential risk from outhouse privies at the campground has been ameliorated by re-sealing the chambers.

It is a recommendation of this report that additional stream sampling and sampling at the monitoring stations for days after rainfall in order to verify that the cows and other animals upstream on Little River and the pastures on Burdett Road do not have an impact on water quality in Recompense Cove. It is further recommended that the Town of Freeport work with the farm manager to continue moving fencing from low lying areas along the Burnett Road pastures and streams.



Appendix L. Data Analysis and Recommendation for Classification Change – Harraseeket River, Freeport

The Harraseeket River has conditionally approved areas and conditionally restricted areas. The entire river is conditional on the proper functioning of the wastewater treatment plant (WWTP). A section of the river is conditionally approved based on a marina season with a closed status of May 1 through November 30. The WWTP conditionally approved area, stations WJ 1 through 6, met approved standards when the river was in the open status. Station WJ8 does not meet approved standards in the open status and is highlighted in yellow in Table 1. In the Harraseeket River wastewater treatment plant conditionally restricted area, stations WJ 11 through 14.2, met restricted standards when in the open status.

Table 1. Geomean and P90- Open Status Harraseeket River WWTP Conditional Area Stations 2003-2007

STATION	CLASS	COUNT	MFCNT	GEO_MEAN	SDV	MAX	P90	APPD_STD	RESTR_STD
WJ001.00	CA	30	17	4.5	0.48	93	18.4	38	212
WJ003.00	CA	30	16	4.5	0.45	56	16.8	38	217
WJ006.00	CA	30	10	4.6	0.41	43	15.5	42	245
WJ008.00	CA	23	17	6.4	0.74	1700	58	35	191
WJ011.00	CR	30	17	7	0.73	460	59.7	38	212
WJ014.00	CR	30	16	6.7	0.68	580	49.6	38	217
WJ014.20	CR	30	15	7.3	0.64	460	48.7	39	221

In order to determine if an expanded data set would yield different results, the data was analyzed including all open status data from 2000-2007 at station WJ8 and the results are in Table 2. The station still does not meet the approved standard.

Table 2. Geomean and P90-Year Open Status WWTP Conditional Area Station WJ8 2000-2007

STATION	CLASS	COUNT	MFCNT	GEO_MEAN	SDV	MAX	P90	APPD_STD	RESTR_STD
WJ008.00	CA	30	17	5.6	0.66	1700	39.2	38	212

On October 11, 2006, a sample result at station WJ8 yielded a very high score of 1700CFU/100ml; there was no precipitation occurring within 72 hours of this sample's collection and no adversity was noted on the field sheet. On the same day, a nearby station WJ 9.5, which is classified as prohibited, had a score of 88CFU/100ml, while other nearby stations that were sampled on the same date had scores ranging from <2.0 to 30 CFU/100ml. Since station WJ8 no longer meets approved standards, it must be reclassified to restricted, and the area south of the WWTP prohibited area must be classified restricted down to the next approved station, which is station WJ6. Additionally, a new monitoring station should be established off Wolfe Neck Road, in order to monitor the boundary line for this conditional area.



Appendix M. Recommendation for Classification Changes Area No. 15

TITLE & TEXT OF RULE: DMR Chapter 95.03(F) Area No. 15, Harraseeket River and Recompense Cove (Freeport)

A. Effective immediately, because of pollution, it shall be unlawful to dig, take or possess any clams, quahogs, oysters or mussels taken from the shores, flats and waters of the following areas:

1. Harraseeket River: north of a line beginning at the north end of Nappi's Cove, then running due east to the south tip of Bartol Island, then running southeast to an orange painted post, located 375 yards north of Winer's Cove. This area is classified as "Conditionally Restricted" and requires a special MDMR permit. This area shall be closed to all harvest during any malfunction at the Freeport Sewage Treatment Plant.
2. Harraseeket River: south of a line beginning at the north end of Nappi's Cove, then running due east to the south tip of Bartol Island, then running southeast to an orange painted post, located 375 yards north of Winer's Cove; AND north of a line beginning at an orange painted post located 66 yards north of the end of Brigantine Cove Lane on the west shore of the Harraseeket River, extending southeast to a orange painted post located 150 yards north of the southern most boundary of Wolf Neck State Park.
- ~~3. Recompense Cove: north of a line beginning at a red painted post on the point of land at Wolfe Neck State Park picnic area, 50 yards north of the osprey island and approximately 1,200 yards west of the Little River, and extending east to the small point of land at the bend by 77 Shore Drive, approximately 33 yards west of the right of way landing. This area is classified restricted and requires a special MDMR permit.~~
3. Harraseeket River: north of a line beginning at an orange painted post located approximately 25 yards north of the northwest end of Brewer's Marine Service, then running southeast to an orange painted rock located on the west shore of Wolf Neck; AND south of a line beginning at an orange painted post located 66 yards north of the end of Brigantine Cove Lane on the west shore of the Harraseeket River, extending southeast to a orange painted post located 150 yards north of the southern most boundary of Wolf Neck State Park. This area is classified conditionally restricted and requires a special MDMR permit. This area shall be closed to all harvest during any malfunction at the Freeport Sewage Treatment Plant.
4. Little River: north of a line at the Burnett Road bridge. This area is classified as "Restricted" and requires a special MDMR permit.

~~B. Effective immediately, because of pollution, the shores, flats and waters of the Harraseeket River: south of a line beginning at an orange painted post located 66 yards~~



~~north of the end of Brigantine Cove Lane on the west shore of the Harraseeket River, extending southeast to a orange painted post located 150 yards north of the southern most boundary of Wolf Neck State Park; AND north of a line beginning at an orange painted post located approximately 25 yards north of the northwest end of Brewer's Marine Service, then running southeast to an orange painted rock located on the west shore of Wolf Neck; have been classified as "Conditionally Approved," and shall be closed to the harvest of clams, quahogs, oysters and mussels during any malfunction at the Freeport Sewage Treatment Plant. The area is currently CLOSED.~~

G. B. Effective immediately, because of pollution, the shores, flats and waters of the Harraseeket River: south of a line beginning at an orange painted post located approximately 25 yards north of the northwest end of Brewer's Marine Service, then running southeast to an orange painted rock located on the west shore of Wolf Neck; AND north of a line beginning at an orange painted post located about 230 yards south of the Harraseeket Yacht Club, then running southeast to the north tip of Stockbridge Point, then continuing east across the mouth of the Harraseeket River to the south end of the old stone pier on Moore Point; have been classified as "Conditionally Approved," and shall be closed to the harvest of clams, quahogs, oysters and mussels from May 1 through November 30, and any malfunction at the Freeport Sewage Treatment Plant. The area is currently CLOSED.

~~D.~~ C. Effective immediately, because of pollution, the shores, flats and waters of the Harraseeket River: southwest of a line beginning at an orange painted post located about 230 yards south of the Harraseeket Yacht Club, then running southeast to the north tip of Stockbridge Point; have been classified as "Conditionally Approved," and shall be closed to the harvest of clams, quahogs, oysters and mussels during any malfunction at the Freeport Sewage Treatment Plant. The area is currently CLOSED.



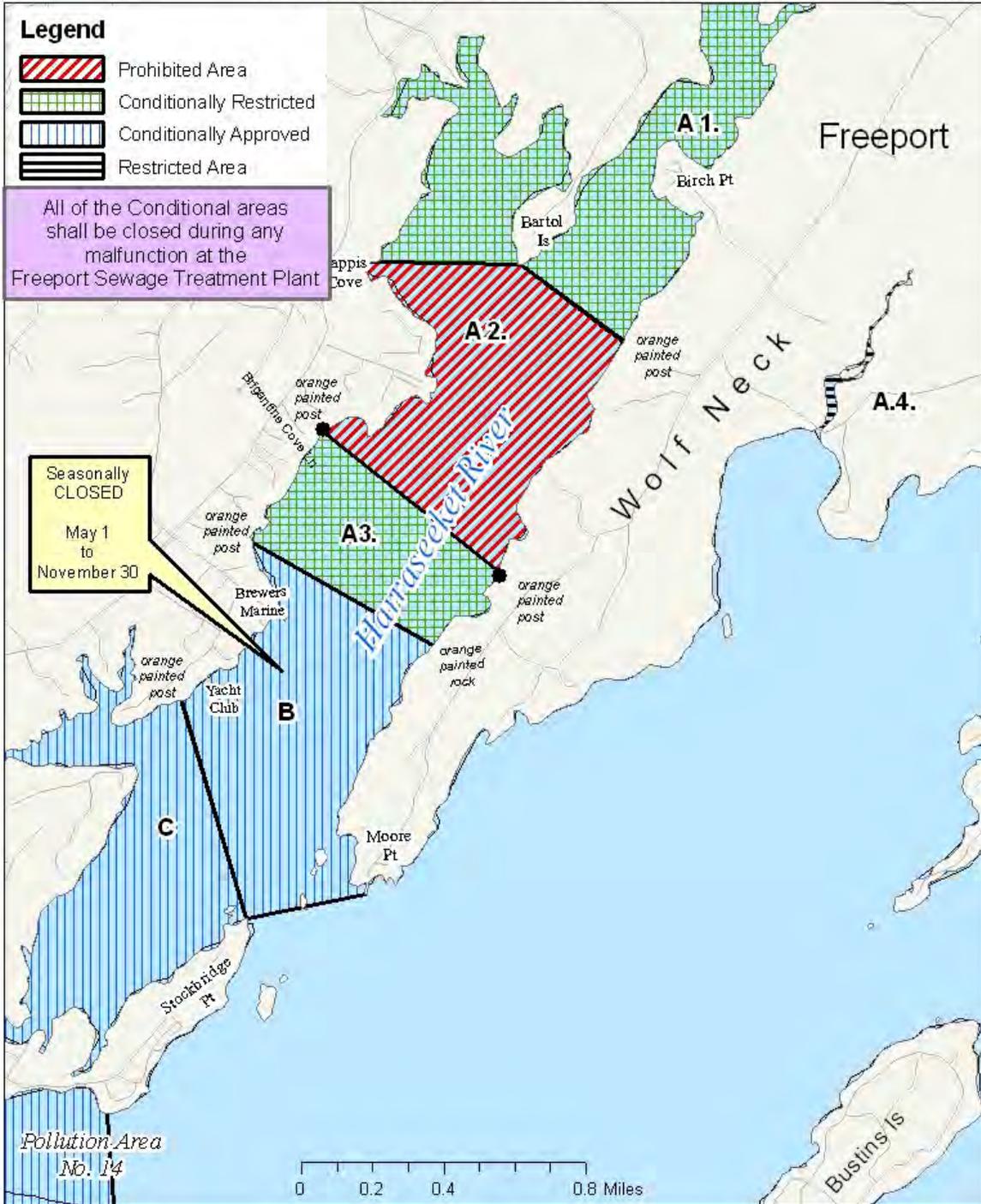
Maine Department of Marine Resources

Pollution Area No. 15

Harraseeket River and Little River (Freeport)



08/25/08





Appendix N. Recommendation for Classification Changes Area No. 17-B

TITLE & TEXT OF RULE: DMR Chapter 95.03(Y), Area No. 17-B, Harpswell Neck (Harpswell)

A. Effective immediately, because of pollution, it shall be unlawful to dig, take or possess any clams, quahogs, oysters or mussels taken from the shores, flats and waters of the following areas:

1. Harpswell Sound: extending 200 feet offshore, between the southeast tip of High Head, and a red painted post located on the point of land north of the High Head Yacht Club dock.

2. Middle Bay: inside and shoreward of a line beginning at the north tip of Whites Point, then running southwest to a red painted post, located approximately 1400 feet south of the U.S. Navy Harpswell Fuel Depot pier.

3. Harpswell Sound: inside and shoreward of a line beginning at the northeast point of Clark Cove, then running southwest to navigational buoy C"15" at Merriman Ledges, then northwest to the end of Thompson Road.

~~4. Basin Point and Ash Point: south of a line beginning at the end of Bufflehead Lane, then running southeast to the marina landing on the opposite shore; AND north of a line beginning at the south tip of Ash Point, then running southwest to the south tip of Basin Point.~~

~~4.~~ 4. Potts Point: inside and shoreward of a line beginning at the end of Graveyard Point Road, then running south to the north tip of Pinkham Island, then running southwest to the tip of Potts Point, then running northwest to navigational buoy "C13", then running northeast to the south end of the causeway on Harpswell Neck Road.

5. Ash Point Cove: north of a line beginning at the end of Bibber Way, the running northeast to the end of Austin Point Road.

6. Ash Point Cove: south of a line beginning at the end of Bibber Way, the running northeast to the end of Austin Point Road AND north of a line beginning at the south end of the causeway on Harpswell Neck Road, then running northwest to the south tip of Ash Point Road. This area is classified as "Restricted" and requires a special MDMR permit.

B. Effective immediately, because of pollution, the shores, flats and waters of Basin Cove: north of a line beginning at the end of Bufflehead Lane, then running southeast to the marina landing on the opposite shore are classified as "Conditionally Approved," and shall be closed to the harvest of clams, quahogs, oysters and mussels from May 1 through November 30.

C. Effective immediately, because of pollution, the shores, flats and waters of ~~Ash Point Cove:~~ ~~north of a line beginning at the south end of the causeway on Harpswell Neck Road, then running northwest to the south tip of Ash Point; AND Harpswell Harbor:~~ inside and shoreward of a line beginning at the end of Thompson Road, then running southwest to the northeast tip of Stover Pt., are all classified as "Conditionally Approved," and shall be closed to the harvest of clams, quahogs, oysters and mussels from May 1 through September 30.



D. Effective immediately, because of pollution, the shores, flats and waters of Basin Point and Ash Point: south of a line beginning at the end of Bufflehead Lane, then running southeast to the marina landing on the opposite shore; AND north of a line beginning at the south tip of Ash Point, then running southwest to the south tip of Basin Point, are classified as "Conditionally Approved", and shall be closed to the harvest of clams, quahogs, oysters and mussels from April 15 through October 31.



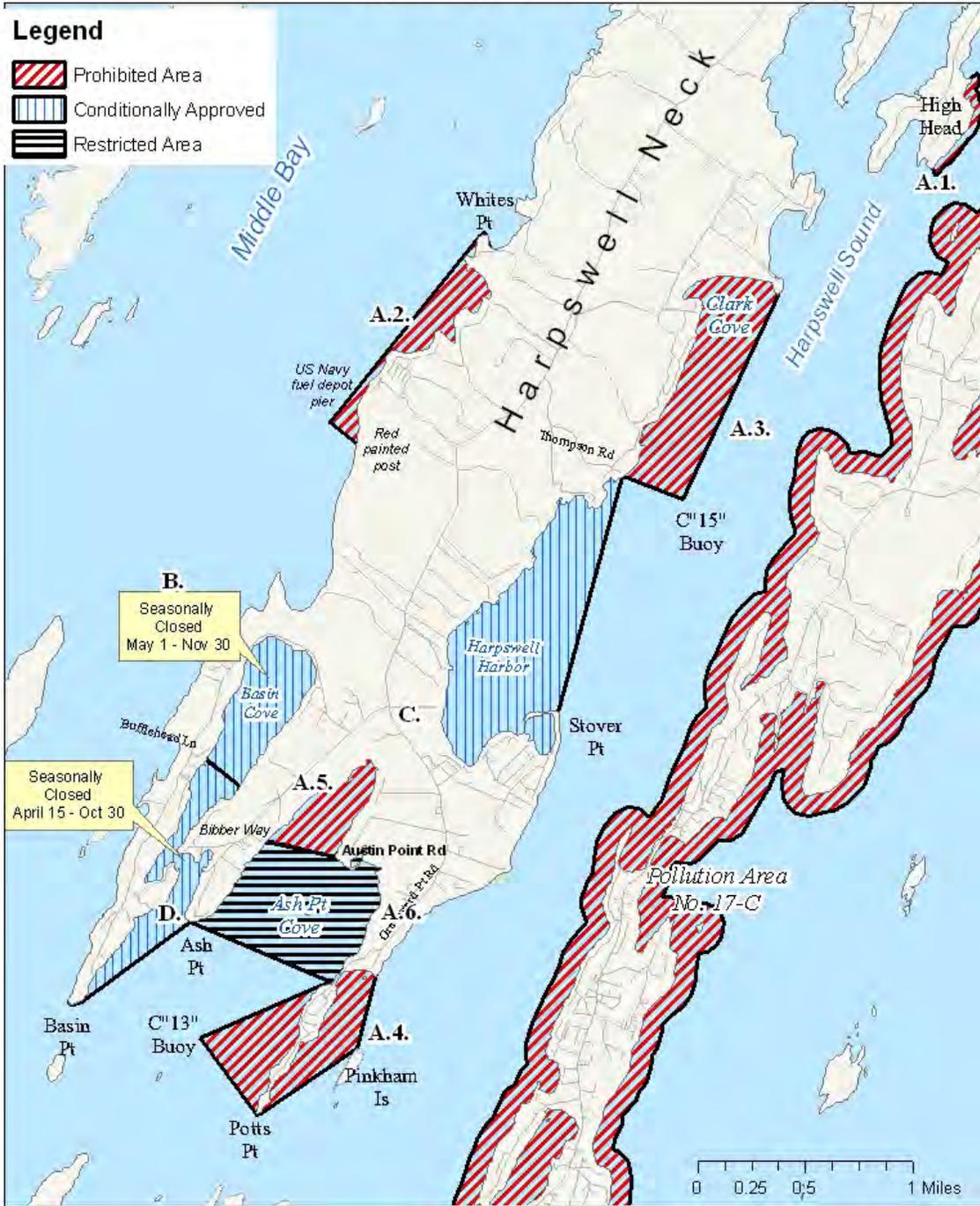
Maine Department of Marine Resources

Pollution Area No. 17-B

Harpswell Neck (Harpswell)



08-25-08





Appendix O. Rainfall Data Tables for All Random and Extra Samples Collected 2003-2007

STATION	Rain Range	COLLECT_DATE	SAL%	COLIFORM	Rain 72 Hours
WJ001.00	0	7/30/2003	30	3.6	0
		8/20/2003	32	2.9	0
		11/18/2003	30	3.6	0
		12/22/2003	30	9.1	0
		9/7/2004	31	2.9	0
		11/18/2004	32	2.9	0
		3/22/2005	29	2.9	0
		9/13/2005	30	2.9	0
		3/8/2006	31	2.9	0
		8/28/2007	32	6	0
	0.001-0.25	3/12/2003	30	2.9	0.001
		12/13/2005	30	7.3	0.002
		1/7/2004	32	7.3	0.003
		1/15/2003	33	2.9	0.01
		11/13/2007	30	1.9	0.01
		3/3/2004	26	3.6	0.02
		2/11/2004	31	2.9	0.03
		12/5/2006	28	14	0.05
		6/10/2007	28	2	0.05
		10/11/2006	32	20	0.06
		9/27/2006	30	1.9	0.07
		2/6/2007	32	1.9	0.08
		10/10/2007	32	1.9	0.08
		6/7/2005	26	2.9	0.21
		10/22/2003	30	3.6	0.221
		2/23/2005	30	2.9	0.24
		0.26-0.50	6/9/2004	30	3.6
	8/11/2004		32	2.9	0.33
	10/13/2004		30	2.9	0.34
	8/2/2005		30	2.9	0.39
	8/14/2007		32	1.9	0.4
	4/26/2006		32	2.9	0.42
	4/23/2003		23	2.9	0.441
	7/14/2004		31	2.9	0.451
	6/2/2003		29	2.9	0.49
	0.51-1.00	4/7/2004	30	2.9	0.51
		7/12/2005	30	2.9	0.52
		7/24/2007	30	1.9	0.52
		4/3/2007	30	1.9	0.53
		9/23/2003	32	2.9	0.7
		12/5/2007	30	2	0.78



STATION	Rain Range	COLLECT_DATE	SAL%	COLIFORM	Rain 72 Hours
	1.01-1.25	7/12/2006	28	3.6	0.98
		9/11/2007	31	2	1.01
		10/30/2007	30	18	1.01
		8/2/2006	29	9.1	1.1
		5/28/2003	30	15	1.201
		5/10/2006	29	2.9	1.21
		1/8/2007	26	10	1.21
	1.26-2.00	5/5/2004	30	2.9	1.271
		3/5/2007	31	1.9	1.28
		6/28/2006	27	2.9	1.34
		5/1/2007	26	1.9	1.57
		2/7/2006	26	2.9	1.571
	2.01-2.75	5/24/2005	18	93	2.39
		11/15/2006	29	9.1	2.63
		4/25/2005	21	93	2.65
WJ003.00	0	7/30/2003	30	43	0
		8/20/2003	32	3.6	0
		11/18/2003	30	2.9	0
		12/22/2003	30	3	0
		9/7/2004	31	2.9	0
		11/18/2004	28	2.9	0
		3/22/2005	31	2.9	0
		9/12/2005	30	2.9	0
		3/8/2006	32	2.9	0
		8/28/2007	30	1.9	0
	0.001-0.25	3/12/2003	30	3.6	0.001
		12/13/2005	31	3.6	0.002
		1/7/2004	32	9.1	0.003
		1/15/2003	32	2.9	0.01
		11/13/2007	30	1.9	0.01
		3/3/2004	29	2.9	0.02
		2/11/2004	31	2.9	0.03
		12/5/2006	30	6	0.05
		6/10/2007	28	2	0.05
		10/11/2006	32	11	0.06
		9/27/2006	30	1.9	0.07
		2/6/2007	32	1.9	0.08
		10/10/2007	32	1.9	0.08
		6/7/2005	26	2.9	0.21
		10/22/2003	30	2.9	0.221
		2/23/2005	30	3.6	0.24
		12/28/2004	30	3.6	0.25
	0.26-0.50	6/9/2004	31	2.9	0.291
		8/11/2004	32	3.6	0.33



STATION	Rain Range	COLLECT_DATE	SAL%	COLIFORM	Rain 72 Hours
		10/13/2004	30	2.9	0.34
		8/2/2005	28	2.9	0.39
		8/14/2007	32	3.6	0.4
		4/26/2006	32	2.9	0.42
		4/23/2003	30	2.9	0.441
		7/14/2004	30	2.9	0.451
		6/2/2003	30	2.9	0.49
	0.51-1.00	4/7/2004	31	2.9	0.51
		7/12/2005	28	2.9	0.52
		7/24/2007	30	2	0.52
		4/3/2007	30	1.9	0.53
		9/23/2003	32	3.6	0.7
		12/5/2007	32	4	0.78
		7/12/2006	28	23	0.98
	1.01-1.25	9/11/2007	31	1.9	1.01
		8/2/2006	29	23	1.1
		5/28/2003	30	3.6	1.201
		5/10/2006	30	2.9	1.21
		1/8/2007	30	12	1.21
	1.26-2.00	5/5/2004	31	2.9	1.271
		3/5/2007	32	1.9	1.28
		6/28/2006	27	23	1.34
		5/1/2007	26	1.9	1.57
		2/7/2006	28	93	1.571
	2.01-2.75	5/24/2005	25	43	2.39
		11/15/2006	26	56	2.63
		4/25/2005	30	9.1	2.65
WJ006.00	0	7/30/2003	30	3.6	0
		8/20/2003	31	2.9	0
		11/18/2003	30	2.9	0
		12/22/2003	30	3.6	0
		9/7/2004	31	2.9	0
		11/18/2004	32	7.3	0
		1/31/2005	30	2.9	0
		3/22/2005	30	2.9	0
		9/12/2005	30	2.9	0
		3/8/2006	31	2.9	0
		8/28/2007	30	10	0
		0.001-0.25	3/12/2003	30	2.9
	12/13/2005		30	2.9	0.002
	1/7/2004		32	23	0.003
	1/15/2003		32	2.9	0.01
	11/13/2007		30	2	0.01
	3/3/2004		32	3.6	0.02
	2/11/2004		31	2.9	0.03



STATION	Rain Range	COLLECT_DATE	SAL%	COLIFORM	Rain 72 Hours
		12/5/2006	30	2	0.05
		10/11/2006	32	1.9	0.06
		9/27/2006	30	2	0.07
		10/10/2007	31	7.3	0.08
		6/7/2005	28	2.9	0.21
		10/22/2003	30	2.9	0.221
		2/23/2005	30	43	0.24
		12/28/2004	30	9.1	0.25
	0.26-0.50	6/9/2004	31	2.9	0.291
		8/11/2004	32	2.9	0.33
		10/13/2004	30	2.9	0.34
		8/2/2005	30	2.9	0.39
		8/14/2007	32	2	0.4
		4/26/2006	32	2.9	0.42
		4/23/2003	30	2.9	0.441
		7/14/2004	31	2.9	0.451
	6/2/2003	30	2.9	0.49	
	0.51-1.00	4/7/2004	30	2.9	0.51
		7/12/2005	30	3.6	0.52
		4/3/2007	30	1.9	0.53
		9/23/2003	32	3.6	0.7
		12/5/2007	30	3.6	0.78
		7/12/2006	30	43	0.98
	7/23/2007	30	5.5	0.99	
	1.01-1.25	9/11/2007	31	8	1.01
		10/30/2007	30	4	1.01
		8/2/2006	28	75	1.1
		5/28/2003	31	9.1	1.201
		5/10/2006	29	2.9	1.21
		1/8/2007	30	35	1.21
	1.26-2.00	5/5/2004	31	2.9	1.271
		3/5/2007	32	2	1.28
		6/28/2006	26	240	1.34
		6/6/2007	28	40	1.49
		5/1/2007	26	1.9	1.57
		2/7/2006	23	43	1.571
	2.01-2.75	5/24/2005	30	23	2.39
		11/15/2006	12	500	2.63
		4/25/2005	31	3.6	2.65
	WJ008.00	0	7/30/2003	30	3.6
8/20/2003			31	2.9	0
11/18/2003			30	2.9	0
12/22/2003			25	2.9	0
9/7/2004			28	9.1	0
11/18/2004			32	15	0



STATION	Rain Range	COLLECT_DATE	SAL%	COLIFORM	Rain 72 Hours
		3/22/2005	30	2.9	0
		9/12/2005	30	2.9	0
		3/28/2006	29	2.9	0
		8/28/2007	30	29	0
	0.001-0.25	12/13/2005	30	2.9	0.002
		1/7/2004	32	2.9	0.003
		1/15/2003	32	2.9	0.01
		11/13/2007	31	1.9	0.01
		3/3/2004	26	2.9	0.02
		12/5/2006	28	8	0.05
		6/10/2007	28	2	0.05
		10/11/2006	31	> 1600	0.06
		9/27/2006	30	1.9	0.07
		2/27/2006	32	3.6	0.08
		2/6/2007	32	1.9	0.08
		10/10/2007	31	1.9	0.08
		11/29/2006	26	6	0.16
		6/7/2005	25	2.9	0.21
		10/22/2003	30	3.6	0.221
		12/28/2004	30	2.9	0.25
	0.26-0.50	6/9/2004	30	2.9	0.291
		8/11/2004	32	6.2	0.33
		10/13/2004	30	9.1	0.34
		8/2/2005	30	2.9	0.39
		8/14/2007	31	4	0.4
		4/26/2006	32	2.9	0.42
		4/23/2003	30	43	0.441
		7/14/2004	30	9.1	0.451
		6/2/2003	30	2.9	0.49
	0.51-1.00	4/7/2004	26	2.9	0.51
		7/12/2005	30	3.6	0.52
		7/24/2007	30	6	0.52
		4/3/2007	26	1.9	0.53
		9/23/2003	30	15	0.7
		12/5/2007	30	1.9	0.78
		10/24/2006	28	29	0.93
		7/12/2006	29	3.6	0.98
	1.01-1.25	9/11/2007	31	5.5	1.01
		5/28/2003	30	15	1.201
		5/10/2006	29	20	1.21
1/8/2007		30	4	1.21	
1.26-2.00	5/5/2004	31	23	1.271	
	3/5/2007	30	1.9	1.28	
	6/28/2006	24	240	1.34	
	5/1/2007	25	1.9	1.57	



STATION	Rain Range	COLLECT_DATE	SAL%	COLIFORM	Rain 72 Hours
	2.01-2.75	5/24/2005	25	93	2.39
WJ009.00	0	7/30/2003	30	3.6	0
		8/20/2003	31	2.9	0
		11/18/2003	30	2.9	0
		12/22/2003	16	15	0
		9/7/2004	31	2.9	0
		11/18/2004	29	3.6	0
		3/22/2005	30	2.9	0
		9/12/2005	30	2.9	0
		3/8/2006	30	2.9	0
		8/28/2007	30	540	0
		0.001-0.25	3/12/2003	30	2.9
	12/13/2005		30	3.6	0.002
	1/7/2004		25	2.9	0.003
	1/15/2003		32	3.6	0.01
	11/13/2007		30	2	0.01
	3/3/2004		24	3.6	0.02
	2/11/2004		31	2.9	0.03
	12/5/2006		28	76	0.05
	10/11/2006		32	30	0.06
	9/27/2006		30	1.9	0.07
	2/6/2007		32	1.9	0.08
	10/10/2007		32	1.9	0.08
	6/7/2005		26	3.6	0.21
	10/22/2003		31	2.9	0.221
	2/23/2005		30	3.6	0.24
	12/28/2004		30	2.9	0.25
	0.26-0.50		6/9/2004	31	15
		8/11/2004	31	2.9	0.33
		10/13/2004	30	2.9	0.34
		8/2/2005	30	3.6	0.39
		8/14/2007	31	1.9	0.4
		4/26/2006	30	3.6	0.42
		4/23/2003	30	2.9	0.441
		7/14/2004	30	3.6	0.451
		6/2/2003	30	2.9	0.49
	0.51-1.00	4/7/2004	26	2.9	0.51
		7/12/2005	30	2.9	0.52
		4/3/2007	28	1.9	0.53
		9/23/2003	30	2.9	0.7
		12/5/2007	30	1.9	0.78
		7/12/2006	28	>1100	0.98
		7/23/2007	30	1.9	0.99
	1.01-1.25	9/11/2007	31	1.9	1.01
10/30/2007		30	8	1.01	
8/2/2006		26	93	1.1	



STATION	Rain Range	COLLECT_DATE	SAL%	COLIFORM	Rain 72 Hours
		5/28/2003	30	93	1.201
		5/10/2006	30	2.9	1.21
		1/8/2007	30	4	1.21
	1.26-2.00	5/5/2004	31	3.6	1.271
		3/5/2007	23	1.9	1.28
		6/28/2006	24	240	1.34
		6/6/2007	22	160	1.49
		5/1/2007	26	4	1.57
		2/7/2006	25	9.1	1.571
		7/8/2007	30	12	2.38
	2.01-2.75	5/24/2005	30	43	2.39
		11/15/2006	5	520	2.63
WJ009.50	0	3/28/2006	30	2.9	0
		8/28/2007	30	2	0
	0.001-0.25	11/13/2007	30	1.9	0.01
		12/5/2006	28	220	0.05
		6/10/2007	27	10	0.05
		10/11/2006	32	88	0.06
		9/27/2006	30	1.9	0.07
		2/6/2007	32	1.9	0.08
		10/10/2007	32	1.9	0.08
	0.26-0.50	8/14/2007	31	1.9	0.4
		4/26/2006	31	2.9	0.42
	0.51-1.00	7/24/2007	30	1.9	0.52
		4/3/2007	26	1.9	0.53
		12/5/2007	30	1.9	0.78
		10/24/2006	26	12	0.93
		7/12/2006	28	23	0.98
	1.01-1.25	9/11/2007	31	2	1.01
		10/30/2007	28	6	1.01
		5/10/2006	28	3.6	1.21
		1/8/2007	22	92	1.21
	1.26-2.00	3/5/2007	32	3.6	1.28
		6/28/2006	26	150	1.34
		5/1/2007	16	1.9	1.57
	2.01-2.75	7/8/2007	30	18	2.38
		11/15/2006	9	660	2.63
	WJ011.00	0	7/30/2003	31	9.1
8/20/2003			31	2.9	0
11/18/2003			10	3.6	0
12/22/2003			24	93	0
9/7/2004			29	3.6	0
11/18/2004			31	2.9	0
3/22/2005			10	2.9	0
9/13/2005			21	43	0



STATION	Rain Range	COLLECT_DATE	SAL%	COLIFORM	Rain 72 Hours	
		3/28/2006	30	2.9	0	
		8/28/2007	30	8	0	
	0.001-0.25	3/12/2003	27	43	0.001	
		12/13/2005	30	2.9	0.002	
		1/7/2004	29	2.9	0.003	
		1/15/2003	29	2.9	0.01	
		11/13/2007	30	1.9	0.01	
		3/3/2004	4	43	0.02	
		2/11/2004	31	2.9	0.03	
		12/5/2006	28	1.9	0.05	
		6/10/2007	27	1.9	0.05	
		10/11/2006	32	1.9	0.06	
		9/27/2006	29	1.9	0.07	
		2/6/2007	32	1.9	0.08	
		10/10/2007	32	5.5	0.08	
		6/7/2005	25	3.6	0.21	
		10/22/2003	31	2.9	0.221	
		12/28/2004	27	2.9	0.25	
		0.26-0.50	6/9/2004	30	9.1	0.291
			8/11/2004	30	2.9	0.33
	10/13/2004		30	3.6	0.34	
	8/2/2005		30	3.6	0.39	
	8/14/2007		31	6	0.4	
	4/26/2006		30	2.9	0.42	
	4/23/2003		10	23	0.441	
	7/14/2004		30	2.9	0.451	
	6/2/2003		28	2.9	0.49	
	0.51-1.00	4/7/2004	26	2.9	0.51	
		7/12/2005	30	2.9	0.52	
		7/24/2007	28	4	0.52	
		4/3/2007	28	1.9	0.53	
		9/23/2003	30	3.6	0.7	
		7/12/2006	26	11	0.98	
	1.01-1.25	9/11/2007	31	5.5	1.01	
		10/30/2007	30	1.9	1.01	
		8/2/2006	10	460	1.1	
		5/28/2003	29	43	1.201	
		5/10/2006	28	2.9	1.21	
		1/8/2007	22	35	1.21	
	1.26-2.00	5/5/2004	31	2.9	1.271	
3/5/2007		21	1.9	1.28		
6/28/2006		23	75	1.34		
5/1/2007		24	2	1.57		
2/7/2006		20	23	1.571		
2.01-2.75	5/24/2005	30	93	2.39		



STATION	Rain Range	COLLECT_DATE	SAL%	COLIFORM	Rain 72 Hours
		11/15/2006	4	420	2.63
		4/25/2005	10	93	2.65
WJ014.00	0	7/30/2003	31	9.1	0
		8/20/2003	31	2.9	0
		11/18/2003	15	7.3	0
		12/22/2003	26	9.1	0
		9/7/2004	28	2.9	0
		11/18/2004	31	3.6	0
		3/22/2005	10	3.6	0
		9/13/2005	31	2.9	0
		3/8/2006	26	2.9	0
		8/28/2007	30	13	0
	0.001-0.25	3/12/2003	12	2.9	0.001
		12/13/2005	30	2.9	0.002
		1/7/2004	32	2.9	0.003
		1/15/2003	29	2.9	0.01
		11/13/2007	30	2	0.01
		3/3/2004	15	9.1	0.02
		12/5/2006	26	1.9	0.05
		6/10/2007	28	8	0.05
		10/11/2006	32	28	0.06
		9/27/2006	28	1.9	0.07
		2/6/2007	31	1.9	0.08
		10/10/2007	30	4	0.08
		6/7/2005	25	9.1	0.21
	0.26-0.50	10/22/2003	31	460	0.221
		12/28/2004	30	2.9	0.25
		6/9/2004	30	9.1	0.291
		8/11/2004	30	2.9	0.33
		10/13/2004	30	9.1	0.34
		8/2/2005	30	2.9	0.39
		8/14/2007	31	6	0.4
		4/26/2006	31	2.9	0.42
		4/23/2003	24	3.6	0.441
		7/14/2004	30	2.9	0.451
	0.51-1.00	6/2/2003	28	2.9	0.49
		4/7/2004	30	2.9	0.51
		7/12/2005	30	2.9	0.52
		7/25/2007	30	1.9	0.52
		4/3/2007	26	1.9	0.53
		9/23/2003	30	9.1	0.7
		12/5/2007	30	1.9	0.78
1.01-1.25	7/12/2006	30	43	0.98	
	9/11/2007	30	1.9	1.01	
		8/2/2006	18	240	1.1



STATION	Rain Range	COLLECT_DATE	SAL%	COLIFORM	Rain 72 Hours	
		5/28/2003	30	43	1.201	
		5/10/2006	29	2.9	1.21	
		1/8/2007	26	24	1.21	
	1.26-2.00	5/5/2004	31	3.6	1.271	
		3/5/2007	25	1.9	1.28	
		6/28/2006	24	9.1	1.34	
		5/1/2007	26	1.9	1.57	
	2.01-2.75	2/7/2006	12	43	1.571	
		5/24/2005	30	93	2.39	
		11/15/2006	3	580	2.63	
		4/25/2005	20	43	2.65	
WJ014.20	0	7/30/2003	31	9.1	0	
		8/20/2003	29	2.9	0	
		11/18/2003	0	43	0	
		12/22/2003	0	3.6	0	
		9/7/2004	28	9.1	0	
		11/18/2004	2	5.7	0	
		9/13/2005	30	23	0	
		3/28/2006	29	2.9	0	
		8/28/2007	30	20	0	
	0.001-0.25	1/7/2004	2	2.9	0.003	
		7/30/2007	29	5.5	0.01	
		11/13/2007	30	1.9	0.01	
		3/3/2004	0	2.9	0.02	
		12/5/2006	25	4	0.05	
		6/10/2007	26	1.9	0.05	
		10/11/2006	31	1.9	0.06	
		9/27/2006	29	1.9	0.07	
		2/27/2006	32	2.9	0.08	
		10/10/2007	31	1.9	0.08	
		6/7/2005	25	3.6	0.21	
	0.26-0.50	10/22/2003	0	240	0.221	
		8/11/2004	30	23	0.33	
		10/13/2004	30	3.6	0.34	
		8/2/2005	30	5.7	0.39	
		8/14/2007	30	10	0.4	
		4/26/2006	31	3.6	0.42	
		4/23/2003	12	3.6	0.441	
		7/14/2004	31	2.9	0.451	
	0.51-1.00	6/2/2003	18	23	0.49	
		4/7/2004	0	2.9	0.51	
		7/12/2005	30	2.9	0.52	
		4/3/2007	17	2	0.53	
		9/23/2003	30	9.1	0.7	
			12/5/2007	30	1.9	0.78



STATION	Rain Range	COLLECT_DATE	SAL%	COLIFORM	Rain 72 Hours
		10/24/2006	18	260	0.93
		7/12/2006	28	15	0.98
		9/11/2007	30	8	1.01
	1.01-1.25	5/28/2003	0	460	1.201
		5/10/2006	26	9.1	1.21
		1/8/2007	8	106	1.21
	1.26-2.00	5/5/2004	20	149	1.271
		3/5/2007	28	1.9	1.28
		6/28/2006	22	43	1.34
	2.01-2.75	5/1/2007	24	2	1.57
		7/8/2007	30	4	2.38
		5/24/2005	20	460	2.39
WJ016.00	0	7/23/2003	30	2.9	0
		9/10/2003	32	2.9	0
		12/22/2003	30	15	0
		9/15/2004	31	2.9	0
		9/12/2005	30	2.9	0
		10/3/2005	30	2.9	0
		3/8/2006	32	2.9	0
		8/28/2007	32	1.9	0
	0.001-0.25	6/16/2004	30	2.9	0.001
		11/13/2007	30	7.3	0.01
		11/29/2005	30	43	0.022
		9/27/2006	30	1.9	0.07
		2/6/2007	32	1.9	0.08
		8/6/2003	31	3.6	0.161
		5/12/2004	30	2.9	0.161
	0.26-0.50	10/13/2004	31	9.1	0.34
		4/26/2006	32	2.9	0.42
		7/7/2005	28	3.6	0.48
	0.51-1.00	4/3/2007	30	1.9	0.53
		8/16/2005	30	3.6	0.88
		7/27/2004	32	2.9	0.89
		7/12/2006	30	9.1	0.98
		7/23/2007	30	1.9	0.99
	1.01-1.25	5/14/2003	31	2.9	1.01
		7/25/2005	30	3.6	1.01
		9/11/2007	32	1.9	1.01
		10/30/2007	30	2	1.01
		6/25/2003	30	3.6	1.09
		8/2/2006	29	2.9	1.1
		5/10/2006	30	2.9	1.21
1.26-2.00	5/1/2007	26	1.9	1.57	
WJ017.00	0	8/28/2007	32	2	0



STATION	Rain Range	COLLECT_DATE	SAL%	COLIFORM	Rain 72 Hours
	0.001-0.25	11/13/2007	30	20	0.01
		10/10/2007	32	1.9	0.08
		7/19/2007	30	2	0.19
	0.26-0.50	8/14/2007	32	1.9	0.4
	0.51-1.00	7/23/2007	31	1.9	0.99
	1.01-1.25	9/11/2007	32	1.9	1.01
		10/30/2007	30	4	1.01
	1.26-2.00	6/6/2007	28	25	1.49
		5/1/2007	26	1.9	1.57
2.01-2.75	7/8/2007	30	1.9	2.38	
WJ017.50	0	8/28/2007	32	4	0
	0.001-0.25	11/13/2007	31	12	0.01
		10/10/2007	32	2	0.08
	0.26-0.50	7/19/2007	30	1.9	0.19
		8/14/2007	32	1.9	0.4
	0.51-1.00	7/24/2007	30	1.9	0.52
		12/5/2007	30	76	0.78
	1.01-1.25	9/11/2007	31	2	1.01
	1.26-2.00	6/6/2007	28	6	1.49
5/1/2007		26	1.9	1.57	
2.01-2.75	7/8/2007	30	6	2.38	
WJ017.80	0	8/28/2007	32	1.9	0
	0.001-0.25	7/30/2007	32	13	0.01
		11/13/2007	30	4	0.01
		6/10/2007	28	2	0.05
		10/10/2007	32	8	0.08
		7/19/2007	30	12	0.19
	0.26-0.50	8/14/2007	31	1.9	0.4
	0.51-1.00	12/5/2007	30	33	0.78
	1.01-1.25	9/11/2007	30	3.6	1.01
1.26-2.00	5/1/2007	26	6	1.57	
2.01-2.75	7/8/2007	30	1.9	2.38	
WJ018.00	0	7/23/2003	31	43	0
		9/10/2003	32	3.6	0
		10/8/2003	30	3.6	0
		9/15/2004	31	9.1	0
		9/13/2005	31	2.9	0
		10/3/2005	31	2.9	0
		3/28/2006	31	2.9	0
		8/28/2007	32	1.9	0
	0.001-0.25	6/16/2004	30	2.9	0.001
		7/30/2007	30	4	0.01
		11/13/2007	30	1.9	0.01
		11/29/2005	26	240	0.022



STATION	Rain Range	COLLECT_DATE	SAL%	COLIFORM	Rain 72 Hours
		6/10/2007	28	6	0.05
		9/27/2006	30	1.9	0.07
		2/6/2007	32	1.9	0.08
		10/10/2007	32	2	0.08
		8/6/2003	31	23	0.161
		5/12/2004	30	2.9	0.161
		7/19/2007	30	1.9	0.19
	0.26-0.50	10/13/2004	30	3.6	0.34
		8/14/2007	31	1.9	0.4
		4/26/2006	32	9.1	0.42
		7/7/2005	27	9.1	0.48
	0.51-1.00	4/3/2007	28	1.9	0.53
		12/5/2007	30	12	0.78
		8/16/2005	30	9.1	0.88
		7/27/2004	32	2.9	0.89
	1.01-1.25	7/12/2006	26	150	0.98
		5/14/2003	30	2.9	1.01
		7/25/2005	30	7.3	1.01
		9/11/2007	31	3.6	1.01
		10/30/2007	27	1.9	1.01
6/25/2003		31	3.6	1.09	
1.26-2.00	8/2/2006	1	460	1.1	
	5/10/2006	28	3.6	1.21	
2.01-2.75	5/1/2007	26	2	1.57	
7/8/2007	30	2	2.38		
WJ018.20	0	8/28/2007	32	11	0
	0.001-0.25	11/13/2007	30	4	0.01
		6/10/2007	28	2	0.05
		10/10/2007	32	2	0.08
		7/19/2007	31	1.9	0.19
	0.26-0.50	8/14/2007	31	2	0.4
	0.51-1.00	4/3/2007	30	1.9	0.53
		12/5/2007	30	6	0.78
	1.01-1.25	9/11/2007	32	4	1.01
		7/24/2007	30	4	1.04
1.26-2.00	5/1/2007	26	2	1.57	
2.01-2.75	7/8/2007	30	1.9	2.38	
WJ018.60	0	8/28/2007	32	3.6	0
	0.001-0.25	11/13/2007	30	1.9	0.01
		6/10/2007	28	1.9	0.05
		10/10/2007	32	1.9	0.08
		7/19/2007	31	1.9	0.19
	0.26-0.50	8/14/2007	31	1.9	0.4
0.51-1.00	7/25/2007	31	22	0.52	



STATION	Rain Range	COLLECT_DATE	SAL%	COLIFORM	Rain 72 Hours
		12/5/2007	30	2	0.78
	1.01-1.25	9/11/2007	32	2	1.01
	1.26-2.00	5/1/2007	26	5.5	1.57
	2.01-2.75	7/8/2007	30	1.9	2.38
WJ018.90	0	8/28/2007	30	1.9	0
	0.001-0.25	11/13/2007	30	1.9	0.01
		6/10/2007	28	1.9	0.05
		10/10/2007	32	1.9	0.08
		7/19/2007	31	1.9	0.19
	0.26-0.50	8/14/2007	31	1.9	0.4
	0.51-1.00	12/5/2007	30	2	0.78
	1.01-1.25	9/11/2007	31	1.9	1.01
		7/24/2007	32	13	1.04
	1.26-2.00	5/1/2007	26	6	1.57
2.01-2.75	7/8/2007	30	2	2.38	
WJ019.00	0	7/23/2003	31	2.9	0
		9/10/2003	32	2.9	0
		10/8/2003	31	2.9	0
		9/15/2004	31	3.6	0
		9/13/2005	30	2.9	0
		10/3/2005	30	2.9	0
		3/28/2006	28	2.9	0
		8/28/2007	30	2	0
	0.001-0.25	6/16/2004	30	2.9	0.001
		7/30/2007	30	10	0.01
		11/13/2007	30	1.9	0.01
		11/29/2005	28	3.6	0.022
		9/27/2006	30	1.9	0.07
		10/10/2007	32	4	0.08
		8/6/2003	30	43	0.161
		5/12/2004	30	2.9	0.161
		7/19/2007	30	2	0.19
		5/14/2007	30	1.9	0.25
	0.26-0.50	10/13/2004	30	2.9	0.34
		8/14/2007	31	2	0.4
		4/26/2006	32	43	0.42
		7/7/2005	29	2.9	0.48
	0.51-1.00	4/3/2007	30	1.9	0.53
		12/5/2007	30	2	0.78
		8/16/2005	30	2.9	0.88
		7/27/2004	32	2.9	0.89
		10/24/2006	28	10	0.93
		7/12/2006	28	43	0.98
	1.01-1.25	5/14/2003	31	2.9	1.01



STATION	Rain Range	COLLECT_DATE	SAL%	COLIFORM	Rain 72 Hours
		7/25/2005	30	2.9	1.01
		9/11/2007	31	2	1.01
		6/25/2003	31	3.6	1.09
		5/10/2006	30	2.9	1.21
	1.26-2.00	5/1/2007	26	2	1.57
	2.01-2.75	7/8/2007	30	1.9	2.38
WJ024.00	0	7/23/2003	30	3.6	0
		9/10/2003	32	2.9	0
		10/8/2003	30	2.9	0
		9/15/2004	31	2.9	0
		9/13/2005	30	2.9	0
		10/3/2005	30	2.9	0
		3/28/2006	32	2.9	0
		8/28/2007	32	10	0
	0.001-0.25	6/16/2004	30	2.9	0.001
		11/13/2007	30	2	0.01
		11/29/2005	30	2.9	0.022
		9/27/2006	30	1.9	0.07
		2/6/2007	32	1.9	0.08
		8/6/2003	30	240	0.161
		5/12/2004	31	2.9	0.161
	0.26-0.50	10/13/2004	30	43	0.34
		4/26/2006	32	9.1	0.42
		7/7/2005	27	3.6	0.48
	0.51-1.00	4/3/2007	30	1.9	0.53
		8/16/2005	30	43	0.88
		7/27/2004	32	2.9	0.89
	1.01-1.25	7/12/2006	30	240	0.98
		5/14/2003	30	2.9	1.01
		7/25/2005	29	2.9	1.01
		9/11/2007	32	1.9	1.01
		7/24/2007	31	1.9	1.04
		6/25/2003	31	2.9	1.09
		8/2/2006	29	2.9	1.1
1.26-2.00	5/10/2006	30	15	1.21	
WJ026.00	0	5/1/2007	26	1.9	1.57
		7/23/2003	31	23	0
		9/10/2003	32	2.9	0
		10/8/2003	31	2.9	0
		9/15/2004	31	3.6	0
		9/12/2005	30	3.6	0
		10/3/2005	30	2.9	0
		3/28/2006	32	2.9	0
8/28/2007	32	6	0		



STATION	Rain Range	COLLECT_DATE	SAL%	COLIFORM	Rain 72 Hours
	0.001-0.25	6/16/2004	29	2.9	0.001
		11/13/2007	31	2	0.01
		11/29/2005	30	7.3	0.022
		9/27/2006	30	1.9	0.07
		2/6/2007	28	1.9	0.08
		8/6/2003	30	75	0.161
		5/12/2004	30	2.9	0.161
	0.26-0.50	10/13/2004	30	3.6	0.34
		4/26/2006	32	2.9	0.42
		7/7/2005	30	2.9	0.48
	0.51-1.00	7/25/2007	31	2	0.52
		4/3/2007	30	1.9	0.53
		8/16/2005	30	3.6	0.88
		7/27/2004	32	7.3	0.89
	1.01-1.25	7/12/2006	28	150	0.98
		5/14/2003	30	2.9	1.01
		7/25/2005	29	2.9	1.01
		9/11/2007	31	1.9	1.01
		6/25/2003	31	2.9	1.09
		8/2/2006	29	2.9	1.1
1.26-2.00	5/10/2006	30	3.2	1.21	
	5/1/2007	26	1.9	1.57	
WJ027.30	0	4/11/2006	30	2.9	0
		11/7/2006	30	2	0
		4/26/2007	28	1.9	0
	0.001-0.25	7/19/2006	30	2.9	0.001
		11/14/2007	32	1.9	0.01
		9/18/2006	30	1.9	0.03
		6/13/2007	30	6	0.1
		5/29/2007	29	1.9	0.11
	0.26-0.50	6/21/2006	28	2.9	0.261
		8/16/2006	30	2.9	0.47
	0.51-1.00	7/24/2007	29	1.9	0.52
		4/3/2007	14	4	0.53
	1.01-1.25	9/12/2007	32	40	1.01
		5/10/2006	30	3.6	1.21
1.26-2.00	7/31/2006	29	2.9	1.37	
	8/8/2007	30	1.9	1.76	
WJ027.50	0	9/8/2003	32	2.9	0
		4/12/2004	30	2.9	0
		9/13/2004	30	3.6	0
		4/11/2006	30	2.9	0
		11/7/2006	30	1.9	0
		4/26/2007	28	1.9	0



STATION	Rain Range	COLLECT_DATE	SAL%	COLIFORM	Rain 72 Hours
	0.001-0.25	9/6/2005	30	2.9	0.001
		7/19/2006	29	2.9	0.001
		11/14/2007	32	2	0.01
		9/18/2006	30	1.9	0.03
		1/5/2004	30	23	0.062
		6/13/2007	30	6	0.1
		5/29/2007	29	2	0.11
		5/5/2003	30	2.9	0.14
		5/10/2005	30	3.6	0.16
		7/7/2003	30	3.6	0.17
		4/7/2003	30	2.9	0.181
		6/7/2004	18	9.1	0.201
		6/7/2005	26	2.9	0.21
		11/1/2004	30	2.9	0.22
		1/6/2003	12	15	0.25
	0.26-0.50	6/21/2006	28	2.9	0.261
		8/2/2005	32	3.6	0.39
		8/2/2004	30	2.9	0.42
		8/16/2006	30	2.9	0.47
		6/2/2003	28	2.9	0.49
	0.51-1.00	7/12/2005	20	2.9	0.52
		7/24/2007	30	1.9	0.52
		4/3/2007	21	2	0.53
		5/17/2005	25	3.6	0.84
		8/4/2003	30	3.6	0.9
		10/6/2003	0	240	0.92
		5/3/2004	30	2.9	0.92
	1.01-1.25	12/1/2003	21	43	0.941
		9/11/2007	32	6	1.01
		7/12/2004	30	2.9	1.2
		3/3/2003	0	2.9	1.201
	1.26-2.00	5/10/2006	30	43	1.21
		7/31/2006	30	2.9	1.37
11/3/2003		29	2.9	1.47	
2.01-2.75	8/8/2007	30	4	1.76	
	8/30/2005	30	240	2.36	
WJ030.00	0	9/8/2003	30	9.1	0
		4/12/2004	8	3.6	0
		9/13/2004	30	9.1	0
		4/11/2006	8	2.9	0
		11/7/2006	30	2	0
		4/26/2007	21	10	0
	0.001-0.25	9/6/2005	30	2.9	0.001
		7/19/2006	28	2.9	0.001
		11/14/2007	26	4	0.01



STATION	Rain Range	COLLECT_DATE	SAL%	COLIFORM	Rain 72 Hours
		9/18/2006	30	2	0.03
		1/5/2004	2	3.6	0.062
		6/13/2007	20	18	0.1
		5/29/2007	28	4	0.11
		5/5/2003	30	23	0.14
		5/10/2005	30	2.9	0.16
		7/7/2003	30	2.9	0.17
		4/7/2003	5	2.9	0.181
		6/7/2004	2	9.1	0.201
		6/7/2005	4	23	0.21
		11/1/2004	30	2.9	0.22
	0.26-0.50	6/21/2006	28	3.6	0.261
		8/2/2005	30	3.6	0.39
		8/2/2004	30	2.9	0.42
		8/16/2006	26	7.3	0.47
		6/2/2003	28	2.9	0.49
	0.51-1.00	7/12/2005	30	2.9	0.52
		7/24/2007	29	5.5	0.52
		4/3/2007	0	6	0.53
		5/17/2005	5	43	0.84
		8/4/2003	30	2.9	0.9
		10/6/2003	2	93	0.92
		5/3/2004	31	43	0.92
	1.01-1.25	12/1/2003	10	9.1	0.941
		9/11/2007	32	16	1.01
		7/12/2004	26	15	1.2
		3/3/2003	2	9.1	1.201
	1.26-2.00	5/10/2006	29	2.9	1.21
		7/31/2006	28	2.9	1.37
		11/3/2003	0	93	1.47
	2.01-2.75	8/8/2007	24	240	1.76
		8/30/2005	7	>1100	2.36
WJ031.50	0	9/8/2003	30	2.9	0
		4/12/2004	30	2.9	0
		9/13/2004	30	3.6	0
		4/11/2006	29	2.9	0
		11/7/2006	30	16	0
		4/26/2007	15	1.9	0
	0.001-0.25	9/6/2005	30	2.9	0.001
		7/19/2006	30	2.9	0.001
		11/14/2007	31	2	0.01
		9/18/2006	30	1.9	0.03
		1/5/2004	30	9.1	0.062
		6/13/2007	30	1.9	0.1
		5/29/2007	29	1.9	0.11



STATION	Rain Range	COLLECT_DATE	SAL%	COLIFORM	Rain 72 Hours	
		5/5/2003	30	2.9	0.14	
		5/10/2005	30	2.9	0.16	
		7/7/2003	31	2.9	0.17	
		4/7/2003	30	2.9	0.181	
		6/7/2004	30	2.9	0.201	
		6/7/2005	25	3.6	0.21	
		11/1/2004	30	2.9	0.22	
	0.26-0.50	1/6/2003	30	23	0.25	
		6/21/2006	30	2.9	0.261	
		8/2/2005	30	2.9	0.39	
		8/2/2004	30	2.9	0.42	
		8/16/2006	30	2.9	0.47	
		6/2/2003	29	2.9	0.49	
	0.51-1.00	7/12/2005	30	2.9	0.52	
		7/24/2007	30	1.9	0.52	
		4/3/2007	30	6	0.53	
		5/17/2005	25	2.9	0.84	
		8/4/2003	30	2.9	0.9	
		10/6/2003	31	9.1	0.92	
		5/3/2004	31	2.9	0.92	
	1.01-1.25	12/1/2003	23	9.1	0.941	
		9/11/2007	32	2	1.01	
		7/12/2004	26	2.9	1.2	
		3/3/2003	20	2.9	1.201	
	1.26-2.00	5/10/2006	30	2.9	1.21	
		7/31/2006	29	2.9	1.37	
		11/3/2003	30	2.9	1.47	
	2.01-2.75	8/8/2007	30	52	1.76	
		8/30/2005	17	460	2.36	
	WJ032.00	0	9/8/2003	31	2.9	0
			4/12/2004	30	2.9	0
			9/13/2004	30	3.6	0
			11/7/2006	30	2	0
4/26/2007			29	1.9	0	
0.001-0.25		9/6/2005	30	2.9	0.001	
		7/19/2006	30	2.9	0.001	
		11/14/2007	30	5.5	0.01	
		9/18/2006	30	1.9	0.03	
		1/5/2004	30	240	0.062	
		6/13/2007	30	20	0.1	
		5/29/2007	29	1.9	0.11	
		5/5/2003	30	2.9	0.14	
		5/10/2005	30	2.9	0.16	
		7/7/2003	31	2.9	0.17	
4/7/2003	30	2.9	0.181			



STATION	Rain Range	COLLECT_DATE	SAL%	COLIFORM	Rain 72 Hours
		6/7/2004	30	2.9	0.201
		6/7/2005	26	9.1	0.21
		11/1/2004	30	2.9	0.22
		1/6/2003	30	2.9	0.25
	0.26-0.50	6/21/2006	28	3.6	0.261
		8/2/2005	30	2.9	0.39
		8/2/2004	30	2.9	0.42
		8/16/2006	30	23	0.47
		6/2/2003	29	2.9	0.49
	0.51-1.00	7/12/2005	31	2.9	0.52
		7/24/2007	30	1.9	0.52
		4/3/2007	30	4	0.53
		12/17/2007	31	1.9	0.63
		5/17/2005	25	2.9	0.84
		8/4/2003	30	2.9	0.9
		10/6/2003	30	15	0.92
		5/3/2004	31	2.9	0.92
	1.01-1.25	12/1/2003	25	3.6	0.941
		9/11/2007	32	2	1.01
		7/12/2004	30	3.6	1.2
		3/3/2003	18	2.9	1.201
		5/10/2006	30	2.9	1.21
	1.26-2.00	7/31/2006	29	2.9	1.37
		11/3/2003	30	15	1.47
		8/8/2007	30	1.9	1.76
	2.01-2.75	8/30/2005	25	43	2.36
WJ033.00	0	9/8/2003	32	2.9	0
		3/1/2004	0	2.9	0
		4/12/2004	30	2.9	0
		9/13/2004	30	3.6	0
		4/11/2006	16	9.1	0
		11/7/2006	28	96	0
		4/26/2007	27	1.9	0
	0.001-0.25	9/6/2005	30	15	0.001
		7/19/2006	29	9.1	0.001
		11/14/2007	30	6	0.01
		9/18/2006	26	10	0.03
		1/5/2004	31	9.1	0.062
		12/26/2007	21	6	0.07
		6/13/2007	29	10	0.1
		5/29/2007	28	1.9	0.11
		5/5/2003	30	2.9	0.14
		5/10/2005	30	3.6	0.16
		7/7/2003	30	2.9	0.17
		4/7/2003	30	2.9	0.181



STATION	Rain Range	COLLECT_DATE	SAL%	COLIFORM	Rain 72 Hours	
		6/7/2004	30	2.9	0.201	
		6/7/2005	15	23	0.21	
		11/1/2004	30	2.9	0.22	
		1/6/2003	30	43	0.25	
	0.26-0.50	6/21/2006	29	2.9	0.261	
		8/2/2005	30	2.9	0.39	
		8/2/2004	30	2.9	0.42	
		8/16/2006	29	2.9	0.47	
		6/2/2003	29	2.9	0.49	
	0.51-1.00	7/12/2005	26	9.1	0.52	
		7/24/2007	30	1.9	0.52	
		4/3/2007	30	2	0.53	
		5/17/2005	25	2.9	0.84	
		8/4/2003	30	2.9	0.9	
		10/6/2003	31	3.6	0.92	
		5/3/2004	31	1100	0.92	
		12/1/2003	30	240	0.941	
	1.01-1.25	9/11/2007	31	38	1.01	
		9/12/2007	22	520	1.01	
		7/12/2004	30	3.6	1.2	
		3/3/2003	0	2.9	1.201	
		5/10/2006	30	2.9	1.21	
	1.26-2.00	7/31/2006	28	9.1	1.37	
		11/3/2003	30	23	1.47	
		8/8/2007	30	10	1.76	
	2.01-2.75	8/30/2005	12	460	2.36	
	WJ034.00	0	9/8/2003	30	3.6	0
			4/12/2004	30	2.9	0
9/13/2004			30	9.1	0	
4/11/2006			30	2.9	0	
11/7/2006			30	2	0	
4/26/2007			28	1.9	0	
0.001-0.25		9/6/2005	30	2.9	0.001	
		7/19/2006	30	2.9	0.001	
		11/14/2007	31	1.9	0.01	
		9/18/2006	30	1.9	0.03	
		1/5/2004	10	2.9	0.062	
		12/26/2007	27	6	0.07	
		6/13/2007	30	6	0.1	
		5/29/2007	29	1.9	0.11	
		5/5/2003	30	2.9	0.14	
		5/10/2005	30	2.9	0.16	
		7/7/2003	31	3.1	0.17	
		4/7/2003	30	2.9	0.181	
		6/7/2004	30	3.6	0.201	



STATION	Rain Range	COLLECT_DATE	SAL%	COLIFORM	Rain 72 Hours
		6/7/2005	26	3.6	0.21
		11/1/2004	30	2.9	0.22
		1/6/2003	30	2.9	0.25
	0.26-0.50	6/21/2006	28	9.1	0.261
		8/2/2005	28	3.6	0.39
		8/2/2004	30	9.1	0.42
		8/16/2006	30	2.9	0.47
		6/2/2003	27	43	0.49
	0.51-1.00	7/12/2005	30	2.9	0.52
		7/24/2007	30	2	0.52
		4/3/2007	30	1.9	0.53
		5/17/2005	26	2.9	0.84
		8/4/2003	30	2.9	0.9
		10/6/2003	31	20	0.92
		5/3/2004	31	23	0.92
	1.01-1.25	12/1/2003	27	240	0.941
		9/11/2007	31	1.9	1.01
		7/12/2004	30	7.3	1.2
		3/3/2003	15	9.1	1.201
	1.26-2.00	5/10/2006	29	9.1	1.21
		7/31/2006	29	2.9	1.37
11/3/2003		30	2.9	1.47	
2.01-2.75	8/8/2007	30	12	1.76	
	8/30/2005	6	1100	2.36	
WJ035.00	0	4/12/2004	30	2.9	0
		9/13/2004	30	2.9	0
		10/4/2005	31	2.9	0
		4/11/2006	30	2.9	0
		11/7/2006	30	10	0
		4/26/2007	29	1.9	0
	0.001-0.25	2/8/2005	30	2.9	0.001
		7/19/2006	30	2.9	0.001
		12/6/2005	28	3.6	0.01
		11/14/2007	30	1.9	0.01
		9/18/2006	30	8	0.03
		1/5/2004	30	9.1	0.062
		6/13/2007	29	7.3	0.1
		5/29/2007	29	2	0.11
		4/7/2003	30	2.9	0.181
		6/7/2004	30	43	0.201
		11/1/2004	30	2.9	0.22
	0.26-0.50	6/21/2006	29	3.6	0.261
		8/2/2004	30	23	0.42
		8/16/2006	30	2.9	0.47
		6/2/2003	29	9.1	0.49



STATION	Rain Range	COLLECT_DATE	SAL%	COLIFORM	Rain 72 Hours
	0.51-1.00	7/24/2007	32	1.9	0.52
		4/3/2007	31	1.9	0.53
		11/8/2005	28	3.6	0.71
		3/8/2005	27	2.9	0.791
		8/4/2003	30	9.1	0.9
		10/6/2003	30	240	0.92
		5/3/2004	30	2.9	0.92
	12/1/2003	31	9.1	0.941	
	1.01-1.25	9/11/2007	32	2	1.01
		7/12/2004	30	3.6	1.2
		5/10/2006	30	3.6	1.21
	1.26-2.00	7/31/2006	29	2.9	1.37
		1/4/2005	30	3.6	1.48
10/27/2003		30	460	1.57	
8/8/2007		30	1.9	1.76	
WJ038.00	0	3/1/2004	31	2.9	0
		4/12/2004	30	2.9	0
		9/13/2004	30	3.6	0
		10/4/2005	30	3.6	0
		4/11/2006	31	2.9	0
		11/7/2006	30	1.9	0
	0.001-0.25	2/8/2005	31	460	0.001
		7/19/2006	30	5.1	0.001
		12/6/2005	27	3.6	0.01
		11/14/2007	32	1.9	0.01
		9/18/2006	30	1.9	0.03
		2/6/2007	31	1.9	0.04
		1/5/2004	30	23	0.062
		6/13/2007	30	1.9	0.1
		5/29/2007	28	1.9	0.11
		4/7/2003	30	2.9	0.181
		6/7/2004	30	9.1	0.201
		11/1/2004	32	2.9	0.22
	0.26-0.50	6/21/2006	29	2.9	0.261
		8/2/2004	30	2.9	0.42
		8/16/2006	30	2.9	0.47
		6/2/2003	31	2.9	0.49
	0.51-1.00	7/24/2007	31	1.9	0.52
		4/3/2007	30	1.9	0.53
		11/8/2005	30	2.9	0.71
		3/8/2005	31	3.6	0.791
		8/4/2003	30	3.6	0.9
		10/6/2003	31	150	0.92
		5/3/2004	30	2.9	0.92
	12/1/2003	31	15	0.941	



STATION	Rain Range	COLLECT_DATE	SAL%	COLIFORM	Rain 72 Hours
	1.01-1.25	9/11/2007	32	1.9	1.01
		7/12/2004	30	2.9	1.2
	1.26-2.00	7/31/2006	30	2.9	1.37
		1/4/2005	31	23	1.48
		10/27/2003	30	2.9	1.57
		8/8/2007	30	1.9	1.76
WJ046.00	0	3/1/2004	30	2.9	0
		4/12/2004	31	2.9	0
		9/13/2004	30	23	0
		10/4/2005	31	2.9	0
		4/11/2006	30	2.9	0
		11/7/2006	30	1.9	0
	0.001-0.25	2/8/2005	31	2.9	0.001
		12/6/2005	15	3.6	0.01
		11/14/2007	32	1.9	0.01
		9/18/2006	30	1.9	0.03
		2/6/2007	32	1.9	0.04
		1/5/2004	30	2.9	0.062
		5/29/2007	28	1.9	0.11
		4/7/2003	30	2.9	0.181
		6/7/2004	30	2.9	0.201
		11/1/2004	32	2.9	0.22
	0.26-0.50	6/21/2006	28	2.9	0.261
		8/2/2004	30	2.9	0.42
		8/16/2006	30	2.9	0.47
		6/2/2003	31	2.9	0.49
	0.51-1.00	7/24/2007	31	2	0.52
		4/3/2007	31	1.9	0.53
		11/8/2005	28	2.9	0.71
		3/8/2005	26	2.9	0.791
		8/4/2003	30	2.9	0.9
		10/6/2003	31	23	0.92
		5/3/2004	30	2.9	0.92
		12/1/2003	31	9.1	0.941
	1.01-1.25	9/11/2007	32	4	1.01
		7/12/2004	30	2.9	1.2
	1.26-2.00	7/31/2006	30	2.9	1.37
		1/4/2005	31	3.6	1.48
		10/27/2003	30	240	1.57
WJ047.00	0	3/1/2004	31	2.9	0
		4/12/2004	31	2.9	0
		9/13/2004	30	3.6	0
		10/4/2005	30	3.6	0
		4/11/2006	32	2.9	0
		11/7/2006	30	1.9	0



STATION	Rain Range	COLLECT_DATE	SAL%	COLIFORM	Rain 72 Hours	
	0.001-0.25	4/26/2007	28	2	0	
		2/8/2005	30	3.6	0.001	
		3/7/2006	31	2.9	0.001	
		12/6/2005	26	43	0.01	
		11/14/2007	32	1.9	0.01	
		9/18/2006	30	1.9	0.03	
		2/6/2007	32	1.9	0.04	
		12/5/2006	30	1.9	0.05	
		1/5/2004	31	2.9	0.062	
		6/13/2007	30	14	0.1	
		5/29/2007	29	4	0.11	
		4/7/2003	30	2.9	0.181	
		6/7/2004	30	9.1	0.201	
		11/1/2004	32	2.9	0.22	
		0.26-0.50	6/21/2006	28	2.9	0.261
	12/6/2004		29	5.2	0.301	
	8/2/2004		30	2.9	0.42	
	8/16/2006		30	2.9	0.47	
	6/2/2003		31	2.9	0.49	
	0.51-1.00	7/24/2007	32	2	0.52	
		4/3/2007	32	1.9	0.53	
		12/17/2007	32	1.9	0.63	
		11/8/2005	30	3.6	0.71	
		3/8/2005	30	2.9	0.791	
		8/4/2003	31	3.6	0.9	
		10/6/2003	32	23	0.92	
		5/3/2004	30	3.6	0.92	
		12/1/2003	30	3.6	0.941	
	1.01-1.25	9/11/2007	32	1.9	1.01	
		1/9/2007	29	1.9	1.12	
		11/28/2007	30	3.6	1.14	
		7/12/2004	30	3.6	1.2	
	1.26-2.00	7/31/2006	30	2.9	1.37	
		1/4/2005	32	2.9	1.48	
		2/7/2006	20	2.9	1.571	
		8/8/2007	30	6	1.76	
		1/17/2006	30	2.9	1.781	
	WJ048.00	0	3/1/2004	30	2.9	0
			4/12/2004	23	2.9	0
			9/13/2004	30	3.6	0
10/4/2005			30	2.9	0	
4/11/2006			30	2.9	0	
11/7/2006			30	1.9	0	
0.001-0.25		2/8/2005	30	2.9	0.001	
		12/6/2005	28	43	0.01	
		11/14/2007	32	1.9	0.01	



STATION	Rain Range	COLLECT_DATE	SAL%	COLIFORM	Rain 72 Hours
		9/18/2006	31	1.9	0.03
		2/6/2007	32	1.6	0.04
		1/5/2004	30	3.6	0.062
		5/29/2007	30	1.9	0.11
		4/7/2003	25	2.9	0.181
		6/7/2004	23	1100	0.201
		11/1/2004	32	2.9	0.22
	0.26-0.50	6/21/2006	30	3.6	0.261
		8/2/2004	30	2.9	0.42
		8/16/2006	30	2.9	0.47
		6/2/2003	30	3.6	0.49
	0.51-1.00	7/24/2007	31	1.9	0.52
		4/3/2007	28	2	0.53
		11/8/2005	30	2.9	0.71
		3/8/2005	30	9.1	0.791
		8/4/2003	31	2.9	0.9
		10/6/2003	24	93	0.92
		5/3/2004	31	3.6	0.92
	1.01-1.25	12/1/2003	30	93	0.941
		9/11/2007	32	6	1.01
1.26-2.00	7/12/2004	30	9.1	1.2	
	7/31/2006	30	2.9	1.37	
	1/4/2005	29	3.2	1.48	
		10/27/2003	31	93	1.57
WJ048.50	0	11/7/2006	30	1.9	0
		12/12/2006	31	1.9	0
	0.001-0.25	11/14/2007	32	1.9	0.01
		9/18/2006	31	1.9	0.03
		2/6/2007	32	1.9	0.04
	0.26-0.50	5/29/2007	28	1.9	0.11
		6/21/2006	28	9.1	0.261
	0.51-1.00	8/16/2006	31	2.9	0.47
		7/24/2007	31	1.9	0.52
		4/3/2007	28	1.9	0.53
1.01-1.25	9/6/2006	30	1.9	0.98	
	9/11/2007	32	10	1.01	
WJ049.00	0	3/1/2004	30	2.9	0
		4/12/2004	31	2.9	0
		9/13/2004	31	2.9	0
		4/11/2006	32	2.9	0
		11/7/2006	30	2	0
	0.001-0.25	9/6/2005	30	3.6	0.001
		11/14/2007	32	2	0.01
		9/18/2006	30	2	0.03
		2/6/2007	32	1.9	0.04



STATION	Rain Range	COLLECT_DATE	SAL%	COLIFORM	Rain 72 Hours	
		1/5/2004	31	2.9	0.062	
		5/29/2007	30	1.9	0.11	
		5/10/2005	30	2.9	0.16	
		4/7/2003	30	3.6	0.181	
		6/7/2004	30	9.1	0.201	
		6/7/2005	28	23	0.21	
		11/1/2004	32	2.9	0.22	
	0.26-0.50	6/21/2006	28	23	0.261	
		8/2/2005	30	2.9	0.39	
		8/2/2004	30	3.6	0.42	
		8/16/2006	30	2.9	0.47	
		6/2/2003	31	2.9	0.49	
	0.51-1.00	7/12/2005	30	2.9	0.52	
		7/24/2007	31	1.9	0.52	
		4/3/2007	32	1.9	0.53	
		5/17/2005	28	2.9	0.84	
		8/4/2003	31	3.6	0.9	
		10/6/2003	30	15	0.92	
		5/3/2004	31	2.9	0.92	
	1.01-1.25	12/1/2003	26	15	0.941	
		9/11/2007	32	120	1.01	
		9/12/2007	30	154	1.01	
	1.26-2.00	7/12/2004	30	2.9	1.2	
		7/31/2006	30	2.9	1.37	
	2.01-2.75	10/27/2003	30	93	1.57	
		8/30/2005	30	240	2.36	
	WJ049.50	0	3/1/2004	30	2.9	0
			4/12/2004	30	2.9	0
9/13/2004			30	9.1	0	
4/11/2006			30	2.9	0	
11/7/2006			30	1.9	0	
0.001-0.25		9/6/2005	30	2.9	0.001	
		11/14/2007	34	1.9	0.01	
		9/18/2006	30	1.9	0.03	
		2/6/2007	32	1.9	0.04	
		1/5/2004	30	3.6	0.062	
		6/13/2007	30	5.5	0.1	
		5/10/2005	28	2.9	0.16	
		4/7/2003	30	2.9	0.181	
		6/7/2004	30	2.9	0.201	
		6/7/2005	26	3.6	0.21	
0.26-0.50		11/1/2004	32	2.9	0.22	
		6/21/2006	30	2.9	0.261	
		8/2/2005	30	9.1	0.39	
		8/2/2004	31	9.1	0.42	



STATION	Rain Range	COLLECT_DATE	SAL%	COLIFORM	Rain 72 Hours	
		8/16/2006	30	9.1	0.47	
		6/2/2003	31	2.9	0.49	
	0.51-1.00	7/24/2007	32	1.9	0.52	
		4/3/2007	30	4	0.53	
		5/17/2005	28	15	0.84	
		8/4/2003	31	3.6	0.9	
		10/6/2003	30	2.9	0.92	
		5/3/2004	31	2.9	0.92	
		12/1/2003	31	9.1	0.941	
	1.01-1.25	9/11/2007	32	3.6	1.01	
		7/12/2004	30	2.9	1.2	
	1.26-2.00	7/31/2006	30	3.6	1.37	
		10/27/2003	30	240	1.57	
	2.01-2.75	8/30/2005	21	240	2.36	
WJ050.50	0	4/11/2006	30	2.9	0	
		11/7/2006	30	1.9	0	
	0.001-0.25	11/14/2007	32	1.9	0.01	
		9/18/2006	30	1.9	0.03	
		2/6/2007	32	1.9	0.04	
		5/29/2007	29	2	0.11	
	0.26-0.50	6/21/2006	29	2.9	0.261	
		8/16/2006	30	2.9	0.47	
	0.51-1.00	7/24/2007	31	1.9	0.52	
		4/3/2007	30	9.1	0.53	
	1.01-1.25	9/11/2007	32	2	1.01	
	1.26-2.00	7/31/2006	30	2.9	1.37	
	WJ051.00	0	9/15/2004	32	2.9	0
			9/14/2005	31	2.9	0
11/21/2005			30	2.9	0	
4/11/2006			30	2.9	0	
0.001-0.25		7/9/2003	30	3.6	0.021	
		9/18/2006	30	1.9	0.03	
		9/3/2003	32	2.9	0.04	
		10/10/2007	32	4	0.08	
		6/11/2003	32	2.9	0.09	
		10/27/2004	32	2.9	0.09	
		3/27/2007	28	3.6	0.15	
		8/7/2003	31	2.9	0.162	
		6/29/2005	28	23	0.18	
		11/28/2005	30	3.6	0.202	
0.26-0.50		6/21/2006	28	2.9	0.261	
		6/9/2005	28	2.9	0.27	
		6/9/2004	30	2.9	0.291	
		8/4/2005	30	2.9	0.39	



STATION	Rain Range	COLLECT_DATE	SAL%	COLIFORM	Rain 72 Hours
		7/14/2004	32	2.9	0.451
		8/17/2006	30	2.9	0.47
	0.51-1.00	6/20/2007	30	6	0.59
		8/15/2007	31	24	0.68
	1.01-1.25	1/10/2007	28	1.9	0.75
		6/23/2003	30	9.1	1.101
	1.26-2.00	5/5/2004	30	2.9	1.271
		5/2/2007	26	1.9	1.36
		7/31/2006	30	3.6	1.37
	2.01-2.75	10/28/2003	32	2.9	1.6
		10/23/2006	30	3.6	2.06
			8/31/2005	30	93
WJ055.00	0	9/15/2004	32	2.9	0
		9/14/2005	30	2.9	0
		11/21/2005	30	2.9	0
		4/11/2006	30	2.9	0
	0.001-0.25	7/9/2003	20	10.5	0.021
		9/18/2006	30	1.9	0.03
		9/3/2003	32	2.9	0.04
		6/25/2007	30	2	0.06
		10/10/2007	32	6	0.08
		6/11/2003	32	2.9	0.09
		10/27/2004	32	2.9	0.09
		3/27/2007	30	1.9	0.15
		8/7/2003	31	3.2	0.162
		6/29/2005	28	75	0.18
		11/28/2005	30	3.6	0.202
	0.26-0.50	6/21/2006	28	9.1	0.261
		6/9/2005	26	2.9	0.27
		6/9/2004	31	2.9	0.291
		8/4/2005	30	3.6	0.39
		7/14/2004	32	2.9	0.451
		8/17/2006	30	2.9	0.47
	0.51-1.00	6/20/2007	30	6	0.59
		8/15/2007	30	4	0.68
	1.01-1.25	1/10/2007	28	1.9	0.75
		6/23/2003	30	23	1.101
	1.26-2.00	5/5/2004	30	2.9	1.271
		5/2/2007	21	1.9	1.36
		7/31/2006	29	2.9	1.37
2.01-2.75	10/28/2003	30	9.1	1.6	
	10/23/2006	30	1.9	2.06	
		8/31/2005	30	>1100	2.56
WJ056.00	0	9/15/2004	32	2.9	0



STATION	Rain Range	COLLECT_DATE	SAL%	COLIFORM	Rain 72 Hours			
		9/14/2005	30	2.9	0			
		11/21/2005	31	2.9	0			
		4/11/2006	32	240	0			
	0.001-0.25		7/9/2003	30	3.6	0.021		
			9/18/2006	30	1.9	0.03		
			9/3/2003	32	2.9	0.04		
			6/25/2007	30	1.9	0.06		
			10/10/2007	31	2	0.08		
			6/11/2003	32	3.6	0.09		
			10/27/2004	32	2.9	0.09		
			3/27/2007	30	12	0.15		
			8/7/2003	30	3	0.162		
			6/29/2005	29	2.9	0.18		
			11/28/2005	28	2.9	0.202		
			0.26-0.50		6/21/2006	28	2.9	0.261
					6/9/2005	26	9.1	0.27
	6/9/2004	31			2.9	0.291		
	8/4/2005	30			2.9	0.39		
	7/14/2004	32			2.9	0.451		
	8/17/2006	30			2.9	0.47		
	0.51-1.00		6/20/2007	30	24	0.59		
			8/15/2007	30	12	0.68		
			1/10/2007	30	1.9	0.75		
	1.01-1.25		6/23/2003	30	9.1	1.101		
	1.26-2.00		5/5/2004	30	2.9	1.271		
			5/2/2007	26	1.9	1.36		
			7/31/2006	30	3.6	1.37		
			10/28/2003	30	3.6	1.6		
	2.01-2.75		10/23/2006	30	4	2.06		
			8/31/2005	30	3.6	2.56		
WJ057.00	0	9/15/2004	32	2.9	0			
		9/14/2005	30	2.9	0			
		11/21/2005	31	2.9	0			
		4/11/2006	30	2.9	0			
	0.001-0.25		7/9/2003	30	7.3	0.021		
			9/18/2006	30	2	0.03		
			9/3/2003	32	3.6	0.04		
			10/10/2007	32	22	0.08		
			6/11/2003	32	2.9	0.09		
			10/27/2004	32	2.9	0.09		
			8/7/2003	30	3.6	0.162		
			6/29/2005	28	23	0.18		
			11/28/2005	30	2.9	0.202		
			0.26-0.50		6/21/2006	28	3.6	0.261
	6/9/2005	26			2.9	0.27		



STATION	Rain Range	COLLECT_DATE	SAL%	COLIFORM	Rain 72 Hours
		6/9/2004	31	2.9	0.291
		3/12/2007	20	1.9	0.3
		8/4/2005	30	2.9	0.39
		7/14/2004	32	3	0.451
		8/17/2006	31	2.9	0.47
	0.51-1.00	6/20/2007	30	1.9	0.59
		8/15/2007	30	1.9	0.68
		1/10/2007	12	2	0.75
	1.01-1.25	6/23/2003	30	3.6	1.101
	1.26-2.00	5/5/2004	30	3	1.271
		5/2/2007	26	2	1.36
		7/31/2006	30	9.1	1.37
		10/28/2003	30	3.6	1.6
	2.01-2.75	10/23/2006	29	12	2.06
8/31/2005		30	460	2.56	
WJ058.00	0	9/15/2004	32	2.9	0
		9/14/2005	30	43	0
		11/21/2005	30	2.9	0
		4/11/2006	22	3.6	0
	0.001-0.25	7/9/2003	30	2.9	0.021
		9/18/2006	30	16	0.03
		9/3/2003	32	2.9	0.04
		10/10/2007	31	2	0.08
		6/11/2003	31	3.6	0.09
		10/27/2004	32	2.9	0.09
		8/7/2003	30	3.6	0.162
		6/29/2005	28	93	0.18
		11/28/2005	30	2.9	0.202
		0.26-0.50	6/21/2006	27	2.9
	6/9/2005		26	3	0.27
	6/9/2004		31	9.1	0.291
	3/12/2007		28	1.9	0.3
	8/4/2005		30	2.9	0.39
	7/14/2004		31	9.1	0.451
	8/17/2006		30	23	0.47
	0.51-1.00	6/20/2007	31	58	0.59
		8/15/2007	30	66	0.68
		1/10/2007	30	1.9	0.75
	1.01-1.25	6/23/2003	30	93	1.101
	1.26-2.00	5/5/2004	30	2.9	1.271
		5/2/2007	28	8	1.36
		7/31/2006	30	9.1	1.37
		10/28/2003	30	2.9	1.6
	2.01-2.75	10/23/2006	30	2	2.06
		8/31/2005	30	240	2.56



STATION	Rain Range	COLLECT_DATE	SAL%	COLIFORM	Rain 72 Hours	
WJ059.00	0	9/15/2004	31	2.9	0	
		9/14/2005	30	3.6	0	
		11/21/2005	30	2.9	0	
		4/11/2006	30	2.9	0	
	0.001-0.25	7/9/2003	30	9.1	0.021	
		9/18/2006	30	124	0.03	
		9/3/2003	32	2.9	0.04	
		10/10/2007	32	2	0.08	
		6/11/2003	32	2.9	0.09	
		10/27/2004	32	2.9	0.09	
		8/7/2003	31	2.9	0.162	
		6/29/2005	28	7.3	0.18	
		11/28/2005	30	2.9	0.202	
		0.26-0.50	6/21/2006	27	9.1	0.261
			6/9/2005	28	2.9	0.27
	6/9/2004		30	2.9	0.291	
	3/12/2007		32	1.9	0.3	
	8/4/2005		30	2.9	0.39	
	7/14/2004		31	2.9	0.451	
	8/17/2006		30	2.9	0.47	
	0.51-1.00	6/20/2007	30	70	0.59	
		8/15/2007	30	1.9	0.68	
		1/10/2007	30	1.9	0.75	
	1.01-1.25	6/23/2003	30	9.1	1.101	
	1.26-2.00	5/5/2004	30	2.9	1.271	
		5/2/2007	28	1.9	1.36	
		7/31/2006	30	2.9	1.37	
		10/28/2003	32	2.9	1.6	
2.01-2.75	10/23/2006	28	440	2.06		
	8/31/2005	30	9.1	2.56		
WJ060.00	0	9/15/2004	32	2.9	0	
		9/14/2005	30	3.6	0	
		11/21/2005	29	2.9	0	
		4/11/2006	30	2.9	0	
		12/19/2006	32	1.9	0	
	0.001-0.25	7/9/2003	30	3.6	0.021	
		9/18/2006	30	2	0.03	
		9/3/2003	32	3.6	0.04	
		10/10/2007	32	14	0.08	
		6/11/2003	32	2.9	0.09	
		10/27/2004	32	2.9	0.09	
		8/7/2003	30	23	0.162	
		6/29/2005	29	2.9	0.18	
		11/28/2005	30	9.1	0.202	
		0.26-0.50	6/21/2006	28	2.9	0.261



STATION	Rain Range	COLLECT_DATE	SAL%	COLIFORM	Rain 72 Hours
		6/9/2005	28	2.9	0.27
		6/9/2004	31	2.9	0.291
		3/12/2007	30	1.9	0.3
		8/4/2005	30	2.9	0.39
		7/14/2004	31	3.6	0.451
		8/17/2006	30	2.9	0.47
	0.51-1.00	6/20/2007	32	32	0.59
		8/15/2007	30	2	0.68
		1/10/2007	30	1.9	0.75
		6/23/2003	30	3.6	1.101
	1.26-2.00	5/5/2004	32	2.9	1.271
		5/2/2007	28	1.9	1.36
		7/31/2006	30	2.9	1.37
		10/28/2003	32	3.6	1.6
2.01-2.75	8/31/2005	30	3.6	2.56	
WJ061.00	0	9/15/2004	31	2.9	0
		9/14/2005	30	3.6	0
		11/21/2005	31	2.9	0
		4/11/2006	30	2.9	0
	0.001-0.25	7/9/2003	30	3.6	0.021
		9/18/2006	30	2	0.03
		9/3/2003	32	2.9	0.04
		10/10/2007	32	1.9	0.08
		6/11/2003	32	3.6	0.09
		10/27/2004	32	2.9	0.09
		8/7/2003	31	2.9	0.162
		6/29/2005	28	8.2	0.18
		11/28/2005	30	3.6	0.202
		0.26-0.50	6/21/2006	27	3.6
	6/9/2005		28	2.9	0.27
	6/9/2004		31	2.9	0.291
	3/12/2007		32	1.9	0.3
	8/4/2005		30	2.9	0.39
	7/14/2004		31	2.9	0.451
	8/17/2006		31	2.9	0.47
	0.51-1.00	6/20/2007	30	1.9	0.59
		8/15/2007	30	1.9	0.68
		1/10/2007	30	1.9	0.75
	1.26-2.00	6/23/2003	31	9.1	1.101
		5/5/2004	30	2.9	1.271
		5/2/2007	28	1.9	1.36
		7/31/2006	30	2.9	1.37
		10/28/2003	32	2.9	1.6
	2.01-2.75	10/23/2006	30	1.9	2.06
		8/31/2005	30	3.6	2.56



STATION	Rain Range	COLLECT_DATE	SAL%	COLIFORM	Rain 72 Hours
WJ062.00	0	4/16/2003	30	2.9	0
		11/18/2004	30	2.9	0
		3/23/2005	32	2.9	0
		4/11/2006	31	2.9	0
		4/11/2007	32	1.9	0
		9/24/2007	31	4	0
	0.001-0.25	12/3/2003	32	3.6	0.001
		2/9/2005	30	2.9	0.001
		1/7/2004	31	2.9	0.003
		12/7/2005	31	3.6	0.01
		3/3/2004	31	2.9	0.02
		2/12/2007	33	1.9	0.02
		9/18/2006	32	6	0.03
		11/19/2003	31	9.1	0.04
		10/10/2007	32	16	0.08
		9/29/2004	31	23	0.1
		3/26/2003	30	2.9	0.231
	0.26-0.50	6/21/2006	27	2.9	0.261
		3/12/2007	32	1.9	0.3
		10/13/2004	32	2.9	0.34
		8/17/2006	31	2.9	0.47
		1/19/2005	32	2.9	0.49
	0.51-1.00	4/7/2004	32	2.9	0.51
		11/16/2005	30	7.3	0.52
		2/4/2004	32	2.9	0.54
		6/20/2007	30	17.5	0.59
		8/15/2007	30	4	0.68
		9/24/2003	30	9.1	0.69
		1/10/2007	32	1.9	0.75
		12/5/2007	30	1.9	0.78
	1.26-2.00	12/8/2004	30	23	1.261
		5/2/2007	28	25	1.36
7/31/2006		30	3.6	1.37	
2/7/2006		30	2.9	1.571	
12/19/2005		32	2.9	1.591	
1/17/2006		31	2.9	1.781	
2.01-2.75	10/23/2006	30	2	2.06	
2.76-3.50	10/29/2003	30	93	3.48	
WJ063.00	0	4/16/2003	30	2.9	0
		11/18/2004	30	3.6	0
		3/23/2005	32	2.9	0
		4/11/2006	32	2.9	0
		4/11/2007	31	1.9	0
		9/24/2007	32	33	0
	0.001-0.25	12/3/2003	32	3.6	0.001



STATION	Rain Range	COLLECT_DATE	SAL%	COLIFORM	Rain 72 Hours
		2/9/2005	30	2.9	0.001
		1/7/2004	31	2.9	0.003
		12/7/2005	31	2.9	0.01
		3/3/2004	30	2.9	0.02
		2/12/2007	32	6	0.02
		9/18/2006	31	4	0.03
		11/19/2003	32	15	0.04
		10/10/2007	32	6	0.08
		9/29/2004	31	9.1	0.1
		3/26/2003	6	9.1	0.231
	0.26-0.50	6/21/2006	27	3.6	0.261
		3/12/2007	32	1.9	0.3
		10/13/2004	32	3.6	0.34
		8/17/2006	30	2.9	0.47
		1/19/2005	32	3.6	0.49
	0.51-1.00	4/7/2004	32	2.9	0.51
		11/16/2005	30	2.9	0.52
		2/4/2004	32	2.9	0.54
		6/20/2007	30	2	0.59
		8/15/2007	31	2	0.68
		9/24/2003	31	93	0.69
		1/10/2007	32	1.9	0.75
		12/5/2007	30	2	0.78
	1.26-2.00	12/8/2004	30	43	1.261
		5/2/2007	28	1.9	1.36
		7/31/2006	31	2.9	1.37
		2/7/2006	30	2.9	1.571
		12/19/2005	32	2.9	1.591
		1/17/2006	30	2.9	1.781
	2.01-2.75	10/23/2006	30	360	2.06
2.76-3.50	10/29/2003	31	93	3.48	
WJ064.00	0	4/16/2003	30	2.9	0
		11/18/2004	30	2.9	0
		1/31/2005	30	2.9	0
		3/23/2005	32	2.9	0
		4/11/2006	32	2.9	0
		4/11/2007	30	1.9	0
		9/24/2007	32	1.9	0
		0.001-0.25	12/3/2003	33	9.1
	2/9/2005		30	2.9	0.001
	1/7/2004		31	2.9	0.003
	12/7/2005		32	2.9	0.01
	3/3/2004		30	2.9	0.02
	2/12/2007		33	1.9	0.02
			9/18/2006	30	3.6



STATION	Rain Range	COLLECT_DATE	SAL%	COLIFORM	Rain 72 Hours
		11/19/2003	32	2.9	0.04
		10/10/2007	31	27	0.08
		9/29/2004	31	15	0.1
		3/26/2003	6	9.1	0.231
	0.26-0.50	6/21/2006	27	2.9	0.261
		3/12/2007	32	1.9	0.3
		10/13/2004	32	9.1	0.34
		8/17/2006	31	2.9	0.47
	0.51-1.00	4/7/2004	32	2.9	0.51
		11/16/2005	30	2.9	0.52
		6/20/2007	30	4	0.59
		8/15/2007	30	1.9	0.68
		9/24/2003	31	9.1	0.69
		1/10/2007	30	6	0.75
		12/5/2007	30	1.9	0.78
	1.26-2.00	12/8/2004	30	2.9	1.261
		5/2/2007	28	1.9	1.36
		7/31/2006	30	2.9	1.37
		2/7/2006	30	2.9	1.571
		1/17/2006	32	2.9	1.781
	2.01-2.75	10/23/2006	30	44	2.06
		4/27/2005	26	9.1	2.62
	2.76-3.50	10/29/2003	31	460	3.48
WJ065.00	0	4/16/2003	30	2.9	0
		11/18/2004	30	3.6	0
		1/31/2005	30	2.9	0
		3/23/2005	30	2.9	0
		4/11/2006	20	2.9	0
		4/11/2007	32	1.9	0
		9/24/2007	32	20	0
	0.001-0.25	12/3/2003	32	2.9	0.001
		2/9/2005	31	2.9	0.001
		1/7/2004	31	2.9	0.003
		12/7/2005	32	2.9	0.01
		3/3/2004	30	2.9	0.02
		9/18/2006	31	1.9	0.03
		11/19/2003	29	2.9	0.04
		2/27/2006	32	2.9	0.08
		10/10/2007	32	18	0.08
		9/29/2004	30	2.9	0.1
		3/27/2007	30	2	0.15
		3/26/2003	6	2.9	0.231
	0.26-0.50	6/21/2006	27	93	0.261
		3/12/2007	23	27	0.3
		10/13/2004	32	9.1	0.34



STATION	Rain Range	COLLECT_DATE	SAL%	COLIFORM	Rain 72 Hours
		8/17/2006	32	15	0.47
	0.51-1.00	4/7/2004	18	2.9	0.51
		11/16/2005	23	43	0.52
		8/15/2007	30	2	0.68
		9/24/2003	30	240	0.69
		1/10/2007	31	1.9	0.75
		12/5/2007	26	1.9	0.78
	1.01-1.25	7/24/2007	30	8	1.04
	1.26-2.00	12/8/2004	30	3.6	1.261
		5/2/2007	26	1.9	1.36
		1/17/2006	31	2.9	1.781
	2.01-2.75	10/23/2006	29	4	2.06
		4/27/2005	12	43	2.62
	2.76-3.50	10/29/2003	30	150	3.48
WJ066.00	0	4/16/2003	30	2.9	0
		11/18/2004	30	3.6	0
		1/31/2005	31	2.9	0
		3/23/2005	31	15	0
		4/11/2006	30	2.9	0
		4/11/2007	28	2	0
		9/24/2007	32	1.9	0
	0.001-0.25	12/3/2003	32	3.6	0.001
		2/9/2005	31	2.9	0.001
		1/7/2004	31	2.9	0.003
		12/7/2005	32	2.9	0.01
		3/3/2004	30	9.1	0.02
		9/18/2006	30	13	0.03
		11/19/2003	21	3.6	0.04
		10/10/2007	32	1.9	0.08
		9/29/2004	30	2.9	0.1
		3/27/2007	30	1.9	0.15
	0.26-0.50	3/26/2003	30	2.9	0.231
		6/21/2006	27	3.6	0.261
		3/12/2007	30	14	0.3
		10/13/2004	32	3.6	0.34
	0.51-1.00	8/17/2006	31	2.9	0.47
		4/7/2004	30	2.9	0.51
		11/16/2005	30	240	0.52
		8/15/2007	30	1.9	0.68
		9/24/2003	31	23	0.69
		1/10/2007	30	1.9	0.75
	1.01-1.25	12/5/2007	30	1.9	0.78
		7/24/2007	31	6	1.04
	1.26-2.00	12/8/2004	30	43	1.261
		5/2/2007	28	1.9	1.36



STATION	Rain Range	COLLECT_DATE	SAL%	COLIFORM	Rain 72 Hours	
		2/7/2006	25	3.6	1.571	
		1/17/2006	32	2.9	1.781	
	2.01-2.75	10/23/2006	30	680	2.06	
		4/27/2005	25	23	2.62	
	2.76-3.50	10/29/2003	10	460	3.48	
WJ067.00	0	4/16/2003	30	2.9	0	
		11/18/2004	27	3.6	0	
		3/23/2005	32	2.9	0	
		4/11/2006	30	2.9	0	
		4/11/2007	30	3.6	0	
		9/24/2007	32	15	0	
	0.001-0.25	12/3/2003	32	2.9	0.001	
		2/9/2005	30	2.9	0.001	
		1/7/2004	31	15	0.003	
		12/7/2005	29	2.9	0.01	
		3/3/2004	31	3.6	0.02	
		2/12/2007	32	1.9	0.02	
		9/18/2006	31	1.9	0.03	
		11/19/2003	22	3.6	0.04	
		10/10/2007	32	3.6	0.08	
		9/29/2004	31	3.6	0.1	
	0.26-0.50	3/26/2003	30	2.9	0.231	
		6/21/2006	26	9.1	0.261	
		3/12/2007	32	1.9	0.3	
		10/13/2004	32	2.9	0.34	
		8/17/2006	31	2.9	0.47	
	0.51-1.00	1/19/2005	32	460	0.49	
		4/7/2004	31	2.9	0.51	
		11/16/2005	30	43	0.52	
		2/4/2004	32	3.6	0.54	
		6/20/2007	30	4	0.59	
		8/15/2007	31	3.6	0.68	
		9/24/2003	31	43	0.69	
		1/10/2007	30	1.9	0.75	
	1.26-2.00	12/5/2007	30	1.9	0.78	
		12/8/2004	30	23	1.261	
		5/2/2007	28	4	1.36	
		7/31/2006	30	2.9	1.37	
		2/7/2006	30	2.9	1.571	
	2.01-2.75	1/17/2006	30	2.9	1.781	
		10/23/2006	30	40	2.06	
	2.76-3.50	4/27/2005	25	3.6	2.62	
		10/29/2003	20	1100	3.48	
	WJ068.00	0	4/16/2003	30	2.9	0



STATION	Rain Range	COLLECT_DATE	SAL%	COLIFORM	Rain 72 Hours	
		11/18/2004	31	2.9	0	
		1/31/2005	31	2.9	0	
		3/23/2005	24	9.1	0	
		4/11/2006	30	2.9	0	
		4/23/2007	23	1.9	0	
		9/24/2007	32	1.9	0	
		12/3/2003	32	2.9	0.001	
	0.001-0.25	2/9/2005	30	2.9	0.001	
		1/7/2004	30	2.9	0.003	
		12/7/2005	31	2.9	0.01	
		3/3/2004	30	43	0.02	
		9/18/2006	31	4	0.03	
		11/19/2003	22	2.9	0.04	
		6/25/2007	30	1.9	0.06	
		9/29/2004	31	3.6	0.1	
		3/27/2007	26	15	0.15	
		3/26/2003	6	23	0.231	
		0.26-0.50	6/21/2006	26	43	0.261
			10/13/2004	32	6.2	0.34
			8/17/2006	32	240	0.47
	0.51-1.00	4/7/2004	31	2.9	0.51	
		11/16/2005	29	460	0.52	
		8/15/2007	30	27	0.68	
		9/24/2003	29	93	0.69	
		1/10/2007	12	4	0.75	
		12/5/2007	30	1.9	0.78	
	1.01-1.25	10/29/2007	30	2	1.01	
		11/28/2007	32	2	1.14	
	1.26-2.00	12/8/2004	31	9.1	1.261	
		5/2/2007	28	1.9	1.36	
2/7/2006		26	2.9	1.571		
1/17/2006		30	2.9	1.781		
2.01-2.75	10/23/2006	30	29	2.06		
	4/27/2005	26	3.6	2.62		
2.76-3.50	10/29/2003	21	240	3.48		
WJ070.00	0	4/16/2003	30	2.9	0	
		11/18/2004	30	2.9	0	
		3/23/2005	28	2.9	0	
		4/11/2006	30	2.9	0	
		4/11/2007	30	2	0	
		9/24/2007	32	2	0	
	0.001-0.25	12/3/2003	32	3.6	0.001	
		2/9/2005	30	2.9	0.001	
		1/7/2004	31	3.6	0.003	
		12/7/2005	32	2.9	0.01	



STATION	Rain Range	COLLECT_DATE	SAL%	COLIFORM	Rain 72 Hours
		3/3/2004	31	3.6	0.02
		2/12/2007	32	1.9	0.02
		9/18/2006	30	1.9	0.03
		11/19/2003	22	2.9	0.04
		10/10/2007	32	1.9	0.08
		9/29/2004	30	2.9	0.1
		3/26/2003	6	5.1	0.231
	0.26-0.50	6/21/2006	26	23	0.261
		3/12/2007	32	1.9	0.3
		10/13/2004	32	2.9	0.34
		8/17/2006	31	2.9	0.47
		1/19/2005	32	2.9	0.49
	0.51-1.00	4/7/2004	32	2.9	0.51
		11/16/2005	30	2.9	0.52
		2/4/2004	32	2.9	0.54
		6/20/2007	30	8	0.59
		8/15/2007	30	11	0.68
		9/24/2003	29	63	0.69
		1/10/2007	30	1.9	0.75
		12/5/2007	30	1.9	0.78
	1.26-2.00	12/8/2004	31	9.1	1.261
		5/2/2007	28	1.9	1.36
		2/7/2006	30	2.9	1.571
		1/17/2006	30	2.9	1.781
	2.01-2.75	10/23/2006	29	15	2.06
		4/27/2005	30	2.9	2.62
	2.76-3.50	10/29/2003	30	31	3.48