Chapter 8 Public Health

8.1 Fish Consumption Advisories

Concern about protecting the public from possible health exposure to mercury from eating fish has led to the issuance of several new fish consumption advisories for bodies of water in Alabama. The quality of water in Alabama generally continues improvements made in recent years. The Alabama Department of Environmental Management (ADEM) collected more than 500 fish samples for analysis from various waterbodies throughout the state during the fall of 2006. The Alabama Department of Public Health assessed the results to determine potential human health effects. Fish consumption advisories are issued for specific waterbodies and specific species taken from those areas. The advisories apply to waters as far as a boat can be taken upstream in a tributary, that is, to full pool elevations. The Alabama Department of Public Health, in consultation with ADEM and the Alabama Department of Conservation and Natural Resources, has shifted to a more protective level for mercury. Mercury, which occurs both naturally and from man-made sources, can cause developmental disabilities and behavioral problems in children if it is consumed at high levels. One way to minimize exposure in populations at risk is to reduce mercury derived from eating fish from contaminated water. These populations include women of childbearing age, pregnant women, and children younger than 15 years of age. The fish consumption advisories are based on a stricter action level for mercury developed by the U.S. Environmental Protection Agency. Previously, Food and Drug Administration guidelines were used for mercury advisories. The FDA level was based on eating one fish meal per week.

Beginning with the 2006 advisories the Department of Public Health adopted a contaminant level for mercury in fish that would protect those who eat more than one fish meal per week. The new EPA standards are four times more protective. This advisory will be represented as the
safe number of meals of that fish species that can be eaten in a given period of time, such as meals per week, meals per month or no consumption. A meal portion consists of six (6) ounces of cooked fish and eight (8) ounces of raw fish. Table 8-1 shows 2006 / 2007 Fish Consumption Advisories for Alabama.

For more information about Fish Consumption Advisories contact Neil L. Sass, Ph.D, at the ADPH (334) 206-5973 or Nsass@adph.state.al.us.

8.2 Shellfish Harvesting Areas

Shellfish harvesting area closures are issued when the Mobile River stage rises above 8 feet at the Barry Steam Plant. For reopening the closed areas, the river stage must be below 8 feet, ambient fecal coliform counts must be below a geometric mean of 14 MPN (most probable

Table 8-1 Alabama Fish Consumption Advisories for 2006 / 2007

New Consumption Advisories for 2006					
Water Body	**County**	**Species**	**Portion**	**Pollutant**	**Consumption Level**
Bear Creek Reservoir	Franklin	Largemouth Bass	Dam forebay area	Mercury	One meal per month
Bilbo Creek	Washington	Largemouth Bass	Upstream of the confluence with the Tombigbee River	Mercury	One meal per month
Cedar Creek	Houston	Largemouth Bass	Cedar Creek drainage from American Brass site near Headland tributary to Omussee Creek	Mercury	Two meal per month
Claiborne Reservoir	Monroe / Clarke	Largemouth Bass	Dam forbay area and in vicinity of Lower Peachtree Access Area, approximately River Mile 96 close to the intersection of Clarke, Monroe and Wilcox Counties	Mercury	Two meal per month
Cowpen Creek	Baldwin	Largemouth Bass	Upstream of the confluence with Fish River	Mercury	One meal per month
Escatawpa River	Mobile	Spotted Bass	At U.S. Highway 98 Bridge crossing approximately 1/10 mile upstream of Alabama/Mississippi State Line	Mercury	One meal per 2 months (or one-half meal per month)
Escatawpa River	Mobile	Largemouth Bass	At U.S. Highway 98 Bridge crossing approximately 1/10 mile upstream of Alabama/Mississippi State Line	Mercury	One meal per month
Fish River	Baldwin	Largemouth Bass	In vicinity of confluence with Polecat Creek approximately one mile upstream of County Road 32 Bridge	Mercury	One meal per 2 months (or one-half meal per month)
Fish River	Baldwin	Largemouth Bass	Approximately two miles upstream of U.S. 98 Bridge in the vicinity of Waterhole Branch/Fish River conflu-	Mercury	Two meal per month
Perdido River	Baldwin	Largemouth Bass	Near confluence with Styx River in vicinity of U.S. Highway 90 bridge crossing	Mercury	One meal per month
Perdido River	Baldwin	River Redhorse	Near confluence with Styx River in vicinity of U.S. Highway 90 bridge crossing	Mercury	Two meal per month
Polecat Creek	Baldwin	Largemouth Bass	Upstream of confluence with Fish River	Mercury	One meal per month
New Consumption Advisories for 2007					
Water Body	**County**	**Species**	**Portion**	**Pollutant**	**Consumption Level**
Big Creek Reservoir	Mobile	Largemouth Bass	Lakewide Sampling	Mercury	One meal per month
Claiborne Reservoir	Monroe	Largemouth Bass	Dam forbay area, approximately River Mile 73	Mercury	Two meal per month
Lay Reservoir	St. Clair	Spotted Bass	Upper Lay Reservoir, approximately 2 miles downstream of Logan Martin Dam and one-half mile down-	Mercury	Two meal per month
Mobile River	Mobile	Largemouth Bass	Mobile River at David Lake, River Mile 41.3	Mercury	Two meal per month
Tombigbee River	Clarke	Largemouth Bass	Vicinity of Tombigbee River Mile 83.6	Mercury	One meal per month
Upper Bear Creek	Marion	Largemouth Bass	Dam forebay area	Mercury	Two meal per month

1 No consumption advisory – Everyone should avoid eating the designated species of fish in the defined areas.

2 Limited consumption advisory – Women of childbearing age and children less than 15 years old should avoid eating the designated species of fish from the defined areas. Other people should limit

number) in 100 milliliters of sample water, and E. coli count in oyster meat must be below 230 MPN. Figure 8-1 depicts Alabama's Oyster/Shellfish Harvesting Areas in Coastal Waters. For exceptions to these areas such as around outfalls, marinas, or other specific waters refer to the ADEM Administrative Code Water Quality Program Volume II Chapter 335-6-11. Table 8-2 contains the notices pertaining to shellfish harvesting area closures and subsequent reopenings.

For more information about shellfish harvesting areas refer to the ADPH Seafood Branch Triennial Report and contact Mr. Jeff McCool with the ALDH Seafood Branch Mobile at (251) 432-7618 or JeffMcCool@adph.state.al.us or Mr. Ron Dawsey ALDH Montgomery at (334) 206-5375 or rdawsey@adph.state.al.us.

Figure 8-1 Alabama's Oyster/Shellfish Harvesting Areas in Coastal Waters

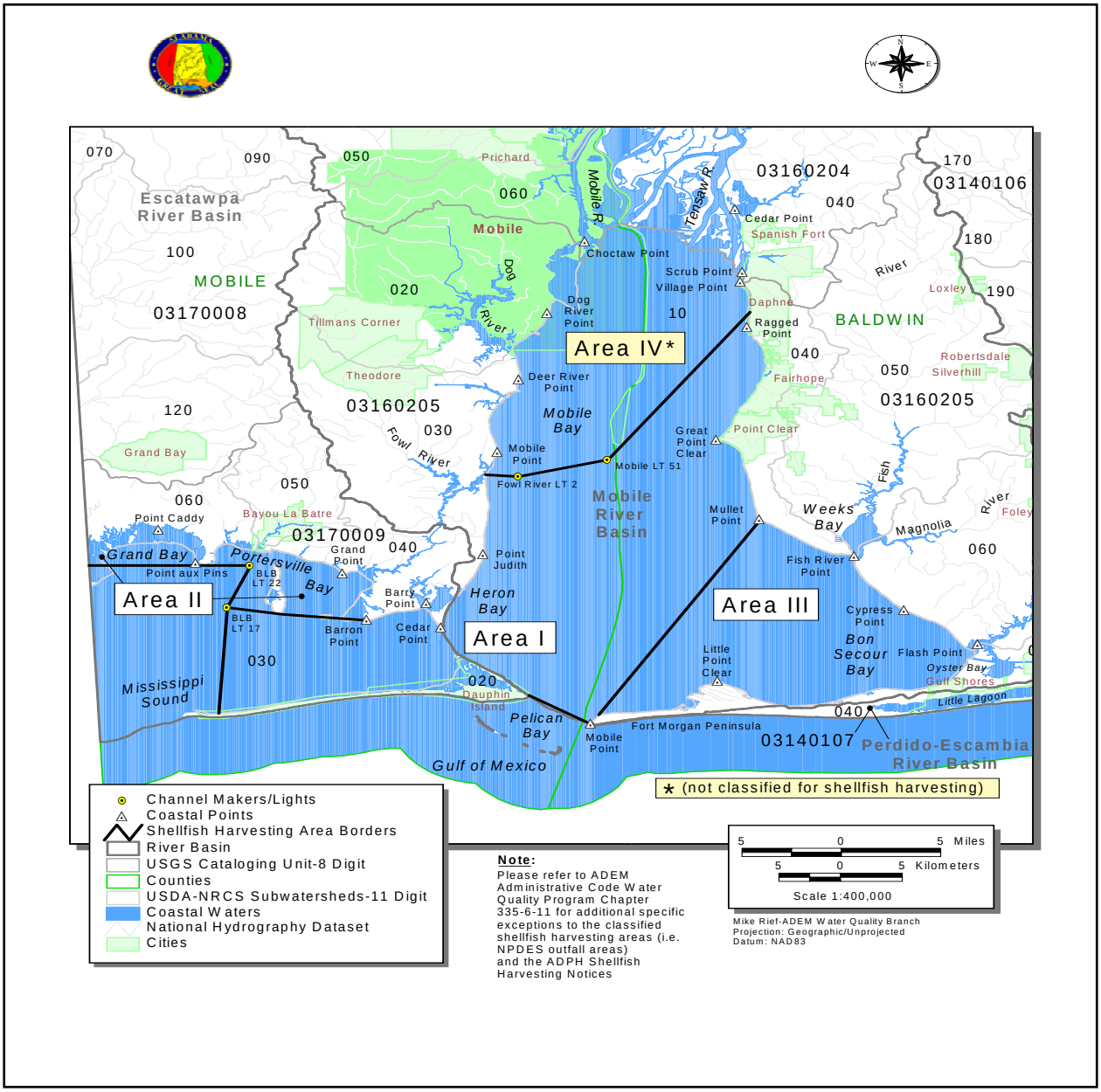

Table 8-2 Shellfish Harvesting Area Closures/Reopening

2006														
NOTICE DATE	EFFECTIVE DATE	TIME EFFECTIVE	AREA I			AREA II			AREA III			AREA IV		
				#DAYS OPEN	# DAYS CLOSED		#DAYS OPEN	# DAYS CLOSED		#DAYS OPEN	# DAYS CLOSED		#DAYS OPEN	# DAYS CLOSED
12/31/2006														
4/1/2006	4/2/2006	600	Conditionally Open	274		Conditionally Open	**274**		Conditionally Open	274		Conditionally Closed	0	274
3/28/2006	3/28/2006	1500	Conditionally Open		5	Conditionally Closed		5	Conditionally Closed		5	Conditionally Closed	0	5
3/11/2006	3/11/2006	600	Conditionally Open	17		Conditionally open	**17**		Conditionally Open	17		Conditionally Closed	0	17
3/2/2006	3/2/2006	1500	Conditionally Closed		9	Conditionally Closed		9	Conditionally Closed		9	Conditionally Closed	0	9
2/20/2006	2/21/2006	600	Conditionally Open	9		Conditionally Open	**9**		Conditionally Open	9		Conditionally Closed	0	9
2/15/2006	2/15/2006	1500	Conditionally Closed		6	Conditionally Closed		6	Conditionally Closed		6	Conditionally Closed	0	6
2/5/2006	2/6/2006	600	Conditionally Open	9		Conditionally Open	**9**		Conditionally Open	9		Conditionally Closed	0	9
1/30/2006	1/30/2006	1500	Conditionally Closed		7	Conditionally Closed		7	Conditionally Closed		7	Conditionally Closed	0	7
1/1/2006			Conditionally Open	29		Conditionally Open	**29**		Conditionally Open	29		Conditionally Closed	0	29
				338	27		338	27		338	27		0	365
Totals					7.40% **FULL**			7.40% **FULL**			7.40% **FULL**			100.00% **NON**

Conditionally means there are some exceptions to the open status, some parts of the area may still remain closed. See original notice for more detailed information.

***No Notice Found

Table 8-2 Shellfish Harvesting Area Closures/Reopening (Continued)

2007														
NOTICE DATE	**EFFECTIVE DATE**	**TIME EFFECTIVE**	**AREA I**			**AREA II**			**AREA III**			**AREA IV**		
12/31/2007				**#DAYS OPEN**	**# DAYS CLOSED**		**#DAYS OPEN**	**# DAYS CLOSED**		**#DAYS OPEN**	**# DAYS CLOSED**		**#DAYS OPEN**	**# DAYS CLOSED**
10/22/07 & 10/23/07	10/23/2007	1500	Conditionally Open	69		Conditionally Open	**69**		Conditionally Closed		69	Conditionally Closed	0	69
1/18/2007	1/19/2007	600	Conditionally Open	277		Conditionally Open	**277**		Conditionally Open	277		Conditionally Closed	0	277
1/12/2007	1/12/2007	1500	Conditionally Closed		7	Conditionally Closed		7	Conditionally Closed		7	Conditionally Closed	0	7
1/1/2007			Conditionally Open	12		Conditionally Open	**12**		Conditionally Open	12		Conditionally Closed	0	12
				358	7		358	7		12	76		0	365
Totals					1.92% **FULL**			1.92% **FULL**			20.82% **PARTIAL**			100.00% **NON**

Conditionally means there are some exceptions to the open status, some parts of the area may still remain closed. See original notice for more detailed information.

***No Notice Found

8.3 Public Water Supply/Drinking Water

Approximately 850,000,000 gallons of water are taken from ground and surface sources each day, provided with treatment, and made available to approximately four million citizens in Alabama. Five hundred and thirty-six (536) community systems, sixty-two (62) transient non-community systems and twenty-eighty (28) non-transient non-community systems are permitted by the ADEM.

Approximately sixty-five (65) percent of the water used is obtained from surface sources such as lakes, rivers, and streams and provided with full treatment to include coagulation, sedimentation, filtration, and disinfection. One hundred (100) percent of these systems meet turbidity requirements, ninety-eight (98) percent meet trihalomethane standards, ninety-nine (99) percent meet haloacetic acid standards and one hundred (100) percent meet inorganic and radiological drinking water standards. These water treatment facilities are required to employ Grade IV Certified Operators to ensure that proper doses of chemicals are applied and hourly tests are performed to demonstrate a satisfactory water quality.

Thirty-five (35) percent of the water is obtained from ground water sources such as wells and springs. An adequate source of ground water is generally available in this State; however, the ground water is extremely limited in the Piedmont area. Ground water sources are required to provide disinfection and monitor the draw down (water level change) in wells ensuring that a satisfactory available quantity of water remains. More than ninety-nine (99) percent of the Community Systems and eighty-six (86) percent of the Non-community Systems met the bacteriological quality standard of the Department. More than ninety-three (93) percent of the community systems and approximately seventy-two (72) percent of the non-community systems were in full compliance with the bacteriological monitoring requirements. Ninety-nine (99) percent meet trihalomethane standards and one hundred (100) percent of the groundwater public water systems were able to meet the inorganic and radiological maximum contaminant levels. These figures demonstrate that the majority of the water provided to the citizens in Alabama is excellent. Contaminants, chemicals, and byproducts that water systems monitor for are shown in Tables 8-3 through 8-8.

All water systems continue to monitor for lead and copper. Two systems exceeded the lead action level out of the 300 community and non-transient, non-community systems that were sampled in 2006 and 2007. This system is being required to formulate a corrosion control plan, and continue sampling every six months.

All community and non-transient non-community water system sources continued to be monitored for volatile organic chemicals (VOCs) and synthetic organic chemicals (SOCs). More than ninety-eight (98) percent of the community systems and non-transient non-community systems required to monitor in 2006 and 2007 were in full compliance with the VOC and SOC monitoring requirements. Of the contaminants found, tetrachloroethylene (TCE) is the most common regulated VOC and Di(2-ethylhexyl)phthalate is the most common regulated SOC. Table 8-3 shows surface source public water systems with compliance violations. Surface Source Public Water Systems with Compliance Violations

For more information about to Public Water Supply/Drinking Water, contact Mr. Tom Deloach in ADEM's Montgomery Office at (334) 271-7791 or tsd@adem.state.al.us..

Table 8-3 Surface Source Public Water Systems with Compliance Violations

Name of Facility	Municipality Served	Name of Water body	Contaminants with Percent Violations
Wedowee Water, Sewer and Gas Board	Wedowee	Lake wedowee	Haloacetic Acids
York Water System	York	Lake Louise	Haloacetic Acids-50%

Table 8-4 Public Water Supply Elemental Contaminants

Elemental Contaminants	MCL in mg/L
Antimony	0.006
Arsenic	0.05
Asbestos	7 million fibers*/L
Barium	2
Beryllium	0.004
Cadmium	0.005
Chromium	0.1
Cyanide	0.2
Fluoride	4
Lead	0.015
Mercury	0.002
Nickel	0.1
Nitrate (as N)	10
Nitrite (as N)	1
Total Nitrate/Nitrite (as N)	10
Selenium	0.05
Sulfate	500
Thallium	0.002

* Longer than 10 micrometers

Table 8-5 Public Water Supply Radiological Contaminants

Radiological Contaminants	Concentrations
Gross alpha particle	15pCi/L
Combined radium226 and radium228	5 pCi/L
Tritium	20,000 pCi/L
Strontium90	8 pCi/L
Beta particle and photon radioactivity	4 millirem/Yr

8.4 Source Water Assessment Program

All public water supply systems have completed a Source Water Assessment Program (SWAP) for each of their existing groundwater sources. All water systems are required to update their SWAP's when applying for reissuance of their permits-to-furnish water. All new groundwater sources must have a completed SWAP, prior to using the source for potable water. A completed SWAP for a groundwater source must include the following:

- Delineation of the source water assessment area (SWAA),
- An inventory of the possible contaminant sources within the SWAA,
- A susceptibility analysis of each possible contaminant source in the inventory, and
- A public awareness requirement

When the Source Water Assessment Program requirements were initially promulgated, Alabama had a total of 414 public water supply systems that utilized one or more groundwater sources. Each of these systems was required to complete a SWAP for their groundwater

Table 8-6 Public Water Supply Synthetic Organic Chemicals

Synthetic Organic Chemicals (non-volatile)	MCL in mg/L
Alachlor	0.002
Atrazine	0.003
Carbofuran	0.04
Chlordane	0.002
Dibromochloropropane	0.0002
2,4-D	0.07
Endrin	0.002
Ethylene Dibromide	0.00005
Heptachlor	0.0004
Heptachlor Epoxide	0.0002
Lindane	0.0002
Methoxychlor	0.04
Polychlorinated Biphenyls	0.0005
Pentachlorophenol	0.001
Toxaphene	0.003
2,4,5-TP	0.05
Benso(a)pyrene	0.0002
Dalapon	0.2
Di (2-ethylhexyl) adipate	0.4
Di (2-ethylhexyl) phthalate	0.006
Dinoseb	0.007
Diquat	0.02
Endothall	0.1
Glyphosate	0.7
Hexachlorobenzene	0.001
Hexachlorocyclopentadiene	0.05
Oxamyl (Vydate)	0.2
Picloram	0.5
Simazine	0.004
2,3,7,8-TCDD (Dioxin)	$3x10^{-8}$

Table 8-7 Public Water Supply Disinfection Byproducts

Disinfection Byproduct	MCL in mg/L
Bromate	0.01
Chlorite	1
Haloacetic Acids	0.06
Trihalomethanes	0.08

Table 8-8 Public Water Supply Volatile Synthetic Organic Chemicals

Volatile Synthetic Organic Chemicals (VOC)	MCL in mg/L
Benzene	0.005
Carbon Tetrachloride	0.005
1,2-Dichloroethane	0.005
Trichloroethylene	0.005
para-Dichlorobenzene	0.075
1,1-Dichloroethylene	0.007
1,1,1-Trichloroethane	0.2
Vinyl chloride	0.002
cis-1,2-Dichloroethylene	0.07
1,2-Dichlorpropane	0.005
Ethylbenzene	0.7
Monochlorobenzene	0.1
0-Dichlorobenzene	0.6
Styrene	0.1
Tetrachloroethylene	0.005
Toluene	1
Trans-1,2-Dichloroethylene	0.1
Xylene (Total)	10
Dichloromethane	0.005
1,2,4-Trichlorobenzene	0.07
1,1,2-Trichloroethane	0.005

sources. These public water supply systems were categorized as follows:

- 310 Community Groundwater Systems
- 75 Non-Community Transient Groundwater Systems, and
- 29 Non-Community Non-Transient Groundwater Systems

Over the past year Alabama has received Source Water Assessment Reports for seventeen new or expanded groundwater sources. All of these new Source Water Assessment Reports were from existing public water systems. Of these eight reports, all were for new well sources. The Source Water Assessment Program has been finalized for seven of the new well sources. The SWAP's for the other three groundwater sources are currently in the process of being reviewed and finalized.

For more information about the Source Water Assessment Program, contact Mr. Jack Bryant in ADEM's Montgomery Office at (334) 271-7776 or wjb@adem.state.al.us.

8.5 Wellhead Protection Program

A Ground Water Branch staff member is assigned to the ADEM Public Water Supply Branch to support Source Water Assessment (SWA) and Drinking Water State Revolving Fund (DWSRF) grants and contracts, to manage the Wellhead Protection Program, and to conduct technical reviews of ground water source delineations and contaminant inventories. The Wellhead Protection Program supports the Source Water Assessment Program (SWAP) by providing a mechanism for communities and water systems to develop and implement drinking water protection strategies. The Ground Water Branch provides assistance and guidance to systems in developing a Wellhead Protection Plan, promotes the Ground Water Guardian program, coordinates drinking water protection sign distribution, coordinates with the Alabama Rural Water Association (ARWA) in recognizing water systems that have completed a Wellhead Protection Plan, attends meetings, conferences and workshops, and coordinates inspections and compliance issues in wellhead protection areas with ADEM Branches and other State agencies. ADEM and the ARWA are working together to integrate the WHPP Tool Kit into implementation of the WHP Program. Nine utilities have developed a protection program utilizing the Tool Kit. In addition, the ADEM and ARWA are working together to install Drinking Water Protection signs in those communities with completed Wellhead Protection Plans. The sign installations were publicized for several of the communities in both the local media as well as the ARWA journal.

ADEM is working to insure that delineated source water area maps and potential contaminant site location information are available for use within the Department. Source Water Area maps have been digitized for use in developing a GIS layer. The ADEM Information Systems Branch is providing the digitizing and GIS support. The database is currently available to the agency as a draft. The ADEM Groundwater Branch UIC, UST and 106 Programs and the ADEM Industrial and Municipal Branches all consider existing Source Water Assessment areas as part of their permitting process. ADEM personnel conducted inspections of 1573 underground storage tank (UST) sites (including corrective action and compliance) and 23 UIC sites within source water areas during the reporting period.

The Groundwater Guardian Program was established within the State to provide recognition to communities, municipalities and counties that implement groundwater protection initiatives. The Department was awarded the Ground Water Guardian Affiliate designation for the 12th year by the Ground Water Foundation. Nine communities were designated Groundwater Guardians during the reporting period. These communities include the City of Tuscumbia, the City of Eufaula, Madison County, Crenshaw County, Sumter/Marengo Counties, the St Clair County Groundwater Festival Committee and the Etowah County Groundwater Festival Committee, Covington County Water Festival Committee, Washington County Water Festival Committee.

Twenty seven (27) Groundwater or Water Festivals were hosted. Approximately 43,000 students participated in a festival during the reporting period. The ADEM Groundwater Branch with the assistance of the ADEM Office of Education and Outreach manages the State program and coordinates (on average) three festival committees per year. The ARWA Groundwater and Source Water Technicians provide volunteer hours to several festivals per year and provide 4th grade teacher training on groundwater in preparation for the festivals. Funding to support the program is provided through an ADEM grant program. Festival committees can apply yearly for a $1000 grant.

The Annual Alabama Groundwater Conference was held in May 2007 at the Gordon Persons Building in Montgomery. The conference provides a forum for discussion of the latest technology and protection programs for groundwater. Two hundred and thirty (230) people were registered for the conference. The audience for the conference is comprised of utility personnel, consultants, watershed managers, geologist, university professors and students, and ADEM personnel.

For more information about the Wellhead Protection Program, contact Mr. Whit Slagle in ADEM's Montgomery Office at (334) 271-7831 or cws@adem.state.al.us. For information about the Water Festival Program contact Scott Hughes, ADEM Office of Education and Outreach, at (334) 271-7955 or ash@adem.state.al.us.

8.6 Coastal Beach Monitoring

Alabama has approximately 50 miles of Gulf beaches and almost 70 miles of bay beaches, both of which are major tourist attractions and represent a significant component of the lifestyle of Alabama residents. In June 1999, ADEM, in cooperation with the ADPH, initiated a program to routinely monitor bacteria levels at five swimming beaches on the Gulf Coast and in August 2000, six additional beaches were added. Congressional passage of the Beaches Environmental Assessment and Coastal Health (BEACH) Act expanded the monitoring and assessment activities at public beaches and in the fall of 2002, ADEM and the Baldwin County Health Department conducted on-site surveys to evaluate additional public beach sites to add to the program. Figure 8-3 shows Alabama's coastal waters covered under the 2000 B.E.A.C.H. Act.

During the past summer, a total of 25 public beach areas were monitored. A majority of these sites were sampled twice weekly from Memorial Day through Labor Day and for the remainder

of the year sampling is conducted monthly. All sample collection and analyses are performed by qualified ADEM or ADPH staff, with analytical results made available to the public within approximately 24 hours.

The public beach locations that are sampled have signage with a color-coded bacteriological advisory status to inform the public of the potential health risk associated with swimming or other water contact activities at that site. A GREEN advisory means the most recent water quality test revealed bacterial levels are below recommended thresholds while a YELLOW advisory indicates the most recent water quality test revealed bacterial levels exceed recommended thresholds and an increased risk of illness may be associated with swimming. Once a yellow advisory status has been issued, the site is re-tested. A RED advisory indicates continued elevated bacterial levels at the site and the ADPH issues a public health advisory. The site is re-tested until bacterial levels return to an acceptable level.

The Department documented 18 events during FY07 that required the issuance of a red advisory. These events occurred at nine of the beach sites that are monitored, with no red advisories issued at the other 16 sites. Elevated bacterial levels can be caused by heavy rainfall events that allow stormwater runoff to carry bacterial matter into the coastalwaters. ADEM and the ADPH use on-site signs, the ADEM web-page, press releases, and local newspapers to notify the public of the latest monitoring results.

For information pertaining to Coastal Beach Monitoring, contact Ms. Susan Farr in ADEM's Mobile Office at (251) 450-3427 or sfarr @adem.state.al.us
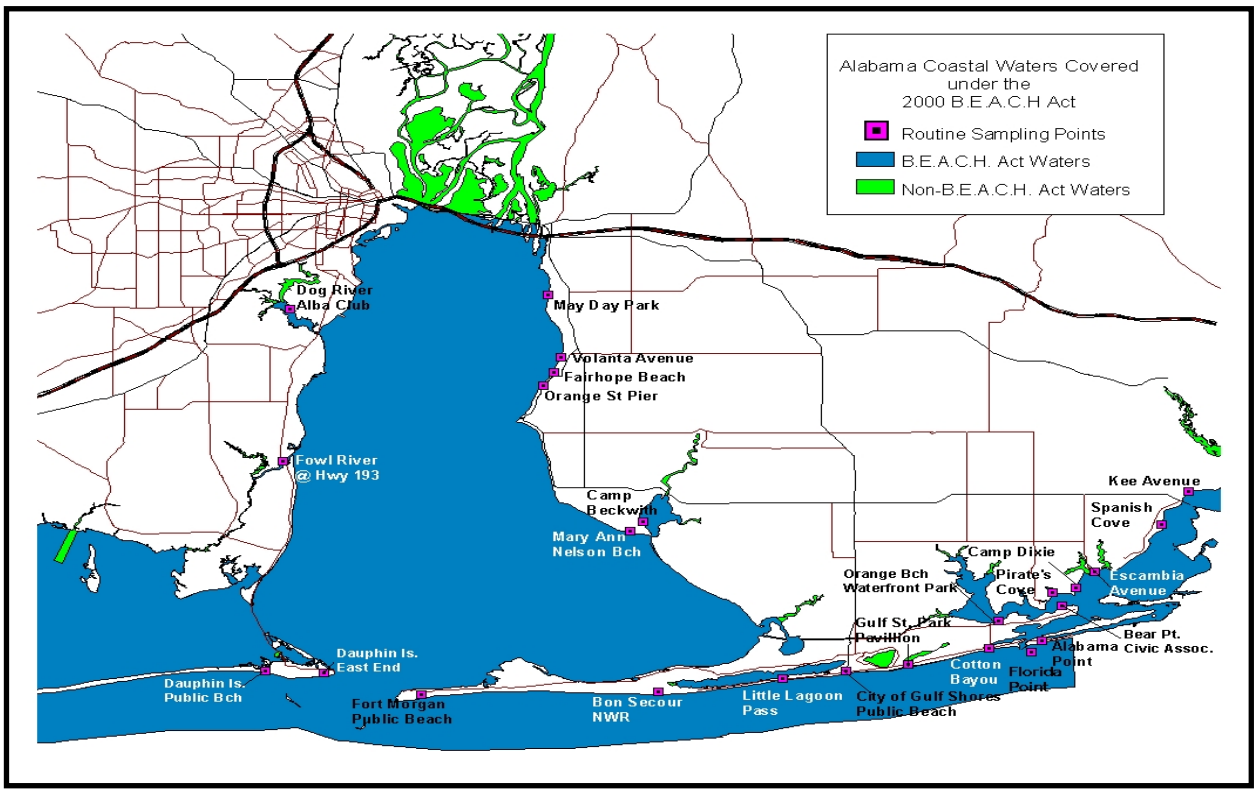
Figure 8-2 Coastal Beach Monitoring