

## *Alabama's 2006 §303(d) List Fact Sheet*

### **Background**

§303(d) of the Clean Water Act requires that each state identify those waters that do not currently support designated uses, and to establish a priority ranking of these waters by taking into account the severity of the pollution and the designated uses of such waters. For each waterbody on the list, the state is required to establish a total maximum daily load (TMDL) for the pollutant or pollutants of concern at a level necessary to implement the applicable water quality standards. Guidance issued in August 1997 by the Environmental Protection Agency (EPA) suggested that states also include a schedule for TMDL development. The TMDL schedule included as part of Alabama's 2006 List provides the expected date the specific TMDL will be drafted and submitted for public notice and comment. TMDL dates range from one to ten years following EPA approval of the 2006 §303(d) List. For some waterbody/pollutant combinations the Draft TMDL date is historical (i.e. 2002), which signifies a Draft TMDL has been established but remains to be finalized and approved for various reasons.

### **Alabama's 2006 §303(d) List**

Alabama's 2006 §303(d) List includes segments of rivers, streams, lakes, reservoirs, and estuaries that do not fully support their currently designated use or uses. Most of the waterbodies on the 2006 §303(d) List also appeared on Alabama's 2004 §303(d) List as submitted to EPA in April 2004. The Department has attempted to obtain and evaluate all existing and readily available water quality-related data and information. The notice soliciting information is included in **Appendix A**. The notice was published in Alabama's four major daily newspapers, appeared on the Department's web page, and was mailed to the Department's general mailing list. Data in the Department's multiple databases, information from §319 nonpoint assessments, special watershed studies, other federal and state agencies, industries, and watershed initiatives were evaluated as the 2006 §303(d) List was compiled. Any individual or organization may submit additional data or information during the advertised comment period relative to water quality impairment in waterbodies in Alabama. Chemical, physical, and biological data collected primarily during the previous six years have been considered in the preparation of the 2006 §303(d) List, consistent with the Department's water quality assessment and listing methodology. Comments on the methodology were solicited in the public notice included in **Appendix A**. The assessment and listing methodology is included as **Appendix B**. Data sources include the Alabama Department of Environmental Management, the Alabama Department of Public Health, the Geological Survey of Alabama, the United States Geological Survey, the Tennessee Valley Authority, other public agencies, universities, county and municipal governments, and industries.

The list contains information such as the waterbody name, county(s) in which the listed segment is located, dates when the data on which the listing is based were collected, cause(s) for the use impairment, the source(s) of the pollutant(s) causing the impairment, the size of the impaired segment, and the location of the listed waterbody. Also included on the list is the segment's priority ranking (high, low, medium), which was developed using the prioritization strategy included in the assessment and listing methodology in **Appendix B**.

### **Changes Since the 2004 §303(d) List**

A number of differences exist between the 2006 §303(d) List and the 2004 §303(d) List. Some of the changes were to correct errors or omissions in the 2004 List and to provide additional or updated information about waterbodies on the list. Other significant changes since 2004 include the addition and deletion of waterbodies. **Table 1** shows the waterbody/pollutant combinations that are proposed for addition to Alabama's §303(d) List and the justification for the additions. **Table 2** provides the waterbody/pollutant combinations that are proposed for removal from the list and the corresponding justification for each removal.

Changes have also been made to the TMDL completion schedule since the 2004 Section 303(d) List. The changes reflect the pace of TMDL development that can reasonably be expected given ADEM's current funding and staffing levels. The TMDL schedule provides the expected date the specific TMDL will be drafted and submitted for public notice and comment. TMDL dates range from one to seven years following EPA approval of the 2006 303(d) List. Where more than one TMDL is required for a segment, TMDLs for specific pollutants may be developed in advance of the expected date shown on the list. A notice of availability will be published on the Department's web page as draft TMDLs are completed and offered for public review and comment.

**Table 3** provides a listing of other changes appearing on the 2006 §303(d) List that were not on the 2004 List. Most of these changes result from corrections to the hydrological unit codes for Alabama which are the basis for the assessment unit number assigned to each listed segment. Many previously listed segments have been subdivided to coincide with the new hydrological unit codes and to more closely reflect the designated uses shown in ADEM Administrative Rules 335-6-11-.02.

**Table 4** provides revisions made between the draft 2006 List and the final 2006 List. These revisions were made to the list as a result of additional minor errors or omissions identified by ADEM staff since the Draft 2006 §303(d) List was public noticed. Segment lengths for some previously listed segments may be slightly different due to the use of the available high resolution National Hydrography Database (NHD) for delineation of listed segments and the use of the EPA Assessment Database (ADB) for tracking purposes.

### **Changes Since the Draft 2006 §303(d) List**

Three segments of the Cahaba River (AL03150202-0104-102, AL03150202-0201-102, AL03150202-0101-102) were added to the draft 2006 list as impacted by nutrients. The new listing for these segments, which were already on the list for other pollutants, was inadvertently left off the Draft Fact Sheet. They have been included in Table 1 of the final fact sheet. In addition, Little Bear Creek Reservoir (AL06030006-0201-102) was added to the 2006 list for impairment due to nutrients after consultation with EPA Region IV.

**Table 1**  
**Alabama's 2006 §303(d) List**  
**Waterbody/Pollutant Combinations Added to the 2004 List**

The waterbody/pollutant combinations listed in the following table have been added to Alabama's 2006 §303(d) List for the reasons presented in the table.

Assessment Unit	Waterbody Name	River Basin	County	Causes	Basis for Addition to the List	Source / Date of Data
AL03150201-0402-100	Pintlalla Creek	Alabama	Crenshaw Montgomery	Pathogens	United States Geological Survey National Water Information System 2000,2001; site number 02421115.	USGS, 1999-2000
AL03150201-0203-102	Autauga Creek	Alabama	Autauga	Unknown	From <b>Surface Water Quality Screening Assessment of the Alabama River Basin – 2000, page 57.</b> “At AUC-2, Autauga Creek is a low-gradient, sand and gravel bottomed stream located in the Fall Line Hills (65i) subcoregion (Appendix F-3a). Habitat quality was assessed as excellent for this stream type. However, only 4 EPT families were collected at the site, indicating the macroinvertebrate community to be in poor condition (Appendix F-3b).	ADEM, 2000
AL03150203-0802-100	Pursley Creek	Alabama	Wilcox	Pathogens	ADEM 303(d) Monitoring - 2000-2001, Stations PURW-1, PURW-2, PURW-3.	ADEM, 2000-2001

Assessment Unit	Waterbody Name	River Basin	County	Causes	Basis for Addition to the List	Source / Date of Data
AL03150203-0802-400	UT to Pursley Creek	Alabama	Wilcox	Pathogens	ADEM 303(d) Monitoring - 2000-2001, Station TWNW-1.	ADEM, 2000-2001
AL03160109-0601-601	Old Town Creek	Black Warrior	Walker	Nutrients Siltation	From <b>Surface Water Quality Screening Assessments of the Cahaba Black Warrior River Basins – 2002, page 94</b> . “Old Town Creek: In 2002, Old Town Creek at OTC-1 was a relatively wide and open glide-pool stream characterized by sand, silt, and gravel substrates (Appendix J). The macroinvertebrate community was assessed as poor (Appendix K). Filamentous algae was common, suggesting nutrient enrichment as a potential cause of the impairment. Deposits of sand and sludge were noted and sediments were characterized by an anaerobic smell. Conductivity, alkalinity, hardness, total dissolved solids, and nitrogen concentrations (TKN, NO <sub>3</sub> +NO <sub>2</sub> -N) were elevated during June of 2002 (Appendix M). Intensive water quality sampling was conducted once on Old Town Creek at OTC-1 and OTC-2 during May of 1999 as part of ADEM’s §303(d) Monitoring Program (Appendix P). Both sites are located within the Shale Hills	ADEM, 2002

Assessment Unit	Waterbody Name	River Basin	County	Causes	Basis for Addition to the List	Source / Date of Data
					(68f) subcoregion (Appendix E). Nitrate+nitrite-nitrogen was elevated at OTC-1. Total Kjeldahl nitrogen was above background levels at OTC-2.” Poor macro assessment and comments from field biologist indicate impairment.	
AL03160109-0101-600	Tibb Creek	Black Warrior	Cullman Marshall	Toxicity Siltation	From <b>Water Quality Assessment Riley-Maze Creek Arab, Alabama Cullman County, page 3</b> . “The results of this study indicate that Riley Maze Creek below the Arab WWTP is severely impaired. Degradation to the macroinvertebrate community below the discharge was evidenced by low EPT taxa richness. The impairment is probably due to a combination of effluent toxicity and the presence of sewage solids on the streambed. The data from RMA-4, further downstream from the WWTP, suggest that the stream had not yet recovered from the adverse impacts of the WWTP.” Poor macro (WMB-I) assessment, reported effluent toxicity, sediment from WWTP.	ADEM, 1998

Assessment Unit	Waterbody Name	River Basin	County	Causes	Basis for Addition to the List	Source / Date of Data
AL03160109-0101-150	Riley Maze Creek	Black Warrior	Cullman Marshall	Toxicity Siltation	From <b>Water Quality Assessment Riley-Maze Creek Arab, Alabama Cullman County, page 3.</b> “The results of this study indicate that Riley Maze Creek below the Arab WWTP is severely impaired. Degradation to the macroinvertebrate community below the discharge was evidenced by low EPT taxa richness. The impairment is probably due to a combination of effluent toxicity and the presence of sewage solids on the streambed. The data from RMA-4, further downstream from the WWTP, suggest that the stream had not yet recovered from the adverse impacts of the WWTP.” Poor macro (WMB-I) assessment, reported effluent toxicity, sediment from WWTP.	ADEM, 1998
AL03160110-0502-100	Ryan Creek	Black Warrior	Cullman	Pathogens	From <b>Surface Water Quality Screening Assessments of the Cahaba Black Warrior River Basins – 2002, page 130.</b> Geomean = 221 colonies/100 ml.	ADEM, 2002
AL03160109-0604-900	Baker Creek	Black Warrior	Walker	Siltation	From <b>Surface Water Quality Screening Assessments of the Cahaba Black Warrior River Basins – 2002, page 109.</b> “Located within the Shale Hills	ADEM, 2002

Assessment Unit	Waterbody Name	River Basin	County	Causes	Basis for Addition to the List	Source / Date of Data
					(68f) subcoregion, Baker Creek at BAKW-10 is characterized by deep pools and gravel riffles (Appendix J). Substrates were a mixture of sand, organic silt, gravel, and clay. Despite sediment deposition and a lack of instream habitat, habitat quality was rated as good. A bioassessment completed at the site indicated the macroinvertebrate community to be in poor condition (Appendix G). One-time water quality sampling conducted in June of 2002 indicated relatively high alkalinity, hardness, and conductivity (Appendix M). Concentrations of nitrate+nitrite-nitrogen and total dissolved solids were also elevated (Appendix M).” One Level III WMB-EPT. No numeric criteria exceedances. Limited water quality data.	
AL03160111-0408-102	Village Creek	Black Warrior	Jefferson	Pathogens Pesticides (Dieldrin)	From <b>Surface Water Screening Assessment of the Cahaba and Black Warrior River Basins</b> - 2002, ADEM, 2004. Appendix P-3 - Stations VLGJ-4, VLGJ-3, VLGJ-1. United States Geological Survey National Water Information System 2000,2001; site number	ADEM, 2002, 2004 USGS 2000, 2001

Assessment Unit	Waterbody Name	River Basin	County	Causes	Basis for Addition to the List	Source / Date of Data
					02458150.	
AL03160111-0408-103	Village Creek	Black Warrior	Jefferson	Pathogens Pesticides (Dieldrin)	From <b>Surface Water Screening Assessment of the Cahaba and Black Warrior River Basins - 2002</b> , ADEM, 2004. Appendix P-3 - Stations VLGJ-4, VLGJ-3, VLGJ-1. United States Geological Survey National Water Information System 2000,2001; site number 02458150.	ADEM, 2002, 2004 USGS 2000, 2001
AL03160112-0303-100	Pegues Creek	Black Warrior	Tuscaloosa	Metals (Cr, Pb) Siltation	From <b>Surface Water Quality Screening Assessments of the Cahaba Black Warrior River Basins – 2002, page 163</b> . “Pegues Creek at PGC-1 was a riffle-run stream located in the Shale Hills (68f) subcoregion (Appendix P-1). Substrate was mainly gravel with some cobble and silt. Habitat quality was impacted by embeddedness, sediment deposition, and eroded banks. Six EPT families were collected, indicating the macroinvertebrate community to be in poor condition (Appendix P-2). Intensive water quality data were collected from Pegues Creek at PGC-1 from May through September of 1999 (Appendix P-	ADEM, 2002



Assessment Unit	Waterbody Name	River Basin	County	Causes	Basis for Addition to the List	Source / Date of Data
					3). Mean conductivity was 779 $\mu$ mhos at 25oC, 7 times greater than values measured at least-impaired ecoregional reference sites. Chromium, iron, and manganese were periodically elevated (Appendix P-4).” Elevated conductivity indicates acid mine drainage.	
AL03160112-0304-100	Daniel Creek	Black Warrior	Tuscaloosa	Metals (Cr, Pb)	From <b>Surface Water Quality Screening Assessments of the Cahaba Black Warrior River Basins – 2002, page 163.</b> “Daniel Creek at DNC-1 is a cobble-gravel stream located in the Shale Hills (68f) subcoregion (Appendix P-1). Habitat quality was assessed as excellent. Three EPT families were collected, indicating the macroinvertebrate community to be in poor condition (Appendix P-2). Intensive water quality data were collected from Daniel Creek at DNC-1 from May through September of 1999 (Appendix P-3). Total dissolved solids were not measured, but mean conductivity was 1,922 $\mu$ mhos at 25oC, approximately 19 times greater than values measured at least-impaired ecoregional reference	ADEM, 2002

Assessment Unit	Waterbody Name	River Basin	County	Causes	Basis for Addition to the List	Source / Date of Data
					sites (ADEM 2004d). Chromium, iron, and manganese were periodically elevated (Appendix P-4).” Elevated conductivity indicates acid mine drainage.	
AL03160113-0703-100	Cottonwood Creek	Black Warrior	Hale Marengo Perry	OE/DO Siltation Nutrients	From <b>Surface Water Quality Screening Assessments of the Cahaba Black Warrior River Basins – 2002, page 186</b> . “At COTH-57c, Cottonwood Creek was a low-gradient, clay, gravel, and sand-bottomed stream located in the Blackland Prairie (65a) subecoregion (Appendix J). Water quality at the site was severely impacted by permitted runoff from land application activities upstream of the sampling reach (ADEM in house memo). One-time water quality sampling was conducted at COTH-57c on May 8 <sup>th</sup> of 2002 (Appendix M). The dissolved oxygen concentration was measured at 2.2 mg/L. Nutrient concentrations were very high (NH <sub>3</sub> -N=7.0 mg/L; TKN=7.4 mg/L; TP=2.1 mg/L, DRP=0.5 mg/L). Conductivity, total dissolved solids, alkalinity, and hardness were also elevated. Habitat quality was impaired from heavy	ADEM, 2002

Assessment Unit	Waterbody Name	River Basin	County	Causes	Basis for Addition to the List	Source / Date of Data
					sedimentation, poor instream habitat, and eroded banks. Algal mats and decaying algae were common at the site. No EPT families were collected, indicating the macroinvertebrate community to be in very poor condition (Appendix K).” Failure to properly operate the land application waste disposal site is contributing to the water quality impairment at this site. Additional water quality data has been collected during the investigation of the facility.	
AL03150202-0104-102	Cahaba River	Cahaba	Jefferson St. Clair	Nutrients	<b>EPA Region 4 SESD Cahaba River: Biological and Water Quality Studies 2002 Report-</b> chemical, physical and biological data collected by EPA in 2001 and 2002 document impairment to aquatic life as a result of nutrient over-enrichment within the Upper Cahaba River. In addition, EPA on page 4 of the report recommends the segment from US280 – I-59 of the Cahaba River be reevaluated to include nutrients as a cause of impairment on Alabama’s 303(d) List. <b>GSA’s Hatchet Creek Regional Watershed Study, GSA Open-</b>	EPA, 2002 GSA, 2005 ADEM, 2002, 2004-2005 ADEM, 2004

Assessment Unit	Waterbody Name	River Basin	County	Causes	Basis for Addition to the List	Source / Date of Data
					<p><b>File Report 0509, 2005-</b> indicates fair IBI scores for Cahaba Stations CABJ-6 and C1. The fair IBI score may be a result of “large numbers of stonerollers, as occur in the Cahaba, generally indicate a biologically degraded stream system due to over-nuttrification, over-sedimentation, or both in combination.”</p> <p><b>ADEM Monitoring Program – 2002, 2004-2005,</b> Station CABJ-9 (same as Station C1). There were a total of 27 Total Phosphorus (TP) samples collected with values ranging from 37 ug/L to 499 ug/L. The growing season median concentration for 2002, 2004 and 2005 was reported at 160 ug/L, 122 ug/L and 112 ug/L respectively. These levels exceed the Cahaba River TP target value of 35 ug/L, which, according to the 2004 Draft Cahaba River Nutrient TMDL is considered necessary to protect designated uses of the Cahaba River.</p>	
AL03150202-0201-102	Cahaba River	Cahaba	Jefferson	Nutrients	<p><b>EPA Region 4 SESD Cahaba River: Biological and Water Quality Studies 2002 Report-</b> chemical, physical and biological data collected by EPA in 2001</p>	EPA, 2002 GSA, 2005 ADEM, 2002, 2004-2005 ADEM, 2004

Assessment Unit	Waterbody Name	River Basin	County	Causes	Basis for Addition to the List	Source / Date of Data
					<p>and 2002 document impairment to aquatic life as a result of nutrient over-enrichment within the Upper Cahaba River. In addition, EPA on page 4 of the report recommends the segment from US280 – I-59 of the Cahaba River be reevaluated to include nutrients as a cause of impairment on Alabama’s 303(d) List.</p> <p><b>GSA’s Hatchet Creek Regional Watershed Study, GSA Open-File Report 0509, 2005-</b> indicates fair IBI scores for Cahaba Stations CABJ-6 and C1. The fair IBI score may be a result of “large numbers of stonerollers, as occur in the Cahaba, generally indicate a biologically degraded stream system due to over-nutrition, over-sedimentation, or both in combination.”</p> <p><b>ADEM Monitoring Program – 2002, 2004-2005,</b> Station CABJ-9 (same as Station C1). There were a total of 27 Total Phosphorus (TP) samples collected with values ranging from 37 ug/L to 499 ug/L. The growing season median concentration for 2002, 2004 and 2005 was reported at 160 ug/L, 122 ug/L and 112 ug/L</p>	

Assessment Unit	Waterbody Name	River Basin	County	Causes	Basis for Addition to the List	Source / Date of Data
					respectively. These levels exceed the Cahaba River TP target value of 35 ug/L, which, according to the 2004 Draft Cahaba River Nutrient TMDL is considered necessary to protect designated uses of the Cahaba River.	
AL03150202-0101-102	Cahaba River	Cahaba	Jefferson	Nutrients	<p><b>EPA Region 4 SESD Cahaba River: Biological and Water Quality Studies 2002 Report-</b> chemical, physical and biological data collected by EPA in 2001 and 2002 document impairment to aquatic life as a result of nutrient over-enrichment within the Upper Cahaba River. In addition, EPA on page 4 of the report recommends the segment from US280 – I-59 of the Cahaba River be reevaluated to include nutrients as a cause of impairment on Alabama’s 303(d) List.</p> <p><b>GSA’s Hatchet Creek Regional Watershed Study, GSA Open-File Report 0509, 2005-</b> indicates fair IBI scores for Cahaba Stations CABJ-6 and C1. The fair IBI score may be a result of “large numbers of stonerollers, as occur in the Cahaba, generally indicate a biologically degraded stream system due to over-nuttrification,</p>	EPA, 2002 GSA, 2005 ADEM, 2002, 2004-2005 ADEM, 2004

Assessment Unit	Waterbody Name	River Basin	County	Causes	Basis for Addition to the List	Source / Date of Data
					<p>over-sedimentation, or both in combination.”</p> <p><b>ADEM Monitoring Program – 2002, 2004-2005</b>, Station CABJ-9 (same as Station C1). There were a total of 27 Total Phosphorus (TP) samples collected with values ranging from 37 ug/L to 499 ug/L. The growing season median concentration for 2002, 2004 and 2005 was reported at 160 ug/L, 122 ug/L and 112 ug/L respectively. These levels exceed the Cahaba River TP target value of 35 ug/L, which, according to the 2004 Draft Cahaba River Nutrient TMDL is considered necessary to protect designated uses of the Cahaba River.</p>	
AL03150202-0901-100	Childers Creek	Cahaba	Dallas	Siltation	<p>From <b>Surface Water Quality Screening Assessments of the Cahaba Black Warrior River Basins – 2002, page 73</b>. “Sand comprised approximately 90% of the stream bottom of Childers Creek at CHIL-2 (Appendix J). Habitat quality was assessed as fair due to poor bank stability and a lack of instream habitat and riparian buffer. The macroinvertebrate community was assessed as poor (Appendix</p>	ADEM, 2002

Assessment Unit	Waterbody Name	River Basin	County	Causes	Basis for Addition to the List	Source / Date of Data
					K). Cattle had direct access to the creek at several points along the reach. Anaerobic sediments and heavy erosion were noted at the site. Total suspended solids, total Kjeldahl nitrogen, and chlorides were elevated (Appendix M).” Poor Macro., comments of field biologist indicate impairment due to sediment from pasture grazing.	
AL03130003-0101-100	Mill Creek	Chattahoochee	Lee Russell	Unknown	From <b>Nonpoint Source Screening Assessment of Southeast Alabama River Basins – 1999, Volume I, Chattahoochee and Chipola Basins, page 43.</b> “Mill Creek at MICR-1 is a riffle-run stream characterized by sand, gravel, and cobble substrates (Table 6a). Habitat quality was estimated as excellent for this stream type and region (Table 6a). However, only 3 EPT families were collected, indicating the station to be in poor condition (Table 7a). A fish IBI assessment found the fish community to be in poor condition (Table 7a).” One Level III WMB-EPT. Excellent habitat. Two of five turbidity measurements elevated at CHA03. (1996 Clean Water Strategy Report)	ADEM, 1999
AL03140201-0404-100	Judy Creek	Choctawhatchee	Barbour Dale	Nutrients	From <b>Nonpoint Source Screening Assessment of Southeast Alabama River Basins – 1999, Volume III, Choctawhatchee Basin, page 16.</b>	ADEM, 1999



Assessment Unit	Waterbody Name	River Basin	County	Causes	Basis for Addition to the List	Source / Date of Data
					<p>“Habitat and aquatic macroinvertebrate community assessments were conducted at JDYD-1 in 1998 and 1999. A fish community assessment was conducted in 1999. The habitat was evaluated as good and excellent 1998 and 1999, respectively (Table 6c). The aquatic macroinvertebrate assessments indicated a poor community in both 1998 and 1999. The fish sample collected in 1999 indicated a poor-fair fish community. Water chemistry samples were collected 9 different times from August 1998 through September 1999. Overall water quality data collected from 1998-99 indicated elevated nutrient concentrations compared to reference sites within the region (Appendix F-6C).” One Level III WMB-EPT. No numeric criteria exceedances</p>	
AL03140201-1001-100	Harrand Creek	Choctawhatchee	Coffee Dale	Siltation	<p>From <b>Nonpoint Source Screening Assessment of Southeast Alabama River Basins – 1999, Volume III, Choctawhatchee Basin, page 20.</b> “Habitat and aquatic macroinvertebrate community assessments were conducted at two locations on Harrand Creek in 1999. The sampling reach at HDC-1 was dominated by sand (88%) with lesser amounts of detritus (6%), silt (2%), gravel (2%) and clay (2%). Habitat</p>	ADEM, 1999

Assessment Unit	Waterbody Name	River Basin	County	Causes	Basis for Addition to the List	Source / Date of Data
					quality was assessed as excellent using the glide/pool assessment matrix (Table 6c). Seven EPT families were collected indicating a fair aquatic macroinvertebrate community (Table 7c). The sampling reach at HDC-2 was dominated by sand (45%) with lesser amounts of clay (30%), detritus (12%) and silt (12%). Habitat quality was assessed as excellent using the glide/pool assessment matrix (Table 6c). Four EPT families were collected indicating a poor aquatic macroinvertebrate community (Table 7c).” One Level III WMB-EPT. No numeric criteria exceedances	
AL03140201-1001-700	UT to Harrant Creek	Choctawhatchee	Coffee	Pathogens	ADEM 303(d) Monitoring - 1999,2004, Station UTHC-1.	ADEM, 1999,2004
AL03150105-0807-103	Spring Creek	Coosa	Cherokee	Nutrients	ADEM 303(d) Monitoring - 2002; Station SPRC-2.	ADEM, 2002
AL03170009-0201-300	Grand Bay	Escatawpa	Mobile	Pathogens	ADPH Shellfish Harvesting Closure Notices	ADPH, 2003-2005
AL03170008-0402-700	Collins Creek	Escatawpa	Mobile	Metals (As)	ADEM 303(d) Monitoring - 2001, 2002; Station CLNM-1.	ADEM, 2001-2002
AL03160205-0202-700	Bolton Branch	Mobile	Mobile	Pathogens	Mobile Area Water and Sewer Service Water Quality Monitoring Program, Stations MCR-13 and MCR-15.	MAWSS, 2003-2005

Assessment Unit	Waterbody Name	River Basin	County	Causes	Basis for Addition to the List	Source / Date of Data
AL03160205-0205-100	Middle Fork Deer River	Mobile	Mobile	OE/DO	Mobile Area Water and Sewer Service Water Quality Monitoring Program, Station NFDR-19.	MAWSS, 2003-2005
AL03160205-0306-200	Polecat Creek	Mobile	Baldwin	Metals (Hg)	Fish consumption advisory issued by the Alabama Department of Public Health	ADPH, 2005
AL03160205-0310-101	Bon Secour River	Mobile	Baldwin	Metals (Hg)	Fish consumption advisory issued by the Alabama Department of Public Health.	ADPH, 2005
AL03160205-0310-102	Bon Secour River	Mobile	Baldwin	Metals (Hg)	Fish consumption advisory issued by the Alabama Department of Public Health.	ADPH, 2005
AL03160205-0311-100	Oyster Bay	Mobile	Baldwin	Pathogens	ADPH Shellfish Harvesting Closure Notices	ADPH, 2003-2005
AL03160205-0306-500	Baker Branch	Mobile	Baldwin	OE/DO	From <b>Surface Water Quality Screening Assessment of the Escatawpa River, Mobile Bay, and Upper &amp; Lower Tombigbee River Basins – 2001, page 359.</b> “A tributary of Polecat Creek, Baker Branch was monitored at GSA-5a, 1994-1998 (Appendix F-5a). The site is located within the Southern Pine Plains and Hills (65f) subcoregion (Appendix E-1). Based on GSA’s assessment methods, habitat quality was assessed as good (Appendix F-5a; O’Neil et al. 2003).	ADEM, 2001

Assessment Unit	Waterbody Name	River Basin	County	Causes	Basis for Addition to the List	Source / Date of Data
					<p>Macroinvertebrate assessment results indicated the community to be in poor condition (Appendix F-5a; O'Neil et al. 2003). Intensive water quality data collected from May 1995 through September 1998 is provided in Appendix F-5b. The dissolved oxygen concentration was below the Fish &amp; Wildlife water use classification criteria of 5.0 mg/L during 7 (17%) of 41 sampling event events. Fecal coliform concentrations were &gt;2,000 colonies/100mL during 2 (5%) of 41 sampling events. Nitrate/nitrite-nitrogen concentrations were &gt;1.0 mg/L during 28 (68%) of 41 sampling events. Although average nitrate/nitrite-nitrogen concentrations were lower during April-September 1998, dissolved oxygen concentrations were consistently below Fish &amp; Wildlife water use classification criteria." 18% of the measured DO values were less than the criterion.</p>	
AL03140106-0302-201	Boggy Branch	Perdido-Escambia	Escambia	Pathogens	ADEM 303(d) Monitoring - 2004, Station BOB-4.	ADEM, 2004

Assessment Unit	Waterbody Name	River Basin	County	Causes	Basis for Addition to the List	Source / Date of Data
AL03140106-0302-201	Boggy Branch	Perdido-Escambia	Escambia	Metals (Pb, Cu)	ADEM 303(d) Monitoring - 2004, Station BOB-4.	ADEM, 2004
AL03140106-0302-202	Boggy Branch	Perdido-Escambia	Escambia	Ammonia	ADEM 303(d) Monitoring - 2004, 2005; Station BOB-3.	ADEM, 2004-2005
AL03140106-0302-101	Brushy Creek	Perdido-Escambia	Escambia	Metals (Pb)	ADEM 303(d) Monitoring - 2004, 2005; Station BOB-4.	ADEM, 2004-2005
AL03140106-0703-100	Perdido River	Perdido-Escambia	Baldwin	Metals (Hg)	Fish consumption advisory issued by the Alabama Department of Public Health.	ADPH, 2005
AL03140107-0204-300	Perdido Bay	Perdido-Escambia	Baldwin	Pathogens	2001 - 2002 §303(d) Sampling - Perdido Bay, Stations PB-1, PDBB-2, PDBB-3, PDBB-4.	ADEM, 2001-2002
AL03140107-0205-100	Little Lagoon	Perdido-Escambia	Baldwin	Pathogens	<i>A Survey of Little Lagoon Watershed</i> , ADEM Coastal Program, 2000. Stations LLSS-2 through LLSS-8.	ADEM, 2000
AL03150110-0702-102	Cubahatchee Creek	Tallapoosa	Macon Bullock	Pathogens	ADEM 303(d) Monitoring - 2000, Station CUBM-1.	ADEM, 2000
AL06030002-0304-200	Hester Creek	Tennessee	Madison	Turbidity	United States Geological Survey National Water Information System 1999-2004; site number 0357479650.	USGS, 1999-2004
AL06030002-0401-102	Flint River	Tennessee	Madison	Turbidity	United States Geological Survey National Water Information System 1999-2004; site number 03575100.	USGS 1999-2004
AL06030002-0502-102	Huntsville Spring Branch	Tennessee	Madison	Metals (Hg, As)	Based upon EPA Region 4's review of ADEM's <i>Final Delisting Decision for Huntsville Spring Branch, Metals (ADEM, 2004)</i> , it was determined that	ADEM, 2004 EPA Correspondence, March 29, 2006

Assessment Unit	Waterbody Name	River Basin	County	Causes	Basis for Addition to the List	Source / Date of Data
					insufficient data and information was available to remove Mercury and Arsenic as pollutants of concern.	
AL06030002-0602-200	Mud Creek	Tennessee	Morgan	OE/DO	ADEM 303(d) Monitoring - 2004, 2005; Station MUDM-1.	ADEM, 2004-2005
AL06030002-0702-100	Pond Creek	Tennessee	Colbert	Metals (Cn, As, Hg)	Based upon EPA Region 4's review of ADEM's <i>Final Delisting Decision for Pond Creek, Metals (ADEM, 2004)</i> , it was determined that insufficient data and information was available to remove Cyanide, Mercury and Arsenic as pollutants of concern.	ADEM, 2004 EPA Correspondence, March 29, 2006
AL06030006-0103-101	Bear Creek (Bear Creek Lake)	Tennessee	Franklin	Metals (Hg)	Fish consumption advisory issued by the Alabama Department of Public Health.	ADPH, 2005
AL06030006-0201-102	Little Bear Creek (Little Bear Creek Lake)	Tennessee	Franklin	Nutrients	The chlorophyll a criterion (8 ug/l) in Little Bear Creek Reservoir (dam forebay) has been exceeded twice since 1999. In 2003 the growing season mean chlorophyll a concentration was 10 ug/l and in 2005 the growing season mean chlorophyll a level was 12 ug/l. The reservoir had rated fair all previous years. Ratings for each indicator have generally been consistent from year to year, but the lower score in 2005 was primarily due to	TVA, 1994-2005

<b>Assessment Unit</b>	<b>Waterbody Name</b>	<b>River Basin</b>	<b>County</b>	<b>Causes</b>	<b>Basis for Addition to the List</b>	<b>Source / Date of Data</b>
					lower rating for chlorophyll.	
AL03160105-0101-200	East Branch Luxapallila Creek	Upper Tombigbee	Fayette Marion	Pathogens	ADEM 303(d) Monitoring -1999, Station ELBC-1.	ADEM, 1999
AL03160201-0903-101	Wahalak Creek	Lower Tombigbee	Choctaw	Pathogens	ADEM 303(d) Monitoring - 2001, Station WHKC-1.	ADEM, 2001

**Table 2**  
**Alabama's 2006 §303(d) List**  
**Waterbody/Pollutants Removed from the 2004 List**

The waterbody/pollutant combinations listed in the following table are proposed for removal from Alabama's 2004 §303(d) List and will not be included on Alabama's 2006 §303(d) List for the reasons presented.

<b>Waterbody ID</b>	<b>Waterbody Name</b>	<b>River Basin</b>	<b>County</b>	<b>Pollutant</b>	<b>Good Cause Justification for Removal</b>
AL03150201-0309-100	Catoma Creek	Alabama	Montgomery	OE/DO	TMDL approved by EPA.
AL03160109-0105-101	<a href="#">Brindley Creek</a>	Black Warrior	Cullman	Ammonia	Data collected during 2001-2003 indicated no exceedances of EPA's recommended water quality criteria for ammonia.
AL03160109-0105-102	<a href="#">Brindley Creek</a>	Black Warrior	Cullman	Ammonia	Data collected during 2001-2003 indicated no exceedances of EPA's recommended water quality criteria for ammonia.
AL03160109-0105-102	Brindley Creek	Black Warrior	Cullman	Pathogens	TMDL approved by EPA.
AL03160111-0408-300	Camp Branch	Black Warrior	Jefferson	pH Siltation Other habitat alteration	TMDLs approved by EPA.
AL03160111-0408-102	Village Creek	Black Warrior	Jefferson	Metals pH Siltation	TMDLs approved by EPA.
AL03160111-0408-101	Village Creek (Bayview Lake)	Black Warrior	Jefferson	Siltation	TMDL approved by EPA.



<b>Waterbody ID</b>	<b>Waterbody Name</b>	<b>River Basin</b>	<b>County</b>	<b>Pollutant</b>	<b>Good Cause Justification for Removal</b>
AL03160112-0101-200	<a href="#">Opossum Creek</a>	Black Warrior	Jefferson	OE/DO	A combination of the DO data from the 2002 and 2004 303(d) sampling program yielded a total of 134 samples at five stations. Of these 134 samples collected, no dissolved oxygen values measured less than 3.0 mg/L. Therefore, more recent and accurate data shows that Opossum Creek is fully supporting its use classification with respect to dissolved oxygen.
AL03160112-0503-100	Hurricane Creek	Black Warrior	Tuscaloosa	Metals (Al, Fe) Pathogens Turbidity	TMDLs finalized by EPA.
AL03160112-0502-200	Little Hurricane Creek	Black Warrior	Tuscaloosa	Metals (Al, As, Cu, CrT, Fe) Pathogens	TMDLs finalized by EPA.
AL03160112-0502-300	North Fork of Hurricane Creek	Black Warrior	Tuscaloosa	Metals (Al)	TMDL finalized by EPA.
AL03150202-0201-300	Patton Creek	Cahaba	Jefferson Shelby	OE/DO	TMDL approved by EPA.
AL03150202-0302-100	Shades Creek	Cahaba	Jefferson Bibb Shelby	Siltation Other habitat alteration Turbidity	TMDLs finalized by EPA.
AL03150105-1003-102	Weiss Lake	Coosa	Cherokee	Priority organics Nutrients	TMDLs finalized by EPA.
AL03150105-1001-102	Weiss Lake	Coosa	Cherokee	Priority organics Nutrients	TMDLs finalized by EPA.
AL03170008-0205-102	Puppy Creek	Escatawpa	Mobile	Pathogens	TMDL approved by EPA.

<b>Waterbody ID</b>	<b>Waterbody Name</b>	<b>River Basin</b>	<b>County</b>	<b>Pollutant</b>	<b>Good Cause Justification for Removal</b>
AL03170008-0401-200	Juniper Creek	Escatawpa	Mobile	Pathogens	TMDL approved by EPA.
AL03170009-0102-100	<a href="#">Bayou la Batre</a>	Escatawpa	Mobile	OE/DO	Based on an assessment of all available water quality data, ADEM has determined that a dissolved oxygen impairment for Bayou La Batre does not exist. The low dissolved oxygen concentrations in Bayou La Batre are due to natural conditions. In the summertime, dissolved oxygen concentrations are inversely proportional to salinity at stations BLB-1, BLBM-1, BLBM-2, and BLBM-3. The low dissolved oxygen concentrations are a result of salinity and the tidal influences on Bayou La Batre from Portersville Bay and the Gulf of Mexico.
AL03160204-0403-103	Eightmile Creek	Mobile	Mobile	Pathogens	TMDL approved by EPA.
AL03160204-0403-200	Gum Tree Branch	Mobile	Mobile	Pathogens	TMDL approved by EPA.
AL03160205-0204-301	Rabbit Creek	Mobile	Mobile	OE/DO Pathogens	TMDLs approved by EPA.
AL03160205-0204-101	Dog River	Mobile	Mobile	OE/DO Pathogens	TMDLs approved by EPA.
AL03160205-0204-102	Dog River	Mobile	Mobile	OE/DO Pathogens	TMDLs approved by EPA.
AL03140301-0302-102	Conecuh River	Perdido- Escambia	Pike	Siltation OE/DO	TMDLs approved by EPA.
AL03140301-0404-100	Conecuh River	Perdido- Escambia	Covington	Siltation	TMDL approved by EPA.
AL03140301-0403-102	Conecuh River	Perdido- Escambia	Covington Crenshaw	Siltation	TMDL approved by EPA.
AL03150108-1004-300	Wolf Creek	Tallapoosa	Randolph	Pathogens	TMDL approved by EPA

<b>Waterbody ID</b>	<b>Waterbody Name</b>	<b>River Basin</b>	<b>County</b>	<b>Pollutant</b>	<b>Good Cause Justification for Removal</b>
AL03150109-0503-401	<a href="#">Sugar Creek</a>	Tallapoosa	Tallapoosa	Nutrients	Following relocation of the Sugar Creek WWTP discharge to the Tallapoosa River, 28 monthly nutrient samples collected by ADEM between 2003 and 2005, revealed instream Total Phosphorous values within acceptable range of background conditions established from two comparable eco-regional reference streams.
AL03150109-0503-401	<a href="#">Sugar Creek</a>	Tallapoosa	Tallapoosa	Chloride	Following relocation of the Sugar Creek WWTP discharge to the Tallapoosa River, 13 monthly chloride samples collected by ADEM in 2005 complied with EPA recommended acute and chronic criteria for chloride.
AL06030002-0404-200	Goose Creek	Tennessee	Madison	OE/DO	TMDL approved by EPA
AL06030002-0405-100	Yellow Bank Creek	Tennessee	Madison	OE/DO	TMDL approved by EPA
AL06030002-0405-100	<a href="#">Flint River</a>	Tennessee	Madison	OE/DO	In 2003 and 2005, ADEM collected water column DO measurements at three stations on the listed segment of Flint River, yielding a total of 51 samples. Of the 51 samples collected, only two measurements were slightly less than the criterion. In July 2005, ADEM collected continuous DO data at two of the stations which revealed no exceedances of ADEM's DO criterion. This data demonstrates that Flint River is fully supporting its use classification with respect to OE/DO.
AL06030002-0404-102	<a href="#">Flint River</a>	Tennessee	Madison	OE/DO	In 2003 and 2005, ADEM collected water column DO measurements at three stations on the listed segment of Flint River, yielding a total of 51 samples. Of the 51 samples collected, only two measurements were slightly less than the criterion. In July 2005, ADEM

Waterbody ID	Waterbody Name	River Basin	County	Pollutant	Good Cause Justification for Removal
					collected continuous DO data at two of the stations which revealed no exceedances of ADEM's DO criterion. This data demonstrates that Flint River is fully supporting its use classification with respect to OE/DO.
AL03160106-0504-202	<a href="#">Little Bear Creek</a>	Upper Tombigbee	Pickens	OE/DO	Water quality data collected by ADEM from 2001 and 2002 indicates that depressed dissolved oxygen concentrations in the watershed are due to natural conditions, i.e. beaverdams.

**Table 3**  
**List of Other Changes Appearing on the 2006 §303(d) List**

Assessment Unit ID	Waterbody Name	River Basin	County	Revision
AL03160109-0405-104	Lost Creek	Black Warrior	Walker	Corrected AU ID number from AL03160109-0405-102
AL03160109-0503-100	Wolf Creek	Black Warrior	Walker	Corrected AU ID number from AL03160109-0503-101
AL03150106-0612-100	Chocolocco Creek	Coosa	Talladega Calhoun	Corrected AU ID number from AL03150106-0612-102
AL03140201-1001-700	UT to Harrand Creek	Choctawhatchee	Coffee	Stream length updated by Assessment Database (ADB)
AL03160204-0106-101	Cold Creek	Mobile	Mobile	Corrected AU ID number from AL03160204-0106-102
AL03160204-0106-101	Cold Creek	Mobile	Mobile	Changed name from Cold Creek Swamp to reflect listing in classified use documents.
AL03140106-0302-202	Boggy Branch	Perdido- Escambia	Escambia	Stream length updated by Assessment Database (ADB)
AL03140106-0302-101	Brushy Creek	Perdido- Escambia	Escambia	Stream length updated by Assessment Database (ADB)
AL06030002-1204-103	Second Creek	Tennessee	Lauderdale	Corrected AU ID number from AL06030002-1204-102
AL03160106-0607-101	Factory Creek	Upper Tombigbee	Sumter	Corrected AU ID number from AL03160106-0606-101
AL03150110-0703-100	Cubahatchee Creek	Tallapoosa	Macon	Changed segment from 'Tallapoosa River to its source' to 'Tallapoosa River to Coon Hop Creek' to create new Cubahatchee Creek segment AL03150110-0702-102.
AL03140201-0502-100	Hurricane Creek	Choctawhatchee	Dale	Based on new data, added as sources 'municipal' and 'urban runoff/storm sewers'

**Table 4**  
**Additional Revisions made between the Draft 2006 §303(d) List and the Final 2006 §303(d) List**

Assessment Unit ID	Waterbody Name	River Basin	County	Revision
AL03130003-1307-100	Barbour Creek	Chattahoochee	Barbour	Updated waterbody size calculated by ADB
AL03130004-0601-201	Poplar Spring Branch	Chattahoochee	Houston	Updated waterbody size calculated by ADB
AL03130012-0201-400	Cypress Creek	Chipola	Houston	Updated waterbody size calculated by ADB
AL03140103-0102-700	UT to Jackson Lake 2-S	Perdido-Escambia	Covington	Updated waterbody size calculated by ADB
AL03140103-0102-800	UT to Jackson Lake 3-C	Perdido-Escambia	Covington	Updated waterbody size calculated by ADB
AL03140103-0402-100	Yellow River	Perdido-Escambia	Covington	Updated waterbody size calculated by ADB
AL03140104-0104-100	Blackwater River	Perdido-Escambia	Covington	Updated waterbody size calculated by ADB
AL03140106-0302-202	Boggy Branch	Perdido-Escambia	Escambia	Corrected Cause Chlorine to Chlorides
AL03140106-0502-100	Styx River	Perdido-Escambia	Baldwin	Updated waterbody size calculated by ADB
AL03140106-0506-100	Styx River	Perdido-Escambia	Baldwin	Updated waterbody size calculated by ADB
AL03140106-0603-101	Blackwater River	Perdido-Escambia	Baldwin	Updated waterbody size calculated by ADB
AL03140106-0703-100	Perdido River	Perdido-Escambia	Baldwin	Updated waterbody size calculated by ADB
AL03140107-0103-100	Perdido Bay	Perdido-Escambia	Baldwin	Updated waterbody size calculated by ADB
AL03140107-0205-100	Little Lagoon	Perdido-Escambia	Baldwin	Updated waterbody size calculated by ADB
AL03140201-0502-100	Hurricane Creek	Choctawhatchee	Dale	Updated waterbody size calculated by ADB
AL03140201-0602-201	Beaver Creek	Choctawhatchee	Houston	Updated waterbody size calculated by ADB
AL03140201-0704-600	Dowling Branch	Choctawhatchee	Geneva	Updated waterbody size calculated by ADB
AL03140202-0502-102	Walnut Creek	Choctawhatchee	Pike	Corrected upstream location to Walters Branch
AL03140202-0502-102	Walnut Creek	Choctawhatchee	Pike	Updated waterbody size calculated by ADB
AL03140303-0302-101	Rocky Creek	Perdido-Escambia	Butler	Updated waterbody size calculated by ADB
AL03140304-0605-100	Little Escambia Creek	Perdido-Escambia	Escambia	Updated waterbody size calculated by ADB
AL03140305-0301-100	Big Escambia Creek	Perdido-Escambia	Escambia	Updated waterbody size calculated by ADB
AL03150105-0807-102	Spring Creek	Coosa	Cherokee	Updated waterbody size calculated by ADB

<b>Assessment Unit ID</b>	<b>Waterbody Name</b>	<b>River Basin</b>	<b>County</b>	<b>Revision</b>
AL03150105-0807-200	Mud Creek	Coosa	Cherokee	Updated waterbody size calculated by ADB
AL03150106-0104-101	Coosa River (Neely Henry Lake)	Coosa	Etowah	Updated waterbody size calculated by ADB
AL03150106-0104-102	Coosa River (Neely Henry Lake)	Coosa	Etowah Cherokee	Updated waterbody size calculated by ADB
AL03150106-0309-101	Coosa River (Neely Henry Lake)	Coosa	Etowah St. Clair Calhoun	Updated waterbody size calculated by ADB
AL03150106-0309-102	Coosa River (Neely Henry Lake)	Coosa	Etowah	Updated waterbody size calculated by ADB
AL03150106-0501-101	Coosa River (Logan Martin Lake)	Coosa	St. Clair Calhoun Talladega	Updated waterbody size calculated by ADB
AL03150106-0501-102	Coosa River (Logan Martin Lake)	Coosa	St. Clair Calhoun	Updated waterbody size calculated by ADB
AL03150106-0612-100	Chocolocco Creek	Coosa	Talladega Calhoun	Corrected Priority Organics Cause to include PCBs
AL03150106-0612-100	Chocolocco Creek	Coosa	Talladega Calhoun	Updated waterbody size calculated by ADB
AL03150106-0801-100	Coosa River (Logan Martin Lake)	Coosa	St. Clair Talladega	Updated waterbody size calculated by ADB
AL03150106-0808-102	Coosa River (Lay Lake)	Coosa	Talladega Shelby St. Clair	Updated waterbody size calculated by ADB
AL03150107-0101-102	Coosa River (Lay Lake)	Coosa	Talladega Shelby	Updated waterbody size calculated by ADB
AL03150107-0102-700	UT to Dry Branch	Coosa	Shelby	Updated waterbody size calculated by ADB
AL03150107-0401-100	Coosa River (Lay Lake)	Coosa	Coosa Chilton	Updated waterbody size calculated by ADB
AL03150107-0601-100	Coosa River (Mitchell Lake)	Coosa	Coosa Chilton	Updated waterbody size calculated by ADB
AL03150110-0201-700	Pepperell Branch	Tallapoosa	Lee	Updated waterbody size calculated by ADB
AL03150110-0204-101	Sougahatchee Creek (Yates Reservoir)	Tallapoosa	Tallapoosa	Updated waterbody size calculated by ADB

Assessment Unit ID	Waterbody Name	River Basin	County	Revision
	Embayment)			
AL03150110-0301-400	Moore's Mill Creek	Tallapoosa	Lee	Updated waterbody size calculated by ADB
AL03150110-0504-101	Calebee Creek	Tallapoosa	Macon	Updated waterbody size calculated by ADB
AL03150201-0309-100	Catoma Creek	Alabama	Montgomery	Updated waterbody size calculated by ADB
AL03150202-0101-102	Cahaba River	Cahaba	Jefferson	Updated waterbody size calculated by ADB
AL03150202-0103-300	Lee Branch	Cahaba	Shelby	Updated waterbody size calculated by ADB
AL03150202-0104-102	Cahaba River	Cahaba	Jefferson St. Clair	Updated waterbody size calculated by ADB
AL03150202-0201-101	Cahaba River	Cahaba	Jefferson St. Clair	Updated waterbody size calculated by ADB
AL03150202-0201-102	Cahaba River	Cahaba	Jefferson	Updated waterbody size calculated by ADB
AL03150202-0202-101	Buck Creek	Cahaba	Shelby	Updated waterbody size calculated by ADB
AL03150202-0202-401	Cahaba Valley Creek	Cahaba	Shelby	Updated waterbody size calculated by ADB
AL03150202-0203-101	Cahaba River	Cahaba	Shelby	Updated waterbody size calculated by ADB
AL03150202-0203-102	Cahaba River	Cahaba	Shelby	Updated waterbody size calculated by ADB
AL03150202-0405-100	Cahaba River	Cahaba	Bibb	Updated waterbody size calculated by ADB
AL03150202-0503-102	Cahaba River	Cahaba	Bibb	Updated waterbody size calculated by ADB
AL03150203-0703-101	Alabama River	Alabama	Wilcox	Updated waterbody size calculated by ADB
AL03150203-0802-400	Town Branch	Alabama	Wilcox	Corrected name from UT to Pursley Creek
AL03160103-0204-202	Purgatory Creek	Upper Tombigbee	Marion	Updated waterbody size calculated by ADB
AL03160103-0204-203	Purgatory Creek	Upper Tombigbee	Marion	Updated waterbody size calculated by ADB
AL03160106-0402-102	Tombigbee River (Aliceville Reservoir)	Upper Tombigbee	Pickens	Updated waterbody size calculated by ADB
AL03160106-0607-101	Factory Creek	Upper Tombigbee	Sumter	Updated waterbody size calculated by ADB
AL03160107-0306-100	Sipsey River	Upper Tombigbee	Pickens Greene	Updated waterbody size calculated by ADB
AL03160109-0102-101	Mulberry Fork	Black Warrior	Blount Cullman	Updated waterbody size calculated by ADB
AL03160109-0105-101	Brindley Creek	Black Warrior	Cullman	Updated waterbody size calculated by ADB
AL03160109-0105-102	Brindley Creek	Black Warrior	Cullman	Updated waterbody size calculated by ADB
AL03160109-0201-102	Mud Creek	Black Warrior	Cullamn	Updated waterbody size calculated by ADB
AL03160109-0204-101	Mulberry Fork	Black Warrior	Blount Cullman	Updated waterbody size calculated by ADB



<b>Assessment Unit ID</b>	<b>Waterbody Name</b>	<b>River Basin</b>	<b>County</b>	<b>Revision</b>
AL03160109-0204-102	Mulberry Fork	Black Warrior	Blount Cullman	Updated waterbody size calculated by ADB
AL03160109-0403-103	Lost Creek	Black Warrior	Walker	Updated waterbody size calculated by ADB
AL03160109-0404-101	Cane Creek (Oakman)	Black Warrior	Walker	Updated waterbody size calculated by ADB
AL03160109-0404-102	Cane Creek (Oakman)	Black Warrior	Cullman	Updated waterbody size calculated by ADB
AL03160109-0404-103	Cane Creek (Oakman)	Black Warrior	Walker	Updated waterbody size calculated by ADB
AL03160109-0404-500	Black Branch	Black Warrior	Walker	Updated waterbody size calculated by ADB
AL03160109-0405-104	Lost Creek	Black Warrior	Walker	Updated waterbody size calculated by ADB
AL03160111-0303-102	Locust Fork	Black Warrior	Blount Jefferson	Updated waterbody size calculated by ADB
AL03160111-0306-102	Locust Fork	Black Warrior	Blount Jefferson	Updated waterbody size calculated by ADB
AL03160111-0404-102	Locust Fork	Black Warrior	Blount Jefferson	Updated waterbody size calculated by ADB
AL03160111-0406-101	Newfound Creek	Black Warrior	Jefferson	Corrected Biology as a cause to Siltation
AL03160111-0406-101	Newfound Creek	Black Warrior	Jefferson	Updated waterbody size calculated by ADB
AL03160111-0406-101	Newfound Creek	Black Warrior	Jefferson	2002 added as a date for assessment data
AL03160112-0101-200	Opossum Creek	Black Warrior	Jefferson	Updated waterbody size calculated by ADB
AL03160112-0105-101	Mud Creek	Black Warrior	Jefferson	Updated waterbody size calculated by ADB
AL03160112-0201-101	Big Yellow Creek	Black Warrior	Tuscaloosa	Updated waterbody size calculated by ADB
AL03160112-0404-102	North River	Black Warrior	Fayette Tuscaloosa	Updated waterbody size calculated by ADB
AL03160201-0903-101	Wahalak Creek	Lower Tombigbee	Choctaw	Updated waterbody size calculated by ADB
AL03160203-0601-100	Bassett Creek	Lower Tombigbee	Clarke	Updated waterbody size calculated by ADB
AL03160203-1103-700	Bilbo Creek	Lower Tombigbee	Washington	Updated waterbody size calculated by ADB
AL03160203-1103-800	Olin Basin	Lower Tombigbee	Washington	Corrected the pesticides listing as by DDT
AL03160203-1103-800	Olin Basin	Lower Tombigbee	Washington	Updated waterbody size calculated by ADB
AL03160204-0105-302	Tensaw River	Mobile	Baldwin	Updated waterbody size calculated by ADB
AL03160204-0105-303	Tensaw River	Mobile	Baldwin Mobile	Updated waterbody size calculated by ADB

Assessment Unit ID	Waterbody Name	River Basin	County	Revision
AL03160204-0106-101	Cold Creek	Mobile	Mobile	Updated waterbody size calculated by ADB
AL03160204-0201-200	Middle River	Mobile	Baldwin Mobile	Updated waterbody size calculated by ADB
AL03160204-0303-102	Mobile River	Mobile	Baldwin Mobile	Updated waterbody size calculated by ADB
AL03160204-0402-100	Chickasaw Creek	Mobile	Mobile	Updated waterbody size calculated by ADB
AL03160204-0404-101	Chickasaw Creek	Mobile	Mobile	Updated waterbody size calculated by ADB
AL03160204-0404-102	Chickasaw Creek	Mobile	Mobile	Updated waterbody size calculated by ADB
AL03160204-0503-102	Bay Minette Creek	Mobile	Mobile	Updated waterbody size calculated by ADB
AL03160204-0504-101	Threemile Creek	Mobile	Mobile	Updated waterbody size calculated by ADB
AL03160204-0504-101	Threemile Creek	Mobile	Mobile	Updated waterbody size calculated by ADB
AL03160204-0504-102	Threemile Creek	Mobile	Mobile	Updated waterbody size calculated by ADB
AL03160204-0504-103	Threemile Creek	Mobile	Mobile	Updated waterbody size calculated by ADB
AL03160204-0504-300	Toulmins Spring Branch	Mobile	Mobile	Updated waterbody size calculated by ADB
AL03160204-0504-500	UT to Threemile Creek	Mobile	Mobile	Updated waterbody size calculated by ADB
AL03160204-0505-100	Mobile River	Mobile	Mobile	Updated waterbody size calculated by ADB
AL03160204-0505-201	Tensaw River	Mobile	Baldwin	Updated waterbody size calculated by ADB
AL03160204-0505-202	Tensaw River	Mobile	Baldwin	Updated waterbody size calculated by ADB
AL03160205-0104-100	Mobile Bay	Mobile	Mobile	Updated waterbody size calculated by ADB
AL03160205-0104-200	Bon Secour Bay	Mobile	Baldwin	Updated waterbody size calculated by ADB
AL03160205-0202-300	Bolton Branch	Mobile	Mobile	Updated waterbody size calculated by ADB
AL03160205-0202-400	Eslava Creek	Mobile	Mobile	Updated waterbody size calculated by ADB
AL03160205-0206-100	Fowl River	Mobile	Mobile	Updated waterbody size calculated by ADB
AL03160205-0307-102	Fish River	Mobile	Baldwin	Updated waterbody size calculated by ADB
AL03160205-0310-702	UT to Bon Secour River	Mobile	Baldwin	Updated waterbody size calculated by ADB
AL03170008-0205-102	Puppy Creek	Escatawpa	Mobile	Updated waterbody size calculated by ADB
AL03170008-0302-100	Escatawpa River	Escatawpa	Mobile	Updated waterbody size calculated by ADB
AL03170008-0402-400	Boggy Branch	Escatawpa	Mobile	Updated waterbody size calculated by ADB
AL03170009-0102-100	Bayou La Batre	Escatawpa	Mobile	Updated waterbody size calculated by ADB
AL03170009-0201-100	Mississippi Sound	Escatawpa	Mobile	Updated waterbody size calculated by ADB
AL03170009-0201-200	Portersville Bay	Escatawpa	Mobile	Updated waterbody size calculated by ADB

Assessment Unit ID	Waterbody Name	River Basin	County	Revision
AL06030001-0402-401	Warren Smith Creek	Tennessee	Jackson	Updated waterbody size calculated by ADB
AL06030002-0105-101	Guess Creek	Tennessee	Jackson	Updated waterbody size calculated by ADB
AL06030002-0304-100	Mountain Fork	Tennessee	Madison	Updated waterbody size calculated by ADB
AL06030002-0304-200	Hester Creek	Tennessee	Madison	Updated waterbody size calculated by ADB
AL06030002-0304-200	Hester Creek	Tennessee	Madison	Updated waterbody size calculated by ADB
AL06030002-0306-100	Beaverdam Creek	Tennessee	Madison	Updated waterbody size calculated by ADB
AL06030002-0307-100	Brier Fork	Tennessee	Madison	Updated waterbody size calculated by ADB
AL06030002-0401-102	Flint River	Tennessee	Madison	Updated waterbody size calculated by ADB
AL06030002-0403-101	Hurricane Creek	Tennessee	Madison	Updated waterbody size calculated by ADB
AL06030002-0404-200	Goose Creek	Tennessee	Madison	Updated waterbody size calculated by ADB
AL06030002-0502-101	Huntsville Spring Branch	Tennessee	Madison	Corrected the Priority Organics cause to Pesticides (DDT)
AL06030002-0502-101	Huntsville Spring Branch	Tennessee	Madison	Updated waterbody size calculated by ADB
AL06030002-0502-102	Huntsville Spring Branch	Tennessee	Madison	Corrected the metals listing to list Hg and As as causes
AL06030002-0502-102	Huntsville Spring Branch	Tennessee	Madison	Updated waterbody size calculated by ADB
AL06030002-0505-101	Indian Creek	Tennessee	Madison	Corrected the Priority Organics cause to Pesticides (DDT)
AL06030002-0505-101	Indian Creek	Tennessee	Madison	Updated waterbody size calculated by ADB
AL06030002-0601-300	Hughes Creek	Tennessee	Morgan Marshall	Updated waterbody size calculated by ADB
AL06030002-0601-700	Mill Pond Creek	Tennessee	Marshall	Updated waterbody size calculated by ADB
AL06030002-0602-102	West Fork Cotaco Creek	Tennessee	Morgan	Updated waterbody size calculated by ADB
AL06030002-0603-102	Cotaco Creek	Tennessee	Morgan	Updated waterbody size calculated by ADB
AL06030002-0604-100	Town Creek	Tennessee	Morgan	Updated waterbody size calculated by ADB
AL06030002-0802-201	French Mill Creek	Tennessee	Limestone	Updated waterbody size calculated by ADB
AL06030002-1002-300	Herrin Creek	Tennessee	Morgan	Updated waterbody size calculated by ADB
AL06030002-1008-200	Flat Creek	Tennessee	Lawrence	Updated waterbody size calculated by ADB
AL06030004-0102-100	Shoal Creek	Tennessee	Limestone	Updated waterbody size calculated by ADB
AL06030004-0104-102	Anderson Creek	Tennessee	Lauderdale	Updated waterbody size calculated by ADB
AL06030004-0105-101	Elk River	Tennessee	Limestone	Updated waterbody size calculated by ADB

Assessment Unit ID	Waterbody Name	River Basin	County	Revision
			Lauderdale	
AL06030004-0105-101	Elk River	Tennessee	Limestone Lauderdale	Updated waterbody size calculated by ADB
AL06030005-0701-201	McKiernan Creek	Tennessee	Colbert	Updated waterbody size calculated by ADB
AL06030005-0702-100	Pond Creek	Tennessee	Colbert	Updated waterbody size calculated by ADB
AL06030006-0101-700	Little Dice Branch	Tennessee	Franklin	Updated waterbody size calculated by ADB
AL06030006-0103-101	Bear Creek (Bear Creek Lake)	Tennessee	Franklin	Updated waterbody size calculated by ADB
AL06030006-0103-101	Bear Creek (Bear Creek Lake)	Tennessee	Franklin	Changed source for Metals (Hg) from Atmospheric deposition to Unknown source
AL-Gulf of Mexico	Gulf of Mexico	Mobile	Baldwin Mobile	Updated waterbody size calculated by ADB
AL-Gulf of Mexico	Gulf of Mexico	Mobile	Baldwin Mobile	Corrected affected counties listing to include Baldwin County

# **APPENDIX A**

## **Public Notice Soliciting Available Data and Information for Preparation of Alabama's Draft 2006 303(d) List and Comments on Alabama's Draft Assessment and Listing Methodology**

**NOTICE REQUESTING DATA AND INFORMATION FOR PREPARATION OF  
ALABAMA'S DRAFT 2006 SECTION 303(d) LIST OF IMPAIRED WATERS AND  
COMMENTS ON ALABAMA'S DRAFT ASSESSMENT AND LISTING  
METHODOLOGY**

Section 303(d) of the Clean Water Act requires that each state identify those waters that do not currently support designated uses, and establish a priority ranking of the waters taking into account the severity of the pollution and the uses to be made of the waters. For each water on the list, the state is required to establish the total maximum daily load (TMDL) at a level necessary to implement the applicable water quality standards.

The Alabama Department of Environmental Management (ADEM) has begun development of the draft 2006 Section 303(d) list and is soliciting data and information for consideration during preparation of the list. In addition, the Department is soliciting comments on the draft assessment and listing methodology which will be used to develop the draft 2006 Section 303(d) list. The draft methodology has been prepared to assist the Department in the development of the 303(d) list and establishes minimum data requirements and listing criteria. **In order to be fully considered in this process, the data and comments on the draft methodology should be submitted to ADEM by October 1, 2005. If possible, water quality data should be submitted in electronic format.**

While the Department will consider all data submitted, we reserve the right to incorporate only those data that meet minimum quality standards. The Department is not bound by interpretations provided by data submitters. It should also be noted that the Department is unable to pay a fee for the use of data. Data, information, and comments on the draft assessment methodology should be submitted to the following contact person:

Joseph Roy  
ADEM – Water Division  
P.O. Box 301463  
Montgomery, Alabama 36130-1463

Mr. Roy's phone number is 334-270-5635. His e-mail address is [jtr@adem.state.al.us](mailto:jtr@adem.state.al.us).

A copy of the draft assessment and listing methodology can be found on the Department's web site at the following address:  
[www.adem.state.al.us/WaterDivision/WQuality/WQMainInfo.htm](http://www.adem.state.al.us/WaterDivision/WQuality/WQMainInfo.htm)

This notice is hereby given this August 14, 2005, by authorization of the Alabama Department of Environmental Management.

---

Onis "Trey" Glenn, III, P.E., Director

## **APPENDIX B**

### **Alabama's Water Quality Assessment and Listing Methodology**



*Alabama's Water Quality Assessment  
and Listing Methodology*

**Final  
December 2005**



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## List of Acronyms

A&I	Agriculture and Industry water supply use classification
ADB	Assessment Database
ADEM	Alabama Department of Environmental Management
ADPH	Alabama Department of Public Health
AEMC	Alabama Environmental Management Commission
AWIC	Alabama Water Improvement Commission
CaCO <sub>3</sub>	Calcium Carbonate
CBOD <sub>5</sub>	Five-Day Carbonaceous Biochemical Oxygen Demand
Cl <sup>-1</sup>	Chlorides
CWA	Clean Water Act
DO	Dissolved Oxygen
DRP	Dissolved Reactive Phosphorus
EPA	Environmental Protection Agency
EPT	Ephemeroptera/Plecoptera/Trichoptera
F&W	Fish and Wildlife
GIS	Geographical Information System
GPS	Global Positioning System
IBI	Index of Biotic Integrity
LWF	Limited Warmwater Fishery
MDL	Method Detection Limit
NH <sub>3</sub> -N	Ammonia Nitrogen
NHD	National Hydrography Dataset
NO <sub>3</sub> + NO <sub>2</sub> -N	Nitrate + Nitrite Nitrogen
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Units
OAW	Outstanding Alabama Waters
ONRW	Outstanding National Resource Water
PWS	Public Water Supply
QAPP	Quality Assurance Project Plan
S	Swimming and Other Whole Body Water-Contact Sports
SH	Shellfish Harvesting
SOP/QCA	Standard Operating Procedures/Quality Control Assurance
SW	Surface Water
TDS	Total Dissolved Solids
TKN	Total Kjeldahl Nitrogen
TMDL	Total Maximum Daily Load
Total-P	Total Phosphorus
TSS	Total Suspended Solids
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
WMB-EPT	Wadeable Multi-habitat Bioassessment - EPT Families

WMB-I Intensive Wadeable Multi-habitat Bioassessment

## **1.0 Introduction**

Alabama has long been recognized for its abundant water resources. With over 77,000 miles of perennial and intermittent streams and rivers, 481,757 acres of publicly-owned lakes and reservoirs, 610 square miles of estuaries, and 50 miles of coastal shoreline, the state is faced with a tremendous challenge to monitor and accurately report on the condition of its surface waters (ADEM, 2004).

Sections 305(b) and 303(d) of the federal Clean Water Act direct states to monitor and report the condition of their water resources. Recent guidance published by the Environmental Protection Agency (EPA) provides a basic framework that states may use to fulfill this reporting requirement. *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* provides recommendations on the delineation of assessment units, reporting the status and progress towards comprehensive assessment of state waters, attainment of state water quality standards and the basis for making attainment decisions, schedules for additional monitoring, listing waters which do not fully support their designated uses (i.e. impaired waters), and schedules to address impaired waters (EPA, 2005).

Alabama's assessment and listing methodology establishes a process, consistent with EPA's guidance, to assess the status of surface waters in Alabama relative to the designated uses assigned to each waterbody. The methodology will also describe the procedure to assign the size or extent of assessed waterbodies. This methodology is not intended to limit the data or information that the State considers as it prepares an integrated water quality assessment report. Rather, it is intended to establish a rational and consistent process for reporting the status of Alabama's surface waters relative to their designated uses.

## **2.0 Alabama's Water Quality Standards**

State water quality standards are the yardstick by which the condition of the nation's waters is measured. They are intended to protect, restore and maintain the condition of the nation's waters. In Alabama, water quality standards were first adopted in 1967 by the Alabama Water Improvement Commission (AWIC). In 1982 the Alabama Department of Environmental Management (ADEM) was formed by merging AWIC with elements of the Alabama Department of Public Health (ADPH). Since first being adopted in 1967, Alabama's water quality standards have been amended on numerous occasions (ADEM, 2005).

The Alabama Environmental Management Commission (AEMC) has the authority to adopt revisions to the ADEM Administrative Code. The Designated Uses (Chapter 335-6-11 of the Administrative Code) and the Water Quality Criteria (Chapter 335-6-10 of the Administrative Code) are reviewed once every three years pursuant to EPA regulations at 40 CFR Part 131.20. This review process is known as the triennial review and affords the public the opportunity to make comments and suggestions regarding Alabama's water quality standards. Any changes that ADEM may propose as a result of the review process are subject to further public comment before consideration by the AEMC.

Water quality standards consist of three components: designated uses, numeric and narrative criteria, and an antidegradation policy. These three components have been compared to the three legs of a stool which work together to provide water quality protection for the nation's surface waters.

Designated uses describe the best uses reasonably expected of waters. These uses should include such activities as recreation in and on the water, public water supply, agricultural and industrial water supply, and habitat for fish and wildlife. While all waters may not support all of these uses, the goal of the Clean Water Act is to provide protection of water quality consistent with "fishable/swimable" uses, where attainable. In Alabama, waters can be assigned one or more of seven designated uses pursuant to ADEM Administrative Code 335-6-11. These uses include:

1. Outstanding Alabama Water (OAW)
2. Public Water Supply (PWS)
3. Shellfish Harvesting (SH)
4. Swimming and Other Whole Body Water-Contact Sports (S)
5. Fish and Wildlife (F&W)

6. Limited Warmwater Fishery (LWF)
7. Agricultural and Industrial Water Supply (A&I)

Designated uses 1 through 5 in the list above are considered by EPA to be consistent with the “fishable/swimable” goal.

The State also has one special designation – Outstanding National Resource Water (ONRW). These high quality waters are protected from new or expanded point sources of pollutants and may be assigned to any one of the first five designated uses in the list above.

Numeric and narrative criteria provide the means to measure the degree to which the quality of waters is consistent with their designated use or uses. The criteria are intended to provide protection of the water quality commensurate with the water’s use, to include protection of human health. Narrative criteria generally describe minimum conditions necessary for all uses and may include certain restrictions for specific uses. Numeric criteria include pollutant concentrations or physical characteristics necessary to protect a specific designated use. Alabama’s narrative and numeric criteria are defined in ADEM Administrative Code 335-6-10.

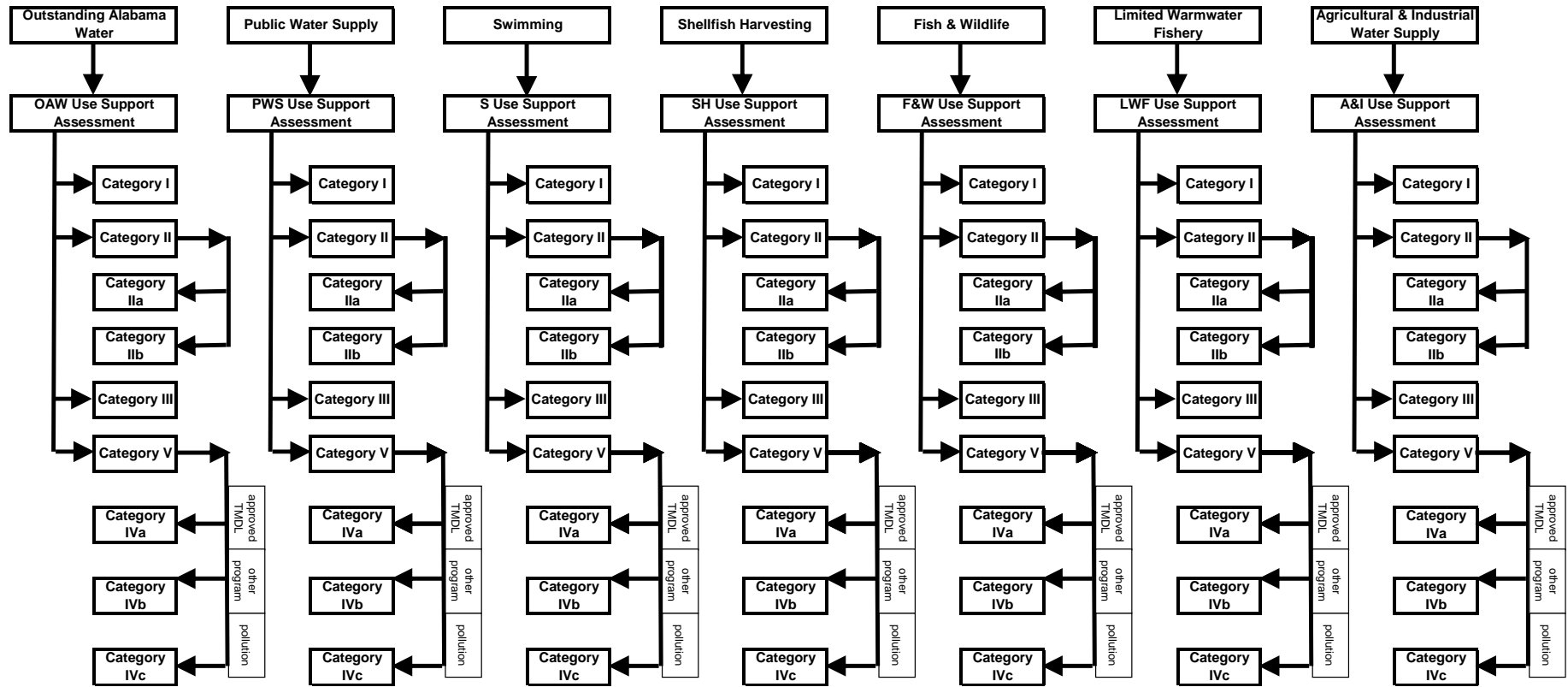
The state’s antidegradation policy provides for protection of high quality waters that constitute an outstanding national resource (Tier 3), waters whose quality exceeds the levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water (Tier 2), and existing instream water uses and the level of water quality necessary to protect the existing uses (Tier 1). In Tier 3 waters, ADEM Administrative Code 335-6-10-10 prohibits new or expanded point source discharges. In Tier 2 waters, ADEM Administrative Code 335-6-10-.04 provides for new or expanded discharge of pollutants only after intergovernmental coordination, public participation, and a demonstration that the new or expanded discharge is necessary for important economic or social development. Alabama’s water quality standards regulations (ADEM Administrative Code 335-6-10 and 335-6-11) are included in the **Appendix** of this document.

### **3.0 Waterbody Categorization**

The water quality assessment process begins with the collection, compilation, and evaluation of water quality data and information for the purpose of determining if a waterbody is supporting all of its designated uses. It is imperative that the data and information used in the process be of adequate quality and provides an accurate indication of the water quality conditions in the waterbody since decisions arising from the assessment process may have long-term consequences. Issues of data sufficiency and data quality must be addressed to ensure that use support decisions are based on accurate data and information. However, the minimum data requirements discussed in this methodology are not intended to exclude data and information from the assessment process but are a guide for use in designing monitoring activities to assess the State’s surface waters and to ensure that decisions are made using the best available data. The goal is to accurately describe the status of surface waters where possible and to identify waters where more information is needed to make use support decisions.

The use support assessment process considers all readily available data and information with a goal of placing waterbodies in one of five separate categories. This process is specific to the highest designated use assigned to the waterbody and is described by the flow chart depicted in **Figure 1**.

**Figure 1**  
**Alabama's Waterbody Assessment Process**





Waterbody data and information are evaluated using the use support assessment methodology and the waterbody is assigned to one of the following categories.

Category 1

Waters that are attaining all applicable water quality standards.

Category 2

Waters for which readily available data, which meets the State's requirements as described in Section 4.9, supports a determination that some water quality standards are met and there is insufficient data to determine if remaining water quality standards are met. Attainment status of the remaining standards is unknown because data is insufficient. Waters for which the minimum data requirements (as described later) have not been met will be placed in Category 2.

1. *Category 2A*

For these waters available data does not satisfy minimum data requirements but there is a high potential for use impairment based on the limited data. These waters will be given a higher priority for additional data collection.

2. *Category 2B*

For these waters available data does not satisfy minimum data requirements but there is a low potential for use impairment based on the limited data. These waters will be included in future basin monitoring rotations as resources allow.

Category 3

Waters for which there is no data or information to determine if any applicable water quality standard is attained or impaired. These waters will be considered unassessed.

Category 4

Waters in which one or more applicable water quality standards are not met but establishment of a TMDL is not required.

1. *Category 4A*

Waters for which all TMDLs needed to result in attainment of all applicable WQSs have been approved or established by EPA.

2. *Category 4B*

Waters for which other required control measures are expected to attain applicable water quality standards in a reasonable period of time. Adequate documentation is required to indicate that the proposed control mechanisms will address all major pollutant sources and should result in the issuance of more stringent effluent limitations required by either Federal, State, or local authority or the implementation of "other pollution control requirements (e.g., best management practices) required by local, state, or federal authority" that are stringent enough to implement applicable water quality standards. Waters will be evaluated on a case by case basis to determine if the proposed control measures or activities under another program can be expected to address the cause of use impairment within a reasonable time period. A reasonable time period may vary depending on the degree of technical difficulty or extent of the modifications to existing measures needed to achieve water quality standards. EPA's 2006 assessment and listing guidance offers additional clarification of what might be expected of waters placed in Category 4b.

3. *Category 4C*

Waters in which the impairment is not caused by a pollutant. This would include waters which are impaired due to natural causes or pollution. A pollutant is defined in Section 502(6) of the Clean Water Act (CWA) as "spoil, solid waste, incinerator residue, sewerage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal, and agricultural waste discharged into water." Pollution is defined as "the man-made or man-induced alteration of the chemical, physical, or radiological integrity of a waterbody." Invasive plants and animal species are considered pollution.

#### Category 5

Waters in which a pollutant has caused or is suspected of causing impairment. If the impairment is caused by an identified pollutant the water should be placed in Category 5. All “readily available data and information” will be used to determine when a water should be placed in Category 5. Waters in this category comprise the State’s list of impaired waters or §303(d) list.

When the information used to assess the waterbody consist primarily of observed conditions, (limited water quality data, water quality data older than six years, or estimated impacts from observed or suspected activities), the assessment is generally referred to as an evaluated assessment (Category 2). Evaluated assessments usually require the use of some degree of professional judgment by the person making the assessment and these assessments are not considered sufficient to place waters in or to remove waters from the impaired category (Category 5) or the fully supporting category (Category 1).

Monitored assessments (Categories 1 and 5) are based on readily available chemical, physical, and/or biological data collected during the previous six years, using commonly accepted and well-documented methods. Readily available data are data that have been collected or assembled by the Department or other groups or agencies and are available to the public. Data older than six years old may be used on a case-by-case basis when assessing waters that are not currently included in Category 1 or Category 5. (For example, older data could be used if conditions, such as land use, have not changed.) Much of the remainder of this document will pertain to the use of monitoring data to make use support determinations.

### **4.0 The Water Quality Assessment Process**

The water quality assessment process is different for each of Alabama’s seven designated uses because each use is protected by specific numeric and narrative water quality criteria. As such, the methodology for assigning a given waterbody to one of the five categories may have different data requirements and thresholds for determining the waterbody’s use support status. In addition, interpretation of narrative criteria may differ by classified use and waterbody type. Data and information that may be considered when assessing state waters could include water chemistry data such as chemical specific concentration data, land use or land cover data, physical data such as water temperature and conductivity, habitat evaluations, biological data such as macroinvertebrate and fish community assessments, and bacteriological data such as fecal coliform or enterococci counts.

In order to ensure consistent and accurate assessment of a waterbody’s support status and proper categorization of the waterbody, minimum data requirements must be defined that address data quality and data quantity. Data requirements will not only be dictated by the classified use of the waterbody but also by the waterbody type to account for the different monitoring strategies that may be used for different waterbody types. The minimum data requirements are expected to guide future water quality monitoring activities and provide the basis for making use support decisions. However, in those cases where a data set may not include all of the elements specified by the minimum data requirements, a decision to include the water in Category 5 can still be made provided the available data indicates a clear impairment and the cause of the impairment is evident. These decisions will be made on a case by case basis and the decision will be documented in the ADB.

In the assessment methodology, the terms “Level IV WMB-I”, “Level III WMB-EPT”, “Fish IBI”, “habitat assessment”, “conventional parameter samples”, “pesticide/herbicide samples”, “inorganic samples”, “chlorophyll *a* samples”, and “fish tissue analysis” are used. For the purposes of this assessment methodology, these terms will have the following meanings.

#### **Level IV WMB-I:**

- An intensive multihabitat assessment of the macroinvertebrate community in a wadeable stream involving the collection of macroinvertebrates for identification and enumeration in a laboratory

**Level III WMB-EPT:**

- A screening-level multihabitat assessment of the macroinvertebrate community in a stream focusing on the collection, field processing and enumeration of the pollution-sensitive Ephemeroptera, Plecoptera, and Trichoptera taxa

**Fish IBI:**

- A multihabitat fish community assessment method developed by the Geological Survey of Alabama (O'Neil and Shepard, 1998) for streams in the Black Warrior and Cahaba River basins

**Habitat assessment:**

- An assessment of available aquatic habitat in a stream which considers habitat characteristics important to supporting a diverse and health aquatic community

**Conventional parameter samples** will include analyses for the following constituents:

- Collector Name
- Date (Month, Day, Year)
- Time (24 hr)
- Air Temperature, °C
- Water Temperature, °C
- Total Stream Depth at Sampling Point, feet
- Sample Collection Depth, feet
- Dissolved Oxygen (DO), mg/l
- Conductivity,  $\mu\text{mhos/cm}$  @ 25C
- Salinity, ppt (coastal waters only)
- pH, s.u.
- Turbidity, NTU (with Nephelometer, not multiprobe)
- Weather Conditions
- Stream Flow (where appropriate)
- Five-day Carbonaceous Biochemical Oxygen Demand (CBOD5), mg/l
- Alkalinity, mg/l
- Total Suspended Solids (TSS), mg/l
- Total Dissolved Solids (TDS), mg/l
- Dissolved Reactive Phosphorus (DRP), mg/l (field filtered, separate bottle)
- Ammonia Nitrogen (NH<sub>3</sub>-N), mg/l
- Nitrate + Nitrite Nitrogen (NO<sub>3</sub>+ NO<sub>2</sub>-N), mg/l
- Total Kjeldahl Nitrogen (TKN), mg/l
- Total Phosphorus (Total-P), mg/l
- Hardness, mg/l as CaCO<sub>3</sub> (measured when metals samples are collected)

**Pesticide/Herbicide samples** will include analyses for the following constituents:

- Organochlorine Pesticides by method SW8081A
- Organophosphorus Pesticides by method SW8141
- Chlorinated Herbicides by method SW8151
- Atrazine by Immunoassay

**Inorganic (metals) samples** will include analyses for the following constituents:

- "Dissolved" Antimony (Sb), ug/l
- "Dissolved" Arsenic<sup>+3</sup> (As<sup>+3</sup>), ug/l
- "Dissolved" Cadmium (Cd), ug/l
- "Dissolved" Chromium<sup>+3</sup> (Cr<sup>+3</sup>), ug/l
- "Dissolved" Copper (Cu), ug/l
- "Dissolved" Lead (Pb), ug/l

- 
- “Dissolved” Nickel (Ni), ug/l
- 
- “Dissolved” Silver (Ag), ug/l
- “Dissolved” Thallium (Tl), ug/l
- “Dissolved” Zinc (Zn), ug/l
- “Total” Mercury (Hg), ug/l
- “Total” Selenium (Se), ug/l

**Bacteriological Samples**

- Fecal coliform, colonies/100 ml in non-coastal waters and Shellfish Harvesting waters
- Enterococci, colonies/100 ml in coastal waters

**Chlorophyll a samples** will include the collection of photic zone composite water samples to be processed in accordance with ADEM SOP # 2063 Chlorophyll a Collection and Processing.

**Fish tissue analysis** will include collection and analyses of fish for the following constituents:

- Arsenic
- Cadmium
- Mercury
- Selenium
- Lead
- Chlordane
- 4,4-DDD
- 4,4-DDE
- 4,4-DDT
- 2,4-DDD
- 2,4-DDE
- 2,4-DDT
- Chlorpyrifos
- Dieldrin
- Endosulfan I
- Endosulfan II
- Endrin
- Lindane
- Heptachlor
- Heptachlor Epoxide
- Hexachlorobenzene
- Mirex
- Toxaphene
- PCBs
- Dioxin
- Percent lipids

Fish sampling and tissue preparation procedures are described in the ADEM *Standard Operating Procedures And Quality Control Assurance Manual Volume III – Fish Sampling And Tissue Preparation For Bioaccumulative Contaminants* (SOP).

**4.1 Outstanding Alabama Waters (OAW)**

The best usage of waters assigned this classification are those activities consistent with the natural characteristics of the waters. Waterbodies assigned the OAW use are high quality waters that constitute an outstanding Alabama resource, such as waters of state parks and wildlife refuges and waters of exceptional recreational or ecological significance. Beneficial uses encompassed within this classification include: aquatic life support and wildlife propagation, fish and shellfish harvesting and consumption, water contact recreation, agricultural irrigation, livestock watering and industrial cooling and process water supply.

**4.1.1 Minimum Data Requirement for OAW Waters**

For waters with the OAW classification the available data must have been collected consistent with the following standard operating procedures (SOP) manuals:

SOP#	Title
2040	Stream Flow Abbreviated Measurement Method
2041	SW Temperature Field Measurements
2042	SW pH Field Measurements
2043	SW Specific Conductivity Field Measurements
2044	SW Turbidity Field Measurements
2045	SW Dissolved Oxygen Field Measurements
2046	Photic Zone Measurements and Visibility Determinations
2048	Continuous SW Quality Monitoring Using Datasondes

2061	General SW Quality Sample Collection
2062	Dissolved Reactive Phosphorus (DRP) Collection & Field Processing
2063	Chlorophyll_a Collection & Field Processing
2064	Fecal Coliform Sample Collection
2065	Sediment Sampling
9021	Quality Control Samples and Field Measurements
9025	Field Equipment Cleaning Procedures
9040	Station, Sample ID & Chain of Custody Procedures
6300	Physical Characterization
6301	Habitat Assessment

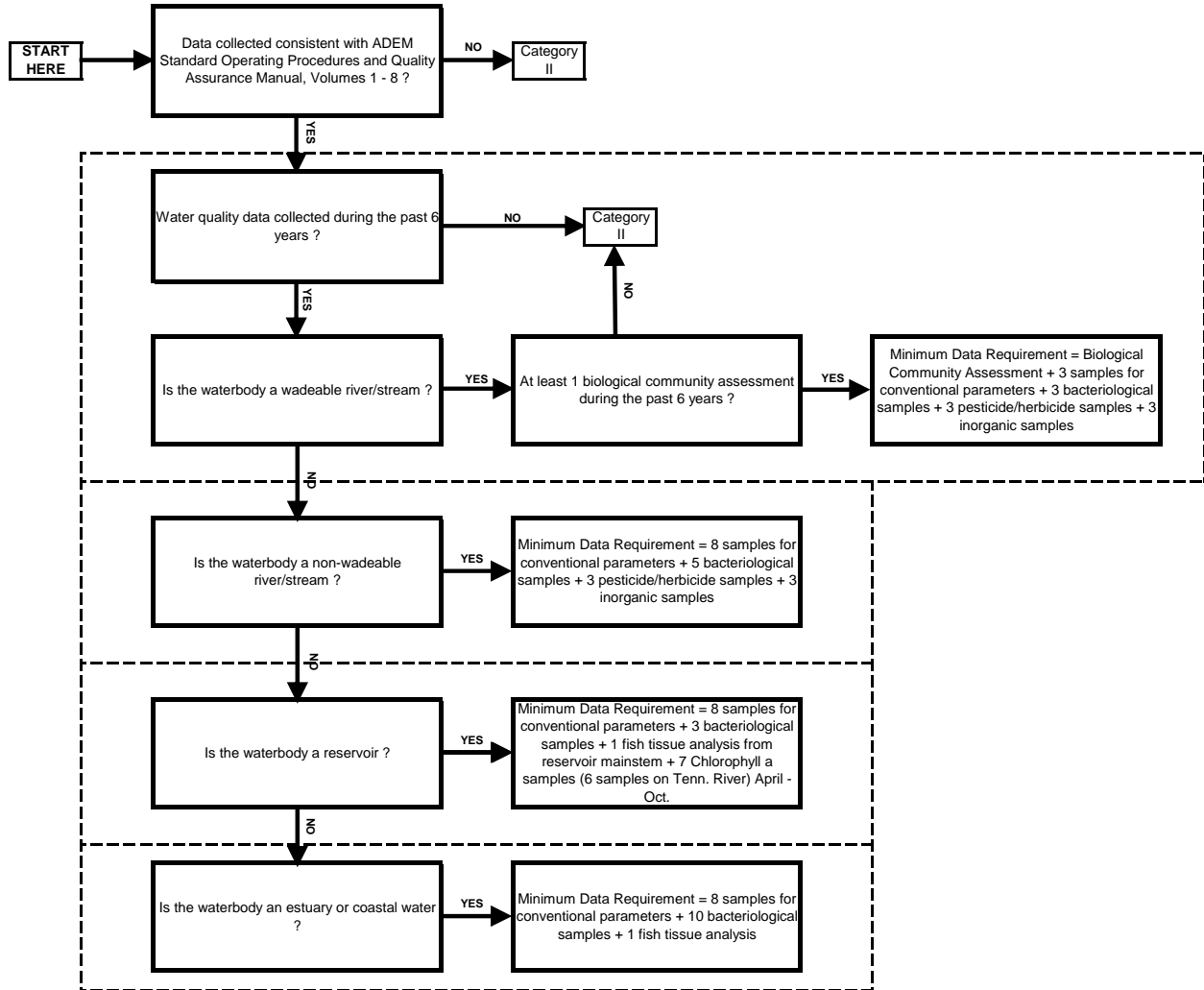
- ADEM SOP/QCA Manual Volume 2 – Aquatic Macroinvertebrate Assessment (2005)
- ADEM SOP/QCA Manual Volume 5 – Algal Growth Potential Testing (2004)

In addition, the data must have been collected within the last six years. The six year timeframe would capture all data collected by ADEM during one complete rotation of the five year monitoring schedule currently used by the Department. Failure to satisfy both of these conditions places the waterbody in Category 2. If these two conditions are met, the determination of the minimum data requirement is dependent upon the waterbody type. Waterbody types include wadeable rivers and streams, non-wadeable rivers and streams, reservoirs and reservoir embayments, and estuary and coastal waters. In addition, the minimum data requirement may change if pollutant sources upstream of the monitoring location are likely. Failure to meet the minimum data requirement for any waterbody type will place the waterbody in Category 2. The following list and **Figure 2** describe the minimum data requirements for assessing waters classified as OAW.

- Wadeable River or Stream
  - 1 Level IV Intensive Wadeable Multi-habitat Bioassessment (WMB-I) or 1 Level III Wadeable Multi-habitat Bioassessments – EPT Families (WMB-EPT) or 1 Level III WMB-EPT plus 1 fish community assessment (IBI). In addition, a habitat assessment must be completed with each biological assessment. Currently, metrics for the fish IBI have been calibrated only in the Black Warrior and Cahaba River basins.
  - 3 conventional parameter samples (including samples for nutrient analysis)
  - 3 bacteriological samples
  - 3 pesticide / herbicide samples
  - 3 inorganic samples
- Non-wadeable River or Stream
  - 8 conventional parameter samples (including samples for nutrient analysis)
  - 5 bacteriological samples (1 geometric mean)
  - 3 pesticide / herbicide samples
  - 3 inorganic samples
- Reservoirs and Embayments
  - 8 conventional parameter samples (including samples for nutrient analysis)
  - 3 bacteriological samples
  - 1 fish tissue analysis from the reservoir mainstem
  - 7 chlorophyll a samples collected between April and October (For the Tennessee River Basin: 6 chlorophyll a samples collected between April and September)
- Estuary or Coastal Waters
  - 8 conventional parameter samples (including samples for nutrient analysis)
  - 10 bacteriological samples (2 geometric means)

- 1 fish tissue analysis

**Figure 2**  
**Minimum Data Requirements for the OAW Designated Use**



**Biological community assessment means:**  
 1 Level IV Intensive Wadeable Multi-habitat Bioassessment (WMB-I) or  
 1 Level III Wadeable Multi-habitat Bioassessment – EPT Families (WMB-EPT) or  
 Level III WMB-EPT plus 1 fish community assessment (IBI)

#### 4.1.2 Use Support Assessment for OAW Waters

Once the minimum data requirements have been met an assessment of the data can be completed resulting in the categorization of the waterbody as either fully supporting the OAW use (Category 1) or not fully supporting the OAW use (Category 5). The assessment process considers the available data and may include any fish consumption advisories, shellfish harvesting closure notices, chemical specific data, bacteriological data, biological community assessments, habitat assessments, periphyton assessments, and toxicity evaluations.

The OAW-classified waterbody is placed in Category 1 if all of the following are true:

- There is no fish/shellfish consumption advisory issued by the Alabama Department of Public Health (ADPH) for the waterbody.
- The Level IV WMB-I assessment result is “good” or “excellent”, or the Level III WMB-EPT assessment is “good” or “excellent” or the Level III WMB-EPT assessment is “good” or “excellent” and the fish community IBI is “fair”, “good”, or “excellent” (Wadeable streams only).
- The growing season mean chlorophyll *a* criterion has not been exceeded where such a criterion has been established. In making this determination, chlorophyll *a* values in excess of the criterion which are due to extreme hydrologic events (i.e., droughts and floods) will not be considered as an exceedance of the criterion.
- There is not an exceedance of any toxic pollutant criterion during the previous six years.
- There are no exceedances of conventional parameters, except due to natural conditions.
- Bacteriological sample results from a single sample in excess of 200 colonies fecal coliform per 100 ml will require a follow-up collection of 5 samples collected during a 30 day period to calculate the geometric mean fecal coliform density in reservoirs and wadeable streams. If the geometric mean fecal coliform density is less than or equal to 200 colonies/100 ml the waterbody will be considered fully meeting the bacteria criteria for this designated use. In coastal waters designated as OAW the geometric mean of enterococci sample must be less than 35 colonies/100 ml and not more than 10% of the individual samples (as determined by the binomial distribution function and Table 2) can exceed 104 colonies/100 ml.

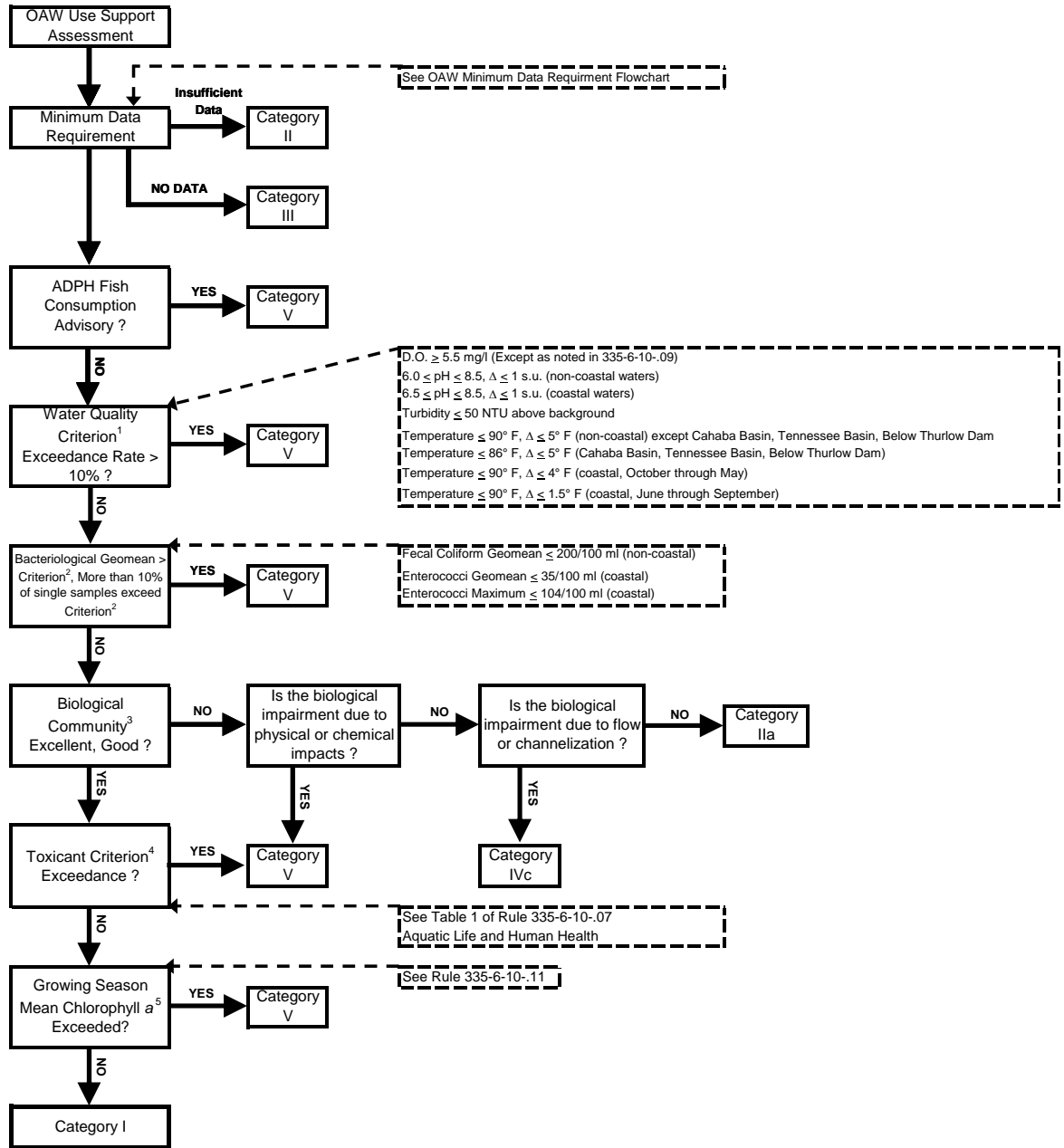
The OAW-classified waterbody is placed in Category 5 if any of the following are true:

- There is a fish consumption advisory issued by the ADPH.
- The Level IV WMB-I assessment result is less than “good”, or the Level III WMB-EPT assessment is less than “good” or the Level III WMB-EPT assessment is less than “good” and the fish community IBI is less than “fair”. In addition, a potential anthropogenic cause for the degraded condition must be identified (Wadeable streams only).
  - There is an exceedance of a conventional parameter for other than natural causes.
  - There is an exceedance of any toxic pollutant criterion during the previous six years.
  - The geometric mean fecal coliform density exceeds 200 colonies/100 ml in follow-up samples collected in response to an exceedance of 200 colonies/100 ml in a single sample. In coastal waters the geometric mean enterococci density exceeds 35 colonies/100 ml.
  - The growing season mean chlorophyll *a* criterion has been exceeded where such a criterion has been established. In making this determination, chlorophyll *a* values in excess of the criterion which are due to extreme hydrologic events (i.e., droughts and floods) will not be considered as an exceedance of the criterion.

**Figure 3** illustrates the assessment process for OAW waters.



**Figure 3**  
**Outstanding Alabama Water (OAW) Assessment Methodology**



1 Water Quality Criterion refers to pH, Dissolved Oxygen, turbidity, and temperature resulting from heat sources  
 2 Bacteriological Criterion refers to both the single sample maximum and geometric mean, see discussion in Section 4.1.2  
 3 Biological community refers to macroinvertebrates and/or fish in wadeable rivers/streams only (See Minimum Data Requirements)  
 4 Toxicant Criterion refers to toxics listed in 335-6-10-.07  
 5 Applies only to reservoirs with established Chlorophyll a criteria and not during extreme hydrologic events  
**Special Note** - Natural waters may, on occasion, have characteristics outside of the limits established by these criteria. These criteria relate to condition of waters as affected by the discharge of sewage, industrial wastes, or other wastes, not to conditions resulting from natural forces. See 335-6-10-.05(4)

4.2 Public Water Supply (PWS)

The best usage of waters assigned this classification is as a source of water supply for drinking or food-processing purposes after approved treatment. Waterbodies assigned the PWS use are considered safe for drinking or food-processing purposes if subjected to treatment approved by the Department equal to coagulation, sedimentation, filtration and disinfection, with additional treatment if necessary to remove naturally present impurities. Beneficial uses encompassed within this classification include: aquatic life support and wildlife propagation, fish and shellfish harvesting and consumption, drinking and food-processing water supply, water contact recreation, agricultural irrigation, livestock watering and industrial cooling and process water supply.

4.2.1 Minimum Data Requirement for PWS Waters

For waters with the PWS classification the available data must have been collected consistent with the following standard operating procedures (SOP) manuals:

SOP#	Title
2040	Stream Flow Abbreviated Measurement Method
2041	SW Temperature Field Measurements
2042	SW pH Field Measurements
2043	SW Specific Conductivity Field Measurements
2044	SW Turbidity Field Measurements
2045	SW Dissolved Oxygen Field Measurements
2046	Photic Zone Measurements and Visibility Determinations
2048	Continuous SW Quality Monitoring Using Datasondes
2061	General SW Quality Sample Collection
2062	Dissolved Reactive Phosphorus (DRP) Collection & Field Processing
2063	Chlorophyll_a Collection & Field Processing
2064	Fecal Coliform Sample Collection
2065	Sediment Sampling
9021	Quality Control Samples and Field Measurements
9025	Field Equipment Cleaning Procedures
9040	Station, Sample ID & Chain of Custody Procedures
6300	Physical Characterization
6301	Habitat Assessment

- D
- ADEM SOP/QCA Manual Volume 2 – Aquatic Macroinvertebrate Assessment (2005)
- ADEM SOP/QCA Manual Volume 5 – Algal Growth Potential Testing (2004)

In addition, the data must have been collected within the last six years. The six year timeframe would capture all data collected by ADEM during one complete rotation of the five year monitoring schedule currently used by the Department. Failure to satisfy both of these conditions places the waterbody in Category 2. If these two conditions are met, the determination of the minimum data requirement is dependent upon the waterbody type. Waterbody types include wadeable rivers and streams, non-wadeable rivers and streams, reservoirs and reservoir embayments, and estuary and coastal waters. Failure to meet the minimum data requirement will place the waterbody in Category 2. The following list and **Figure 4** describe the minimum data requirement for assessing waters classified as PWS.

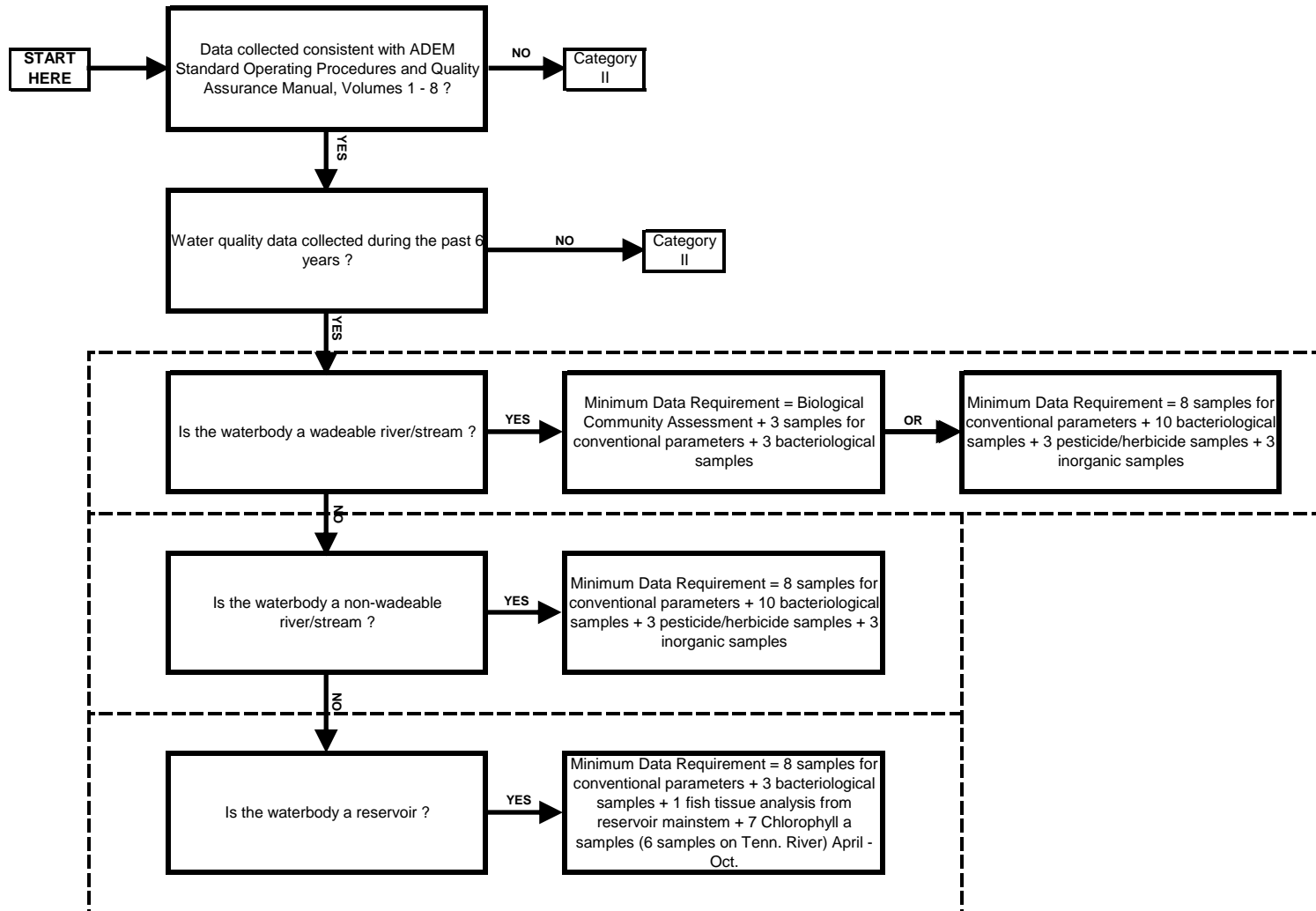
- Wadeable River or Stream

- 1 Level IV Intensive Wadeable Multi-habitat Bioassessment (WMB-I) or 2 Level III Wadeable Multi-habitat Bioassessments – EPT Families (WMB-EPT) or 1 Level III WMB-EPT plus 1 fish community assessment (IBI). In addition, a habitat assessment must be completed with each biological assessment. Currently, metrics for the fish IBI have been calibrated only in the Black Warrior and Cahaba River basins.
- 3 conventional parameter samples (including samples for nutrient analysis)
- 3 bacteriological samples

**OR**

- 8 conventional parameter samples (including samples for nutrient analysis)
  - 10 bacteriological samples (2 geometric mean samples)
  - 3 pesticide / herbicide samples
  - 3 inorganic samples
- Non-wadeable River or Stream
    - 8 conventional parameter samples (including samples for nutrient analysis)
    - 10 bacteriological samples (2 geometric mean samples)
    - 3 pesticide / herbicide samples
    - 3 inorganic samples
  - Reservoirs and Embayments
    - 8 conventional parameter samples (including samples for nutrient analysis)
    - 3 bacteriological samples
    - 1 fish tissue analysis from the reservoir mainstem
    - 7 chlorophyll a samples collected between April and October (For the Tennessee River Basin: 6 chlorophyll a samples collected between April and September)
  - Estuary or Coastal Waters
    - 8 conventional parameter samples (including samples for nutrient analysis)
    - 10 bacteriological samples (2 geometric mean samples)
    - 1 fish tissue analysis

**Figure 4**  
**Minimum Data Requirements for the PWS Designated Use**



**Biological community assessment means:**

- 1 Level IV Intensive Wadeable Multi-habitat Bioassessment (WMB-I) or
- 2 Level III Wadeable Multi-habitat Bioassessments – EPT Families (WMB-EPT) or
- 1 Level III WMB-EPT plus 1 fish community assessment (IBI)

#### 4.2.2 Use Support Assessment for PWS Waters

Once the minimum data requirement has been met an assessment of the data can be completed resulting in the categorization of the waterbody as either fully supporting the PWS use (Category 1) or not fully supporting the PWS use (Category 5). The assessment process considers the available data and may include any fish consumption advisories, shellfish harvesting closure notices, chemical specific data, bacteriological data, biological community assessments, habitat assessments, periphyton assessments, drinking water system compliance records, and toxicity evaluations.

The PWS-classified waterbody is placed in Category 1 if all of the following are true:

- There is no fish/shellfish consumption advisory issued by the Alabama Department of Public Health (ADPH) for the waterbody.
- The Level IV WMB-I assessment result is “fair”, “good” or “excellent”, or both Level III WMB-EPT assessments are “fair”, “good” or “excellent” or the Level III WMB-EPT assessment is “fair”, “good” or “excellent” and the fish community IBI is “fair”, “good”, or “excellent”. (Wadeable streams only)
- The growing season mean chlorophyll *a* criterion has not been exceeded in two consecutive years where such a criterion has been established unless a drinking water system withdrawing from waterbody is not in compliance with a THM requirement. In making this determination, chlorophyll *a* values in excess of the criterion which are due to extreme hydrologic events (i.e., droughts and floods) will not be considered as an exceedance of the criterion.
- There is no more than one exceedance of a particular toxic pollutant criterion during the previous six years.
- The water quality criteria exceedance rate for conventional parameters is not more than 10% as determined using the binomial distribution function and Table 2. Conventional parameters include dissolved oxygen, pH, temperature (where influenced by a heated discharge), and turbidity.
- Bacteriological sample results from a single sample in excess of 200 colonies fecal coliform per 100 ml in non-coastal waters and in excess of 35 colonies enterococci per 100 ml in coastal waters will necessitate a follow-up collection of 5 samples during a 30 day period to calculate the geometric mean density. If the geometric mean fecal coliform density in non-coastal waters is less than or equal to 200 colonies/100 ml (June through September) or less than or equal to 1000 colonies/100ml (October through May) the waterbody will be considered fully meeting the bacteria criteria for this designated use. In coastal waters (June through September) the geometric mean enterococci density must be less than 35 colonies / 100 ml and 10% or less (as determined using the binomial distribution function and Table 2) of the single samples must be less than 158 colonies/100 ml (June through September) or less than 275 colonies/100 ml (October through May).

The PWS-classified waterbody is placed in Category 5 if any of the following are true:

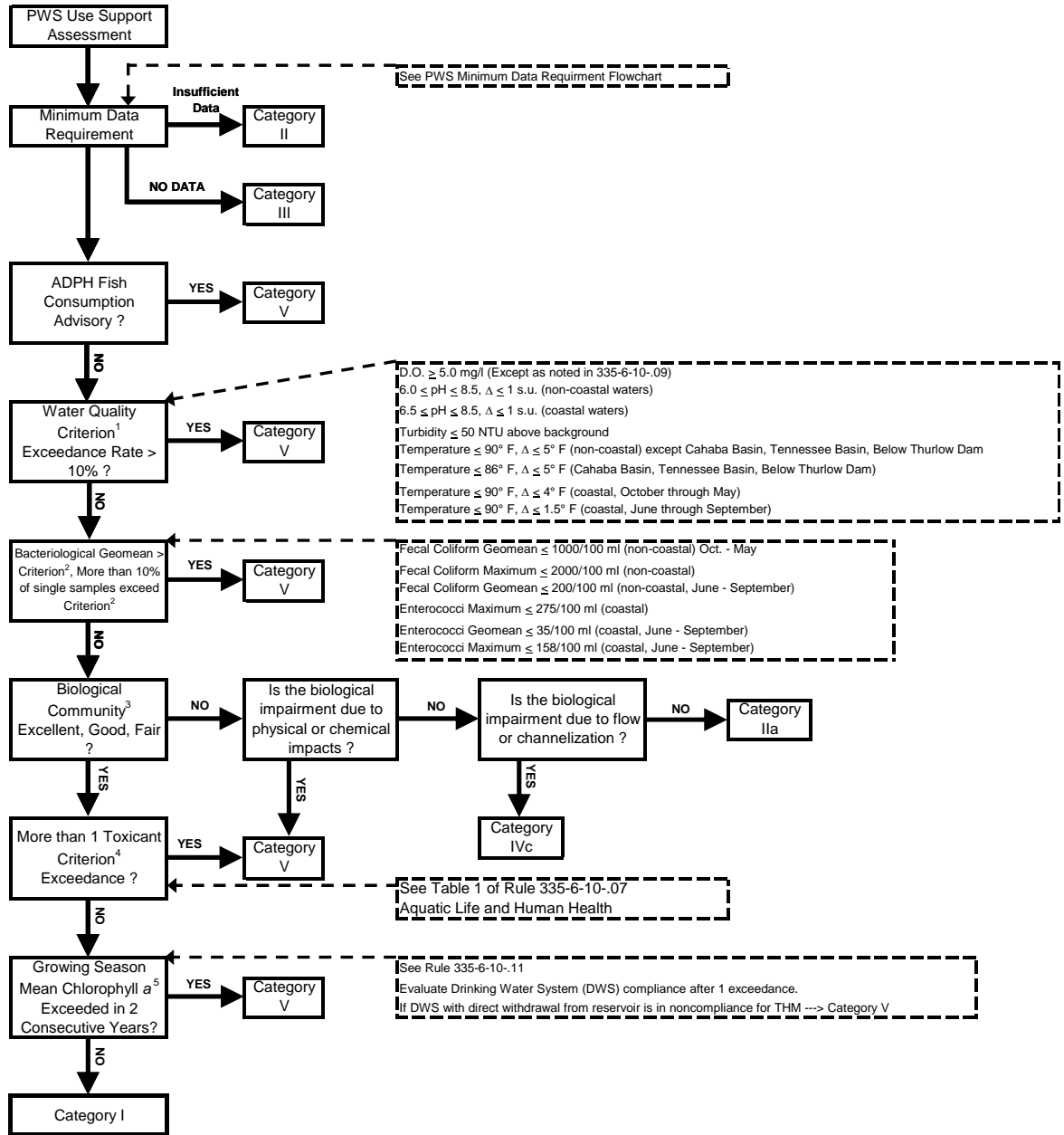
- There is a fish consumption advisory issued by the ADPH.
- The Level IV WMB-I assessment result is less than “fair”, or either of the Level III WMB-EPT assessments are less than “fair” or the Level III WMB-EPT assessment is less than “fair” and the fish community IBI is less than “fair”. In addition, a potential anthropogenic cause for the degraded condition must be identified using observations made during the sampling events or from information contained in the Department’s geographic information system. (Wadeable streams only)
- The water quality criteria exceedance rate for conventional parameters is more than 10% as defined in Table 2.
- There is more than one exceedance of a particular toxic pollutant criterion during the previous six years.
- In non-coastal waters the geometric mean fecal coliform density exceeded 200 colonies/100 ml in follow-up samples collected between June and September in response

to an exceedance of 200 colonies/100 ml in a single sample. During October through May the geometric mean fecal coliform density exceeded 1000 colonies/100ml. In coastal waters the enterococci geometric mean density exceeded 35 colonies/100 ml during June through September or more than 10% of the individual samples (as defined in Table 2) exceeded 158 colonies/100 ml or 275 colonies/100 ml during October through May.

- The growing season mean chlorophyll *a* criterion has been exceeded in two consecutive years or three times during the previous six years where such a criterion has been established or after one exceedance of the chlorophyll *a* criterion if a drinking water system is out of compliance with the THM requirement. In making this determination, chlorophyll *a* values in excess of the criterion which are due to extreme hydrologic events (i.e., droughts and floods) will not be considered as an exceedance of the criterion. However, one exceedance of the chlorophyll *a* criterion may be sufficient justification for inclusion of a water in Category 5 when the exceedance is determined to be result of increasing nutrient loading from anthropogenic sources. These determinations will be made on a case by case basis and the decision will be documented in the ADB.

**Figure 5** illustrates the assessment process for PWS waters.

**Figure 5**  
**Public Water Supply (PWS) Categorization Methodology**



1 Water Quality Criterion refers to pH, Dissolved Oxygen, turbidity, and temperature resulting from heat sources  
 2 Bacteriological Criterion refers to both the single sample maximum and geometric mean, see discussion in Section 4.2.2  
 3 Biological community refers to macroinvertebrates and/or fish in wadeable rivers/streams only (See Minimum Data Requirements)  
 4 Toxicant Criterion refers to toxics listed in 335-6-10-.07  
 5 Applies only to reservoirs with established Chlorophyll a criteria and not during extreme hydrologic events  
**Special Note** - Natural waters may, on occasion, have characteristics outside of the limits established by these criteria. These criteria relate to condition of waters as affected by the discharge of sewage, industrial wastes, or other wastes, not to conditions resulting from natural forces. See 335-6-10-.05(4)

4.3 Swimming and Other Whole Body Water-Contact Sports (S)

The best usage of waters assigned this classification is for swimming and other whole body water-contact sports. Waterbodies assigned the S use, under proper sanitary supervision by the controlling health authorities, will meet accepted standards of water quality for outdoor swimming places and will be considered satisfactory for swimming and other whole body water-contact sports. Beneficial uses encompassed within this classification include: aquatic life support and wildlife propagation, fish and shellfish harvesting and consumption, water contact recreation, agricultural irrigation, livestock watering and industrial cooling and process water supply.

4.3.1 Minimum Data Requirement for S Waters

For waters with the S classification the available data must have been collected consistent with the following standard operating procedures (SOP) manuals:

SOP#	Title
2040	Stream Flow Abbreviated Measurement Method
2041	SW Temperature Field Measurements
2042	SW pH Field Measurements
2043	SW Specific Conductivity Field Measurements
2044	SW Turbidity Field Measurements
2045	SW Dissolved Oxygen Field Measurements
2046	Photic Zone Measurements and Visibility Determinations
2048	Continuous SW Quality Monitoring Using Datasondes
2061	General SW Quality Sample Collection
2062	Dissolved Reactive Phosphorus (DRP) Collection & Field Processing
2063	Chlorophyll <i>a</i> Collection & Field Processing
2064	Fecal Coliform Sample Collection
2065	Sediment Sampling
9021	Quality Control Samples and Field Measurements
9025	Field Equipment Cleaning Procedures
9040	Station, Sample ID & Chain of Custody Procedures
6300	Physical Characterization
6301	Habitat Assessment

- ADEM SOP/QCA Manual Volume 2 – Aquatic Macroinvertebrate Assessment (2005)
- ADEM SOP/QCA Manual Volume 5 – Algal Growth Potential Testing (2004)

In addition, the data must have been collected within the last six years. The six year timeframe would capture all data collected by ADEM during one complete rotation of the five year monitoring schedule currently used by the Department. Failure to satisfy both of these conditions places the waterbody in Category 2. If these two conditions are met, the determination of the minimum data requirement is dependent upon the waterbody type. Waterbody types include wadeable rivers and streams, non-wadeable rivers and streams, reservoirs and reservoir embayments, and estuary and coastal waters. Failure to meet the minimum data requirement will place the waterbody in Category 2. The following list and **Figure 6** describe the minimum data requirement for assessing waters classified as S.

- Wadeable River or Stream
  - 1 Level IV Intensive Wadeable Multi-habitat Bioassessment (WMB-I) or 2 Level III Wadeable Multi-habitat Bioassessments – EPT Families (WMB-EPT) or 1 Level III WMB-EPT plus 1 fish community assessment (IBI). In addition,



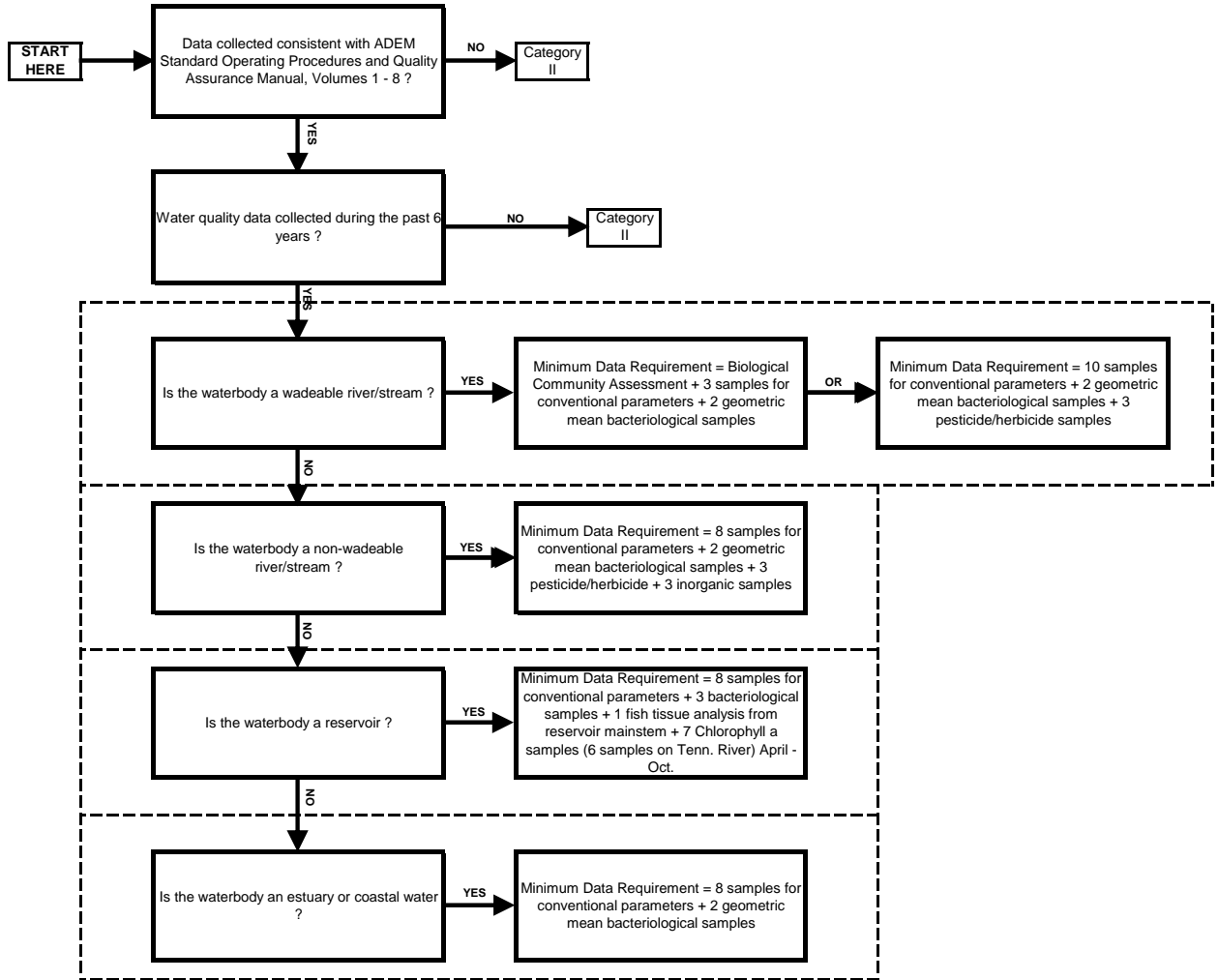
a habitat assessment must be completed with each biological assessment. Currently, metrics for the fish IBI have been calibrated only in the Black Warrior and Cahaba River basins.

- 3 conventional parameter samples (including samples for nutrient analysis)
- 10 bacteriological samples (2 geometric mean samples)

**OR**

- 8 conventional parameter samples (including samples for nutrient analysis)
  - 10 bacteriological samples (2 geometric mean samples)
  - 3 pesticide / herbicide samples
- Non-wadeable River or Stream
    - 8 conventional parameter samples (including samples for nutrient analysis)
    - 10 bacteriological samples (2 geometric mean samples)
    - 3 pesticide / herbicide samples
    - 3 inorganic samples
  - Reservoirs and Embayments
    - 8 conventional parameter samples (including samples for nutrient analysis)
    - 3 bacteriological samples
    - 1 fish tissue analysis from the reservoir mainstem
    - 7 chlorophyll a samples collected between April and October (For the Tennessee River Basin: 6 chlorophyll a samples collected between April and September)
  - Estuary or Coastal Waters
    - 8 conventional parameter samples (including samples for nutrient analysis)
    - 10 bacteriological samples (2 geometric mean samples)

**Figure 6**  
**Minimum Data Requirements for the S Designated Use**



**Biological community assessment means:**  
 1 Level IV Intensive Wadeable Multi-habitat Bioassessment (WMB-I) or  
 2 Level III Wadeable Multi-habitat Bioassessments – EPT Families (WMB-EPT) or  
 1 Level III WMB-EPT plus 1 fish community assessment (IB)

#### 4.3.2 Use Support Assessment for S Waters

Once the minimum data requirement has been met an assessment of the data can be completed resulting in the categorization of the waterbody as either fully supporting the S use (Category 1) or not fully supporting the S use (Category 5). The assessment process considers the available data and may include any fish consumption advisories, shellfish harvesting closure notices, chemical specific data, bacteriological data, biological community assessments, habitat assessments, periphyton assessments, beach closure notices and toxicity evaluations.

The S-classified waterbody is placed in Category 1 if all of the following are true:

- There is no fish/shellfish consumption advisory issued by the Alabama Department of Public Health (ADPH) for the waterbody.
- The Level IV WMB-I assessment result is “fair”, “good” or “excellent”, or at least one of the Level III WMB-EPT assessments is “fair”, “good” or “excellent” or the Level III WMB-EPT assessment is “fair”, “good” or “excellent” and the fish community IBI is “fair”, “good”, or “excellent”. (Wadeable streams only)
- There is no more than one exceedance of a particular toxic pollutant criterion during the previous six years.
- The water quality criteria exceedance rate for conventional parameters is not more than 10% as determined using the binomial distribution function and Table 2. Conventional parameters include dissolved oxygen, pH, temperature (where influenced by a heated discharge), and turbidity. Determination of the 10% exceedance rate is discussed in Section 4.8.
- Bacteriological sample results from a single sample in excess of 200 colonies fecal coliform per 100 ml will require a follow-up collection of 5 samples collected during a 30 day period to calculate the geometric mean fecal coliform density in reservoirs. If the geometric mean fecal coliform density is less than or equal to 200 colonies/100 ml the waterbody will be considered fully meeting the bacteria criteria for this designated use. In coastal waters designated as S the geometric mean of enterococci sample must be less than 35 colonies/100 ml and not more than 10% of the individual samples (as determined by the binomial distribution function and Table 2) can exceed 104 colonies/100 ml.
- The growing season mean chlorophyll *a* criterion has not been exceeded in two consecutive years where such a criterion has been established. In making this determination, chlorophyll *a* values in excess of the criterion which are due to extreme hydrologic events (i.e., droughts and floods) will not be considered as an exceedance of the criterion.

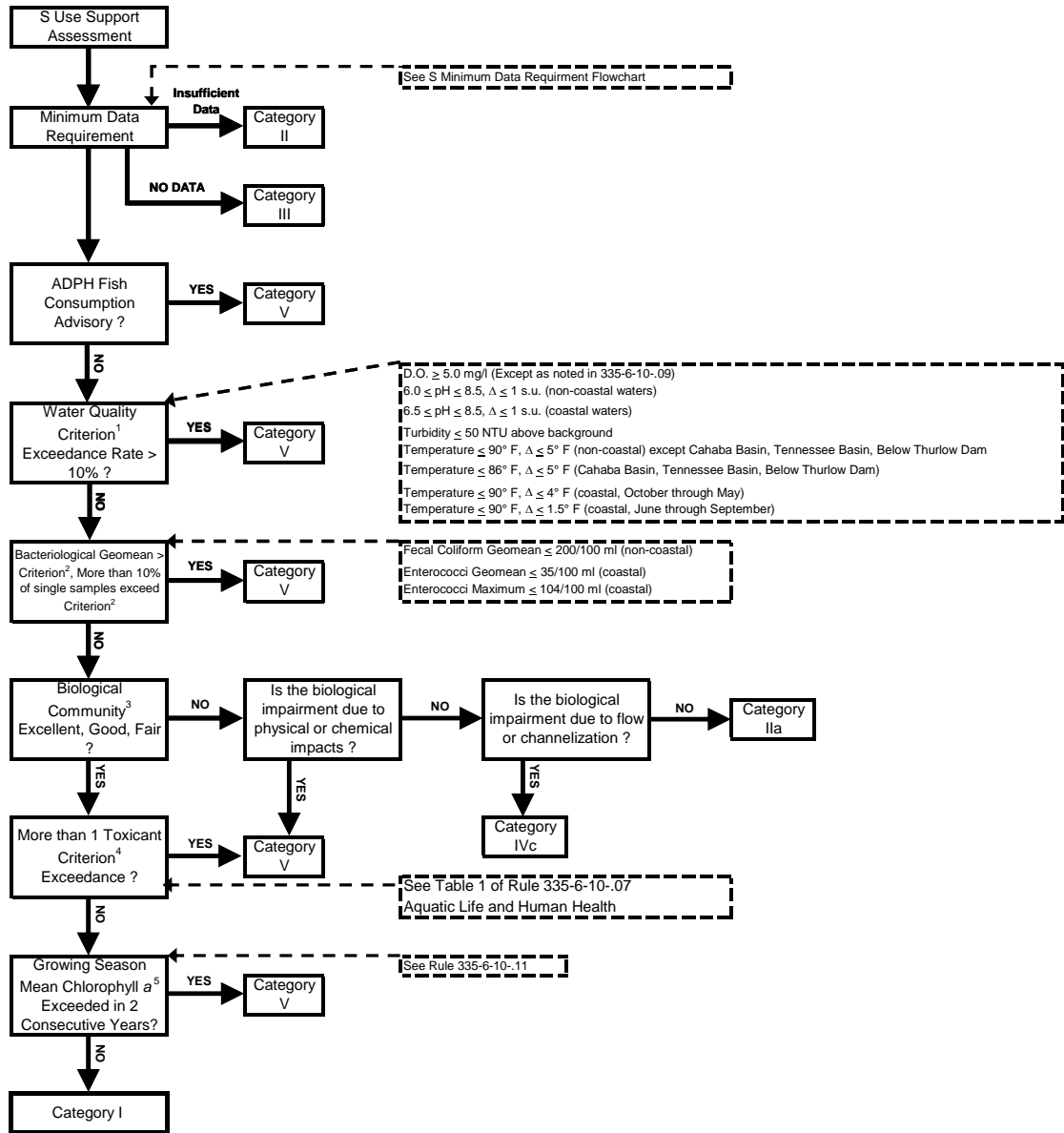
The S-classified waterbody is placed in Category 5 if any of the following are true:

- There is a fish consumption advisory issued by the ADPH.
- The Level IV WMB-I assessment result is less than “fair”, or both of the Level III WMB-EPT assessments are less than “fair” or the Level III WMB-EPT assessment is less than “fair” and the fish community IBI is less than “fair”. In addition, a potential anthropogenic cause for the degraded condition must be identified. (Wadeable streams only)
- The water quality criteria exceedance rate for conventional parameters is more than 10% as defined in Table 2.
- There is more than one exceedance of a particular toxic pollutant criterion during the previous six years.
- In reservoirs the geometric mean fecal coliform density exceeds 200 colonies/100 ml in follow-up samples collected in response to an exceedance of 200 colonies/100 ml in a single sample. In coastal waters designated as S the geometric mean of enterococci sample must be less than 35 colonies/100 ml and not more than 10% of the individual samples (as determined by the binomial distribution function and Table 2) can exceed 104 colonies/100 ml.
- For reservoirs with established chlorophyll *a* criteria, a criterion has been exceeded in two consecutive years or three times during the previous six years. In making this

determination, chlorophyll *a* values in excess of the criterion which are due to extreme hydrologic events (i.e., droughts and floods) will not be considered as an exceedance of the criterion. However, one exceedance of the chlorophyll *a* criterion may be sufficient justification for inclusion of a water in Category 5 when the exceedance is determined to be the result of increasing nutrient loading from anthropogenic sources. These determinations will be made on a case by case basis and the decision will be documented in the ADB.

**Figure 7** illustrates the assessment process for S waters.

**Figure 7**  
**Swimming and Other Whole Body Water-Contact Sports (S) Categorization Methodology**



1 Water Quality Criterion refers to pH, Dissolved Oxygen, turbidity, and temperature resulting from heat sources  
 2 Bacteriological Criterion refers to both the single sample maximum and geometric mean, see discussion in Section 4.3.2  
 3 Biological community refers to macroinvertebrates and/or fish in wadeable rivers/streams only (See Minimum Data Requirements)  
 4 Toxicant Criterion refers to toxics listed in 335-6-10-.07  
 5 Applies only to reservoirs with established Chlorophyll a criteria and not during extreme hydrologic events  
**Special Note** - Natural waters may, on occasion, have characteristics outside of the limits established by these criteria. These criteria relate to condition of waters as affected by the discharge of sewage, industrial wastes, or other wastes, not to conditions resulting from natural forces. See 335-6-10-.05(4)

4.4 Shellfish Harvesting (SH)

The best usage of waters assigned this classification is the propagation and harvesting of shellfish (oysters) for sale or for use as a food product. Waterbodies assigned the SH use will meet the sanitary and bacteriological standards included in the *National Shellfish Sanitation Program Model Ordinance, 1999, Chapter IV*, published by the Food and Drug Administration, U.S. Department of Health and Human Services and the requirements of the Alabama Department of Public Health. The waters will also be of a quality suitable for the propagation of fish and other aquatic life, including shrimp and crabs. Beneficial uses encompassed within this classification include: aquatic life support and wildlife propagation, fish and shellfish harvesting and consumption, water contact recreation, agricultural irrigation, livestock watering and industrial cooling and process water supply.

4.4.1 Minimum Data Requirement for SH Waters

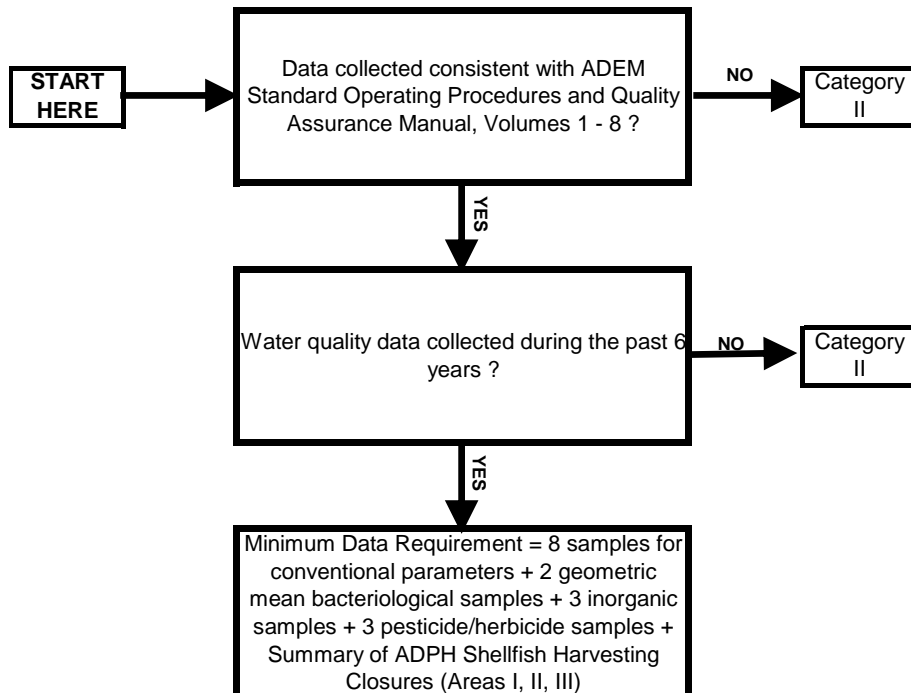
For waters with the SH classification the available data must have been collected consistent with the following standard operating procedures (SOP) manual:

SOP#	Title
2040	Stream Flow Abbreviated Measurement Method
2041	SW Temperature Field Measurements
2042	SW pH Field Measurements
2043	SW Specific Conductivity Field Measurements
2044	SW Turbidity Field Measurements
2045	SW Dissolved Oxygen Field Measurements
2046	Photic Zone Measurements and Visibility Determinations
2048	Continuous SW Quality Monitoring Using Datasondes
2061	General SW Quality Sample Collection
2062	Dissolved Reactive Phosphorus (DRP) Collection & Field Processing
2063	Chlorophyll_a Collection & Field Processing
2064	Fecal Coliform Sample Collection
2065	Sediment Sampling
9021	Quality Control Samples and Field Measurements
9025	Field Equipment Cleaning Procedures
9040	Station, Sample ID & Chain of Custody Procedures
6300	Physical Characterization
6301	Habitat Assessment

In addition, the data must have been collected within the last six years. The six year timeframe would capture all data collected by ADEM during one complete rotation of the five year monitoring schedule currently used by the Department. Failure to satisfy both of these conditions places the waterbody in Category 2. The following list and **Figure 8** describe the minimum data requirement for assessing waters classified as SH.

- 8 conventional parameter samples (including samples for nutrient analysis)
- 10 bacteriological samples (2 geometric mean samples)
- 3 inorganic samples
- 3 pesticide/herbicide samples
- Summary of ADPH shellfish harvesting closure notices for Areas I, II, and III

**Figure 8**  
**Minimum Data Requirements for the SH Designated Use**



#### 4.4.2 Use Support Assessment for SH Waters

Once the minimum data requirement has been met an assessment of the data can be completed resulting in the categorization of the waterbody as either fully supporting the SH use (Category 1) or not fully supporting the SH use (Category 5). The assessment process considers the available data and may include any fish consumption advisories, shellfish harvesting closure notices, chemical specific data, bacteriological data, and toxicity evaluations.

The SH-classified waterbody is placed in Category 1 if:

- There is no fish/shellfish consumption advisory issued by the Alabama Department of Public Health (ADPH) for the waterbody and the ADPH “conditionally approved” shellfish harvesting areas (Areas I, II, and III) are open at least 75% of the year;
- There is no more than one exceedance of a particular toxic pollutant criterion during the previous six years and;
- The water quality criteria exceedance rate for conventional parameters is not more than 10% as determined using the binomial distribution function for the sample sizes shown in Table 2. Conventional parameters include dissolved oxygen, pH, temperature (where influenced by a heated discharge), and turbidity. Determination of the 10% exceedance rate is discussed in Section 4.8.
- The geometric mean of 5 fecal coliform samples collected during a 30-day period must be less than or equal to 14 colonies/100 ml and no more than 10% of the samples can exceed 43 colonies/100 ml. In addition, during June through September the geometric mean enterococci density must be less than 35 colonies/100 ml and 10% or less (as determined using the binomial distribution function and Table 2) of the single samples must be less than 104 colonies/100 ml.

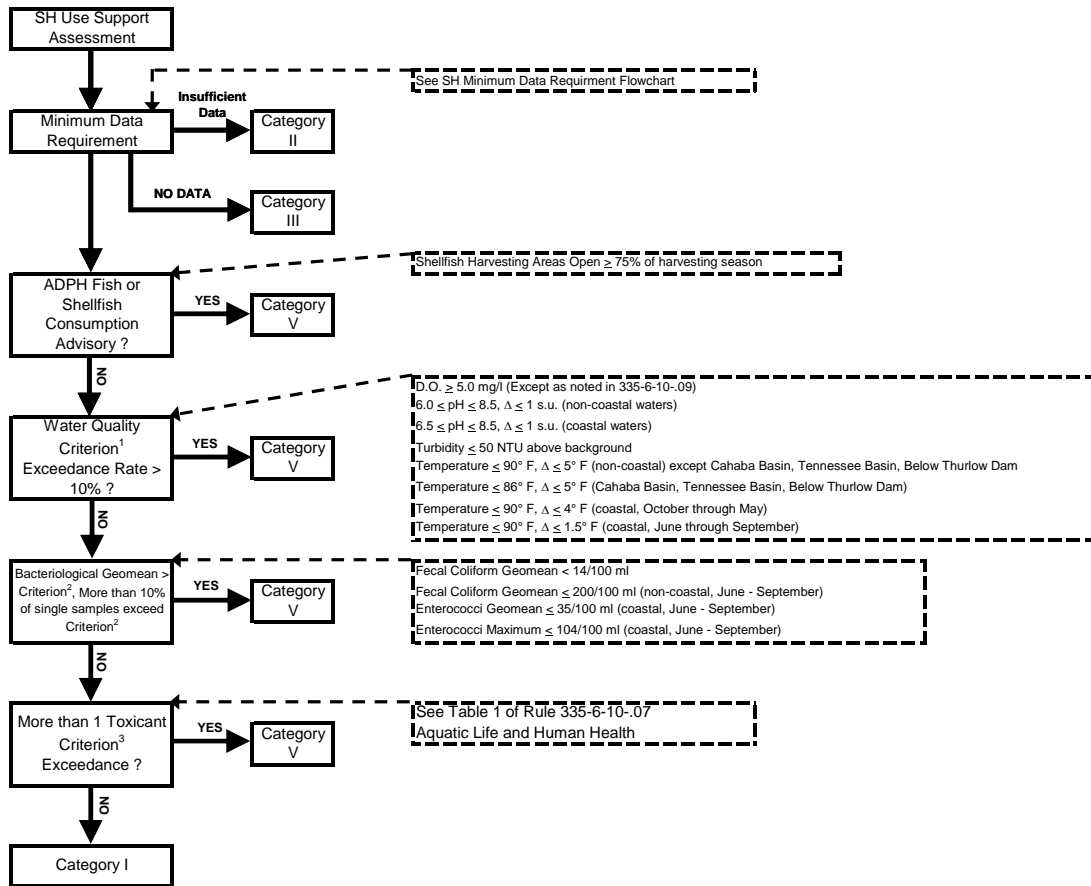
The SH-classified waterbody is placed in Category 5 if:

- There is a fish consumption advisory issued by the ADPH or a designated shellfish harvesting area (Area I, II, or III) is closed by ADPH more than 25% of the days during the year or;
- The water quality criteria exceedance rate for conventional parameters is more than 10% as determined using the binomial distribution function for the sample sizes shown in Table 2 or;
- The geometric mean of 5 fecal coliform samples collected during a 30-day period is greater than 14 colonies/100 ml or more than 10% of the samples exceed 43 colonies/100 ml. In addition, during June through September the geometric mean enterococci density is greater than 35 colonies/100 ml and more than 10% (as determined using the binomial distribution function and Table 2) of the single samples are greater than 104 colonies/100 ml.
- There is more than one exceedance of a particular toxic pollutant criterion during the previous six years.

**Figure 9** illustrates the assessment process for SH waters.



**Figure 9**  
**Shellfish Harvesting (SH) Categorization Methodology**



1 Water Quality Criterion refers to pH, Dissolved Oxygen, turbidity, and temperature resulting from heat sources

2 Bacteriological Criterion refers to both the single sample maximum and geometric mean

3 Toxicant Criterion refers to toxics listed in 335-6-10-.07

**Special Note** - Natural waters may, on occasion, have characteristics outside of the limits established by these criteria. These criteria relate to condition of waters as affected by the discharge of sewage, industrial wastes, or other wastes, not to conditions resulting from natural forces. See 335-6-10-.05(4)

4.5 Fish and Wildlife (F&W)

The best usage of waters assigned this classification includes fishing, the propagation of fish, aquatic life, and wildlife, and any other usage except swimming and water-contact sports or as a source of water supply for drinking or food-processing purposes. Waterbodies assigned the F&W classification will be suitable for fish, aquatic life and wildlife propagation. The quality of salt and estuarine waters to which this classification is assigned will also be suitable for the propagation of shrimp and crabs. In addition, it is recognized that these waters may be used for incidental water contact and recreation during June through September, except in the vicinity of wastewater discharges or other conditions beyond the control of the ADPH. These waters will, under proper sanitary supervision by the controlling health authorities, meet accepted standards of water quality for outdoor swimming places and will be considered satisfactory for swimming and other whole body water-contact sports during the months of June through September.

4.5.1 Minimum Data Requirement for F&W Waters

For waters with the F&W classification the available data must have been collected consistent with the following standard operating procedures (SOP) manuals:

SOP#	Title
2040	Stream Flow Abbreviated Measurement Method
2041	SW Temperature Field Measurements
2042	SW pH Field Measurements
2043	SW Specific Conductivity Field Measurements
2044	SW Turbidity Field Measurements
2045	SW Dissolved Oxygen Field Measurements
2046	Photic Zone Measurements and Visibility Determinations
2048	Continuous SW Quality Monitoring Using Datasondes
2061	General SW Quality Sample Collection
2062	Dissolved Reactive Phosphorus (DRP) Collection & Field Processing
2063	Chlorophyll_a Collection & Field Processing
2064	Fecal Coliform Sample Collection
2065	Sediment Sampling
9021	Quality Control Samples and Field Measurements
9025	Field Equipment Cleaning Procedures
9040	Station, Sample ID & Chain of Custody Procedures
6300	Physical Characterization
6301	Habitat Assessment

- ADEM SOP/QCA Manual Volume 2 – Aquatic Macroinvertebrate Assessment (2005)
- ADEM SOP/QCA Manual Volume 5 – Algal Growth Potential Testing (2004)

In addition, the data must have been collected within the last six years. The six year timeframe would capture all data collected by ADEM during one complete rotation of the five year monitoring schedule currently used by the Department. Failure to satisfy both of these conditions places the waterbody in Category 2. If these two conditions are met, the determination of the minimum data requirement is dependent upon the waterbody type. Waterbody types include wadeable rivers and streams, non-wadeable rivers and streams, reservoirs and reservoir embayments, and estuary and coastal waters. Failure to meet the minimum data requirement will place the waterbody in Category 2. The following list and **Figure 10** describe the minimum data requirement for assessing waters classified as F&W.

- Wadeable River or Stream

- 1 Level IV Intensive Wadeable Multi-habitat Bioassessment (WMB-I) or 2 Level III Wadeable Multi-habitat Bioassessments – EPT Families (WMB-EPT) or 1 Level III WMB-EPT plus 1 fish community assessment (IBI). In addition, a habitat assessment must be completed with each biological assessment. Currently, metrics for the fish IBI have been calibrated only in the Black Warrior and Cahaba River basins.
- 3 conventional parameter samples (including samples for nutrient analysis)
- 3 bacteriological samples

**OR**

- 8 conventional parameter samples (including samples for nutrient analysis)
  - 10 bacteriological samples (2 geometric mean samples)
  - 5 pesticide / herbicide samples
  - 5 inorganic samples
- Non-wadeable River or Stream
    - 8 conventional parameter samples (including samples for nutrient analysis)
    - 10 bacteriological samples (2 geometric mean samples)
    - 5 pesticide / herbicide samples
    - 5 inorganic samples

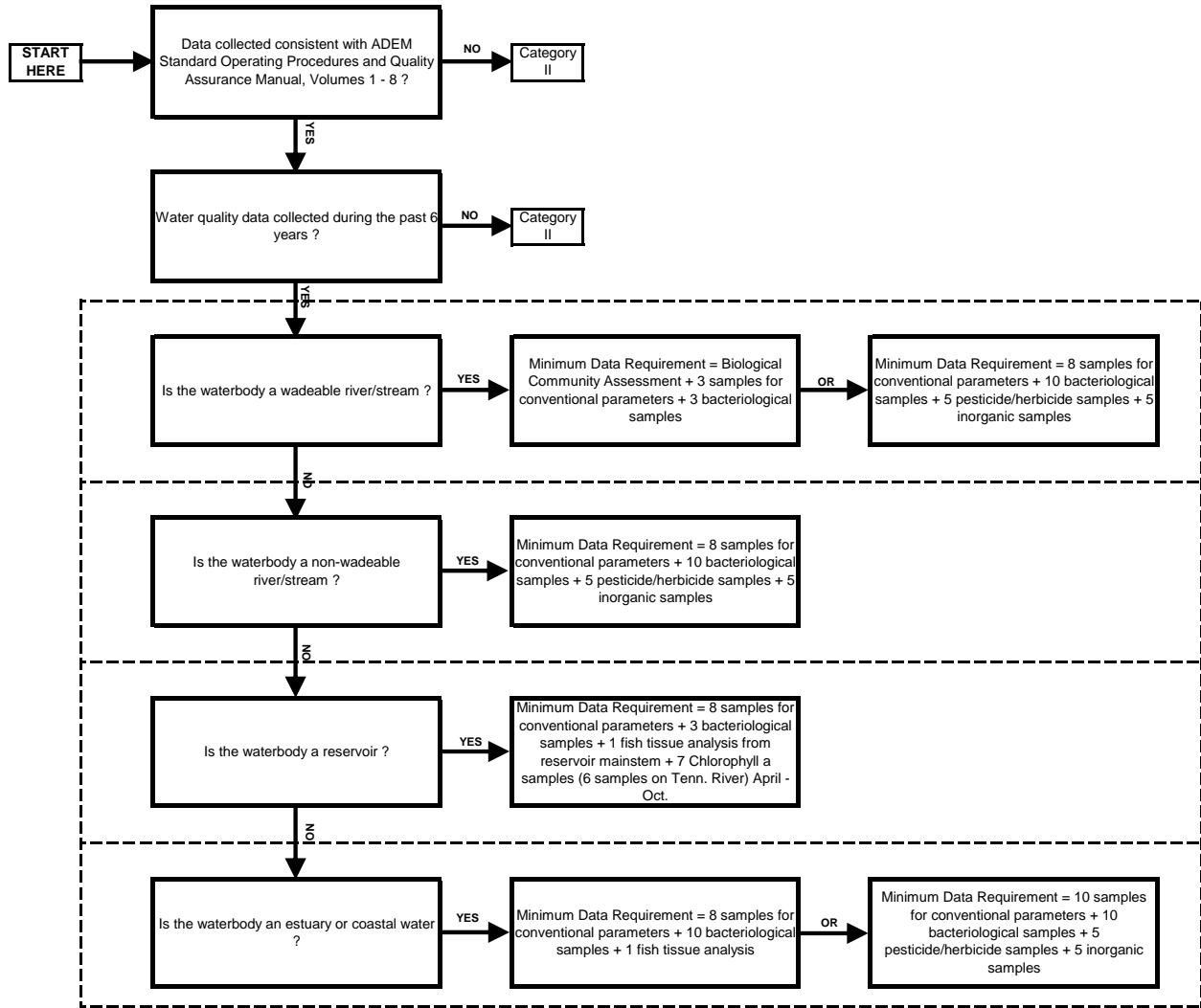
Reservoirs and Embayments

- 8 conventional parameter samples (including samples for nutrient analysis)
  - 3 bacteriological samples
  - 1 fish tissue analysis from the reservoir mainstem
  - 7 chlorophyll *a* samples collected between April and October (For the Tennessee River Basin: 6 chlorophyll *a* samples collected between April and September)
- Estuary or Coastal Waters
    - 8 conventional parameter samples (including samples for nutrient analysis)
    - 10 bacteriological samples (2 geometric mean samples)
    - 1 fish tissue analysis

**OR**

- 8 conventional parameter samples (including samples for nutrient analysis)
- 10 bacteriological samples (2 geometric mean samples)
- 5 pesticide/herbicide samples
- 5 inorganic samples

**Figure 10**  
**Minimum Data Requirements for the F&W Designated Use**



**Biological community assessment means:**  
 1 Level IV Intensive Wadeable Multi-habitat Bioassessment (WMB-I) or  
 2 Level III Wadeable Multi-habitat Bioassessments – EPT Families (WMB-EPT) or  
 1 Level III WMB-EPT plus 1 fish community assessment (IBI)

#### 4.5.2 Use Support Assessment for F&W Waters

Once the minimum data requirement has been met an assessment of the data can be completed resulting in the categorization of the waterbody as either fully supporting the F&W use (Category 1) or not fully supporting the F&W use (Category 5). The assessment process considers the available data and may include any fish consumption advisories, chemical specific data, biological community assessments, bacteriological data, beach closure notices and toxicity evaluations.

The F&W-classified waterbody is placed in Category 1 if all of the following are true:

- There is no fish consumption advisory issued by the Alabama Department of Public Health (ADPH) for the waterbody.
- There are no more than two exceedances of a particular toxic pollutant criterion during the previous six years.
- The Level IV WMB-I assessment result is “fair”, “good” or “excellent”, or either of the Level III WMB-EPT assessments are “fair”, “good” or “excellent” or the Level III WMB-EPT assessment is “fair”, “good” or “excellent” and the fish community IBI is “fair”, “good”, or “excellent”. (Wadeable streams only)
- For reservoirs with established chlorophyll *a* criteria, a criterion has not been exceeded in two consecutive years. In making this determination, chlorophyll *a* values in excess of the criterion which are due to extreme hydrologic events (i.e., droughts and floods) will not be considered as an exceedance of the criterion.
- The water quality criteria exceedance rate for conventional parameters is not more than 10%. Conventional parameters include dissolved oxygen, pH, temperature (where influenced by a heated discharge), and turbidity. Determination of the 10% exceedance rate is discussed in Section 4.8.
- In reservoirs and wadeable streams with biological assessments, bacteriological sample results from a single sample in excess of 200 colonies fecal coliform per 100 ml in non-coastal waters and in excess of 35 colonies enterococci per 100 ml in coastal waters will necessitate a follow-up collection of 5 samples during a 30 day period to calculate the geometric mean density. If the geometric mean fecal coliform density in non-coastal waters is less than or equal to 200 colonies/100 ml (June through September) or less than or equal to 1000 colonies/100ml (October through May) and 10%, as defined in Table 2, or less of the single samples results are less than 2000 colonies/100 ml, the waterbody will be considered fully meeting the bacteria criteria for this designated use. In coastal waters (June through September) the geometric mean enterococci density must be less than 35 colonies / 100 ml and 10% or less (as determined using the binomial distribution function and Table 2) of the single samples must be less than 158 colonies/100 ml (June through September) or less than 275 colonies/100 ml (October through May). Use of the 10% rule will only be applied when there is at least the minimum number of samples.

The F&W-classified waterbody is placed in Category 5 if any of the following are true:

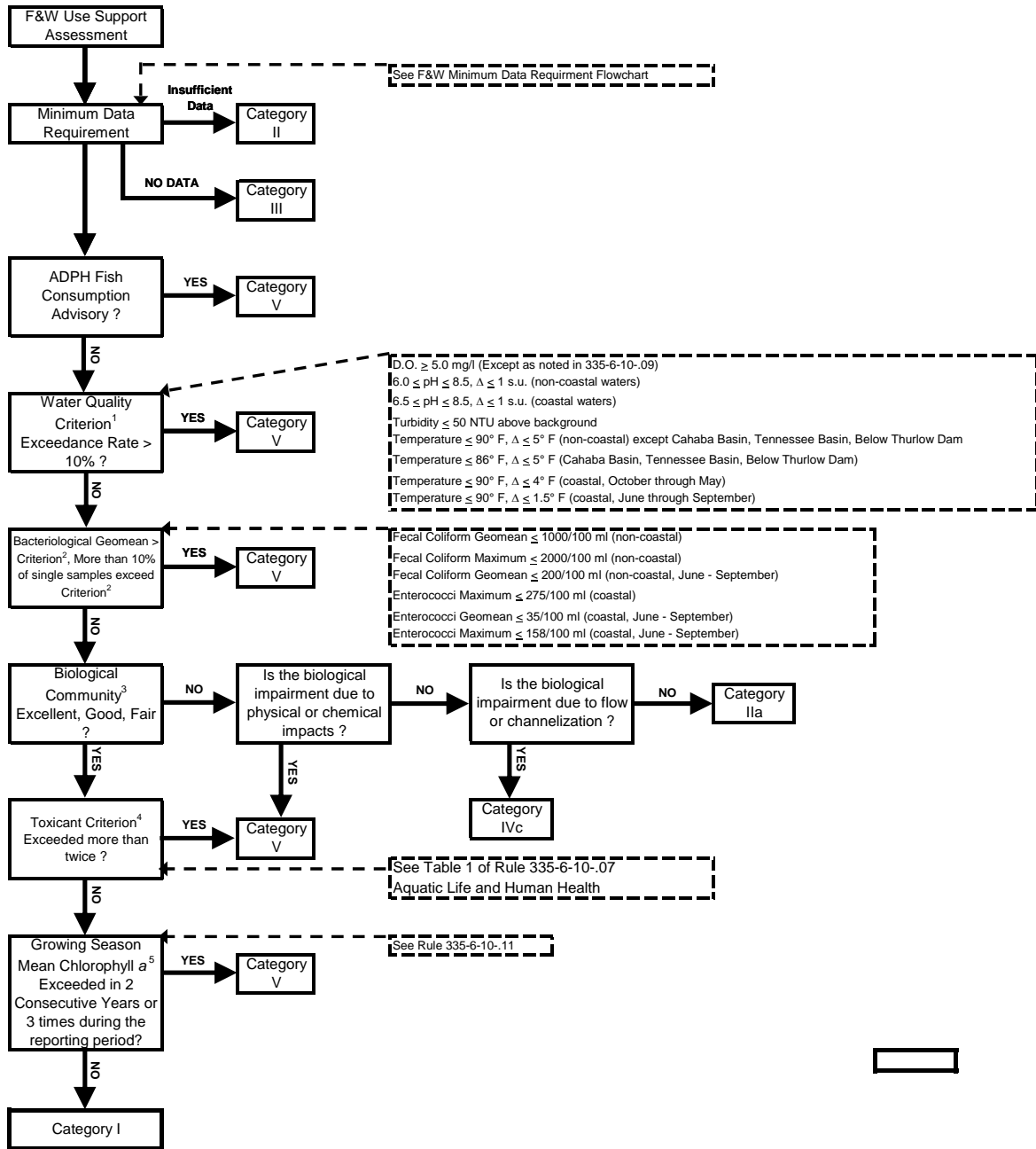
- There is a fish consumption advisory issued by the ADPH.
- The water quality criteria exceedance rate for conventional parameters is more than 10% as defined in Table 2.
- The Level IV WMB-I assessment result is less than “fair”, or both of the Level III WMB-EPT assessments are less than “fair” or the Level III WMB-EPT assessment is less than “fair” and the fish community IBI is less than “fair”. In addition, a potential anthropogenic cause for the degraded condition must be identified. (Wadeable streams only)
- The geometric mean fecal coliform density in non-coastal waters is greater than 200 colonies/100 ml (June through September) or more than 1000 colonies/100ml (October through May) and or more than 10% of the single samples results are greater than 2000 colonies/100 ml. In coastal waters (June through September) the geometric mean enterococci density is greater than 35 colonies / 100 ml and more than 10% (as determined using the binomial distribution function and Table 2) of the single samples is

greater than 158 colonies/100 ml (June through September) or more than 275 colonies/100 ml (October through May). Use of the 10% rule will only be applied to data sets containing at least the minimum number of samples.

- There are more than two exceedances of a particular toxic pollutant criterion during the previous six years.
- For reservoirs with established chlorophyll *a* criteria, a criterion has been exceeded in two consecutive years or three times during the previous six years. In making this determination, chlorophyll *a* values in excess of the criterion which are due to extreme hydrologic events (i.e., droughts and floods) will not be considered as an exceedance of the criterion. However, one exceedance of the chlorophyll *a* criterion may be sufficient justification for inclusion of a water in Category 5 when the exceedance is determined to be the result of increasing nutrient loading from anthropogenic sources. These determinations will be made on a case by case basis and the decision will be documented in the ADB.

**Figure 11** illustrates the assessment process for F&W waters.

**Figure 11**  
**Fish and Wildlife (F&W) Categorization Methodology**



1 Water Quality Criterion refers to pH, Dissolved Oxygen, turbidity, and temperature resulting from heat sources  
 2 Bacteriological Criterion refers to both the single sample maximum and geometric mean, see discussion in Section 4.5.2  
 3 Biological community refers to macroinvertebrates and/or fish in wadeable rivers/streams only (See Minimum Data Requirements)  
 4 Toxicant Criterion refers to toxics listed in 335-6-10-07  
 5 Applies only to reservoirs with established Chlorophyll a criteria and not during extreme hydrologic events  
**Special Note** - Natural waters may, on occasion, have characteristics outside of the limits established by these criteria. These criteria relate to condition of waters as affected by the discharge of sewage, industrial wastes, or other wastes, not to conditions resulting from natural forces. See 335-6-10-05(4)

4.6 Limited Warmwater Fishery (LWF)

For the months of December through April the best usage of waters assigned this classification includes fishing, the propagation of fish, aquatic life, and wildlife, and any other usage except swimming and water-contact sports or as a source of water supply for drinking or food-processing purposes. Waterbodies assigned the LWF classification will be suitable for fish, aquatic life and wildlife propagation except during the months of May through November. During May through November the quality of waters to which this classification is assigned will be suitable for agricultural irrigation, livestock watering, industrial cooling and process water supplies, and any other usage, except fishing, bathing, recreational activities, including water-contact sports, or as a source of water supply for drinking or food-processing purposes.

4.6.1 Minimum Data Requirement for LWF Waters

For waters with the LWF classification the available data must have been collected consistent with the following standard operating procedures (SOP) manuals:

SOP#	Title
2040	Stream Flow Abbreviated Measurement Method
2041	SW Temperature Field Measurements
2042	SW pH Field Measurements
2043	SW Specific Conductivity Field Measurements
2044	SW Turbidity Field Measurements
2045	SW Dissolved Oxygen Field Measurements
2046	Photic Zone Measurements and Visibility Determinations
2048	Continuous SW Quality Monitoring Using Datasondes
2061	General SW Quality Sample Collection
2062	Dissolved Reactive Phosphorus (DRP) Collection & Field Processing
2063	Chlorophyll_a Collection & Field Processing
2064	Fecal Coliform Sample Collection
2065	Sediment Sampling
9021	Quality Control Samples and Field Measurements
9025	Field Equipment Cleaning Procedures
9040	Station, Sample ID & Chain of Custody Procedures
6300	Physical Characterization
6301	Habitat Assessment

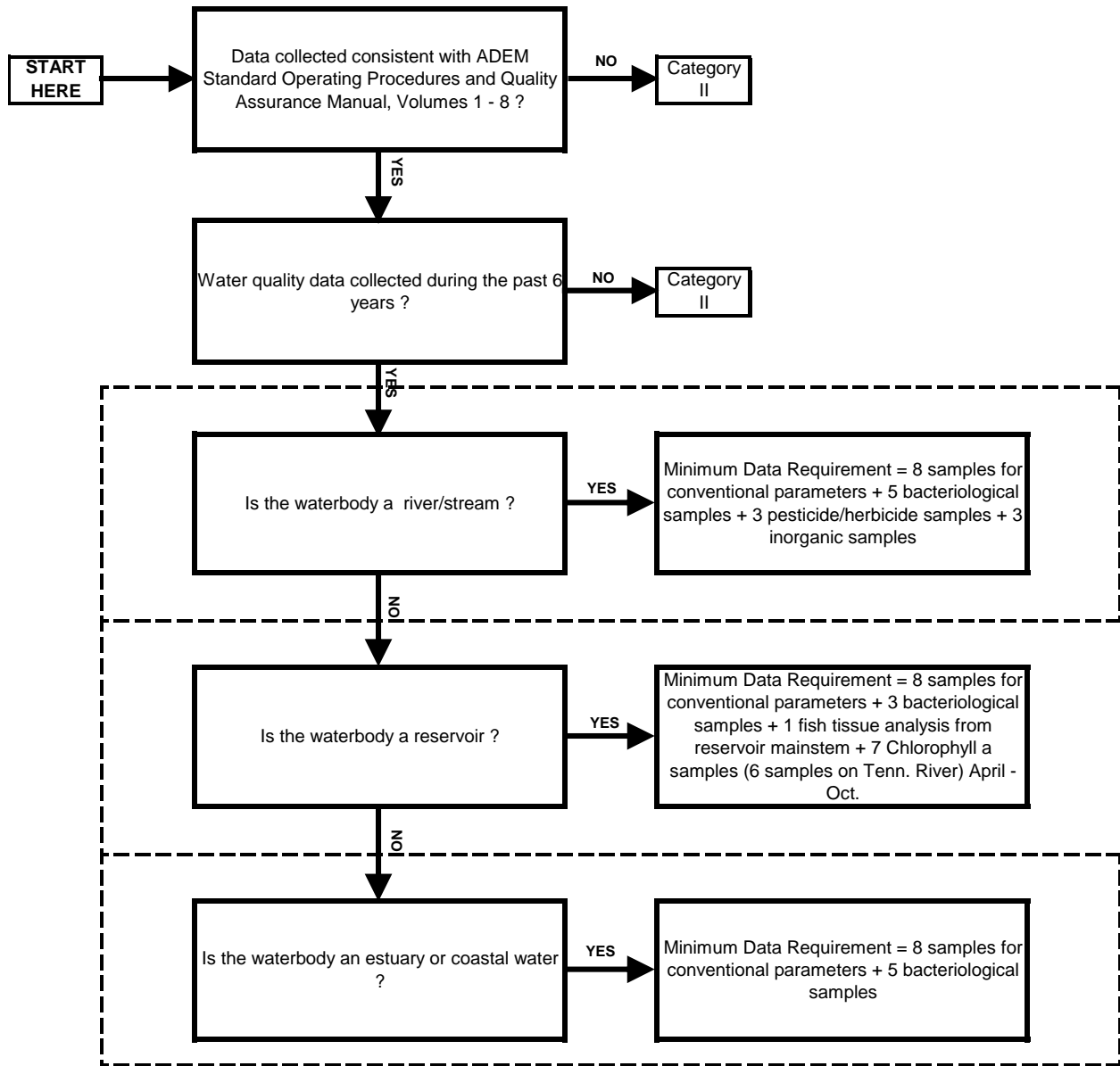
must have been collected within the last six years. The six year timeframe would capture all data collected by ADEM during one complete rotation of the five year monitoring schedule currently used by the Department. Failure to satisfy both of these conditions places the waterbody in Category 2. If these two conditions are met, the determination of the minimum data requirement is dependent upon the waterbody type. Waterbody types include rivers and streams, reservoirs and reservoir embayments, and estuary and coastal waters. Failure to meet the minimum data requirement will place the waterbody in Category 2. The following list and **Figure 12** describe the minimum data requirements for assessing waters classified as LWF.

- River or Stream (Wadeable and Non-wadeable)
  - 8 conventional parameter samples (including samples for nutrient analysis)
  - 5 bacteriological samples (1 geometric mean sample)
  - 3 pesticide / herbicide samples
  - 3 inorganic samples
  
- Reservoirs and Embayments
  - 8 conventional parameter samples (including samples for nutrient analysis)



- 3 bacteriological samples
  - 1 fish tissue analysis from the reservoir mainstem
  - 7 chlorophyll a samples collected between April and October (For the Tennessee River Basin: 6 chlorophyll a samples collected between April and September)
- Estuary or Coastal Waters
    - 8 conventional parameter samples (including samples for nutrient analysis)
    - 5 bacteriological samples (1 geometric mean sample)

**Figure 12**  
**Minimum Data Requirements for the LWF Designated Use**



#### 4.6.2 Use Support Assessment for LWF Waters

Once the minimum data requirement has been met an assessment of the data can be completed resulting in the categorization of the waterbody as either fully supporting the LWF use (Category 1) or not fully supporting the LWF use (Category 5). The assessment process considers the available data and may include any fish consumption advisories, chemical specific data, biological community assessments, bacteriological data, beach closure notices and toxicity evaluations.

The LWF-classified waterbody is placed in Category 1 if all of the following are true:

- There is no fish consumption advisory issued by the Alabama Department of Public Health (ADPH) for the waterbody.
- There is no more than one exceedance of a toxic pollutant acute criterion (May through November) during the previous six years. There is no more than one exceedance of a particular toxic pollutant chronic criterion (December through April) during the previous six years.
- For reservoirs with established chlorophyll *a* criteria, a criterion has not been exceeded in two consecutive years. In making this determination, chlorophyll *a* values in excess of the criterion which are due to extreme hydrologic events (i.e., droughts and floods) will not be considered as an exceedance of the criterion.
- The water quality criteria exceedance rate for conventional parameters is not more than 10%. Conventional parameters include dissolved oxygen, pH, temperature (where influenced by a heated discharge), and turbidity. Determination of the 10% exceedance rate is discussed in Section 4.8.
- In reservoirs, bacteriological sample results from a single sample in excess of 1000 colonies fecal coliform per 100 ml will necessitate a follow-up collection of 5 samples during a 30 day period to calculate the geometric mean density. If the geometric mean fecal coliform density is less than or equal to 1000 colonies/100 ml and 10% or less of the single sample results are less than 2000 fecal coliform colonies/100 ml, the waterbody will be considered fully meeting the bacteria criteria for this designated use. In coastal waters 10% or less (as determined using the binomial distribution function and Table 2) of the single samples must be less than 275 enterococci colonies/100 ml. In non-coastal rivers and streams the geometric mean fecal coliform density is less than 1000 colonies/100 ml and 10% (as defined in Table 2) or less of the single sample results are less than or equal to 2000 fecal coliform colonies/100 ml. Use of the 10% rule will only be applied when there is at least the minimum number of samples.

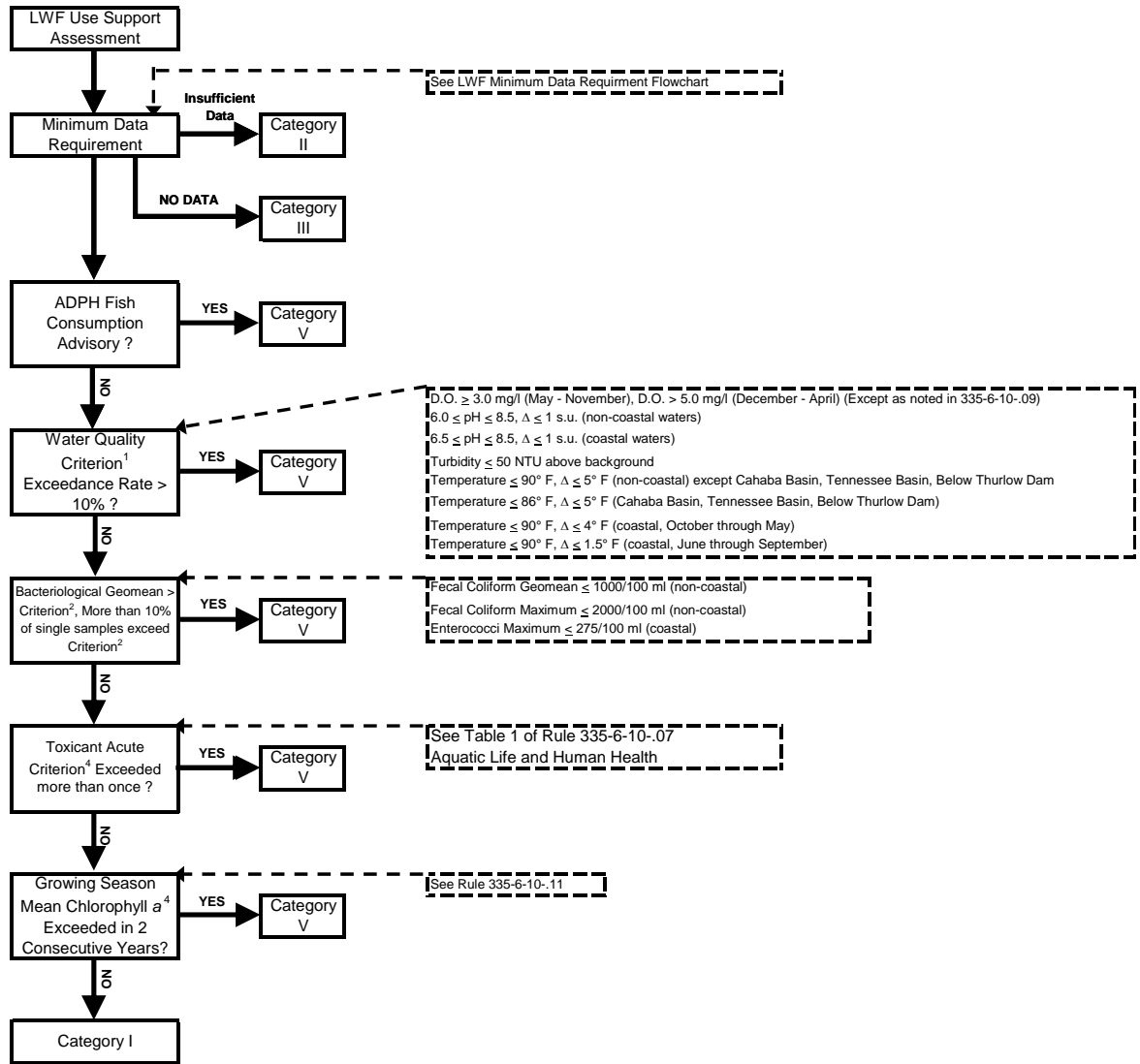
The LWF-classified waterbody is placed in Category 5 if any of the following are true:

- There is a fish consumption advisory issued by the ADPH.
- The water quality criteria exceedance rate for conventional parameters is more than 10%.
- The geometric mean fecal coliform density is greater than 1000 colonies/100 ml or more than 10% of the single sample results are greater than 2000 fecal coliform colonies/100 ml. In coastal waters more than 10% (as determined using the binomial distribution function and Table 2) of the single samples are greater than 275 enterococci colonies/100 ml. Use of the 10% rule will only be applied when there is at least the minimum number of samples.
- There are two or more exceedances of a particular toxic pollutant acute criterion (May through November) during the previous six years. There are two or more exceedances of a particular toxic pollutant chronic criterion (December through April) during the previous six years.
- For reservoirs with established chlorophyll *a* criteria, a criterion has been exceeded in two consecutive years. In making this determination, chlorophyll *a* values in excess of the criterion which are due to extreme hydrologic events (i.e., droughts and floods) will not be considered as an exceedance of the criterion.

**Figure 13** illustrates the assessment process for LWF waters.



**Figure 13**  
**Limited Warmwater Fishery (LWF) Categorization Methodology**



1 Water Quality Criterion refers to pH, Dissolved Oxygen, turbidity, and temperature resulting from heat sources

2 Bacteriological Criterion refers to both the single sample maximum and geometric mean, see discussion in Section 4.6.2

3 Toxicant Criterion refers to toxics listed in 335-6-10-.07

4 Applies only to reservoirs with established Chlorophyll a criteria and not during extreme hydrologic events

**Special Note** - Natural waters may, on occasion, have characteristics outside of the limits established by these criteria. These criteria relate to condition of waters as affected by the discharge of sewage, industrial wastes, or other wastes, not to conditions resulting from natural forces. See 335-6-10-.05(4)

4.7 Agricultural and Industrial Water Supply (A&I)

Best usage of waters assigned this classification include agricultural irrigation, livestock watering, industrial cooling and process water supplies, and any other usage, except fishing, bathing, recreational activities, including water-contact sports, or as a source of water supply for drinking or food-processing purposes. The waters, except for the natural impurities that may be present, will be suitable for agricultural irrigation, livestock watering, industrial cooling waters, and fish survival. The waters will be usable after special treatment, as may be needed under each particular circumstance, for industrial process water supplies. This classification includes watercourses in which natural flow is intermittent and non-existent during droughts and which may, of necessity, receive treated waste from existing municipalities and industries, both now and in the future.

4.7.1 Minimum Data Requirement for A&I Waters

For waters with the A&I classification the available data must have been collected consistent with the following standard operating procedures (SOP) manuals:

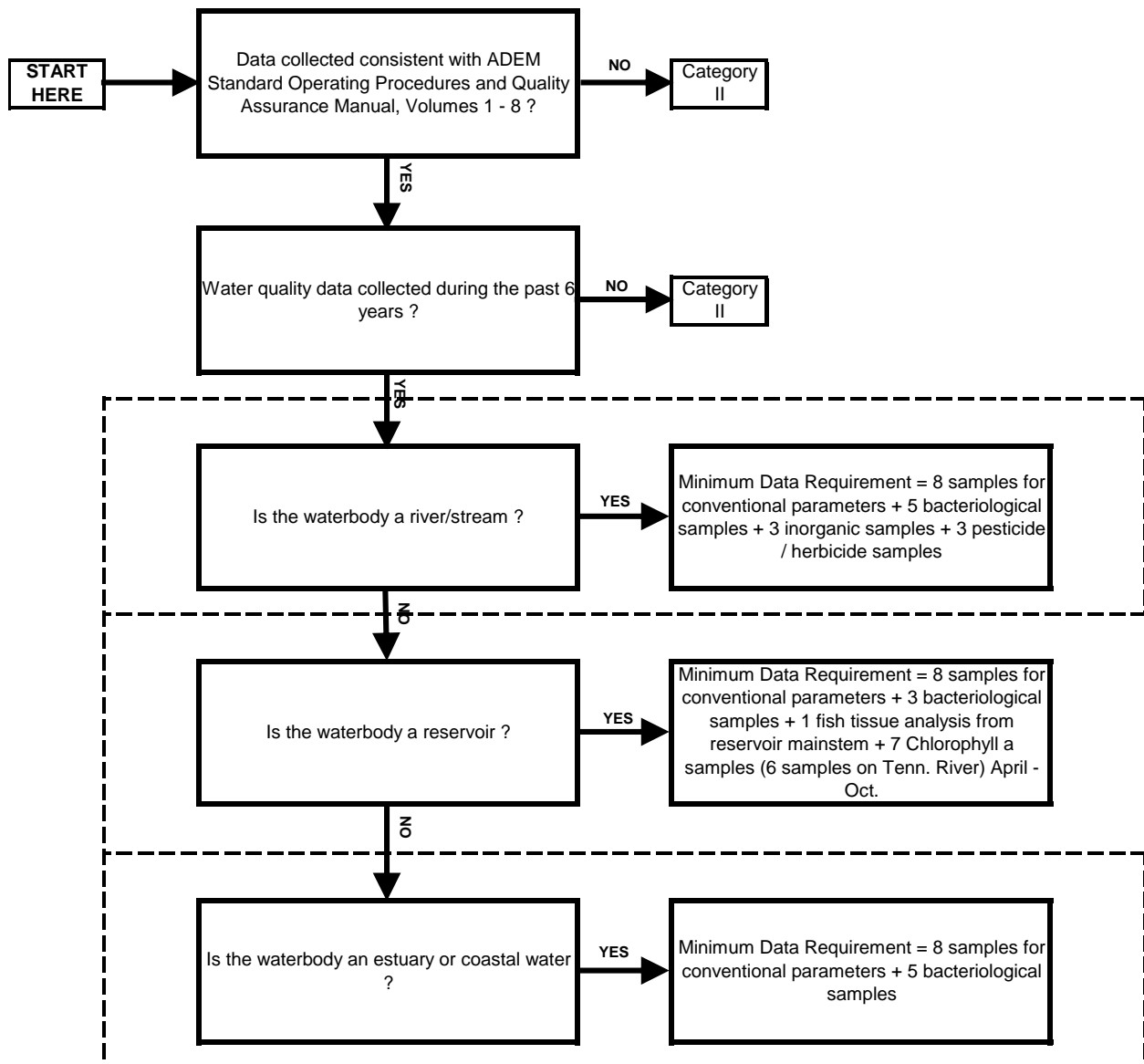
SOP#	Title
2040	Stream Flow Abbreviated Measurement Method
2041	SW Temperature Field Measurements
2042	SW pH Field Measurements
2043	SW Specific Conductivity Field Measurements
2044	SW Turbidity Field Measurements
2045	SW Dissolved Oxygen Field Measurements
2046	Photic Zone Measurements and Visibility Determinations
2048	Continuous SW Quality Monitoring Using Datasondes
2061	General SW Quality Sample Collection
2062	Dissolved Reactive Phosphorus (DRP) Collection & Field Processing
2063	Chlorophyll_a Collection & Field Processing
2064	Fecal Coliform Sample Collection
2065	Sediment Sampling
9021	Quality Control Samples and Field Measurements
9025	Field Equipment Cleaning Procedures
9040	Station, Sample ID & Chain of Custody Procedures
6300	Physical Characterization
6301	Habitat Assessment

a must have been collected within the last six years. The six year timeframe would capture all data collected by ADEM during one complete rotation of the five year monitoring schedule currently used by the Department. Failure to satisfy both of these conditions places the waterbody in Category 2. If these two conditions are met, the determination of the minimum data requirement is dependent upon the waterbody type. Waterbody types include wadeable rivers and streams, non-wadeable rivers and streams, reservoirs and reservoir embayments, and estuary and coastal waters. Failure to meet the minimum data requirement will place the waterbody in Category 2. The following list and **Figure 14** describe the minimum data requirement for assessing waters classified as A&I.

- River or Stream
  - 8 conventional parameter samples (including samples for nutrient analysis)
  - 5 bacteriological samples (1 geometric mean sample)
  - 3 inorganic samples
  - 3 pesticide / herbicide samples

- Reservoirs and Embayments
  - 8 conventional parameter samples (including samples for nutrient analysis)
  - 3 bacteriological samples
  - 1 fish tissue analysis from the reservoir mainstem
  - 7 chlorophyll *a* samples collected between April and October (For the Tennessee River Basin: 6 chlorophyll *a* samples collected between April and September)
  
- Estuary or Coastal Waters
  - 8 conventional parameter samples (including samples for nutrient analysis)
  - 5 bacteriological samples (1 geometric mean sample)

**Figure 14**  
**Minimum Data Requirements for the A&I Designated Use**



#### 4.7.2 Use Support Assessment for A&I Waters

Once the minimum data requirement has been met an assessment of the data can be completed resulting in the categorization of the waterbody as either fully supporting the A&I use (Category 1) or not fully supporting the A&I use (Category 5). The assessment process considers the available data and may include any fish consumption advisories, chemical specific data, biological community assessments, bacteriological data, beach closure notices and toxicity evaluations.

The A&I-classified waterbody is placed in Category 1 if all of the following are true:

- There is no fish consumption advisory issued by the Alabama Department of Public Health (ADPH) for the waterbody.
- There are no more than two exceedances of a toxic pollutant acute criterion during the previous six years.
- For reservoirs with established chlorophyll *a* criteria, a criterion has not been exceeded in two consecutive years. In making this determination, chlorophyll *a* values in excess of the criterion which are due to extreme hydrologic events (i.e., droughts and floods) will not be considered as an exceedance of the criterion.
- The water quality criteria exceedance rate for conventional parameters is not more than 10%. Conventional parameters include dissolved oxygen, pH, temperature (where influenced by a heated discharge), and turbidity. Determination of the 10% exceedance rate is discussed in Section 4.8.
- In reservoirs, bacteriological sample results from a single sample in excess of 2000 colonies fecal coliform per 100 ml will necessitate a follow-up collection of 5 samples during a 30 day period to calculate the geometric mean density. If the geometric mean fecal coliform density is less than or equal to 2000 colonies/100 ml and 10% or less of the single sample results are less than 4000 fecal coliform colonies/100 ml, the waterbody will be considered fully meeting the bacteria criteria for this designated use. In coastal waters 10% or less (as determined using the binomial distribution function and Table 2) of the single samples must be less than 500 enterococci colonies/100 ml. In non-coastal rivers and streams the geometric mean fecal coliform density is less than 2000 colonies/100 ml and 10% or less of the single samples have a fecal coliform density of less than or equal to 4000 colonies/100 ml. Use of the 10% rule will only be applied when there is at least the minimum number of samples.

The A&I-classified waterbody is placed in Category 5 if any of the following are true:

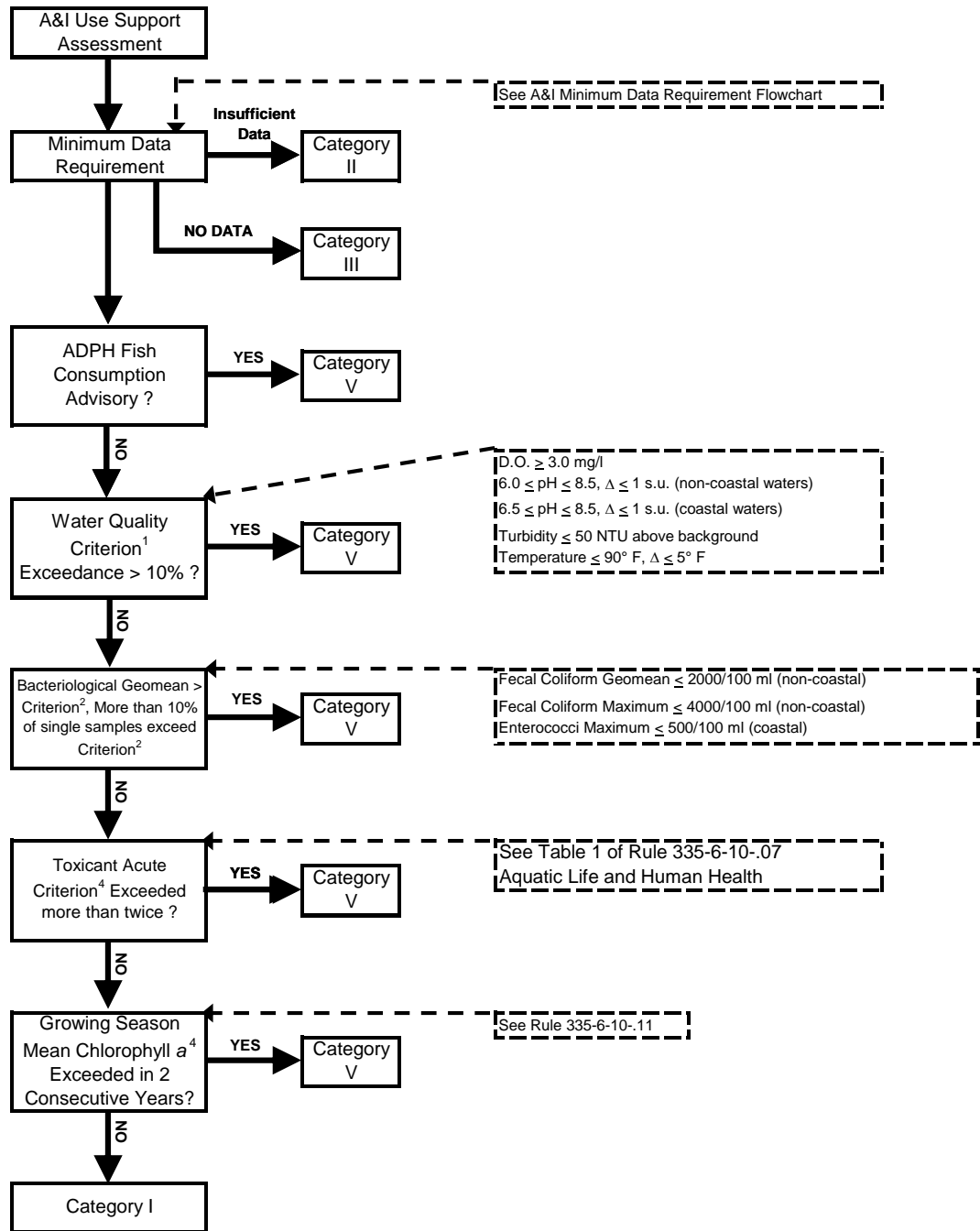
- There is a fish consumption advisory issued by the ADPH.
- The water quality criteria exceedance rate for conventional parameters is more than 10% (as defined in Table 2).
- The geometric mean fecal coliform density is greater than 2000 colonies/100 ml or more than 10% (as defined in Table 2) of the single sample results are greater than 4000 fecal coliform colonies/100 ml. In coastal waters more than 10% (as determined using the binomial distribution function and Table 2) of the single samples are more than 500 enterococci colonies/100 ml. In non-coastal rivers and streams the geometric mean fecal coliform density is greater than 2000 colonies/100 ml and more than 10% of the single samples have a fecal coliform density of greater than 4000 colonies/100 ml. Use of the 10% rule will only be applied when there is at least the minimum number of samples.
- There are more than two exceedances of an acute criterion for a toxic pollutant during the previous six years.
- For reservoirs with established chlorophyll *a* criteria, a criterion has been exceeded in two consecutive years or three times during the the previous six years. In making this determination, chlorophyll *a* values in excess of the criterion which are due to extreme hydrologic events (i.e., droughts and floods) will not be considered as an exceedance of the criterion. However, one exceedance of the chlorophyll *a* criterion may be sufficient justification for inclusion of a water in Category 5 when the exceedance is determined to be the result of increasing nutrient loading from anthropogenic sources. These



determinations will be made on a case by case basis and the decision will be documented in the ADB.

**Figure 15** illustrates the assessment process for A&I waters.

**Figure 15**  
**Agricultural and Industrial Water Supply (A&I) Categorization Methodology**



1 Water Quality Criterion refers to pH, Dissolved Oxygen, turbidity, and temperature resulting from heat sources

2 Bacteriological Criterion refers to both the single sample maximum and geometric mean, see discussion in Section 4.7.2

3 Toxicant Criterion refers to toxics listed in 335-6-10-.07

4 Applies only to reservoirs with established Chlorophyll a criteria and not during extreme hydrologic events

**Special Note** - Natural waters may, on occasion, have characteristics outside of the limits established by these criteria. These criteria relate to condition of waters as affected by the discharge of sewage, industrial wastes, or other wastes, not to conditions resulting from natural forces. See 335-6-10-.05(4)

## 4.8 Other Data considerations and Requirements

### 4.8.1 Use of the 10% Rule

Seasonal variation in water quality conditions, non-anthropogenic impacts (natural conditions), sampling frequency and number of samples collected, and the temporal and spatial sampling coverage of the waterbody must be considered when evaluating water quality data to determine whether a waterbody is fully supporting its designated uses. Most states, including Alabama, determine a waterbody's use support status based on the percent of measured values exceeding a given water quality criterion. Based on USEPA guidance, 10 percent is commonly used as the maximum percent of measurements that may exceed the criterion for waters fully supporting their designated uses. For any given set of samples the percent exceedance indicated by the number of samples which exceed a given criterion is only an estimate of the true percent exceedance for the waterbody segment. As a result, it is important that a level of confidence be assigned to the estimate of percent exceedance for a given set of samples.

Hypothesis testing can be used to make this estimate. When making a decision about whether a water should be included in Category 5 on the basis of data for conventional pollutants, the null hypothesis is that the water is not impaired and sufficient data must be collected to minimize the probability that this assumption is incorrect (Type I error). For the purpose of this methodology, a 90% confidence level will be used so that we can say for a given sample size with a given number of criterion exceedances we are 90% confident that the true exceedance percentage is greater than 0.1 (10%). Using the binomial distribution it is possible to determine the number of exceedances out of a given number of samples which will result in a greater than 10 percent exceedance rate at approximately the 90% confidence level. This is the number of exceedances need to reject the null hypothesis.

When making a decision about whether a water in Category 5 should be removed to Category 1 for a particular conventional pollutant, the null hypothesis is that the water is impaired and sufficient data must be collected to minimize the probability that this assumption is incorrect. Again, a 90% confidence level will be used in the binomial distribution function to estimate the number of samples required to be 90% confident that the water is truly not impaired.

### 4.8.2 Use of Data Older than Six Years

More recent data shall take precedence over older data if:

The newer data indicate a change in water quality and the change is related to changes in pollutant loading to the watershed or improved pollution control mechanisms in the watershed contributing to the assessed area. Or, the Department determines that the older data do not meet the data quality requirements of this methodology or are no longer representative of the water quality of the segment.

Data older than six years will generally not be considered valid, for the purpose of initially placing a water in Category 1 or Category 5. Data older than six years may be used to demonstrate that a waterbody was placed in the wrong category (Category 1 or Category 5) when the original water quality assessment was completed. Also, data older than six years may be used if the data was not considered during a previous reporting cycle and there is evidence that conditions affecting water quality have not changed since the original data was collected. Waters will not be removed from Category 5 on the basis of age of data. However, water may be removed from Category 1 to Category 2 on the basis of age of data when there is evidence that water quality conditions are likely to have changed since the water was originally placed in Category 1.

### 4.8.3 Use of Accurate Location Data

Accurate location data is required to ensure the appropriate use classification is applied, as well as confirming that sampling stations are located outside of regulatory mixing zones where water quality criteria do not apply. The monitoring data is acceptable if the locations are correct to within 200 feet. Digital spatial data (GIS or GPS) or latitude/longitude information obtained from USGS 7.5 minute quadrangle maps are acceptable methods of providing location information.

#### 4.8.4 Use of Temporally Independent Samples and Data from Continuous Monitoring

When relying solely upon chemical data to determine designated use support, at least ten temporally independent samples of chemical and physical conditions obtained during a time period that includes conditions considered critical for the particular pollutant of interest are needed. Independent samples, for the purpose of parameters other than bacteria and in-situ water quality measurements, will have been collected at least four days apart. Samples collected at the same location less than four days apart shall be considered as one sample for the purpose of determining compliance with toxic pollutant criteria, with the mean value used to represent the sampling period.

For conventional parameters measured using continuous monitoring instruments such as multi-probe datasondes, compliance with the applicable criteria will be determined at the regulatory depth established for dissolved oxygen measurements. This depth is five feet in water that is ten feet or more in total depth or is at mid-depth in water that is less than ten feet in total depth. Hourly measurements of dissolved oxygen, temperature, and pH data collected using continuous monitoring equipment will be assessed using the same binomial distribution function used for discrete sampling of these parameters. When measurements are made more frequently than hourly, the hourly values will be calculated as the mean of the measured values within each hour.

#### 4.8.5 Use of Fish / Shellfish Consumption Advisories and Shellfish Growing Area Classifications

In October 2000 EPA issued guidance to states regarding the use of fish and shellfish consumption advisories (EPA, 2000). The guidance recommended that states consider certain information when determining if designated uses were impaired, including consumption advisories for fish and shellfish and certain shellfish growing area classifications. The following is an excerpt from the EPA guidance.

*“Certain shellfish growing area classifications should be used as part of determinations of attainment of water quality standards and listing of impaired waterbodies. Shellfish growing area classifications are developed by the National Shellfish Sanitation Program (NSSP) using water column and tissue data (where available), and information from sanitary surveys of the contributing watershed, to protect public health. The States review these NSSP classifications every three years. There are certain NSSP classifications that are not appropriate to consider, and certain data and information that should not be considered independently of the classification (unless the data and information were not used in the development or review of the classification). These instances are: “Prohibited” classifications set as a precautionary measure due to the proximity of wastewater treatment discharges, or absence of a required sanitary survey; shellfish tissue pathogen data (which can fluctuate based on short-term conditions not representative of general water quality); or short-term actions to place growing areas in the closed status.”*

The ADPH, Seafood Program, regulates shellfish harvesting in coastal waters of Alabama. The ADPH has designated four areas in Mobile Bay and adjacent coastal waters and classifies shellfish harvesting waters within these areas as “conditionally open”, “conditionally restricted”, “unclassified”, and “prohibited”. Area I waters comprise most of Mobile Bay south of East Fowl River and west of Bon Secour Bay and including Mississippi Sound. Area II waters include Grand Bay and Portersville Bay with exceptions near wastewater discharges. Area III waters are

located in Bon Secour Bay and east of a line drawn from Fort Morgan to Mullet Point. Area IV is located in approximately the northern half of Mobile Bay.

Most of the waters designated as Shellfish Harvesting are classified as “conditionally open”. These harvesting areas are closed when the river stage on the Mobile River at Bucks, Alabama reaches a river stage of 8.0 feet above mean sea level and a public notice announcing the closure is published. These procedures are described in detail in the Conditional Area Management Plan developed by ADPH (ADPH, 2001).

For purposes of making use support decisions relative to the SH designated use, the Department will consider the shellfish harvesting closure notices in waters classified as “conditionally open” in Areas I, II, and III. When the shellfish harvesting waters are closed for more than 25% of the year, the area will be included in Category 5. In Area IV and in “prohibited”, “conditionally restricted”, and “unclassified” waters the Department will use water column bacteria sampling results to determine use support. When the applicable bacteria criterion is exceeded in more than 10% of the samples as determined using the binomial distribution function and Table 2, these waters will be included in Category 5.

The October 2000 EPA guidance concerning the use of fish and shellfish consumption advisories for protection of human health also recommended that state’s include waters in Category 5 when there was a consumption advisory which suggested either limited consumption or no consumption of fish due to the presence of toxics in fish tissue. The following is an excerpt from the guidance.

*“When deciding whether to identify a water as impaired, States, Territories, and authorized Tribes need to determine whether there are impairments of designated uses and narrative criteria, as well as the numeric criteria. Although the CWA does not explicitly direct the use of fish and shellfish consumption advisories or NSSP classifications to determine attainment of water quality standards, States, Territories, and authorized Tribes are required to consider all existing and readily available data and information to identify impaired waterbodies on their section 303(d) lists. For purposes of determining whether a waterbody is impaired and should be included on a section 303(d) list, EPA considers a fish or shellfish consumption advisory, a NSSP classification, and the supporting data, to be existing and readily available data and information that demonstrates non-attainment of a section 101(a) “fishable” use when:*

- 1. the advisory is based on fish and shellfish tissue data,*
- 2. a lower than “Approved” NSSP classification is based on water column and shellfish tissue data (and this is not a precautionary “Prohibited” classification or the state water quality standard does not identify lower than “Approved” as attainment of the standard)*
- 3. the data are collected from the specific waterbody in question and*
- 4. the risk assessment parameters (e.g., toxicity, risk level, exposure duration and consumption rate) of the advisory or classification are cumulatively equal to or less protective than those in the State, Territory, or authorized Tribal water quality standards.”*

This listing and assessment methodology will consider fish consumption advisories issued by the ADPH as an indication of impaired use. However, there may be circumstances under which these waters could be placed in a category other than Category 5. For example, it may be appropriate to place certain waters in Category 4b when activities are ongoing under another restoration program with the goal of restoring the water to fully supporting its uses. These decisions will be made on a case by case basis and documented in the ADB.

#### 4.8.6 Use of Biological Assessments

Biological assessments compare data from biological surveys and other direct measurements of resident biota in surface waters to established biological criteria and assess the waterbody’s degree of use support. Alabama has not established numeric biological criteria (except in the case of

chlorophyll *a* in reservoirs) and, as a result, biological data are used as a means of applying narrative criteria contained in Alabama's water quality criteria document (ADEM Administrative Code Chapter 335-6-10). ADEM has been gathering biological assessment data for streams across Alabama since the 1970s. In the early 1990's the Department began assessing the biological health of wadeable streams using the USEPA Rapid Bioassessment Protocol (Level III Wadeable Multi-habitat Bioassessments – EPT Families (WMB-EPT)) and the Intensive Wadeable Multi-habitat Bioassessment (Level IV Intensive Wadeable Multi-habitat Bioassessment (WMB-I)). USEPA has offered the following technical considerations when using biological data to make use support determinations.

- A waterbody's use support should be based on a comparison of site-specific biological data to a reference condition established for the ecoregion in which the waterbody is located.
- A multimetric approach to bioassessment is recommended.
- The use of a standardized index or sampling period is recommended.
- Standard operation procedures and a quality assurance program should be established.
- A determination of the performance characteristics of the bioassessment methodology is suggested.
- An identification of the appropriate number of sampling sites that are representative of the waterbody is also recommended.

Biological assessment data will be used in combination with other surface water quality data or information to arrive at an overall use support determination. However, EPA recommends that biological data should be weighted more heavily than other types of data when integrating information to make use support determinations since biological data provide a more direct indication of the condition of the aquatic community. Alabama's assessment methodology has weighted biological data more heavily by requiring at least one biological assessment for certain use classifications and stream types and by reducing the number of water quality samples needed when a biological assessment is available. However, the biological assessment must include a habitat assessment conducted at the time of the biological sampling. When available, periphyton assessment data and algal growth potential tests results will be used to refine stressor identification.

In this methodology, several bioassessment methodologies can be used to assess aquatic life use support. Two Level III Wadeable Multi-habitat Bioassessments – EPT Families (WMB-EPT) are required since these assessments are intended for screening purposes only. A combination of one WMB-EPT assessment and one fish IBI assessment is sufficient but only in the Cahaba and Black Warrior River basins since the metric ranges for the fish IBI have been calibrated only to the Cahaba and Black Warrior River basins. Alternatively, one Level IV Intensive Wadeable Multi-habitat Bioassessment (WMB-I) would be sufficient for assessing aquatic life use support. These methodologies are described in detail in the Department's SOPs referenced earlier. Occasionally it may be appropriate to place a water in Category 5 based on a single screening level assessment (WMB-EPT) when there is a clear indication of impairment and the cause is readily apparent. These decisions will be made on a case by case basis in consultation with the biologist(s) responsible for conducting the assessment and will be documented in the ADB.

#### 4.8.7 Use of Data Collected by Others

Data collected by other agencies, industry or industry groups, and watershed groups will be considered and evaluated provided the data meet the minimum data requirements specified for each designated use and comply with the quality control and quality assurance requirements discussed in Section 4.9. Examples of other agencies and groups collecting water quality data in Alabama include, but are not limited to, the following agencies and groups:

- USGS
- USEPA
- Tennessee Valley Authority
- National Oceanic and Atmospheric Administration
- United States Fish and Wildlife Service

- Mobile Bay National Estuary Program
- Dauphin Island Sea Lab
- Geological Survey of Alabama
- Natural Resources Conservation Service
- Soil and Water Conservation Districts
- Alabama Department of Conservation and Natural Resources
- Alabama Clean Water Partnership
- Alabama Department of Public Health
- Alabama Department of Transportation
- Citizen and Watershed Groups
- Industries and municipalities conducting river monitoring pursuant to NPDES or CWA Section 401 requirements

Data submitted by third parties for consideration should include documentation describing the data, including a study plan or SOP, and certification that the data were (or were not) collected consistent with the requirements presented in this methodology.

#### 4.8.8 Use of Bacteria Data

Waterbody segments are sampled for bacteria either as part of a special study, routine ambient monitoring, or as part of the Department's Beach Monitoring Program. Bacteria of the fecal coliform group are currently used as indicators of the possible presence of pathogens in non-coastal waters. In coastal waters, bacteria of the enterococci group are used as indicators of the possible presence of pathogens. Alabama's bacteria criteria are summarized for each designated use in **Table 1**.

**Table 1**  
**Alabama's Bacteria Criteria**

<b>Outstanding Alabama Water (OAW)</b>	<b>Public Water Supply (PWS)</b>	<b>Swimming and Other Whole Body Water-Contact Sports (S)</b>	<b>Shellfish Harvesting (SH)</b>	<b>Fish and Wildlife (F&amp;W)</b>	<b>Limited Warmwater Fishery (LWF)</b>	<b>Agricultural and Industrial Water Supply (A&amp;I)</b>
<b>Coastal Waters:</b> Enterococci - Geometric mean $\leq 35$ Single Max. $\leq 104$ <b>Non-coastal Waters:</b> Fecal Coliform – Geometric mean $\leq 200$	<b>Coastal Waters:</b> Enterococci – June through Sept. Geometric mean $\leq 35$ Single Max. $\leq 158$ Enterococci – Oct. through May Single Max. $\leq 275$ <b>Non-coastal Waters:</b> Fecal Coliform – June through Sept. Geometric mean $\leq 200$ Oct. through May Geometric mean $\leq 1000$ Single Max. $\leq 2000$	<b>Coastal Waters:</b> Enterococci - Geometric mean $< 35$ Single Max. $< 104$ <b>Non-coastal Waters:</b> Fecal Coliform – Geometric mean $< 200$	<b>Coastal Waters:</b> Not to exceed FDA limits <sup>1</sup> for fecal coliform bacteria  Enterococci – June through Sept. Geometric mean $\leq 35$ Single Max. $\leq 104$ <b>Non-coastal Waters:</b> Fecal Coliform – June through Sept. Geometric mean $\leq 200$	<b>Coastal Waters:</b> Enterococci – June through Sept. Geometric mean $\leq 35$ Single Max. $\leq 158$ Enterococci – Oct. through May Single Max. $\leq 275$ <b>Non-coastal Waters:</b> Fecal Coliform – June through Sept. Geometric mean $\leq 200$ Oct. through May Geometric mean $\leq 1000$ Single Max. $\leq 2000$	<b>Coastal Waters:</b> Enterococci Single Max. $\leq 275$ <b>Non-coastal Waters:</b> Fecal Coliform – Geometric mean $\leq 1000$ Single Max. $\leq 2000$	<b>Coastal Waters:</b> Enterococci Single Max. $\leq 500$ <b>Non-coastal Waters:</b> Fecal Coliform – Geometric mean $\leq 2000$ Single Max. $\leq 4000$

***4.8.9 Consideration of Stream Flow and Method Detection Limits***

During toxicant sampling in rivers or streams the measured flow must be at or above the 7Q10 value for that location. In cases where the applicable water quality criterion is less than the method detection limit (MDL) for a particular pollutant and the concentration for the pollutant is reported as less than detection (<MDL), the Department will evaluate the data consistent with EPA guidance provided in “*Guidance for Data Quality Assessment*”, EPA QA/G-9, QA00 UPDATE, EPA, July 2000 and will use the approach that is appropriate for the data set.

<sup>1</sup> Not to exceed the limits specified in the latest edition of the National Shellfish Sanitation Program Manual of Operations, Sanitation of Shellfish Growing Areas (1999), published by the Food and Drug Administration, U.S. Department of Health and Human Services.



These requirements are intended to ensure that existing water quality conditions are accurately portrayed, do not characterize transitional conditions, and that obsolete or inaccurate data are not used. In addition, the minimum data requirements may change on a case by case basis if pollutant sources upstream of the monitoring locations are likely. This determination will be made using information obtained from the Department's geographic information system or other databases. Failure to meet the minimum data requirements for any waterbody type will place the waterbody in Category 2.

#### 4.9 Quality Control / Quality Assurance Requirements

All data (including chemical, physical, and biological) should be collected and analyzed consistent with the SOPs presented earlier. Study plans should reference the SOP appropriate for the type of data being collected and should discuss how data quality will be documented. This should include a discussion of the quality control procedures followed during sample collection and analysis. These procedures should describe the number and type of field and laboratory quality control samples for the project, if appropriate for the type of sampling being conducted, field blanks, equipment blanks, split samples, duplicate samples, the name of the laboratory performing the analyses, name of the laboratory contact person, and the number and type of laboratory quality control samples.

While the Department will consider any readily available data and information, the Department reserves the right to not use data or information in making use support decisions which do not comply with the minimum data requirements presented in this document. The decision not to use certain data will be documented in the ADB.

#### 4.10 Minimum Sample Size and Allowable Number of Water Quality Criterion Exceedances

**Table 2** shows the allowable number of exceedances for various samples sizes up to 199 samples. The number of exceedances in each range of sample sizes was calculated using the binomial distribution function. This number is the number of exceedances of a particular water quality criterion needed to say with 90% confidence that the criterion is exceeded in more than 10% of the population represented by the available samples. This table will be used to determine the number of exceedances of Alabama numeric water quality criteria listed in ADEM Administrative Code 335-6-10 (for dissolved oxygen, temperature, turbidity, pH, and bacteria), consistent with the assessment methodology for each use discussed earlier, necessary to establish that a waterbody segment is not fully supporting its designated uses. This approach is consistent with ADEM Administrative Code 335-6-10 which recognizes that natural conditions may cause sporadic excursions of numeric water quality criteria. For conventional water quality parameters, there must be at least ten temporally independent samples collected during the previous six year period to be considered adequate for making use support determinations. As used in this context, temporally independent means that the samples were collected at an interval appropriate to capture the expected variation in the parameter. For example, dissolved oxygen, temperature and pH measurements should capture the normal diurnal variation that occurs in the parameters and temporal independence may occur in several hours (i.e. morning versus afternoon). Measurements for turbidity and bacteria should typically be at least 24 hours apart.

It is the intent of the methodology to ensure that an adequate number of samples are available for use in the assessment process and for developing future monitoring plans. Smaller sample sizes may be appropriate in certain circumstances where there is a clear indication that exceedances of the criteria are not due to natural conditions. For example, a data set comprised of fewer than the required minimum number of samples collected monthly may be sufficient to determine that a waterbody is not supporting its use when a significant number (more than two) exceed a particular criterion. Conversely, a data set with fewer than the required minimum number of samples collected monthly may be sufficient to determine that a waterbody is fully supporting its use if none of the samples exceed any of the criteria and there is sufficient supporting information to support this conclusion (i.e. biological assessment indicates full use support). The decision to use smaller data sets for making use support decisions will be made on a case by case basis using best professional judgment. The basis for these decisions will be documented in the ADB.

## Table 2

### Minimum Number of Samples Exceeding the Numeric Criterion Necessary for Listing\*

Sample Size	Number of Exceedances	Sample Size	Number of Exceedances
8 thru 11	2	97 thru 104	14
12 thru 18	3	105 thru 113	15
19 thru 25	4	114 thru 121	16
26 thru 32	5	122 thru 130	17
33 thru 40	6	131 thru 138	18
41 thru 47	7	139 thru 147	19
48 thru 55	8	148 thru 156	20
56 thru 63	9	157 thru 164	21
64 thru 71	10	165 thru 173	22
72 thru 79	11	174 thru 182	23
80 thru 88	12	183 thru 191	24
89 thru 96	13	192 thru 199	25

\* - For conventional parameters, including bacteria, at the 90 percent confidence level

### 5.0 Removing a Waterbody from Category 5

Waterbodies may be removed from a 303(d) list (category 5) for various reasons, including:

- Assessment of more recent water quality data demonstrates that the waterbody is meeting all applicable water quality standards. (Move to Category 1)
- A review of the original listing decision demonstrates that the waterbody should not have been included in Category 5. (Move to Category 1 or Category 2)
- TMDL has been completed. (Move to Category 4a)
- Other pollution control requirements are reasonably expected to result in the attainment of the water quality standards in the near future. These requirements must be specifically applicable to the particular water quality problem. (Move to Category 4b)
- Impairment is not caused by a pollutant. (Move to Category 4c)
- Natural causes – When it can be demonstrated the exceedance of a numeric water quality criterion is due to natural conditions and not to human disturbance activities, the water may be removed from Category 5. (Move to Category 1)

**Table 3** shows the allowable number of exceedances of criteria for conventional pollutants for various sample sizes and a 90% confidence level. This table will be used to determine the number of allowable exceedances of Alabama numeric water quality criteria for pollutants listed in ADEM Administrative Code 335-6-10, with the exception of chlorophyll *a* criteria and the toxics criteria listed in the appendix to ADEM Administrative Code 335-6-10, for the waterbody to be removed from a 303(d) list for a specific pollutant (move to Category 1).

### Table 3

<b>Maximum Number of Samples Exceeding the Numeric Criterion Necessary for Delisting*</b>			
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Sample Size	Number of Exceedances	Sample Size	Number of Exceedances
8 thru 21	0	104 thru 115	7
22 thru 37	1	116 thru 127	8
38 thru 51	2	128 thru 139	9
52 thru 64	3	140 thru 151	10
65 thru 77	4	152 thru 163	11
78 thru 90	5	164 thru 174	12
91 thru 103	6	175 thru 186	13

\* - For conventional parameters, including bacteria, at the 90 percent confidence level

When a waterbody has been included in Category 5 due to a fish consumption advisory, the waterbody will be moved to Category 1 when subsequent fish tissue results indicate that pollutant concentrations have declined and a fish consumption advisory is no longer needed. The determination that a fish consumption advisory is no longer needed is made by the Alabama Department of Public Health.

For waters originally placed in Category 5 due to a specific toxic pollutant or specific toxic pollutants, there should be no violations of the appropriate criteria in a minimum of 8 samples collected over a three year period before the cause of impairment is removed or the water is placed in Category 1.

### **6.0 Estimating the Size of the Assessed Waterbody**

Waterbodies are assessed on the basis of assessment units. Assessment units vary in size depending on the waterbody type, watershed characteristics, designated use, and the location of monitoring stations. In most cases, individual assessments will lie completely within a designated use or multiple uses. For example, an assessment unit will not generally be partially within one designated use and partially within a different designated use. However, assessment units may be assigned more than one designated use. For example, an assessment unit may have classified uses of both Fish and Wildlife and Public Water Supply provided both uses are assigned to the entire assessment unit. An assessment unit may be defined as a stream, the mainstem of a river, embayment, portion of a lake or reservoir, or a part of an estuary or coastal water.

A monitoring unit is defined as the watershed draining to, or close to, a sampling location and is made up of many assessment units (individual reaches). A monitoring unit will generally have a drainage area of more than 10 square miles and will be characterized by a predominant land use / land cover. When it is necessary to better characterize assessment units within the larger monitoring units, new monitoring units can be delineated based on the location of the additional sampling location or locations. Water quality data and information gathered at a sampling location which defines a monitoring unit will be the primary means for assigning a use support status to assessment units within the monitoring unit.

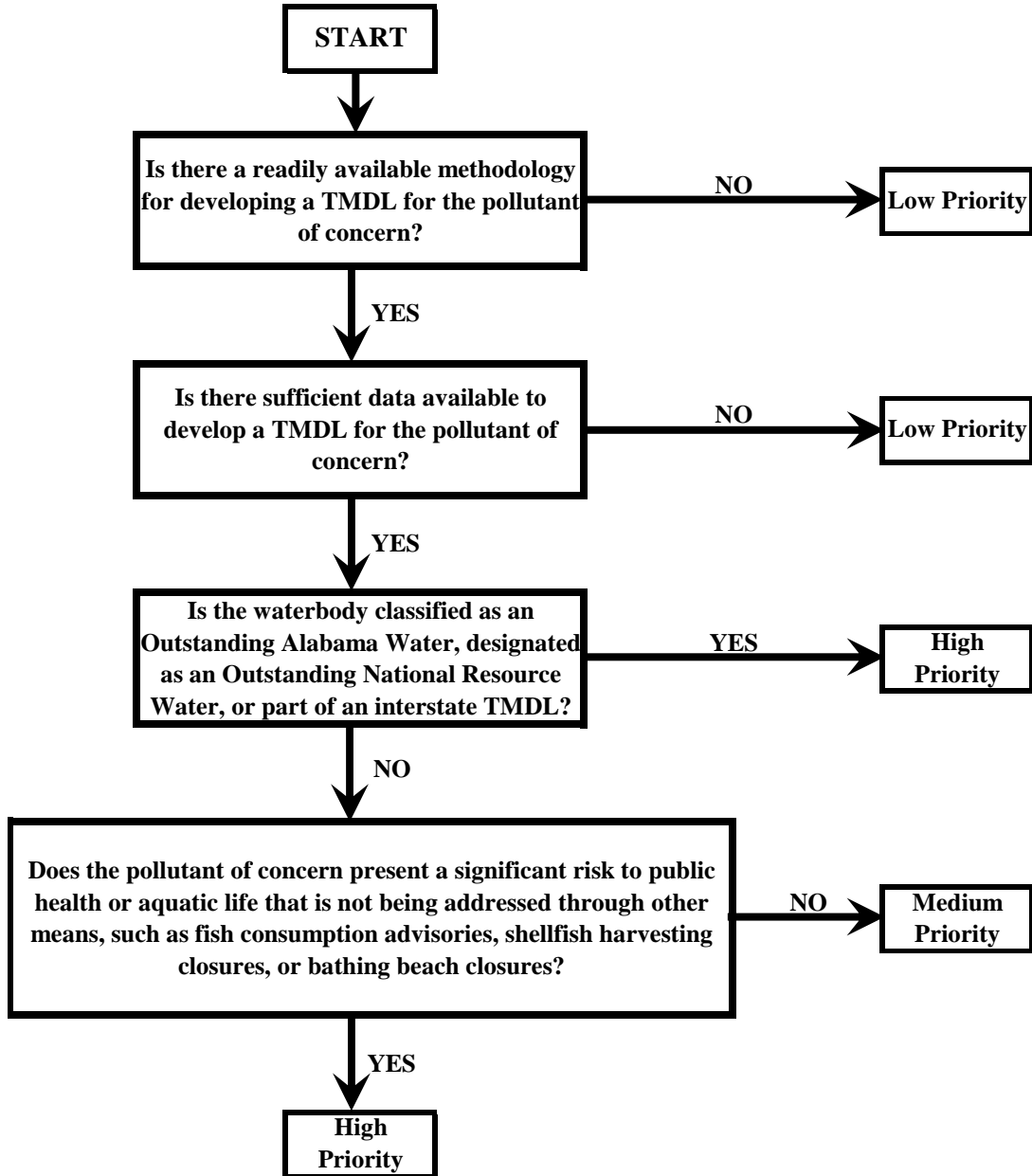
The spatial extent of each monitoring unit will be determined using information contained in the Department's Geographic Information System (GIS). Specifically, stream coverages contained within the National Hydrography Dataset (NHD) will be the basis for determining the size of assessed waters. This database of natural and constructed surface waters is a comprehensive set of digital spatial data that contains information about surface water features such as lakes, ponds, streams, rivers, springs and wells. Within the NHD, surface water features are combined to form "reaches", which provide the framework for linking water-related data to the NHD surface drainage network. These linkages enable the analysis and display of these water-related data in upstream and downstream order. Characteristics such as stream length or reservoir area can be aggregated within a monitoring unit to estimate the size of assessed waters.

## **7.0 Ranking and Prioritizing Impaired Waters**

Waters in Category 5 will be prioritized based on the nature of the pollutant of concern. Pollutants that relate directly to human health issues rank "high", while more conventional water quality parameters rank "medium" while other non-conventional or legacy pollutant impacts such as contaminated sediments, or impaired habitat rank "low". An example of high priority pollutants are toxics. Dissolved oxygen, pH, and unionized ammonia are examples of medium priority. **Figure 16** describes the general approach to assigning a ranking to each TMDL included in Category 5. However, the TMDL development schedule may not always consider only the ranking of the impaired waterbody. The following factors may be used to determine the timing for the development of the TMDL.

- TMDL complexity
- Pollutants of concern
- Need for additional data and information
- Sources of the pollutants
- Severity of the impairment
- Spatial extent of impairment
- Designated uses of the waterbodies
- General watershed management activities (e.g. 319 grant activities and watershed management planning)
- Existence of endangered and sensitive aquatic species
- Degree of public interest and support for particular waterbodies.

**Figure 16**  
*Alabama's TMDL Prioritization Strategy*



Waters which are currently listed on the §303(d) list will have their TMDL developed within 8 to 13 years unless they become eligible for delisting. TMDLs for Category 5 waters will be developed no later than 13 years after the water is first placed in Category 5.

The Integrated Monitoring Report will include proposed schedules (both long term and annually) for the development of TMDLs.

The Department will communicate with bordering states concerning the status of shared waters. When requested, the state will provide data concerning shared waters to the adjacent state.

## **8.0 Schedule for Assessing State Waters**

The State has developed a Watershed Management Schedule and has been operating under the rotating basin plan since 1997. This schedule has the state divided into 5 river basin groups which are sampled on a five year rotating basis. The rotating basin schedule is as follows:

- 2005 - Alabama, Coosa, and Tallapoosa River Basins
- 2006 – Escatawpa, Lower Tombigbee, Upper Tombigbee, and Mobile River Basins
- 2007 – Cahaba and Black Warrior River Basins
- 2008 – Tennessee River Basin
- 2009 – Chipola, Choctawhatchee, Perdido-Escambia, and Chattahoochee River Basins
- 2010 – Tallapoosa, Alabama, and Coosa River Basins
- 2011 – Escatawpa, Lower Tombigbee, Upper Tombigbee, and Mobile River Basins

The Integrated Monitoring and Assessment Report will include a comprehensive monitoring and assessment plan that describes the state’s proposed schedule for the following two years. Elements of this plan include: a description of the sampling approach (i.e. rotating basin and fixed ambient), and a list of the parameters to be collected (i.e. physical, chemical, and biological). The report will also include a schedule (both long term and annually) for collecting data and information for basic assessments and for TMDLs.

## **9.0 Public Participation**

The Integrated Report will combine the Water Quality Inventory Report (§305(b)) with the Impaired Waterbodies (§303(d)) listing. Category 5 in the Integrated Report is considered to be the Impaired Waterbodies list. The remaining categories are considered the Water Quality Inventory. This methodology lays out the framework for assessing data and determining which of the five categories the waterbody will be assigned to. The entire Integrated List will follow the same public process as the §303(d) listing but Categories 1 through 4 and the monitoring schedule will be provided for informational purposes only since these schedules are subject to change as resources allow.

The Department will solicit the submittal of data and information for use in developing the Integrated Report. The public notice requesting data will be published in four major newspapers in the state and on the Department’s Website. The time period for submitting data will be specified in the public notice. The data must be received by the Department by October 31 in the year prior to the report being due to EPA. Data submitted after the specified period will be considered in the development of subsequent Integrated Reports. The Department reviews all existing and readily available data and is committed to using only data with acceptable quality assurance to develop the Integrated Report. Only electronic data or data available in published reports are considered “readily available”. Typically, the Department uses Microsoft databases (i.e., Excel, Access) or the Water Resources Database (WRDB) for database management and retrieval.

The Department will publish notice of the availability of the Integrated Water Quality Monitoring and Assessment Methodology and Draft Integrated Report in four major newspapers of general circulation throughout the State and on the Department Website. Adjacent states, federal and interstate agencies shall also be noticed as necessary. The comment period on a proposed Category 5 (§303(d)) list will be a minimum of 30 days.

The Integrated Report, which will include the integrated List, expected monitoring schedules, TMDL schedules, as well as any other information usually included in the §305(b) Report, will be submitted to the USEPA as required by §305(b) of the Clean Water Act. The Department will post the availability of the Integrated Report on its web page at that time.

## **10.0 References**

ADEM, 2004. Alabama's 2004 Integrated Water Quality Monitoring & Assessment Report. Alabama Department of Environmental Management, Montgomery, AL

ADEM, 2005. ADEM Administrative Code R. 335-6-10, Water Quality Criteria. Alabama Department of Environmental Management, Montgomery, AL.

ADEM, 2005. ADEM Administrative Code R. 335-6-11, Water Use Classifications for Interstate and Intrastate Waters. Alabama Department of Environmental Management, Montgomery, AL.

ADPH, 2001. ADPH, Seafood Branch. Area I-II-III Triennial Report – 1999, 2000, 2001. Alabama Department of Public Health, Montgomery, AL.

EPA, 2000. Guidance: Use of Fish and Shellfish Advisories and Classifications in 303(d) and 305(b) Listing Decisions, Geoffrey H. Grubbs and Robert H. Wayland, III, October 24, 2000. United States Environmental Protection Agency, Washington, DC.

EPA, 2005. Guidance for 2006 Assessment, Listing, and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 3314 of the Clean Water Act; United States Environmental Protection Agency. Washington, DC.

O'Neil, P.E., and T.E. Shepard, 1998. Standard operating procedure manual for sampling freshwater fish communities and application of the index of biotic integrity for assessing biological condition of flowing, wadeable streams in Alabama. ADEM Contract No. AGY7042. Geological Survey of Alabama, Tuscaloosa, Alabama.



**APPENDIX**

Alabama's current water quality standards regulations are found in Chapters 335-6-10 and 335-6-11 and are located at the following web address:

[www.adem.state.al.us/Regulations/regulations.htm](http://www.adem.state.al.us/Regulations/regulations.htm)