



2016

Mississippi

DEPARTMENT
OF ENVIRONMENTAL QUALITY
ANNUAL REPORT



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STRATEGIC GOALS

Building a Better Mississippi: The Statewide Strategic Plan for Performance and Budgetary Success contains goals applicable to MDEQ and its mission. This annual report seeks to correlate the following goals of the agency's strategic plan with the results of its work in Fiscal Year 2016.

1

Natural Resources – To ensure that current and future generations have access to the state's abundant natural resources through restoration, protection, conservation, and wise development of those resources.

2

Infrastructure – To ensure that construction and maintenance of infrastructure are adequate to meet the needs of citizens and the business community and to foster economic growth.

3

Health – To protect Mississippians from risks to public health and to provide them with the health-related information and access to quality healthcare necessary to increase the length and quality of their lives.

4

Economic Development – To develop a robust state economy that provides the opportunity for productive employment for all Mississippians.

5

Public Safety and Order – To protect the public's safety, providing timely and appropriate responses to emergencies and disasters and to operate a fair and effective system of justice.

6

Government and Citizens – To create an efficient government and an informed citizenry that helps to address social problems.

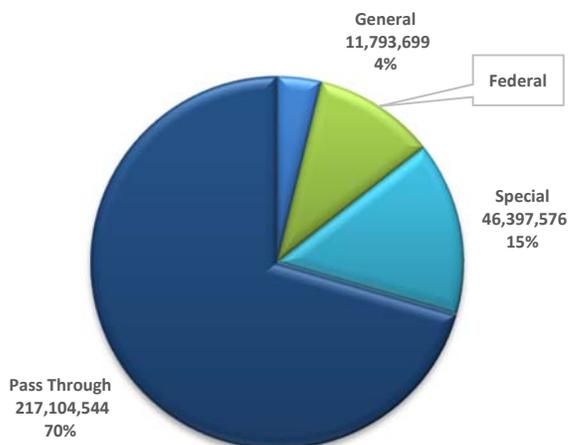
Message from the Executive Director

The programs and initiatives promulgated by the Mississippi Department of Environmental Quality further our mission to protect human health and the environment. The staff at MDEQ are committed to conserving and improving our state's abundant natural resources and will continue to work together to achieve our mission. We are proud to be the stewards of the state's air, land, and water resources which provide a multitude of benefits for our citizens.



Gary Rikard
Executive Director
MDEQ

FY16 APPROPRIATION



I. AIR QUALITY

A. Air Monitoring

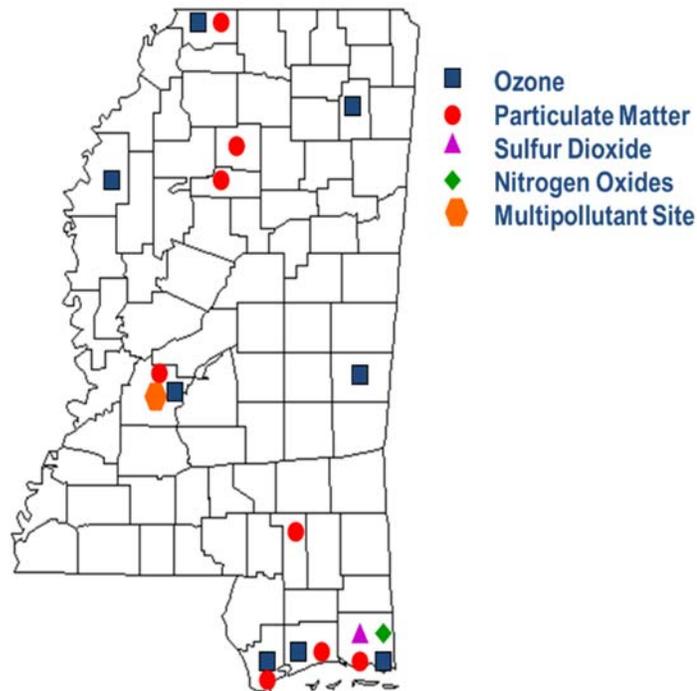
MDEQ operates a network of automated continuous air analyzers and 24-hour manual samplers for the purpose of measuring ambient air levels of ozone, particulate matter, sulfur dioxide, nitrogen dioxide, lead, and carbon monoxide.

Air Quality Goal: Ensure that Mississippi air quality is protective of the health and welfare of its citizens.

This monitoring network serves many purposes:

- Determines attainment and nonattainment areas for ground-level ozone, particulate matter, sulfur dioxide, nitrogen dioxide, and carbon monoxide.
- Generates data to assist in determining methods to reduce visibility obscuration.
- Supports ozone reduction programs.
- Determines general air quality trends.

Mississippi Ambient Air Quality Monitoring Sites

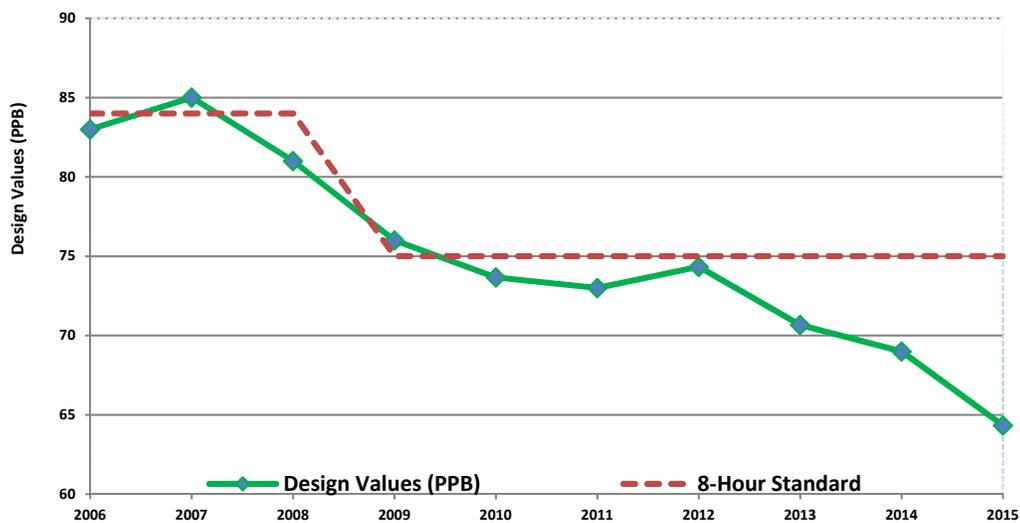


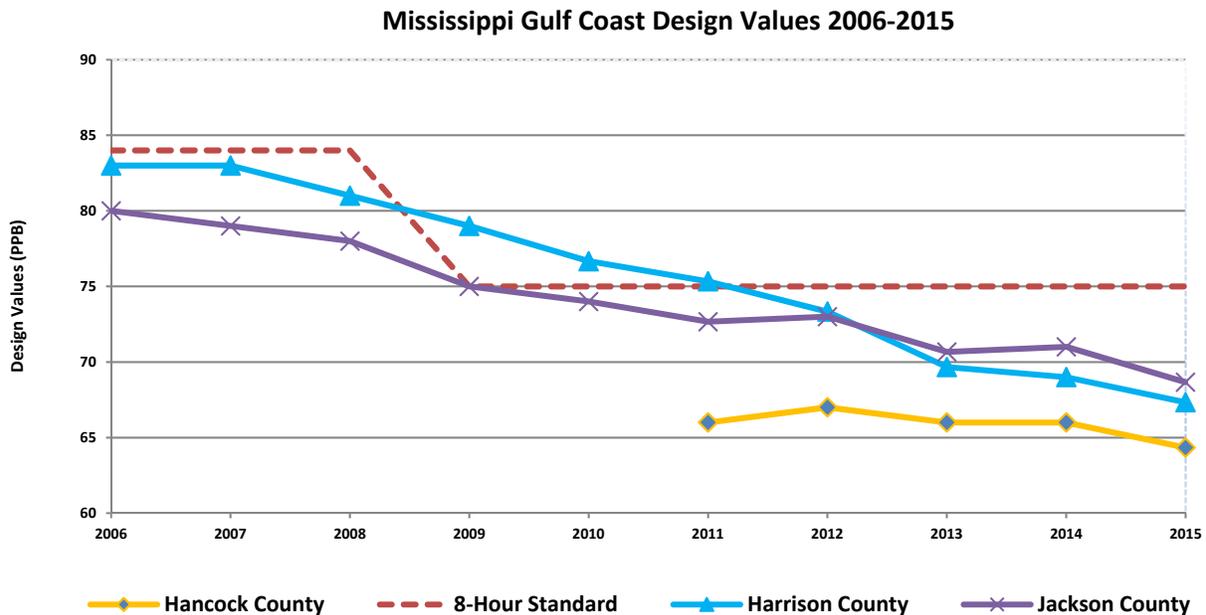
MDEQ issues daily air quality forecasts for the Mississippi Gulf Coast and the Jackson Metropolitan Area from April through October each year. Also, MDEQ, in association with the Memphis-Shelby County Health Department, issues air quality forecasts for DeSoto County.

These forecasts are made available through e-mail, the MDEQ website, and Twitter. The forecasts keep the public informed about the status of air quality, issue health advisories when needed, and notify the members of the respective ozone precursor reduction programs when they should implement their emissions reduction plans.

Air Quality Index Levels of Health Concern	Numerical Value	Meaning
Good	0 to 50	Air quality is considered satisfactory, and air pollution poses little or no risk
Moderate	51 to 100	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution.
Unhealthy for Sensitive Groups	101 to 150	Members of sensitive groups may experience health effects. The general public is not likely to be affected.
Unhealthy	151 to 200	Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects.
Very Unhealthy	201 to 300	Health warnings of emergency conditions. The entire population is more likely to be affected.
Hazardous	301 to 500	Health alert: everyone may experience more serious health effects

DeSoto County Ozone Design Values 2006-2015





Emissions reductions in Mississippi and adjoining states, as well as favorable meteorological conditions, resulted in a recent downward trend in ozone concentrations culminating with all Mississippi counties being designated by EPA as attainment with the ozone standard of 75 parts per billion (ppb) in 2012, with the exception of a portion DeSoto County. Although DeSoto County met the standard, most of the county was designated as part of the Memphis Nonattainment Area. In April 2016, EPA approved MDEQ's recommendation for all of DeSoto County to be in attainment. EPA proposed a new ozone standard within a range of 65-70 ppb in December 2014, and the final standard was issued in October 2015 at 70 ppb. MDEQ is continuing a voluntary ozone precursor air pollution control program in partnership with governmental and business leaders on the Coast and in DeSoto County in efforts to prevent or mitigate future nonattainment.

In 2008, EPA issued a new lead standard that required MDEQ to monitor for lead starting in December 2011, and the state is currently meeting that standard. In addition, EPA has issued new standards for nitrogen dioxide and sulfur dioxide.

AIR QUALITY OBJECTIVE - Maintain Compliance with Federal Air Quality Standards

In 2012, EPA designated all Mississippi counties as attainment with the nitrogen dioxide standards. Sulfur dioxide designations have not been issued yet to states attaining the standard using monitoring data, including Mississippi. However, a sulfur dioxide consent decree was issued in March 2015 that affected a utility in the state. The court-ordered decree required that emissions modeling be performed for the utility to determine its attainment status. EPA designated the area near the facility as attainment in 2016. In addition, EPA issued a sulfur dioxide data requirements rule in September 2015 that will affect other facilities in the state. MDEQ and the facilities are cooperatively working to meet this requirement. Additional modeling, monitoring, or permit actions may be required as a result of this rule.

EPA retained the current standards for carbon monoxide, and Mississippi is meeting those standards. Final standards for annual mean fine particulate matter were made in December 2012. The primary standard was reduced from 15 micrograms per meter cubed ($\mu\text{g}/\text{m}^3$) to 12 $\mu\text{g}/\text{m}^3$. Final designations of the standard were made in December 2014 showing attainment for all particulate matter monitoring sites. The 24-hour average standard remained at 35 $\mu\text{g}/\text{m}^3$. Mississippi is meeting both of those standards.

B. Southeast Modeling, Analysis, and Planning (SEMAP)

Mississippi is working with nine other southeastern states to address the many new air quality standards, that have or will come out, in a more efficient and effective way. The SEMAP group, which includes several MDEQ staff members, is addressing the new standards from a regional perspective. This is necessary because air emissions from Mississippi may impact other states' air quality and other states can impact Mississippi's air quality. It is also more efficient and cost effective because the group can hire contractors to help develop inventories and perform air quality modeling and analysis for much less than each state trying to do the work on their own. The Southeastern States Air Resource Managers handles the administrative tasks for the group with the states providing technical expertise. The modeling effort has been continuing and results will be available to use for the new standards.

C. Air Emission Inventory Branch

Every third year, EPA requires a complete inventory that quantifies emissions from all major Title V sources on a detailed level and estimated emissions from smaller stationary and mobile sources. The MDEQ Air Division develops an inventory each year that quantifies the air emissions from various sources. The inventory quantifies emissions for over 200 air pollutants and also includes emissions related information such as control devices, exhaust stack parameters, and fuel type. This work involves gathering the emissions data from the emissions sources and submitting it to EPA in a prescribed format. The Emission Inventory Branch completed and submitted the 2014 major source inventory and the request for the 2015 inventory was sent out to be reviewed and processed to be submitted to EPA in January 2017.

D. Mississippi Diesel Emissions Reduction Project State Grants (DERA)

In Fiscal Year 2016, MDEQ utilized DERA funds for the replacement of older school buses for newer, cleaner, and more efficient ones. In 2015, MDEQ worked with six districts to replace seven school buses. In 2016, after receiving applications from 14 school districts, MDEQ worked with 10 school districts to replace 11 school buses, with a total of \$165,000 in sub-grant allocations. Due to the success of this program, MDEQ expects to continue with a new DERA State Grant from EPA.



E. Asbestos

Asbestos is a potential danger when disturbed during the course of a building demolition or renovation operation. MDEQ regulations require affected facilities to inspect for asbestos before work begins and specify work practices and procedures that are designed to prevent asbestos fiber release or emissions during building demolition and renovation activities. MDEQ communicates the requirements of the regulations to project owners and operators and performs demolition and renovation project inspections to ensure safe and regulation compliant operations. Home owners are also provided information and guidance to help them be safe with non-regulated activities they perform that are potentially dangerous.



EPA regulations require that schools inspect all buildings for asbestos materials, remove any of the material posing a danger, and perform surveillance inspections periodically to monitor the condition of any asbestos material not previously removed. These and other requirements must be documented in an asbestos management plan required of each Mississippi school district. MDEQ performs asbestos management plan inspections to ensure that the requirements are being satisfied and that students, teachers, and other school employees are being protected from exposure to asbestos.

MDEQ also ensures, through its asbestos abatement activity certification program, that individuals who engage in asbestos abatement activities receive professional training and demonstrate they are competent to perform these services.

During Fiscal Year 2016, MDEQ inspected 262 building demolition and renovation projects and investigated 33 complaints. There were also 1,291 applicants who received certification to perform asbestos abatement activity and 36 school districts evaluated with asbestos management plan inspections.

F. Air Toxics

Many facilities are regulated for air pollutants known as Hazardous Air Pollutants (HAP) because these air pollutants may cause acute or chronic health conditions. HAP emissions are primarily controlled or reduced through regulations called Maximum Achievable Control Technology (MACT) standards. Impacted facilities generally must install additional control equipment or change process equipment and materials in order to reduce HAP emissions to below what are very stringent emission limitations. These standards and emission limitations are based upon the application of best demonstrated technology and very high emission control efficiency.

There are numerous MACT standards that affect 174 different source categories of major HAP emission facilities and 70 source categories of smaller HAP emitting facilities, called area sources. Therefore, there is a very significant number of different, and often changing, HAP regulations to implement, and the universe of regulated facilities to assist and monitor for regulation compliance is quite large. The types of affected facilities range from large chemical plants and petroleum refineries to small dry cleaning facilities, gasoline stations, and even backyard auto body repair and painting shops.

Air toxic activities also include the implementation of accidental release prevention regulations. These regulations apply to facilities with certain chemicals that could be very dangerous to public health and the environment in the event of a chemical accident or an uncontrolled release. Facilities that have or use these chemicals in amounts above the minimal levels must employ appropriate process safety measures or controls and must be prepared to mitigate the consequences should a release of one of the listed chemicals actually occur. A regulated facility's actual planning, techniques, and procedures to prevent chemical accidents must be outlined and submitted in a Risk Management Plan for agency review. Activities also include monitoring the ever-changing regulated source population and completing compliance monitoring inspections of regulated facilities. During Fiscal Year 2016, there were 148 active regulated facilities and staff completed 39 inspections at regulated sources.

G. Title V Program

Mississippi received full approval from EPA in January 1995 to administer the Title V Operating Permit program. This program originated in the amendments to the Clean Air Act enacted in 1990. Each major source of air pollution is required to obtain a Title V Operating Permit which sets out all air requirements applicable to the source and specifies the methods by which the source must demonstrate compliance. All aspects of Title V permitting are handled by the MDEQ Environmental Permits Division while all compliance certifications and demonstrations are handled by the MDEQ Environmental Compliance and Enforcement Division.

The Air Division meets regularly with the Title V Advisory Council (Council) to update them on the Title V workload and level of effort. The Air Division annually compiles data on actual program revenue and expenditures, along with projected expenditures, emission rates, and a work plan for the upcoming year, and submits this information to the Council. The Council uses this data to recommend an adequate Title V permit fee to the Commission on Environmental Quality (Commission) for the upcoming fee year. The program's revenue needs and the Council's fee recommendation are timely reported to the Commission so that they may adopt an appropriate fee rate prior to the September 1 annual permit fee due date. The Air Division also handles the collection of emissions information from fee-subject sources and provides fee-assessment information to the MDEQ Office of Administrative Services which handles fee billing and collection.

During Fiscal Year 2016, there were 53 Title V permits issued, including initial issuances, renewals, and all modifications, and six Synthetic Minor Operating permits. In addition, 121 Title V inspections were conducted during that same time.

H. Greenhouse Gases

On December 7, 2009, the EPA Administrator signed the Endangerment Finding for greenhouse gases for mobile sources. EPA has used this finding as the basis to expand its regulatory efforts to regulate large stationary sources of greenhouse gas emissions, and many of these sources are found in the energy sector. In response to these regulations, the MDEQ Air Division formed the Greenhouse Gas and Energy Branch in 2014 to monitor, assess, and implement these new regulations. Initial regulatory efforts of greenhouse gases include regulations for the power sector, oil and natural gas industries, and landfills. The most significant of these regulations to date is the final release of the Clean Power Plan in August of 2015. In dealing with these regulations, the agency is engaging in inter-agency collaboration, affected stakeholder outreach, and public participation. As of this writing, the Clean Power Plan's implementation has been stayed by the courts awaiting litigation.

I. Lead-Based Paint Program

Exposure to lead-based paint is a serious health concern for everyone, but especially children under six years old and developing fetuses.

- Lead is a heavy metal which has been a serious public health problem for centuries.
- Lead-based paint was used extensively throughout residences before 1978, and is still present under newer paint.
- Dust and debris from activities that disturb lead-based paint can be dangerous if not managed properly.
- Lead poisoning does not usually present apparent symptoms so even children that seem healthy can have high levels of lead in their bodies.
- Lead poisoning can cause permanent learning and behavior problems and have medical consequences throughout a person's life.

Mississippi's Lead-based Paint Program operates a certification program that has been delegated to the state by EPA. The program establishes requirements for the certification of persons and firms engaged in lead-based paint activities, and it establishes work practice standards for performing such activities. The program also establishes procedures and requirements for the accreditation of lead-based paint activity training programs. The regulations are applicable to all persons engaged in lead-based paint abatement and renovation activities in target housing and child-occupied facilities.

MDEQ staff perform audits of training courses and inspections of job sites to ensure compliance with the regulations. During Fiscal Year 2016, MDEQ staff performed five training course audits, 29 paperwork review inspections, 45 site inspections (including investigations at nine complaint sites), and certified 629 individuals and firms involved in lead-based paint activities.

An important step in the goal to eliminate childhood lead poisoning was taken with the EPA's Renovation, Repair, and Painting (RRP) rule. The rule addresses hazards created by renovation, repair, and painting activities that disturb lead-based paint in target housing and child-occupied facilities. MDEQ's RRP regulations were modeled after the federal rules and went into effect in April 2010. MDEQ's Lead-based Paint regulations were amended in 2013 to reflect changes to EPA regulations.

The Lead-based Paint Program has successfully applied for a four-year extension to the Lead-based Paint grant and entered into memorandums of agreement with the Mississippi State Department of Health and the Green and Healthy Housing Initiative to increase awareness statewide and to mitigate lead hazards in some houses in Jackson.

II. WASTE MANAGEMENT

Solid wastes include all types of garbage, refuse, debris, sludge, or other discarded materials from residential, commercial, industrial and institutional sources. The Mississippi Legislature has declared it to be the policy of the

Waste Management Strategic Goal: Protect Mississippi's soil and water resources through proper nonhazardous solid waste, hazardous solid waste and petroleum product management.

state that the generation of waste should be reduced or eliminated at the source, whenever feasible; waste that is generated should be recycled or reused whenever feasible; waste that cannot be reduced or recycled should be treated in an environmentally safe manner; and disposal or other permitted release into the environment should be employed only as a last resort and should be conducted in an environmentally safe manner. MDEQ has been designated as the lead agency in implementing this policy to reduce wastes, reuse and recycle wastes and to safely dispose of wastes when necessary. To do so, MDEQ regulates the management of solid wastes from residences, businesses, industries, and institutions at storage sites, transfer stations, composting operations, recycling facilities, processing facilities, rubbish sites, landfills, and other types of solid waste facilities.

WASTE OBJECTIVE: Ensure statewide waste management activities focus on recycling, proper handling, transportation, and disposal to prevent release of contaminants to the environment.

MDEQ also regulates those solid wastes that are "hazardous wastes" under

delegation from EPA. Hazardous wastes are those discarded materials that have properties that make the waste dangerous or potentially harmful to human health or the environment. To better manage and direct the waste programs, MDEQ recently began an effort to reorganize those programs into a newly-formed Waste Division.

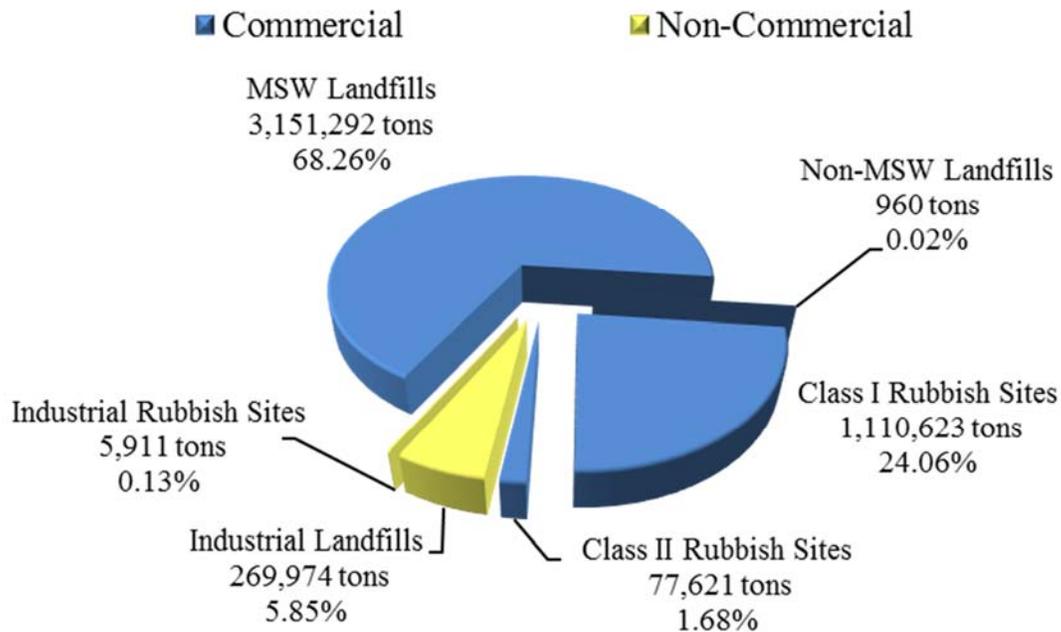
A. Mississippi Solid Waste Management and Disposal

MDEQ Solid Waste programs have worked on a variety of projects and programs to ensure the proper management of solid wastes, to promote the reduction and recycling of solid wastes, and to plan for the future solid waste management needs of the state. To measure the success of these efforts, MDEQ collects an annual report from the owners or operators of permitted solid waste management facilities on activities conducted during the preceding calendar year.

In 2016, MDEQ developed a consolidated report on solid waste disposal activities conducted during Calendar Year 2015. This report indicated that just over 4.6 million tons of wastes were disposed at permitted landfills and rubbish sites in Mississippi. Approximately 3.1 million tons (68.28 percent) of the total waste was disposed at commercial landfills, 270,000 tons (5.85 percent) at non-commercial landfills, 1.19 million tons (25.74 percent) at commercial rubbish sites, and 6,000 tons (0.13 percent) at non-commercial rubbish sites. About 4.3 million tons of solid wastes were disposed at commercial disposal facilities and the remaining 280,000 tons of wastes were disposed at noncommercial disposal facilities. Mississippi received a little less than 640,000

tons of solid waste from out-of-state sources representing approximately 14 percent of the total.

In addition, a total of approximately 20,000 dry tons of wastes were applied at permitted land application sites, and about 26,000 tons of material was received at solid waste composting facilities. The annual reports also indicated that approximately 123,000 tons of material was received for management at solid waste processing facilities and 745,000 tons of wastes was managed by solid waste transfer stations.



B. Solid Waste and Waste Tire Grants Programs

The Solid Waste Programs also continued the management and dispersal of various solid waste and recycling grant program funds. Through the Solid Waste Grant Programs, MDEQ awarded almost \$3.4 million in Fiscal Year 2016 for solid waste management and recycling projects, solid waste planning projects, and waste tire projects.

Of that total, close to \$2.7 million was awarded in Solid Waste Assistance Grants to local governments. These grants are used by local governments to clean up illegal dumps, establish collection programs for bulky wastes and recyclables, fund the hiring of a local solid waste enforcement officer, for household hazardous collection, for public information efforts on solid waste and recycling programs, and for other waste management activities at the local level. These funds are annually awarded through two different categories of grants: the non-competitive (or allocated) grants to county governments and the competitive grants available to municipalities, counties, solid waste authorities, solid waste districts and other local government organizations. These grant awards included supplemental solid waste enforcement officer grant funds awarded to communities that have maintained successful illegal dumping prevention and enforcement programs.

Totals for Fiscal Year 2016:

- \$1,146,443 - Total Non-Competitive Grants Awarded
- 76 Counties Received Non-Competitive, Allocated Grants
- \$1,538,068 - Total Competitive and Supplemental Grant Funds Awarded
- 43 Municipalities and Counties Received Competitive Grants

C. Cooperative Regional Recycling Grants

MDEQ continued its partnership over the past year with the four regional recycling cooperative projects that received grant awards made through the Regional Recycling Cooperative Grants Program. The grant award projects are drawing to a close of the performance period but have continued to make progress over the past year. The cooperative program was developed to encourage local governments to work together on the collection and marketing of municipal recyclables. Over \$1 million in cooperative grants were awarded to four “hub” communities in 2014 to build and enhance regional recycling systems with other partner communities: City of Greenwood, City of McComb, City of Natchez, and City of Oxford. The recipient communities have worked to implement the various aspects of the four regional projects focused on growing recycling in their regions of the state. MDEQ is evaluating the opportunities for another round of the regional recycling cooperative grant awards in the near future.

D. Solid Waste Planning

The MDEQ Solid Waste program works with local governments to develop and implement long-range solid waste planning efforts. Each local government is required by state law to develop and implement a comprehensive local, solid waste management plan for a 20-year period. Most of the original local government solid waste plans were adopted in the early 1990s, so many of these 20-year solid waste plans are reaching the end-of-life.

Over the past year, Comprehensive Local Solid Waste Plans have been granted final approval for Scott County and the Cities of Forest, Morton, Lake and Sebastopol. In addition, local solid waste plans are being finalized for Lauderdale County and the City of Meridian; Kemper County and the City of DeKalb; Simpson County and the Cities of Magee and Mendenhall; the City of Canton; Rankin County and the Cities of Brandon, Florence, Flowood, Pearl, Pelahatchie, and Pearl; and Washington County and the Cities of Greenville, Leland, and Hollandale. Draft plans have also been completed for Hancock County and Warren County. The development of comprehensive, updated solid waste management plans are in process for Holmes County and the Golden Triangle Solid Waste Authority.

MDEQ also reviews amendments to existing local plans to assure adequate disposal services and capacity. These amendments are often conducted to add new disposal or recycling facilities

locally or to make other changes to local solid waste plans regarding the manner that solid wastes are being managed. Communities that completed modifications include: Humphreys County (addition of 13 land application sites), Humphreys County (addition of four more land application sites), Alcorn County (expansion of the City of Corinth's Class II rubbish site), and Winston County (addition of a Class I rubbish site). And, other plan amendments are in process for Hinds and Marshall counties.

E. Waste Tire Management Program

The Waste Tire Management Program develops and implements the state's strategy to achieve statewide recycling of waste tires. The program's success is reflected in the most recent annual program information collected at the end of 2015 indicating that the overall waste tire recycling rate was 92 percent and the recycling rate for tires generated in Mississippi was 86 percent. It is anticipated that the state's waste tire recycling and reuse rates for waste tires will continue to approach or exceed the current national average of approximately 90 percent. Overall, waste tire processors managed approximately 4.5 million waste tire equivalents with approximately 51 percent of the tires being imported from out-of-state.



The Waste Tire Management Program reviewed or otherwise handled the processing of various applications for waste tire management permits and authorizations for waste tire processing facilities, collection sites and disposal facilities. MDEQ conducted compliance assurance activities at approximately 150 local government waste tire collection sites, 10 commercial waste tire processing and collection facilities, and numerous tire retail businesses. Additionally, MDEQ manages the permitting and reporting activities of approximately 120 registered waste tire haulers.

MDEQ also manages a Waste Tire Abatement Program which provides assistance for the clean-up of unauthorized tire dumps and investigates complaints. Since the program was started, MDEQ has cleaned up approximately 2.5 million waste tires.

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Eighteen new waste tire grants totaling \$714,490 were awarded to local governments to fund local waste tire collection and clean-up programs during Fiscal Year 2016. Local governments receiving waste tire grants included: Bolivar, DeSoto, George, Harrison, Jefferson Davis, Kemper, Lamar, Leake, Leflore, Lincoln, Marion, Newton, Pike, Quitman, Sunflower, and Yazoo Counties; and, the Cities of Canton and Jackson. These new waste tire program grants, along with those tire grants previously awarded, assist local governments in the proper collection and disposal of approximately 700,000 passenger tire equivalents annually.

MDEQ also conducted a special initiative with the Mississippi State University Extension Service to collect tires from farms and agricultural sources at two agricultural pesticide collection events

in Tallahatchie and Noxubee counties. These county governments used MDEQ grant funds to provide waste tire collection services in conjunction with the pesticide collection events.

F. Electronic Waste Management



Electronic waste or “e-waste” continues to be one of the fastest growing waste streams nationally and continues to present management and disposal problems for Mississippians. MDEQ continues its work to assist communities, businesses, and private citizens with understanding the proper methods for recycling and disposing of e-waste. MDEQ maintains comprehensive web resources including a directory of electronic recycling companies as

well as other options for managing and recycling e-waste. MDEQ also provides information and resources to support the implementation of the provisions of the Certified Electronics Recyclers Law which requires all state agencies to use a certified electronics recycler for the disposal of electronics such as personal computers, computer components, audio players, videocassette players, facsimile machines, cellular telephones, wireless paging devices, or any electronic items containing an intact or broken cathode-ray tube. The Certified Electronics Recycler Law also requires MDEQ to maintain a listing of certified electronics recyclers for the reference and use of state agencies that can be found on the agency website. State agencies are required under the law to use a recycler from that listing.

State law also requires that MDEQ promote the certification of electronics recyclers. In particular, MDEQ promotes certification programs managed by two organizations, Sustainable Electronics Recycling International (SERI – formerly R2 Solutions) and the Basel Action Network. These two organizations provide certification of those recycling businesses that collect and recycle used electronic products in a safe and responsible manner. MDEQ also encourages the state’s communities, businesses and local and state government agencies when making decisions on electronics recycling services to consider the benefits of using an electronics recycling company certified under one of these programs. MDEQ also encourages any recycling business that collects and manages electronics to consider obtaining certification of its processes for managing and recycling the electronic products. Magnolia Data Solutions of Jackson, and Logista Solutions of Columbus are both currently certified to the R2-2013 standard.

MDEQ assists with and sponsors various e-waste collection and recycling events and programs for residents and small businesses. MDEQ provides grants to communities to sponsor e-waste collection events for the public, often as part of a larger household hazardous waste collection event. MDEQ also joined with the Jackson Metro Chamber Partnership and various other

partners to host two e-waste collection and recycling events for small businesses and residents in the Jackson Metropolitan area.

The agency continued its support for a computer refurbishment program at Jackson State University (through a partnership agreement with Hinds County). MDEQ provides grant support to assist the program in collection and restoration of used computers. The program collects used computers from area businesses and residents and repairs them to be donated to low-income families, churches, summer programs, nonprofit organizations, day care centers. The program provides technical training to young adults on computer repair and restoration. In addition, the JSU program also sponsored an e-waste collection event in West Jackson for local residents and businesses.

G. Medical Waste Management

Medical Wastes

MDEQ shares regulatory authority with the Mississippi State Department of Health which sets minimum standards for management of medical wastes for licensed health care facilities in the state. MDEQ's responsibility includes the oversight of medical wastes collected and transported from health care facilities, veterinary care facilities, medical wastes generated by emergency and trauma response, medical wastes generated by business and institutional clinics, and medical wastes generated in private residences through home healthcare. In addition, MDEQ oversees commercial medical waste management facilities. There are two existing commercial autoclave facilities that are actively operating for the treatment of infectious medical wastes. A third autoclave facility has been permitted but is not currently operating.

While MDEQ has not developed specific medical waste regulations, the agency has continued to maintain web-based resources to better communicate proper management conditions for various types of medical wastes, particularly those originating from health care facilities. MDEQ has seen an increase in the number of medical waste service providers collecting wastes from health care facilities and other generators over the past several years. A listing of these active service providers is maintained on the agency's website for reference by the health care industry.



Medical Sharps

MDEQ also works with the state's citizens to assist them in managing medical wastes that are generated in the home. MDEQ developed and implemented a statewide educational program to inform the public of the safe disposal of home-generated medical sharps to promote proper management and disposal of medical devices such as syringes, needles, and lancets. MDEQ's public outreach efforts included placing additional educational material in medical offices and speaking with professional nurses about the

program. MDEQ also conducted a number of educational and outreach activities to promote the program including speaking and exhibiting at numerous stakeholder meetings and local health fairs.

MDEQ has worked to create and expand its household sharps collection network, including community drop-off locations at pharmacies, fire stations, and other business locations. During Fiscal Year 2016, MDEQ assisted 36 new businesses in joining the network as collection stations bringing the total number of public drop-off locations to 276. Three of the state's medical waste service companies continue to provide collection of the sharps from the public collection stations. The number of people participating in the sharps program and the number of sharps collected had been increasing every year but plateaued somewhat over the past year collecting 7,050 pounds of medical sharps slightly down from 7,137 pounds of medical sharps collected in 2015. This number still represents over one million household medical sharps collected over the past year from Mississippi households.

Pharmaceutical Wastes

A growing area of environmental concern that MDEQ is working to address is the management of pharmaceutical wastes and household personal care products. MDEQ encourages the proper management of pharmaceutical wastes and discourages flushing or washing of household medications and other similar products down the toilet or sink. MDEQ helps promotes the biannual collection events sponsored by the U.S. Drug Enforcement Administration (DEA). The DEA works with numerous local law enforcement agencies throughout Mississippi and the country to host local one-day collection events for prescription drugs and other pharmaceuticals.

In addition, the Mississippi Department of Public Safety provides drop-off collection sites for prescription drugs and expired pharmaceutical wastes at the agency's Driver's License offices. MDEQ has developed a brochure promoting the program and the various drop-off locations are available on the MDEQ website and distributed at various health fairs and public events.

H. Organic Wastes

Over the past year, MDEQ continued efforts to promote organic waste reduction and recycling. Organic wastes originate from plants or animals and are biodegradable. These wastes include items such as grass clippings, leaves, limbs and woody debris, food wastes, biosolids and other organic sludges, animal manures, and certain commercial and industrial woody or plant-based wastes. The re-use or recycling of organics wastes involves processes such as composting, mulching, anaerobic digestion, or other forms of processing waste materials into a form that can be useful.

Composting

In 2011, MDEQ launched its "Pilot Composting Program" to streamline and ease the authorization process for start-up composting operations. The streamlined approval process helps businesses and community composting operations to begin under a less formal and less rigid form of authorization. This program has allowed new composting facilities to develop and build sustainable operations. The feedback continues to be overwhelmingly positive, and MDEQ

receives frequent inquiries on the program and how to launch new composting operations. The most recent data, collected at the end of 2015, estimated that 26,949 tons of material was diverted to composting facilities in 2015, an increase over the 24,226 tons of material reported in 2014. In conjunction with the pilot program, MDEQ has continued to work towards streamlining and simplifying the state's composting facility regulations and permitting process.

Mulching

Many communities do not conduct traditional composting operations but do manage chipping and mulching operations for various types of woody debris. MDEQ has developed a guidance document for start-up mulching operations (both public and private) that seek to create useful products from wood wastes and debris. In addition, MDEQ is modifying regulations governing mulching facilities. Mulching facilities have historically operated under an exclusion to the definition of a solid waste processing facility with little to no operating and siting requirements. The lack of minimal operating criteria has resulted in problems at some facilities including noise, fires, and storm water management issues. Consequently, MDEQ has developed minimum operating criteria for mulch facilities but with a similar streamlined permitting process to that of composting sites.

Biosolids Land Application

MDEQ staff began issuing coverages under the Biosolids Land Application General Permit issued by the Mississippi Environmental Permit Board in late 2015. Coverage under this general permit is now being issued to most biosolids land application sites, except where MDEQ determines that an individual solid waste management permit is needed due to public interest or site specific requirements.

Outreach

MDEQ has updated online resources to include a list of existing composting facilities, the latest in composting news, and current composting related events and activities. These resources also provide important information to the public on home composting, to businesses and government on the MDEQ's Pilot Composting Program, and to schools and families on composting educational resources for students. MDEQ also worked with the Mississippi Recycling Coalition to include a session at the State Recycling Conference on the national food waste initiative by EPA and how communities can plug into this effort to reduce and reuse food wastes.

I. Landfill Methane Outreach Program (LMOP)

MDEQ has continued its partnership with EPA to promote the use of landfill gas as an alternative energy source through the Landfill Methane Outreach Program (LMOP). Landfill gas is a by-product of the decay of municipal solid wastes in landfills and contains methane, a potent greenhouse gas that can be captured and used to fuel power plants, manufacturing facilities, vehicles, homes, and more. Currently Mississippi has six landfill gas-to-energy projects including the direct use and leachate evaporator projects at Waste Management's Pecan Grove Landfill (Pass Christian), the landfill gas-to-electricity projects at Golden Triangle Regional Landfill (West Point), Three Rivers Regional Landfill (Pontotoc), Waste Management's Prairie Bluff Landfill (Houston), and the landfill gas-powered leachate evaporator also at Prairie Bluff.

Through the LMOP program, MDEQ has also identified numerous other landfills as candidates for future energy project development. In 2016, a potential landfill gas end user presented a proposal for a landfill gas-to-energy project which involves converting landfill methane, produced at one of the candidate landfills, to compressed natural gas. It is with these types of projects in mind that the agency updates and maintains an inventory listing of Landfill Methane Outreach Program (LMOP) Candidate Landfills on the agency website and connects landfill operators with project developers and end users.

J. By-Product Beneficial Use Program

The MDEQ Waste Division also promotes the beneficial use of non-hazardous by-product materials that would, otherwise, be disposed of in landfills or managed under a solid waste management permit. The state's beneficial use regulations allow for industries to request that their non-hazardous industrial by-product materials be evaluated for use in the place of products or raw materials. If MDEQ's evaluation of a beneficial use request confirms that the material has suitable physical and chemical properties for the proposed use, then the agency issues a Beneficial Use Determination (BUD). In early 2016, MDEQ reports indicated that BUD holders distributed 980,219 tons of by-product materials for beneficial uses in 2015. Almost 92 percent of the by-products distributed were used for construction purposes while around six percent of materials were used in soil amendment applications and a small fraction used in other types of beneficial uses.

MDEQ works with the suppliers throughout the region who provide by-products and other material for construction uses and soil amendment uses including beneficial use "demonstration projects." These projects allow an industry or company to conduct a short-term pilot project using the material to demonstrate the suitability of the material for longer term use. During 2016, MDEQ approved six new BUDs for new materials and uses: four addressed the beneficial use of materials as soil amendments, one as a road construction material, and one as a landscaper's coloring additive.

MDEQ finalized a decision in 2016 to approve the beneficial use of Digested Lagoon Residuals (DLR) for use in land application and soil amendment projects. This material is a fully digested, non-utrescible by-product of the poultry processing industry. The approval of the soil amendment use allows the material to be land applied under the provisions of a beneficial use determination rather than the more rigorous requirements of a site-specific permit.

MDEQ is working with other suppliers on demonstration projects involving the use of foundry sands, processed silica, and land spreading uses of horizontal directional drilling mud materials. The materials and their associated uses are being evaluated for environmental and physical performance.

K. Recycling and Waste Reduction

State law mandates reduction of waste at its source, re-use of waste materials rather than discarding them, waste recycling whenever possible, and safe disposal of wastes as a last resort. Although MDEQ does not currently collect detailed recycling information from local governments or recycling businesses, the agency measures the access and availability of recycling services to the state's residents. MDEQ's analysis indicates that close to 60 percent of the state's population has access to local government-sponsored recycling programs. This percentage represents continued growth; however, this rate still falls short of the national access rate of 94 percent. Approximately half of Mississippi residents with recycling access are provided curbside recycling services with the remaining half having access to drop-off recycling services. The 40 percent of the state's population that does not have access to community-based programs may still have access to other commercial recycling businesses or to non-profit recycling programs. The access to recycling for the state's population is slowly increasing as more communities add recycling programs and as communities upgrade and expand existing programs.

To grow recycling access, MDEQ emphasizes cooperative efforts among local governments to collect, process, and market recyclables, particularly in rural and underserved communities. Four cooperative projects were funded in the agency's initial round of Regional Recycling Cooperative Grants in 2014, to Greenwood, McComb, Natchez, and Oxford. The components of these regional projects have been initiated and are continuing to be implemented.

MDEQ works with various partners to provide education and outreach on the importance of growing recycling in Mississippi and also provides training and technical resources to recycling professionals. The MDEQ Waste Division provides educational and technical assistance to increase the awareness and the importance of recycling and solid waste reduction measures. One of the key partners that MDEQ works with is the Mississippi Recycling Coalition (MRC). MRC is a non-profit consortium of local governments, state agencies, industries, institutions, businesses, trade organizations and non-profit groups working together to promote and grow recycling. MDEQ staff provide key assistance to MRC promoting and managing membership, hosting board meetings, managing the organization's website, developing and assisting with conferences, press releases, and programs involving student scholarships and school grants and awards. Other partners include Keep Mississippi Beautiful, and its local affiliates, the Mississippi Beverage Association, the Mississippi Municipal League, the Southeast Recycling Development Council, the Mississippi Manufacturer's Association and various other local, state, regional and national organizations.

In addition, as a part of the mission to promote recycling, MDEQ gives presentations to organizations and schools, and provides recycling and solid waste information via exhibits at various events.

L. Solid Waste Training and Certification Programs

MDEQ partners with the state and national chapters of the Solid Waste Association of North America (SWANA) to provide training and certification to municipal solid waste landfill operators. In 2015, there were 33 active certified commercial landfill operators in the state. MDEQ worked with SWANA to help sponsor training opportunities at two state conferences.

In addition, MDEQ hosted the agency's training class and examination session for Class I rubbish site operators at two separate events in December 2015 and in August 2016. Both events were held in Jackson with well over 60 attendees at both events. In 2016, there were 135 active certified Class I rubbish site operators in the state. This past year, MDEQ issued certificates from the training and testing events for 15 new Class I rubbish site operators and issued 14 renewals for existing Class I rubbish site operators. MDEQ also worked with the state SWANA chapter to provide CEU training opportunities through the state SWANA Chapter's spring and fall Conferences.

In February 2016, MDEQ conducted Solid Waste Enforcement Officer Training in Jackson. Many local solid waste enforcement officers' salaries are partially funded through the MDEQ Solid Waste Assistance Grant Program, and MDEQ provides periodic training events to help ensure that these officers have the knowledge needed to properly address solid waste issues in their local area. Training topics at this event included state solid waste laws and regulations, open burning laws, disaster debris management, public outreach and education, conducting clean-up events and electronics waste recycling.

III. REMEDIATION

A. Brownfields

A “brownfield site” is real property which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant that affects the expansion, redevelopment, or reuse of the property. MDEQ provided technical support to the Cities of Greenwood, Hernando, Vicksburg, and Yazoo City which received a combined total of over \$1.5 million in federal grants in 2016 to conduct assessments and cleanups for site redevelopment for locations that have potential or perceived environmental issues. The agency is working with the recipients to help identify high priority locations for assessments and cleanups with the most potential for redevelopment and beautification of their community. MDEQ conducts grant writing workshops to aid Mississippi communities in their efforts to receive these national competitive grants that provide communities with the ability to advance property development opportunities.

Remediation Goal: Protect human health and the environment through proper mitigation, remediation, reclamation, and restoration of natural resources.

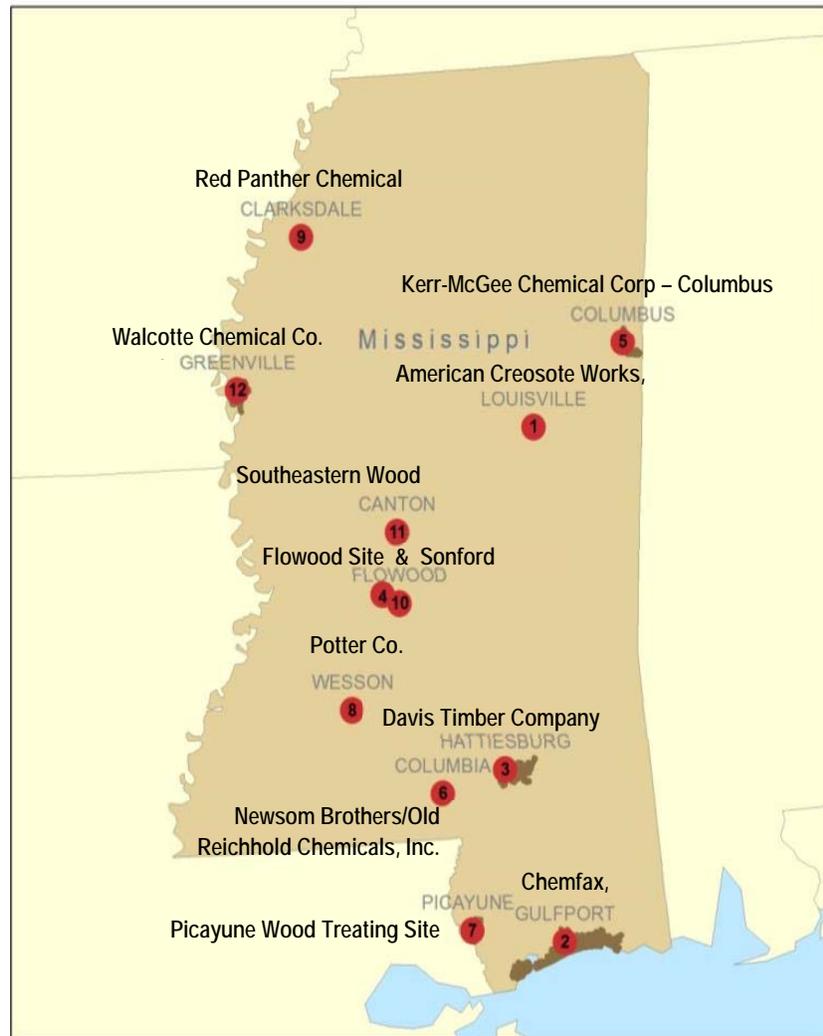
REMEDATION OBJECTIVE – Ensure contaminated sites are properly assessed, remediated, and redeveloped in a manner protective of human health and the environment.

B. Uncontrolled Sites and Voluntary Evaluation Program

During Fiscal Year 2016, Groundwater Assessment Remediation Division (GARD) staff actively oversaw 186 assessments and/or cleanups with the total number of sites at 2,033. Also, MDEQ issued “No Further Action” letters for 11 of these sites that were evaluated and remediated to levels protective of human health and the environment. MDEQ issued seven Restrictive Use Agreed Order/Environmental Covenants in Fiscal Year 2016, thereby allowing these sites to be reused with certain activity and use limitations. MDEQ staff continue to respond expeditiously to requests from the Mississippi Department of Transportation (MDOT) and other governmental agencies for the review of environmental assessments and remediation of contaminated sites and those sites with economic development potential. The Voluntary Evaluation Program (VEP) offers an opportunity to receive an expedited review of site characterization and remediation plans and reports for parties that are voluntarily cleaning up uncontrolled sites that they have an interest in. The VEP is funded entirely by these participants who pay for MDEQ’s oversight costs.

C. Superfund Cleanup and Redevelopment

Oversight of the site assessment and restoration of hazardous waste sites at federal facilities continues to be a large portion of the work involving the CERCLA Branch of MDEQ. Oversight is conducted at seven Department of Defense (DoD) Sites, a Department of Energy Site (Salmon Test Site), a NASA facility (Stennis Space Center), and several Formerly Used Defense Sites (FUDS). MDEQ is funded for this oversight work through agreements with the Department of Defense, Department of Energy, and NASA. Through the grants from the Environmental Protection Agency, CERCLA staff performed preliminary assessments, site investigations and site inspections at hazardous waste sites for National Priority List (NPL) consideration, coordinated with EPA on emergency/removal projects at the American Wood Treating Site (Louisville), and assisted EPA with the oversight of the remediation of three Superfund Sites in the state—Sonford Products (Flowood), American Creosote (Louisville), and Wood Treating (Picayune). At the present time, it is estimated that the remediation costs for these three sites is approximately \$75 million. The state will pay 10 percent of these remediation costs or \$7.5 million. In addition, remedial investigations have begun at Red Panther Chemical (Clarksdale), Kerr-McGee (Tronox) (Columbus), and Southeastern Wood (Canton). Estimations of remedial costs for these sites will be developed after the remedial investigations have been completed by EPA.



Superfund Sites in Mississippi

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The Red Panther Chemical (Clarksdale) site is a potential responsible party (PRP) site and the responsible party(s) will be paying for the further assessment and remediation of this site. The Kerr-McGee (Tronox) (Columbus) site was involved in bankruptcy and other legal proceedings. The bankruptcy proceeding resulted in a trust being created that will provide as much as \$68

million toward further assessment and remediation of the site. The Southeastern Wood (Canton) site does not have a potentially responsible party and will require a 10 percent state match for the remediation costs.

EPA recognized MDEQ's collaboration to support and encourage the appropriate reuse of Superfund sites across the State of Mississippi through a variety of approaches, including offering assistance in reuse planning processes and implementing environmental covenants through the Uniform Environmental Covenants Act. Mississippi's efforts to develop a process and template to streamline placing restrictive covenants on Superfund site properties within Mississippi ensures that remedial actions remain protective as sites are put back into productive use, playing a key role in revitalizing communities. Coordination among MDEQ, EPA, site owners, and the local community is generating success stories and paving the way for future reuse.

C. Underground Storage Tanks

MDEQ manages the state's Underground Storage Tank (UST) Program, which is aimed at preventing and detecting leaks of petroleum products and hazardous substances and protecting groundwater from leaking tanks. The UST program is responsible for conducting operator training, inspections, and compliance assistance at petroleum storage facilities.



The compliance program inspects UST facilities and are responsible for ensuring approximately 8,200 tanks at nearly 3,015 facilities have the appropriately maintained equipment. In Fiscal Year 2016, there were 1,036 inspections conducted. Quarterly compliance workshops are offered for additional compliance assistance.

A UST-certified contractor program ensures proper installation and maintenance of UST systems. This past year 146 licenses were issued through the MDEQ UST Certification Program, and there are currently 263 certified individuals that perform tank installations, alterations, testing, and/or permanent closures.

In the event of a release, the Mississippi Groundwater Protection fund is used by MDEQ to assess and clean up contamination resulting from leaking USTs. The fund began in 1987 and has paid \$182 million dollars to reimburse eligible tank owners for the assessment and cleanup of sites contaminated from leaking underground storage tanks. The average fund commitment per site is nearly \$161,000. At the end of this fiscal year, MDEQ was working on 519 sites that have had a confirmed or non-confirmed release and Trust Fund eligibility may or may not have been determined. During Fiscal Year 2016, \$6.3 million was used to assess and remediate leaking underground storage tanks.

In September 2016, MDEQ hosted a two-day environmental consultant conference at the Mississippi Agricultural Museum to discuss advances in remediation and assessment technologies, to provide an open forum for discussions facing the environmental consulting industry and MDEQ regarding assessment and remediation activities, and to collaborate on clean-up efforts to restore Mississippi properties. This informative conference provided hands-on demonstrations and interactive projects for more than 50 environmental consultants working in Mississippi.

Revenue to operate the UST Program is derived from federal grants and fees imposed on tank owners. The UST Tank Fee has ranged from \$40 per tank in 1988 to \$80 per tank in 1994 and has remained unchanged at \$100 per tank for the past 18 years.

IV. RECLAMATION

Surface Mining and Reclamation of Surface-Mined Lands

MDEQ continued to regulate all non-coal surface mines in the state as provided for in the Mississippi Surface Mining and Reclamation Act of 1977. This includes issuing surface mining permits and notices of exempt operations, inspecting permitted areas and inspecting complaints, overseeing the reclamation done by operators, and enforcing the law as per the promulgated Rules and Regulations and Commission orders. Coal and lignite mines are regulated under the Mississippi Surface Coal Mining and Reclamation Law of 1979, with oversight of the program by the federal Office of Surface Mining (OSM).

RECLAMATION OBJECTIVE – Ensure lands impacted by mining activities are restored to reclamation standards that are protective of human health and the environment.

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In Fiscal Year 2016, the Mining and Reclamation Division performed 687 inspections (of which 73 were bond release inspections), recommended to the Permit Board the issuance of 33 initial and five amended permits, and received 71 Notices of Exempt Operations (operations less than four acres in size). A total of 1,938 exempt operations are on file, covering approximately 7,752 acres, and 1,246 acres were completely reclaimed as a result of the division's efforts to oversee reclamation. The state currently has 683 permits covering 34,063 acres. The Office of Geology's Mining and Reclamation Division continued to update the mining database that provides valuable mining information in a GIS format so that mining sites can be located and viewed by anyone using the online Mining Viewer.

The Mining and Reclamation Division provides the required Mine Safety and Health Administration (MSHA) training for mining operations in the state. MSHA regulations require an eight-hour refresher training course be taught to all mine workers. In Fiscal Year 2016, staff provided training to 18 miners and 71 contractors working in the mining industry.

The Coal Mining Division was established during Fiscal Year 2007 to focus on the complexities of coal mine regulation. Mississippi has an industry-estimated five billion tons of surface mineable lignite, a low-grade coal ranked just below sub-bituminous coal. The Mississippi Lignite Mining Company is mining lignite at the Red Hills Mine in Choctaw County to supply fuel for an adjacent 440 megawatt (MW) mine-mouth power plant. The mine produces over 3.5 million tons of lignite per year and has permitted 6,090 acres. This permit was initially issued in 1998, and was renewed in February 2013 for its fourth five-year term. The planned life of the mine is 30 years.

V. WATER QUANTITY

The Office of Land and Water Resources (OLWR) is responsible for the management of the water resources in Mississippi. Mississippi code requires that "...the water resources of the state be put to beneficial use to the fullest extent of which they are capable, that the waste or unreasonable use, or unreasonable method of use, of water be prevented, that the conservation of such water be exercised ..."

Water Quantity Goal: Maintain sustainable quantities of surface and groundwater in Mississippi.

To achieve this requirement, OLWR pursues a conjunctive water management approach that coordinates the use of the ground and surface water resources of the state to satisfy desired water needs. OLWR strives to ensure that the use, storage, allocation, and management of water resources be accomplished to the fullest extent possible; and that water pumped and impounded in Mississippi complies with applicable permit regulations. OLWR has numerous programs that support these requirements. These include the development and implementation of monitoring plans to facilitate the systematic collection, compilation, and management of data related to aquifers, streams, and lakes in the state; water use surveys and meter reporting tools; application of computer models to assist in making water management decisions; the review and processing of applications for issuance and modification; and, enforcement of ground and surface water use permits.

OLWR is also responsible for licensing and regulating water well contractors operating in Mississippi; regulating the design, construction, and modification of certain dams in accordance with regulatory criteria to ensure that

WATER QUANTITY OBJECTIVE – Increase the efficiency of water use to improve sustainability of groundwater and surface water in Mississippi.

lives and property downstream from dams and reservoirs are protected; and, assessing potential contamination threats to public, domestic and industrial water supplies.

In Fiscal Year 2016, OLWR continued to engage large water use in industry, agriculture, public drinking suppliers, and the energy sector to seek balances between water use and economic development. In the Mississippi Delta, OLWR is developing innovative approaches to studying and addressing water sustainability in the heavily utilized alluvial aquifer. OLWR is also monitoring irrigation use outside of the Delta to mitigate competition with domestic and public supply drinking water resources. Likewise, the OLWR continues to plan for, and work with, the energy sector as it relates to hydraulic fracturing activities in the southwest portion of the state.

A. Water Resource Permitting and Management



A primary objective of OLWR is to research and manage the water resources of the state to assure adequate supplies for the future. This is achieved by the coordinated interaction of the water withdrawal permitting process which is informed by the inventorying and assessment of the availability of water associated with fresh water aquifers and major fresh water streams in Mississippi. As the entity responsible for managing the water withdrawal permits of the state, OLWR issued over 2,456 groundwater permits and 265 surface water diversion permits in Fiscal Year 2016. Included in each permit is an

established maximum withdrawal amount and any necessary special terms and conditions associated with a respective permit. For surface water permits, stream flows and lake levels are routinely monitored, and in the event that these fall below established standards, permittees are required to cease withdrawing water until flows rise above established minimums.

A Compliance Branch was created in Fiscal Year 2015 for the purpose of bringing into compliance those permittees that have failed to meet defined permit conditions. The branch has begun working with industry, public suppliers, water well contractors, and other members of the regulated community.

B. Assessment and Study of Water Resources

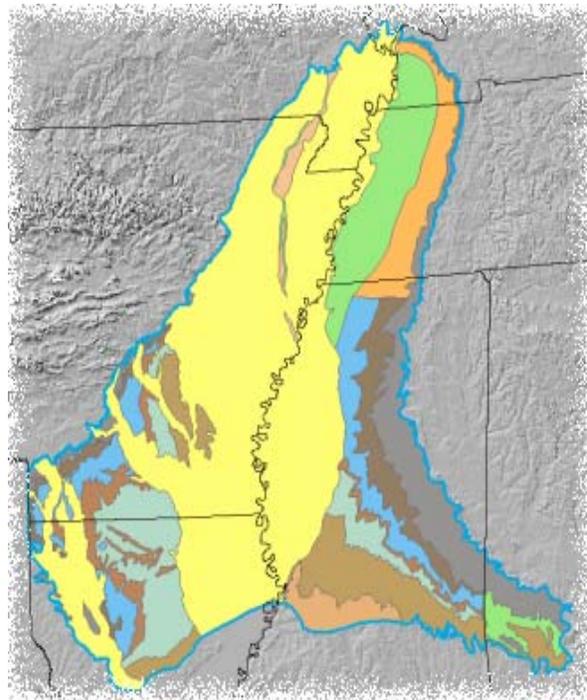
The abundant water supplies in Mississippi constitute one of the most important and valuable natural resources contributing directly to the quality of life and economic prosperity of the state. However, the water resources available in a given area of the state can vary significantly depending on various hydrogeologic conditions that may affect base flow in streams, water quality and quantity, as well as the prolificacy of local aquifers.

The highly variable nature of these resources means that a concerted effort must be maintained to collect related groundwater and surface water data that will allow proper decisions to be made regarding the management and development of the state's water resources. OLWR monitors groundwater levels of the state's major freshwater aquifer systems. Reports and potentiometric maps are created to document changes in water levels associated with these aquifer systems. Additionally, OLWR conducts in-depth regional hydrologic investigations to characterize Mississippi's groundwater resources to gain a better understanding of water supplies in regionally prioritized areas. The OLWR staff provides a wide range of information useful for planning

economic development projects, groundwater modeling and development of groundwater resources for public drinking water supplies.

In Fiscal Year 2016, a project in Lafayette County that characterizes the available drinking water supplies took water samples for baseline water quality information from 32 public water supply wells utilized by the City of Oxford and other rural water associations. These samples were taken from each of the major aquifers in Lafayette County: the Eutaw-McShan, the Ripley, the lower Wilcox, and the Meridian-upper Wilcox.

MDEQ staff completed a project to evaluate the water resources around Gluckstadt with water levels taken at wells throughout the area. In addition, water quality samples were collected to determine raw water characteristics from wells screened in the Cockfield, Sparta, and Meridian-upper Wilcox aquifers. The cross-sections completed across Gluckstadt illustrate the general subsurface structure of each of these aquifers.



Mississippi Embayment Regional Aquifer Study

An investigation of the fresh water aquifers in Jackson County has been initiated with water level measurements and water samples taken from public, private, and industrial water wells. Samples for baseline quality data were analyzed in the field for pH, temperature, and conductivity, with more comprehensive evaluation completed at the MDEQ laboratory. Due to the numerous layers of interbedded sand and clay comprising the water bearing formations in Jackson County, numerous cross-sections were developed to better identify where these strata may be located. Further study of recharge areas will continue in Fiscal Year 2017.

An evaluation of the center of a potentiometric cone of depression in Leflore and Sunflower counties was completed in Fiscal Year 2016. This area encompasses that which falls within the 70-foot contour of a potentiometric surface map of the Mississippi River Valley Alluvial (MRVA) aquifer. This study builds upon previous work and reveals the continuation of a downward trend of water levels in the central Delta. Further research in defining recharge characteristics of the MRVA's geology and geomorphology compliment this work.

Also in Fiscal Year 2016, work continued on a cooperative agreement with the U.S. Geological Survey (USGS) to update, refine, and utilize the Mississippi Delta portion of an existing regional groundwater flow model developed by the USGS. This large-scale regional model covers the entire Mississippi embayment and extends through the primary drinking-water aquifers as part of the Mississippi Embayment Regional Aquifer Study (MERAS). This model will be used to better understand the groundwater flow system, the potential effects of variations in pumping patterns,

and to evaluate various water resources management scenarios. New data continue to be collected for integration into the existing groundwater flow model. Developing new data sets for accurately assessing the water level fluctuations in the Mississippi River Valley Alluvial Aquifer and the Tertiary aquifers in the Delta remains a current priority for OLWR.

MDEQ staff performed 102 flow measurements on streams throughout the state in support of the MDEQ Mississippi Benthic Indicator of Stream Quality project. In addition, USGS continuous stream gauging stations were monitored by OLWR to evaluate low flow conditions in streams, or reaches of streams, to ensure the water bodies did not fall below their respective statistical low flow averages. During such low flow events, on-site streamflow measurements were made where necessary to validate special terms and conditions related to surface water permit requirements. OLWR also worked in conjunction with MDEQ's Office of Pollution Control to ascertain discharge calculations at nine locations during a study on the Leaf River.

C. Water Resources in the Mississippi Delta

The future of the Mississippi Delta's economic and environmental viability depends on



abundant, accessible water of sufficient quality. Over 19,000 permitted irrigation wells screened in the shallow Mississippi River Valley Alluvial Aquifer are used for irrigation, aquaculture, and wildlife management purposes. Over time, pumpage demands have continued to exceed recharge to the MRVA, leading to continued overbalances of groundwater withdrawals versus aquifer recharge, disconnected surface and ground water interaction, and notable water-level declines in the aquifer.

To address serious threats to the viability of the Mississippi Delta's MRVA aquifer and Delta-wide stream flows, MDEQ created an executive-level task force to address these water resource challenges in November of 2011. On August 26, 2014, Governor Phil Bryant issued an Executive Order formalizing the Governor's Delta Sustainable Water Resources Task Force. Under the Order, MDEQ is the lead to "...promote conservation measures, irrigation management practices, and plans for the implementation of new Delta surface water and groundwater supplies."

The Delta Sustainable Water Resources Task Force and its work groups consist of various state and federal agencies, stakeholder organizations, and academia all focused on the development and implementation of approaches and strategies to ensure sustainable ground and surface water resources for current and future generations in the Mississippi Delta. In Fiscal Year 2016, OLWR developed a new general permit (MRVA-002), which updated conservation measures as a way to encourage continued adoption of water conservation practices via the permitting process. An online reporting portal developed by OLWR specifically designed to receive meter reading data from participants yielded valuable information that will be critical to improving total pumpage

estimates and model accuracy.

New research initiatives include the Delta Drilling Program which has drilled five sets of paired wells in one of the major areas of concern. These paired well sets will be instrumented for real-time data relay. The scope of this project is to provide year-round water level data, and to determine what, if any, water exchange is occurring between aquifers. This initiative has already produced one-year's worth of correlated data, and combined with new sets coming online in 2017, will provide data that can be used for future modeling exercises to forecast the impact, if any, withdrawals from the MRVA may be having on the drinking water aquifers that underlay the MRVA.

D. Source Water Protection

The OLWR Source Water Assessment Branch has the primary responsibility of coordinating groundwater quality protection efforts in Mississippi. The 1996 amendments to the Safe Drinking Water Act mandated states to develop and implement a Source Water Assessment Program. The purpose of this program is to notify public water supplies and customers of the relative susceptibility of their drinking water supplies to contamination. Protecting sources of drinking water is essential for maintaining and improving the quality of human health and the environment.

The program also helps site the proper locations for new drinking water wells. The OLWR staff worked closely with Mississippi's 1,118 Public Water Systems consisting of approximately 2,740 groundwater wells, and five surface water intakes, to strengthen protection efforts of underground sources of public drinking water supply.

Potential sources of contamination are identified for each individual city or town in each water supply protection area to use as support for planning decisions. Information gathering in the assessment process is incorporated into recommendations for actions that can be taken at the local level to protect drinking water sources. The assessments help to focus protection efforts to minimize risks of individuals drinking contaminated water. These efforts may include developing source water protection plans, encouraging the use of Best Management Practices, establishing local protection teams, and using other source protection measures.

MDEQ is also working to identify abandoned wells so they can be properly plugged by a licensed well driller. Improperly abandoned water wells can serve as potential conduits for the introduction of contaminants into drinking water aquifers. As of June 2016, 24 wells have been properly plugged and abandoned through the Source Water Assessment Program for the Fiscal Year.

E. Drillers Licensing

The testing and licensing of water well drillers are managed and maintained through OLWR. Applications for licenses are received along with verification that applicants meet basic requirements through testing in accordance with state law and state regulations is performed. These measures ensure that current license holders are in compliance with regulations. During Fiscal Year 2016, the Drillers Licensing Program issued or renewed 223 licenses for drillers or pump installers and data for all water wells drilled in the state were input to a database

management system. MDEQ staff taught a continuing education course regarding Mississippi drilling laws and regulations at the Mississippi Water Well Contractors Association conferences.

F. Mississippi Agricultural Chemical Groundwater Monitoring Program

Over ninety percent of the population in Mississippi relies on groundwater for drinking water supply. Because of this dependence, there have been growing concerns that agricultural chemicals may be impacting and degrading the valuable groundwater resources in the state. The Agricultural Chemical Monitoring Program was established in 1986 to help determine what, if any, impact these practices may be having. For Fiscal Year 2016, OLWR staff sampled 79 water wells in a continuing effort to ascertain if agricultural practices in the state are affecting the quality of groundwater aquifer systems statewide. These data are recorded and reported to well owners who have concerns about their domestic drinking water. During Fiscal Year 2016, the program has sampled over 2,219 groundwater sources throughout the state. To date, results indicate that no significant impacts to groundwater quality are directly attributable to agricultural practices.

VI. WATER QUALITY

A. Ambient Recreational Monitoring Network

MDEQ maintains a monitoring network for flowing waters in the state that are used for primary contact recreation. These sites are located on the recreational water bodies to monitor fecal coliform for the safety of Mississippi citizens that use these waters for recreational purposes. Monitoring is done at these locations to collect five samples within a 30-day period. This

Water Quality Strategic Goal: Protect and restore surface and groundwater quality in Mississippi.

WATER QUALITY OBJECTIVE –
Maintain Compliance with Federal Water Quality Standards and Requirements.

sample frequency allows for the calculation of a geometric mean for the fecal coliform data. In 2016, 44 stations were monitored for recreational purposes in the state. Each location is monitored in both the contact (May-October) and non-contact (November-April) seasons.

B. Ambient Lake Monitoring

In 2009, MDEQ began collecting chemical, physical and biological samples from public lakes throughout the state. Candidate lakes are greater than 100 acres in size and without nutrient enrichment. Since the program's inception, MDEQ has selected 20 lakes per year to sample so that over a five- year cycle, approximately 100 lakes will be sampled for the ambient lake monitoring program.

C. State of Mississippi Water Quality Assessment 2016 Section 305(b) Report

MDEQ is responsible for generating the Water Quality Assessment Report under §305(b) of the Clean Water Act. The report comprehensively describes for EPA, Congress, and the public the status of the quality of the state's surface waters. Along with the water quality assessment information, the report also describes the state's assessment methodology and gives the causes, where known, for those waters identified as impaired.

D. Mississippi Benthic Index of Stream Quality (M-BISQ)

The Mississippi Benthic Index of Stream Quality (M-BISQ) is an index of biological integrity (IBI) that is used to assess all wadeable non-tidal streams in Mississippi with the exception of wadeable streams located in the Mississippi Alluvial Plain. Monitoring efforts completed as part of this effort have greatly increased the number of biological assessments conducted on state waters. The M-BISQ sampling program and the established sampling and analytical methodology contained therein now serves as the foundation for routine biological monitoring in MDEQ's statewide Ambient Monitoring Network. This index was originally developed using biological and environmental data collected from 463 stream locations, and for Fiscal Year 2016 MDEQ staff sampled 140 streams.

E. Mississippi Alluvial Plain Monitoring

In 2002, MDEQ began collecting biological community, physical, chemical and habitat data on wadeable streams in the Mississippi Alluvial Plain, commonly referred to as the Mississippi Delta. These data, along with historical monitoring in the Mississippi Alluvial Plain, were used to develop an index of biological integrity for the Mississippi Delta. In addition, the data collected is also being used to evaluate the dissolved oxygen levels in the Delta as well as support nutrient criteria development. With each new set of data collected annually during September to October, the index will be refined and when finalized, biological monitoring in the Mississippi Delta will be incorporated into MDEQ's Ambient Monitoring Program. Since monitoring was initiated in 2002, approximately 120 sites have been monitored. In 2011, MDEQ acquired Light Detection and Ranging (LIDAR) data for the Mississippi Alluvial Plain and has used that data to establish drainage areas for each of the monitoring locations. Land use analyses have been completed, and were used to refine the preliminary index. A draft report has been provided to MDEQ and currently in the review process during Fiscal Year 2016. The effort to develop an index of biological integrity for the Mississippi Alluvial Plain is an ongoing effort with the USGS.

F. Fixed Station Ambient Monitoring

MDEQ's network of statewide ambient water quality monitoring stations provides systematic water quality sampling at regular intervals and uniform parametric coverage to monitor water quality status and trends over a long-term period. Sampling is carried out by MDEQ scientists from each of the three regional offices.

There are currently 41 stations statewide, and laboratory analyses for the samples are carried out monthly by MDEQ's laboratory located in Pearl. Several stations in the sampling network are historical stations that have monitoring data dating back to the 1970s.

G. Fish Tissue Monitoring Program



The MDEQ Laboratory monitors fish tissue for contaminant levels that could be harmful to people that consume fish from the state's waters. When elevated levels of contaminants are found in fish tissue, the data is used by a multi-agency task force to determine if a fish tissue consumption warning or advisory is warranted. Presently, there are advisories for Mercury, DDT, Toxaphene, and PCBs on many state waters. Special fish tissue monitoring for Fiscal Year 2016 focused on sites where advisories for DDT and Toxaphene have been issued to collect additional data to further inform decisions on the advisory in the Mississippi Delta. These

data are currently being evaluated for advisory updates. In addition, tissue was collected from fishing rodeos in the Mississippi Sound for Mercury and Selenium levels.

Laboratory biologists investigate numerous fish kills throughout the state, and these biologists are on-call during weekends and holidays to respond to fish kill reports and to assist if needed with water sampling and wildlife damages.

H. Triennial Review of Water Quality Standards

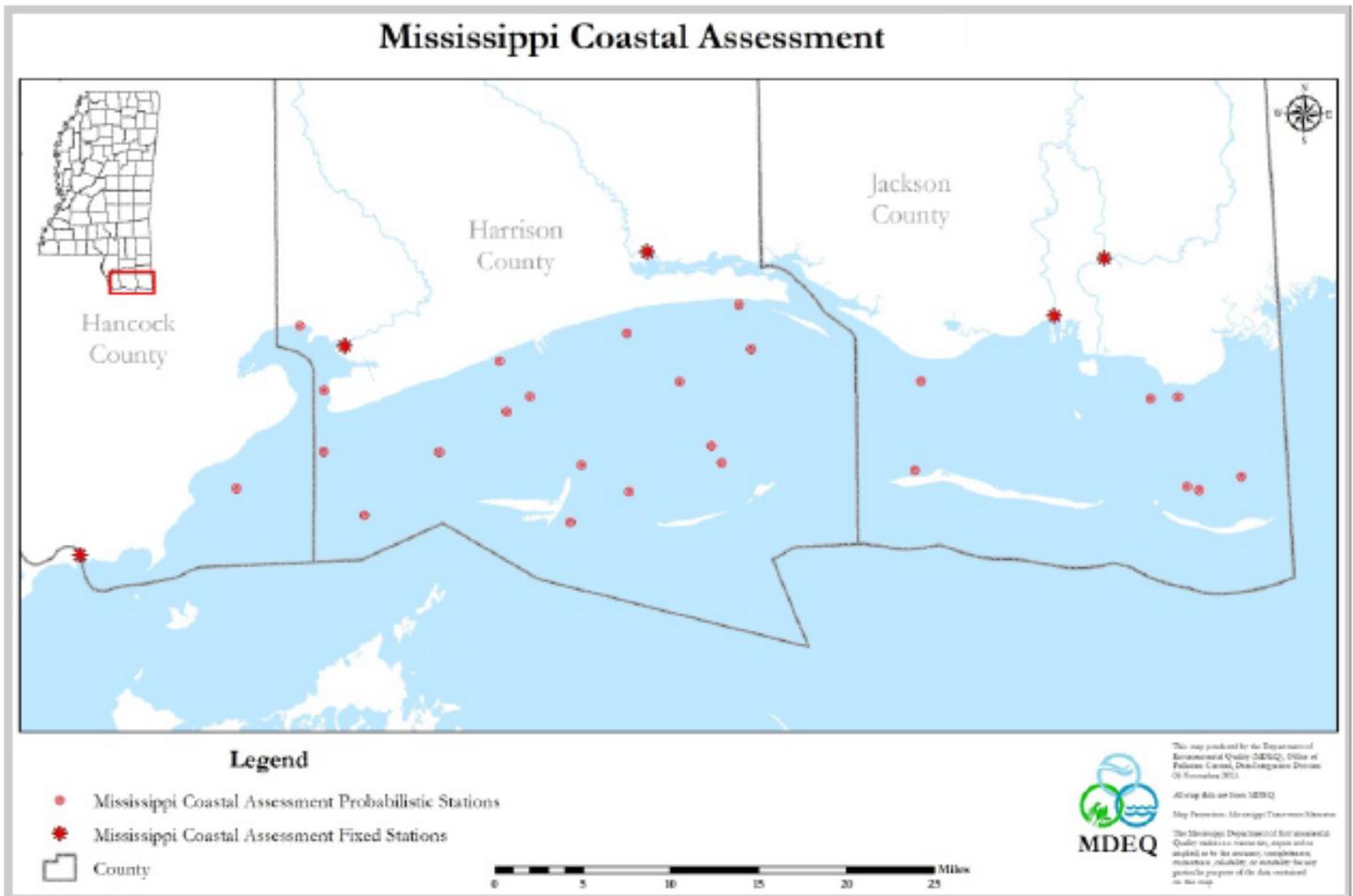
The Clean Water Act requires all states to develop, review, revise (as needed), and adopt water quality standards. States are required to review their water quality standards at least every three years through a process known as the triennial review. As part of the 2015 triennial review, MDEQ proposed the following revisions:

- The water quality criteria for recreational waters were updated based on EPA's most recent recommendations that were released in 2012. The bacterial indicator for freshwaters, fecal coliform, was replaced with the latest recommended bacterial indicator, *E. coli*.
- Based on the latest science and recommendations within EPA's 2012 guidance for Recreational Water Quality Criteria, seasonal criteria for bacteria are no longer recommended. Therefore, the seasonal bacteria option was removed from the following water body classifications: Fish and Wildlife Support and Public Water Supply.
- A statistical threshold value (STV) was added for enterococci within marine and estuarine coastal recreational waters. Enterococci samples examined during a 90-day period should not exceed 130 per 100 ml more than 10 percent of the time.

A public comment period was held in October 2015 and public hearing was held on November 5, 2015, to receive comments related to the proposed revisions to Mississippi Water Quality Criteria for Intrastate, Interstate, and Coastal Waters. The final proposed revisions were adopted by the Commission on February 25, 2016. The revisions have been submitted to EPA Region 4 for review.

I. Coastal Monitoring

MDEQ participated in the EPA National Coastal Assessment (NCA) Program from its inception in 2000 through 2006. When EPA suspended funding for the NCA program, MDEQ partnered with the Gulf Coast Research Lab and the Mississippi Department of Marine Resources to continue a very similar sampling program, the Mississippi Coastal Assessment (MCA) Program. This monitoring was planned to help evaluate long-term coastal water quality conditions, and was particularly valuable after Hurricane Katrina and during the rebuilding efforts. This data will also be utilized to help examine long term environmental impacts following the *Deepwater Horizon* oil spill.



MCA monitoring is conducted during the late summer index period (July to September) and includes biological, chemical, and physical sampling. Sites are selected using a probabilistic site selection methodology, and 37 sites were sampled in Fiscal Year 2016. At the end of a five-year cycle, a total of 125 sites will be sampled for the coastal monitoring program.

K. Mississippi's Numeric Nutrient Criteria Development Activities

In 2016, MDEQ continued efforts to develop numeric nutrient criteria for Mississippi's various water body types. MDEQ's task is to develop scientifically defensible criteria that are appropriate and protective of Mississippi's waters. The criteria for each water body type will be coordinated with those for other water body types to ensure consistency across the state and protection from downstream impacts.

Highlights of MDEQ's numeric nutrient criteria development efforts in Fiscal Year 2016 include:

- MDEQ established the Mississippi Nutrient Technical Advisory Group (TAG) in 2010 to provide technical expertise and regional knowledge to MDEQ for the development of scientifically defensible numeric nutrient criteria. The TAG consists of over 30 members representing multiple state and federal agencies and four Mississippi universities. The TAG focused on providing continued technical input on developing nutrient criteria for Mississippi's lakes and reservoirs, wadeable and non-wadeable streams, coastal and estuarine waters, and Mississippi Delta waters. MDEQ continues criteria development efforts across all water body types based on recommendations from the TAG.
- MDEQ continued to provide Nutrient Criteria Update Sessions for Mississippi stakeholders. These updates promote open communication between MDEQ staff and stakeholders. MDEQ will continue to hold update sessions regularly with this group throughout the numeric nutrient criteria derivation process.
- MDEQ continued to develop the plan for numeric nutrient criteria implementation. While developing the criteria values themselves, MDEQ also focused significant efforts into exploring concerns and questions raised by both MDEQ staff and Mississippi stakeholders. The plan for how numeric nutrient criteria will be implemented must also be developed and understood by both MDEQ and stakeholders. MDEQ will continue to work concurrently on both criteria development and implementation planning.
- MDEQ continues to collect data and conduct studies to support nutrient criteria development. Ongoing activities included development of a benthic index for Mississippi's coastal waters, a benthic index for Delta waters, and data collection efforts across the state.

L. Total Maximum Daily Load and Modeling

Total Maximum Daily Loads (TMDLs) are a requirement of the Clean Water Act (CWA) to provide direction for restoring the nation's waters. TMDL reports provide an analysis of the ability of a water body to assimilate pollutants from point sources, such as industry and communities, and nonpoint sources, such as stormwater runoff from urban areas or agriculture.

Water bodies that do not meet water-quality standards are identified as "impaired" for the particular pollutants of concern. Under Section 303(d) of the Clean Water Act, states are required to develop a list of waters that are not in compliance with water quality standards and establish a TMDL for each pollutant causing the impairment. MDEQ, biennially, creates a list of these

impaired waters called the 303(d) List of Impaired Waters. MDEQ's 2016 list was adopted by the Mississippi Commission on Environmental Quality on June 24, 2016. This list will not be updated again until 2018 during the next biennial review. MDEQ had two TMDLS approved between October 2015 and September 2016 and is also currently working on several stressor identification (SI) reports on water bodies that are identified as biologically impaired within the Big Black and Tombigbee River basins. The SI process identifies the stressors to water quality for individual water bodies that have been identified as biologically impaired. Following the identification of the stressors, TMDLs will be completed for those water bodies.

Leaf River Nutrient Model Calibration Study Project



As part of MDEQs' Basin Approach to TMDLs, the Leaf River was targeted for TMDL development. A water quality study on the Leaf River, located in south Mississippi and a tributary to the Pascagoula River, was initiated in the fall of 2015 and was completed in the fall of 2016. The first phase on the project was a joint collaboration with EPA to evaluate physical and chemical parameters of the river and its segments. The second phase involved monthly sampling of the Leaf River for one year. The primary objective of this study was to collect water quality samples for the evaluation and development

of water quality model inputs to characterize the current conditions of the Leaf River. Study efforts included water quality sampling for an array of analytes including long-term biological oxygen demand, nutrients, solids, and algal analyses. The study area included 13 locations that were selected to provide representative data on waters receiving pollutants from a wide range of agricultural and industrial sources. The water quality model will then be used to establish TMDLs for the Leaf River.

Additionally, as part of MDEQ's nutrient criteria development efforts, this study helps generate data to estimate the total nutrient load allowable in the river and the nutrient input from the point source dischargers.

Modeling for NPDES Permit Limits

MDEQ's TMDL Program also establishes Waste Load Allocations (WLAs). In addition to the TMDLs and stressor identification efforts, TMDL staff members are actively involved in the ongoing issuance and reissuance of WLAs, which include the development of new and/or review of current NPDES permit limits. As a part of this process, the Modeling and TMDL Branch uses water quality models to replicate conditions of a stream and determine the appropriate loads that are allowed from dischargers as a result of those conditions. The Modeling and TMDL Branch completed approximately 82 WLAs from October 2015 to September 2016 to assist the permitting branch in meeting their permitting goals.

M. Development of the Priority Framework

MDEQ is complying with a national initiative by EPA to develop a new collaborative framework for implementing the Clean Water Act. The new framework is designed to help coordinate and focus efforts to advance the effectiveness of the water program. Given resource constraints and competing program priorities, leveraging resources and coordinating efforts is crucial to effective program implementation. This new framework does not change regulation, policy, or issue new mandates. It is intended to provide focus for MDEQ water programs so as to better manage the activities and promote collaboration to achieve water quality goals for the streams, rivers, lakes and estuaries of Mississippi.

In order to select the priority watersheds, MDEQ used landscape information to calculate metrics on the watershed scale that are used to characterize and rank watersheds by resource value and potential stressors. Resource value is determined using environmental and human welfare data layers. Environmental factors considered include erosion potential, impervious area, wetlands, impaired waters, and concentration and types of discharge permits. Human welfare factors include demographics, fishing advisories, water supply intakes, public water supplies, recreational water bodies, public waterways, national and state parks, and recreational locations. Other factors considered were the presence of existing watershed plans, ongoing restoration and/or conservation work, and engaged stakeholders all of which greatly increase the chances of success.

Weights for each of these were adjusted based on professional judgment of the importance of each for characterizing watershed value. Once these factors were developed, standardized, and weighted, the tool produces a relative ranking of every watershed within the state. This ranking was used to screen watershed for activities that will address the water program goals. A total of 21 watersheds were chosen as targeted watersheds through this process.

MDEQ will review the selection process and screening criteria annually to identify the priority watersheds for the following ten year period. Flexibility will be retained to re-evaluate selections and amend watershed selection in the face of changing state priorities as well as changing EPA national and regional priorities.

N. The Gulf of Mexico Alliance

The Gulf of Mexico Alliance (GOMA) is a partnership among the states of Alabama, Florida, Louisiana, Mississippi, and Texas whose goal is to address priority issues related to the ecological health of the Gulf of Mexico. During Fiscal Year 2016, MDEQ led the GOMA Water Resources Team encouraging a collaborative approach to address multiple focus areas related to water quality and quantity in the region as well as working to protect aquatic health, human health, and economic health in the Gulf of Mexico.

O. Mississippi River and Gulf of Mexico Watershed Nutrient Task Force

MDEQ continues to support the efforts of the Mississippi River and Gulf of Mexico Watershed Nutrient Task Force (Task Force). The Task Force was established in 1997 to understand the causes and effects of eutrophication in the Gulf of Mexico, coordinate activities to reduce the size, severity, and duration, and ameliorate the effects of hypoxia. Activities of the Task Force include coordinating and supporting nutrient management activities from all sources, restoring habitats to trap and assimilate nutrients, and supporting other hypoxia related activities in the Mississippi River and Gulf of Mexico watersheds.

P. Nonpoint Source Pollution

Nonpoint Source (NPS) Pollution is rainwater runoff that picks up and carries away a variety of pollutants as it flows over streets, parking lots, construction sites, or farm lands. The pollutants may then flow into rivers, oceans, and underground sources of drinking water. These pollutants include excess fertilizer, sediment, nutrients, pesticides, oil, grease, and bacteria from faulty septic systems.

In 1987, amendments to the Clean Water Act established the Section 319 NPS Management Program. The state's program was approved in August 1989, and funded for implementation in August of 1990. Over the past 27 years, MDEQ, in cooperation with numerous federal, state, and local stakeholders has been successful in developing a comprehensive statewide program to help protect and restore valuable water resources.

In Fiscal Year 2016, MDEQ received approximately \$2.98 million in Section 319 Grant funds. Of this amount, eight percent is allocated for administrative work, 25 percent for program operation and statewide education and public outreach projects, 16 percent for NPS watershed planning, 35 percent for NPS watershed project implementation, and 16 percent for support of priority watershed restoration and protection projects. Grants are awarded for a five-year period and progress is reported annually.

MDEQ currently has five active Section 319 grants covering the grant periods of 2012 to 2016. Section 319 grants are awarded annually to MDEQ by EPA, and MDEQ, in turn, utilizes sub-grant agreements to contract with eligible partners for work needed. Generally, these partners supply matching funds or in-kind services at a rate of 40 percent. During Fiscal Year 2016, the NPS Branch managed a total of 31 projects and activities totaling \$2,010,362 in federal funds. These projects may take from one to four years to complete and include, but are not limited to, education and outreach projects, water-quality monitoring projects, projects that put Best Management Practices (BMPs) on the ground to demonstrate effectiveness of pollution reduction activities, agricultural and chemical waste disposal, and watershed protection and restoration projects.

Q. Stormwater Regulations to Improve Water Quality

MDEQ issues permits covering discharges resulting from rainfall events and the associated stormwater runoff from industrial or commercial sites. These permits focus on avoiding pollutants commingling with stormwater, averting excessive erosion, and preventing

contaminated stormwater from entering waters of the state. The permits contain best management plans, monitoring conditions, and operational requirements to ensure stormwater discharges will not cause or contribute to violations of water quality standards or impair any beneficial uses of waters of the state.

MDEQ's Baseline Stormwater General Permits cover industrial activities, including but not limited to, material handling areas, raw material and final product management, waste materials, and by-products storage areas which may be exposed to rainfall events and thus stormwater runoff. In lieu of receiving coverage under the Baseline General Permit, facilities can certify their operations will not come into contact with stormwater through a No Exposure Certification.

A Construction Stormwater General Permit authorizes discharge from construction activities resulting in land disturbance of more than one acre. Disturbance between one and five acres are covered by the Small Construction General Permit and do not require review by MDEQ. Disturbances greater than five acres require coverage by the Large Construction General Permit.

MDEQ's Mining Stormwater General Permit authorizes stormwater discharges from surface mines across the state. Coverages under the Mining Stormwater General Permit are coordinated between the Environmental Permits Division (EPD) and MDEQ's Office of Geology's issuance of Surface Mining and Reclamation Permits.

In Fiscal Year 2016, MDEQ took the following stormwater permitting actions:

- The Environmental Permits Division issued General Permit coverage for 297 large construction projects (five acres or greater).
- EPD issued General Permit coverage for 790 regulated industrial facilities under the Baseline Stormwater General Permit for Industrial Activities. The Baseline General Permit was reissued in November of 2016.
- EPD received and processed 113 "No Exposure Certifications" from potentially regulated industrial facilities. Facilities that certify "No Exposure" of industrial activity to stormwater are not required to obtain storm water coverage under the Baseline General Permit.
- EPD issued General Permit coverage for 124 regulated surface mining sites under the Mining Stormwater General Permit in 2016.

R. Environmental Operator Training

The Operator Training program began in 1969 to provide instruction and technical assistance to municipal and domestic wastewater personnel and facilities. The training, provided at no cost to the operator, was initially associated with a voluntary certification program offered by the Mississippi Water and Pollution Control Operators' Association. Administration of the certification program was transferred to MDEQ in 1987 when the State Legislature mandated certification of all municipal and domestic wastewater operators. The certification regulations include a requirement for continuing education during each three-year certification period.

The training calendar included 43 days of agency-sponsored training classes. Of these training days, 35 were co-sponsored with the three wastewater related professional associations (Mississippi Water and Pollution Control Operators' Association, Mississippi Water Environment Association, and Mississippi Rural Water Association). Attendance totaled 788 operators, utility managers and engineers. Certification exams were administered to 190 prospective operators with a total number of 178 new and renewal certificates issued. There were 37 wastewater training request approved for wastewater continuing education credits in the classroom and online. There are currently 745 certified pollution control operators in the state.

The training program staff participated in energy conservation studies with EPA Region 4 and a wastewater expert professor in order to save energy costs for facilities while remaining in compliance with their NPDES permit. The program looks forward to expanding this idea in the future to more facilities through specific training of operators.

The MDEQ Operators Training program staff have partnered with other agencies to speak at functions for Mississippi Municipal League with the ultimate goal of increasing communication between operators and municipal officials. The training staff also provide onsite technical assistance to municipal, commercial and industrial wastewater facilities. This assistance program is aimed at providing "no cost" assistance in returning to or maintaining compliance with their wastewater permit. In Fiscal Year 2016, MDEQ Operators Training staff conducted 360 technical assistance and outreach activities through either onsite visits or remotely.

S. Water Pollution Control Revolving Fund

WATER QUALITY OBJECTIVE – Ensure the improvements funded through the Water Pollution Control Revolving Loan Fund Program are adequate to meet the needs of citizens, the business community, and to foster economic growth.

The Water Pollution Control Revolving Fund program (WPCRLF) provides low interest loans to public entities in the state for construction, repair, or replacement of wastewater, stormwater, and nonpoint source pollution projects. Funding for these projects comes from federal grants, state match,

repayments, and interest on deposits. Since 2010, additional subsidy funding, provided through annual Congressional appropriations, has also been made available to "Green" and "Small and Low Income Community" WPCRLF projects. During Fiscal Year 2016, MDEQ funded three new WPCRLF projects totaling \$16.8 million.

Long term goals include: 1) maintaining a financially sound State Revolving Fund in perpetuity; 2) meeting a substantial portion of the wastewater needs in the state within a reasonable period of time; and, 3) funding fiscally sound projects in order of environmental importance as established by the Commission, while continuing to maintain a program that is attractive to the communities in the state.



T. Water Pollution Control Emergency Loan Fund

The Water Pollution Control Emergency Loan Fund (WPCELFF) program provides loans to communities for the emergency construction, repair, or replacement of wastewater collection and treatment facilities. The WPCELFF has approximately \$3.4 million available for such emergency projects. MDEQ encourages communities throughout the state to utilize this program whenever funds for emergency wastewater projects are needed. There were no loans within Fiscal Year 2016.

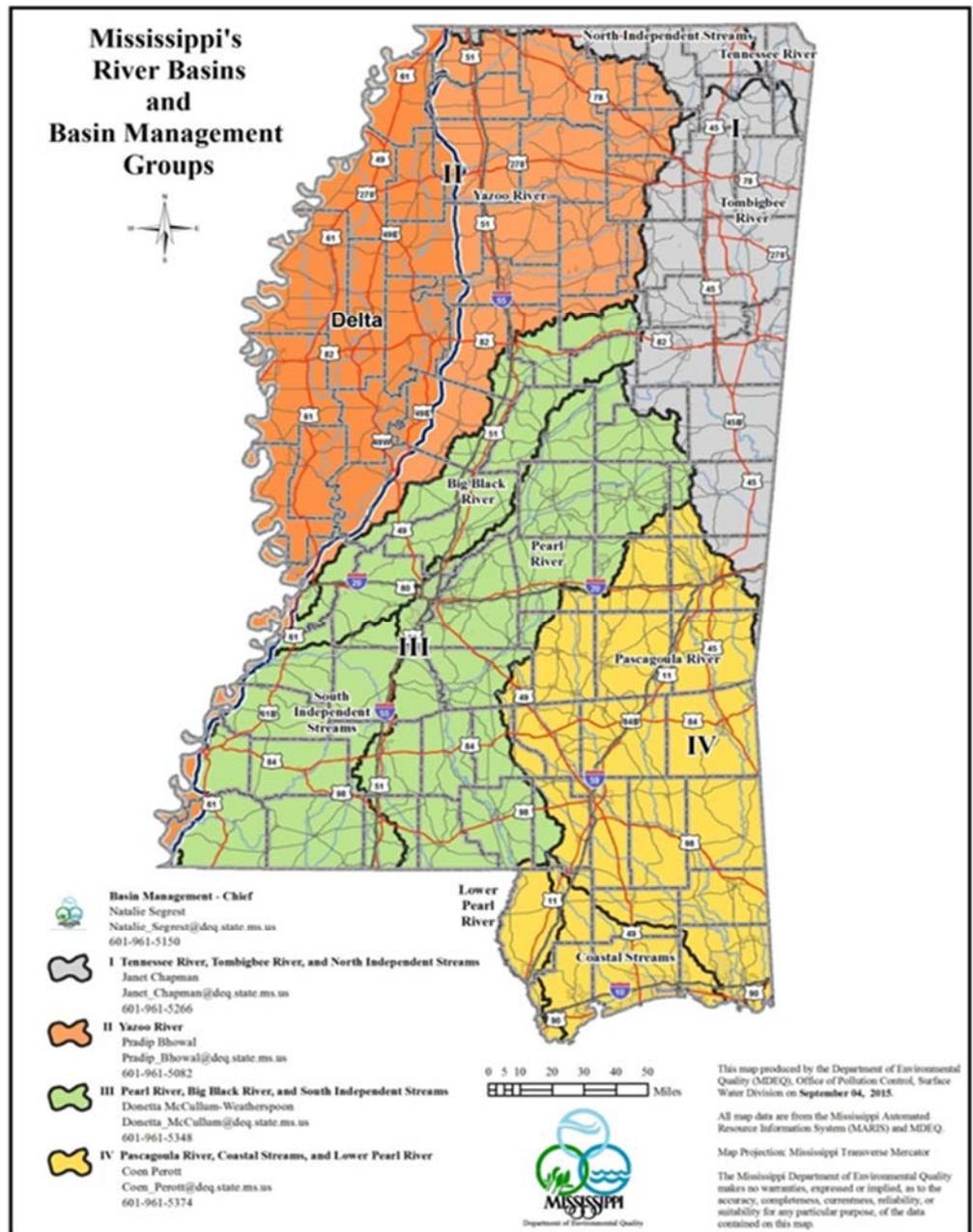
U. Basin Management Approach

The goal of Mississippi's Basin Management Approach (BMA) is to restore and protect water resources of the state through collaborative development and implementation of effective management strategies that help improve water quality and quantity while fostering sound economic growth. In an effort to effectively carry out planning and implementation activities, the ten major river basins in Mississippi have been organized into four basin groups (see map insert). Each basin group has a basin team comprised of the representatives from federal, state and local government agencies, non-governmental organizations, and other stakeholders.

Basin Group I

Bear Creek

Basin Group I is participating in joint work with the Tennessee Valley Authority, the U.S. Fish and Wildlife Service, the Geological Survey of Alabama, the Alabama Department of Environmental Management, and others on Bear Creek in the Tennessee River Basin. The team is collecting data on Bear Creek to determine where restoration efforts will be most beneficial. MDEQ has represented Mississippi's interest and support for this effort on this shared resource. Habitat assessments and erosion potential at bridge crossings and stream



bank surveys have been completed for the portion of Bear Creek in Mississippi. This information soon will be available for use by Tishomingo County supervisors, MDOT, and the Tishomingo Soil and Water Conservation District as well as MDEQ to hopefully lead to projects to reduce sediment runoff in the Bear Creek drainage.

Buttahatchee River

The joint Buttahatchee River effort is just beginning. The initial goal of this effort is to determine where to most effectively target restoration and protection efforts to improve water quality, protect aquatic communities and aid in the recovery of threatened and endangered species. Several Mississippi and Alabama agencies and organizations met near Caledonia in June 2016 to do a fish survey there and in other wadeable reaches of the Buttahatchee drainage in Mississippi. The Mississippi Museum of Natural Science is taking the lead in this data collection effort.

Catalpa Creek

Of major importance for Basin Group I is the formation of the Catalpa Creek Watershed team in the Tombigbee River Basin. Catalpa Creek has its headwaters on the Mississippi State University campus and the southeastern part of the City of Starkville. This grassroots team has done extensive preparation and planning to get this project underway building important partnerships and developing a water resources management plan for the Hydrologic Unit Code 12 Red Bud—Catalpa Creek watershed. The team has members from many departments, various centers and institutes at Mississippi State University, as well as members from the local agricultural community and the City of Starkville. They have written a watershed plan and proposals are going out to many agencies to leverage funding. MDEQ will provide funding for Phase I of the project by using a Section 319 grant.

Basin Group II

Delta Nutrient Reduction Strategy

Implementation of the Delta Nutrient Reduction Strategy (DNRS) is currently ongoing at multiple priority watersheds to answer the following key questions:

- What nutrient load reductions are achievable?
- What will be the cost for these reductions?
- What will be the associated environmental and economic benefits from these reductions?

Once nutrient load reductions are determined to be achievable, then quantitative reduction targets will be established and future progress will be evaluated in relation to achieving those targets.

MDEQ has helped fund many projects in Basin Group II watersheds:

Harris Bayou

Harris Bayou, a tributary of the Big Sunflower River, flows through portions of Bolivar and Coahoma counties. The current priority sub-watershed is Overcup Slough which is in the headwaters of the watershed and contains both catchments that have been the focus of the Delta

Nutrient Reduction Strategy implementation efforts since 2010. BMPs installed (or in process) during Fiscal Year 2016 in the Overcup Slough sub-watershed include: 36 water control structures, four low grade weirs, and approximately 9,100 feet of two-stage ditches. Also, 600 acres of cover crops were planted in 2016.

Collection of Tier 1 nutrient data for the treatment and control catchments has ceased after five years and is currently under analysis. With Tier 2 monitoring in place at the outflow of the watershed, the current project will continue to incrementally implement BMPs to address prioritized resource concerns.

Porter Bayou

Porter Bayou, also a tributary of the Big Sunflower River, flows through portions of Bolivar and Sunflower counties. The current priority sub-watersheds are Upper Porter Bayou and Middle Porter Bayou which contain the catchments that have been a focus of continued DNRS implementation efforts. In Fiscal Year 2016, the following BMPs were installed in Upper Porter Bayou: 23 water control structures, eight low grade weirs, approximately 19,695 feet of two-stage ditches, and 245 acres of land leveling activities. In Middle Porter Bayou, 17 water structures, three low grade weirs, and approximately 7,700 feet of two-stage ditches were installed along with 70 acres of land leveling activities. Along with the BMPs mentioned above, 350 acres of cover crops were planted.

Collection of Tier 1 nutrient data has ceased after five years and is currently under analysis. With Tier 2 monitoring in place at the outflow of both sub-watersheds, the current project will continue to incrementally implement BMPs to address prioritized resource concerns.

Mississippi River Basin Healthy Watershed Initiative (MRBI)

This initiative assists landowners and producers to voluntarily implement conservation and management practices that prevent, control, and trap nutrient runoff from agricultural land. MDEQ works collaboratively with the USDA Natural Resources Conservation Service (NRCS) to target watersheds to receive MRBI funding. In 2015, NRCS selected Brook Bayou, Christmas Lake Bayou, Long Lake, Stillwater Bayou, and Tommie Bayou watersheds located in portions of Bolivar, Sunflower and Washington counties. Burrell Bayou and Beaver Bayou-Mound Bayou (located in Bolivar and Sunflower counties) were added as new watersheds to receive funding this year through the MRBI initiative. All these watersheds combined received \$5.473 million in funding in Fiscal Year 2016.

Basin Group III

Ross Barnett Reservoir

The Ross Barnett Reservoir has been an irreplaceable resource for Central Mississippi since its construction in the late 1960s. It is the largest source of drinking water in the state supplying over 15 million gallons of water to local residents, businesses, and industries.

As it has done for more than 50 years, this plentiful water resource also provides outstanding recreational opportunities, supports economic growth as well as scenic beauty and vital wildlife habitats.

Under a Memorandum of Agreement between MDEQ and the Pearl River Valley Water Supply District (PRV), along with other local partners and assigned contractors, many demonstration projects and workshops were done to reduce nonpoint source impairments due to sediment and nutrients. Interpretive signage for these sites and other existing BMP demonstration sites will also be placed to increase knowledge concerning water quality and protection. In addition, educational workshops are being developed to target three key groups: decision makers (elected officials), professionals (architects, engineers and planners), and developers.

Rezonate

In a continuing effort to leverage resources and to promote the message of protecting and restoring the Reservoir, MDEQ, through the Ross Barnett Reservoir Initiative (known as *Rezonate*), has sponsored and helped facilitate several events in and around the Ross Barnett Reservoir.

Rezonate was a major sponsor for the fifth annual Project Rezway Recycle Fashion show that took place on April 24, 2016, at the Mississippi Craft Center in Ridgeland. The show featured apparel and accessories composed of at least 75 percent recycled materials. Keep the Rez Beautiful hosts this event annually with the aim of raising awareness of the importance of recycling and shows how commonly discarded items can be used again instead of littering the environment. Other major sponsors included Kathryn's Steakhouse, Waste Management, the Barnett Reservoir Foundation, MDOT, Keep Mississippi Beautiful, and PRV.



First Lady Deborah Bryant and MDEQ's Dr. Donetta McCullum-Weatherspoon presented Walt Grayson with the Communicator Award at 2016 Project Rezway.

The annual Gator Bait Kayak Race, a 5.5-mile race for competitive and recreational kayakers, canoeists, and SUP (standup paddleboarding) paddlers, is another event sponsored through the *Rezonate* initiative. The event was held in September 2015 at Pelahatchie Shore Park with 94 kayakers from the local area and other states participating. Once again, this successful event raised awareness about the water quality of the Reservoir and the need to protect it through conservation education and litter control.

The third annual Gator Bait Hatchling Race was held at Lakeshore Park in May of 2016, and its goal is to introduce kids to the sport of kayaking, foster a love for the outdoors, and instill a desire to protect the environment. Partners that contributed to both kayak events were PRV, the Mississippi Wildlife Federation, Keep the Rez Beautiful, Academy Sports and Outdoors, the Barnett Reservoir Foundation, the Mississippi Museum of Natural Science, Dogwood Pediatric Dentistry, Mosquito X, and Marco's Italian Pizza.

The completed BMP practice demonstrations, signage and workshops, were done to reduce

nonpoint source impairments due to sediment and nutrients because of urbanization and recreation. Interpretive signage for these sites and other existing BMP demonstration sites increase knowledge concerning water quality and protection. In addition, educational workshops target three key groups: decision makers (elected officials), professionals (architects, engineers and planners), and developers.

During the 2015 to 2016 project period the following projects were completed:

- Installation of composting toilets upriver at Flag Island to reduce the impact of potential bacteria and pathogens entering the Reservoir.
- Lakeshore Park Rain Garden rehab to reduce stormwater runoff entering the Reservoir.
- Old Trace Park stormwater design to retrofit parking lot to reduce stormwater runoff.
- *Rezonate* kiosks about watershed protection and restoration installed at Old Trace Park and Lakeshore Park.
- Turtle Creek sediment evaluation to determine possible future BMP implementation.
- Development and facilitation of Green Infrastructure and the *Rezonate* Initiative Education and Outreach Workshops to various targeted audiences:
 - Elected officials in Madison and Ridgeland
 - Green Infrastructure Workshop, Ridgeland
 - Green Infrastructure Workshop, Biloxi
 - Elected officials and city engineers in Rankin County
 - Public Works Department and engineers in Flowood
 - Panel Discussion at the Mississippi Municipal League Summer Conference
 - Training Workshop at Mississippi Association of Builders and Contractors

Rezonate, through MDEQ, also partnered with the City of Ridgeland to increase awareness of project mission and goals by reaching more defined targeted audiences. *Rezonate* also partnered with the Summer Library Programs in Hinds, Madison, and Rankin counties to teach students about the importance of protecting drinking water sources especially in the Ross Barnett Reservoir watershed. Over 250 students and parents were reached through this effort.

Basin Group IV

Turkey Creek

The Basin Management Branch and MDEQ continue to work in partnership with other agencies and the Turkey Creek Steering Committee on improving water quality and community engagement in the Turkey Creek watershed. MDEQ continues to support watershed-based teams which have developed plans and have implemented Best Management Practices.

Coastal Streams and Habitat Initiative

MDEQ is also working with restoration projects, as they become implemented in water bodies in the Pascagoula, Coastal Streams, and Lower Pearl River Basins, and on the Coast.

One of these Restoration Projects was the Coastal Streams and Habitat Initiative project funded by the National Fish and Wildlife Foundation's Gulf Benefit Fund Project, awarded to MDEQ, and implemented by The Nature Conservancy in partnership with the Pascagoula River Audubon

Center and the MDEQ Basin Program. This project involved the following nine coastal watersheds: Magnolia Bayou, Watts Bayou, Bear Point Bayou, Turkey Creek, Coffee Creek, Brickyard Bayou, Oyster Bayou, Rhodes Bayou, and Bayou Chico. As a result of this project, The Nature Conservancy has just released a Conservation Action Plan for the nine Mississippi Coastal Streams.

Dry Creek

Partners in the Dry Creek Watershed have been working to develop a watershed-based plan and watershed implementation project for Dry Creek in the Pascagoula River Basin. Implementation should begin in early 2017.

WaterFest

In April 2016, MDEQ partnered with Celebrate the Gulf and Art in the Pass to bring WaterFest to the Mississippi Gulf Coast (photo below). Over 5,000 people attended this event in Pass Christian. At the event, staff from MDEQ presented water models and talked with participants about protecting the state's environmental resources and what they can do to help protect and restore the environment.



VII. PERMITTING

A. Environmental Permitting

MDEQ staff develop various types of environmental permits which are then presented to the Mississippi Environmental Quality Permit Board for issuance. The Permit Board issues, reissues, modifies, denies, transfers, and revokes permits and certifications administered under the Clean Water Act, the Clean Air Act, the Resource Conservation and Recovery Act, the Surface Mining Control and Reclamation Act, state mining laws, and state water resource control laws. MDEQ's Office of Geology manages permitting activities under the Surface Mining Control and Reclamation Act. MDEQ's Office of Land and Water Resources manages permitting activities under the water resources control laws. The Environmental Permits Division (EPD) of the Office of Pollution Control is responsible for all other permitting activities including the following types of permits:

- Air Construction and Air Operating
- Air Title V Operating
- Wastewater - State No Discharge
- Wastewater - National Pollutant Discharge Elimination System
- Wastewater - Pretreatment
- Stormwater Construction and Operating
- Solid Waste
- Hazardous Waste
- Tire Programs
- Wetlands Impacts

Currently there are over 20,000 sites in the permitting database. Many of these sites have permits that, by state and federal regulation, expire every five years and have to be reissued. As new companies come into the state and existing companies have changes or modifications, these activities also require permitting actions.

B. Permitting New Industries

The Environmental Permits Division works closely with the Mississippi Development Authority (MDA) in helping site new industries to Mississippi. EPD believes that a key element in effectively addressing environmental issues surrounding greenfield projects is early interaction between the proposed company and MDEQ. EPD offers and encourages pre-application meetings. Time spent in refining the information needed for permit applications at the front end of a project typically reduces the overall time to bring permitting to a decision point. EPD and MDA recently coordinated a training session, during which numerous MDA project managers and MDA executive staff met

with MDEQ executive staff, EPD Branch managers, and other permitting staff to train each other on processes and to reinforce the commitment to working together effectively.

C. Stormwater General Permits

The Environmental Permits Division reissued the statewide Baseline Stormwater General Permit for Industrial Activities (MSR00) on November 17, 2015. The Baseline General Permit authorizes the discharge of stormwater runoff into waters of the state from regulated industrial activities in accordance with the provisions of the Mississippi Air and Water Pollution Control Law. The reissued general permit allows the continued discharge of storm water from regulated industrial activities for an additional five-year period.

The Environmental Permits Division reissued the statewide Phase II Municipal Separate Storm Sewer System (MSRMS4) on March 18, 2016. The MS4 Phase II General Permit covers the State of Mississippi and authorizes the discharge of stormwater runoff into waters of the state from small MS4s, as defined in 40 CFR 122.26(b)(16). The general permit allows the continued discharge of stormwater from small MS4s for an additional five-year period. This general permit replaces the previous general permit that expired December 31, 2013. Instruction letters with a summary of changes were sent out to all active coverage recipients and newly-designated MS4s outlining the instructions for obtaining coverage under the reissued permit.

Additionally, a renewal of the Large Construction General Permit has been drafted and made available for public comment. The Large Construction Stormwater General Permit covers the State of Mississippi and authorizes the discharge of stormwater runoff into waters of the state from construction sites.

D. Performance Improvements

EPD continued to partner with the Data Integration Division (DID) of MDEQ in the development of new functionality for the agency's enterprise-wide data management system – enSite. Although it has not replaced the agency's official paper files, enSite has become the agency's primary electronic storage database for information. This has made it possible for the department to provide much more information over the Internet to the regulated community, other state agencies, EPA, and citizens.

E. Toxic Release Inventory

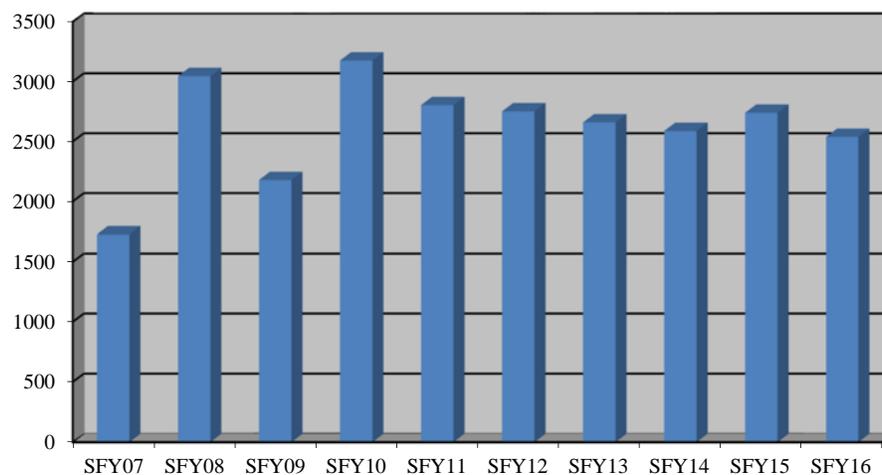
The Toxic Release Inventory is required under Section 313 of the federal Emergency Planning and Community Right-To-Know Act of 1986. This report is required to be submitted every year by facilities that utilize toxic substances in their manufacturing processes if the facility has more than ten full-time employees and falls into certain Standard Industrial Classification codes. These facilities report how toxic substances are utilized in their manufacturing processes and how and to what media they are emitted to the environment. Every year, over 300 facilities from across the state submit more than 1,300 reports to MDEQ.

VIII. COMPLIANCE AND ENFORCEMENT

The Environmental Compliance and Enforcement Division (ECED) of the Office of Pollution Control implements and oversees the majority of MDEQ's compliance and enforcement activities and is responsible for the regulation of sites for compliance with applicable air, water, hazardous waste, and non-hazardous waste permits and regulations. The goal is for continuous compliance with all applicable environmental laws, regulations, and standards. Staff assists Mississippi businesses, industries, and farms with compliance. When a site fails to comply with permit(s) or regulations, appropriate enforcement action is taken to promptly return the site to compliance.

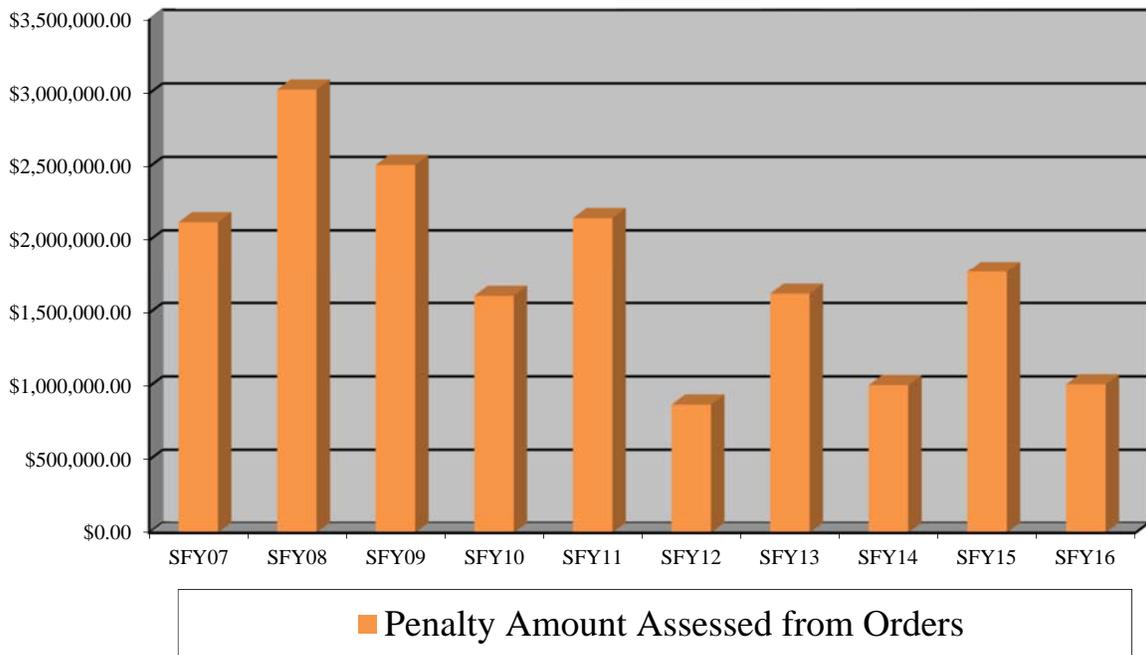
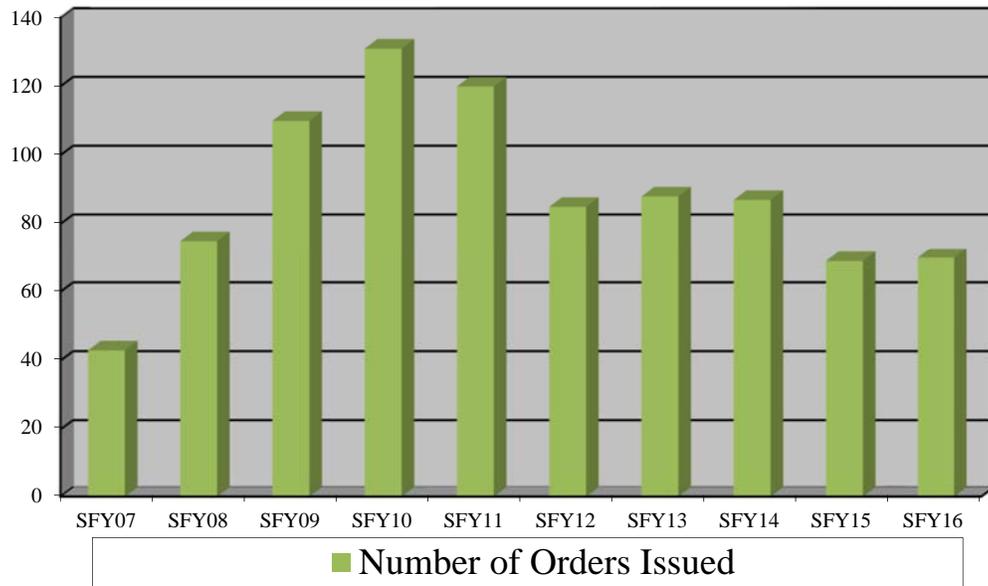
During Fiscal Year 2016, the following number of on-site inspections were performed by ECED and the Field Services Division:

- 198 for compliance with air pollution regulations/permits
- 1,474 for compliance with water pollution regulations/permits
- 83 for compliance with hazardous waste regulations/permits
- 784 for compliance with solid waste regulations/permits



■ Total Inspections (Air, Water, Hazardous Waste & Solid Waste)

During Fiscal Year 2016, ECED actions resulted in 70 orders being issued for non-compliance with air, water, solid waste, and hazardous waste regulations and permits. Sixty-one of these orders contained provisions for a penalty with a total assessed penalty amount of \$1.015 million. When appropriate, MDEQ allows the use of Supplemental Environmental Projects (SEP), projects that go beyond what is required to comply, to offset a portion of a cash penalty. One order allowed the use of a SEP.



ECED, in conjunction with the Field Services Division, is also responsible for responding to citizen complaints regarding air, water, solid waste, and hazardous waste matters. During Fiscal Year 2016, the Office of Pollution Control received and addressed 928 complaints.

IX. EMERGENCY PREPAREDNESS AND RESPONSE

A. Emergency Response

The Emergency Response Division responds as needed to emergencies across the state involving hazardous materials, oil spills, or any pollutant that poses a threat to

human health or the environment. Contractor expenditures for response actions were \$505,138.52, and the agency was reimbursed approximately \$188,723.52 from responsible parties. The Emergency Response staff handled approximately 960 calls for assistance in Fiscal Year 2016.



Emergency Preparedness and Response Strategic

Goal: Prevent, prepare for, and respond to public health, safety, and environmental emergencies.

MDEQ's Emergency Response staff are on-call statewide 24 hours a day and seven days a week. MDEQ and MEMA work together to provide effective around-the-clock spill response. MEMA is notified of emergencies, and they, in turn, contact MDEQ personnel who provide on-site response and technical assistance.

MDEQ maintains the resources and readiness to quickly and effectively support local emergency response personnel and communities when an environmental or public health emergency occurs. This readiness is accomplished by training alongside regional response teams, and state agencies such as MEMA, the Mississippi State Department of Health, the Mississippi Department of Public Safety, and federal agencies such as EPA, the Department of Defense, U.S. Department of Homeland Security, and the Federal Emergency Management Agency. Additionally, MDEQ maintains

expertise in handling hazardous, radioactive materials and biohazard emergencies by participating in advanced-level courses and exercises.

Baseline curriculum courses (IS-700 and ICS-100) are required for emergency operation center personnel and field personnel working within the affected area. On Scene Coordinators are required to

EMERGENCY OBJECTIVE – Maintain staff that is adequately trained and equipped to conduct an environmental emergency response.

have ICS-300 plus baseline curriculum courses. Emergency Coordinating Officers are required to have ICS-400, 300, 100 and IS-700 courses. The number of people assigned and required to work within the Incident Command structure during an expanding incident may include emergency operation center personnel, an emergency coordinating officer, on scene coordinators and field personnel. MDEQ remains committed to training and preparing an adequate number of personnel to respond to an expanding incident where a manmade or natural disaster impacts multiple jurisdictions.

B. Disaster Debris Management

Tornadoes

Over the past year, MDEQ's solid waste programs have worked with various federal, state, and local agencies and organizations regarding the management of disaster-related debris. MDEQ staff worked to assist communities in north Mississippi in after an outbreak of tornadoes hit the state February 12, 2016. MDEQ worked with local governments in Benton, Clay, Coahoma, Itawamba, Marshall, Monroe, Panola, Prentiss, Quitman, Tallahatchie, and Tippah counties to address debris clean up needs. Another outbreak of tornadoes hit southcentral Mississippi in late February, with MDEQ solid waste staff assisting debris assessment efforts in several counties that experienced moderate structural damage. In April, MDEQ worked with numerous counties in the southern part of the state and along the Gulf Coast to deal with severe flooding brought on by torrential rains. MDEQ released a flood cleanup guidance document through MEMA to assist homeowners returning to clean up flood damage.

Flooding

MDEQ also responded to severe flooding in August 2016 in Wilkinson County and the communities of Crosby and Centreville. This flooding event was the same event that produced tremendous flooding in the Baton Rouge, Louisiana, area. The flooding produced a tremendous amount of damage in the small towns, but most of the debris was handled through regional landfills.

Lee County Plan

The "Sandy Act," adopted by Congress after Hurricane Sandy hit the Northeast, provides that communities that have a pre-incident plan approved and in place may qualify for additional federal assistance for local debris management costs. MDEQ has reviewed and approved "pre-incident" disaster debris management plans for Lee County. This pre-incident plan will help the county have the opportunity to receive additional federal assistance in the event of a disaster. In addition, this updated disaster debris plan is to be incorporated into the regional solid waste management plan for Lee County managed by the Three Rivers Solid Waste Management Authority.

Waterway Debris

MDEQ participated in a workshop and regional effort led by the National Oceanic and Atmospheric Administration (NOAA) with other state and federal agencies to build a state plan for Mississippi to address how debris in waterways, wetlands and other marine areas will be cleaned up and removed after a disaster event. The event was kicked off with a workshop in early October in Biloxi, led by NOAA staff and attended by various local, state and federal agencies involved in

the marine debris clean-up efforts.

Katrina Disposal Sites

MDEQ continued to monitor the Hurricane Katrina debris disposal sites used along the Gulf Coast to dispose of 24 million cubic yards of debris in the three coastal counties. In March of 2016, an MDEQ sampling team collected groundwater monitoring samples at three of the Katrina debris disposal sites including the BOCA structural debris site in Hancock County, the Kyle Mallette site in Jackson County, and the Lamey site in Harrison County. These sampling results have been reviewed and catalogued and MDEQ will continue to monitor the results from the groundwater monitoring wells at these locations. In October 2016, the monitoring team sampled the groundwater wells at the Haas Structural Debris Disposal Site, the TCB Highway 53 Structural Debris Disposal site, and the deep well at Lamey Class II Rubbish Site. Upon obtaining the results, MDEQ will review and assess the analysis to determine if any potential groundwater impacts exist around the sites. The Blackmer Rubbish Facility in Harrison County also received Katrina debris, and its monitoring wells are sampled regularly.

C. Dam Safety

All dams in the state are identified, inventoried, and classified as either High Hazard, Significant Hazard, or Low Hazard in accordance with the state's Dam Safety Regulations. MDEQ requires that dam owners perform annual inspections of their High Hazard and Significant Hazard dams and also have periodic

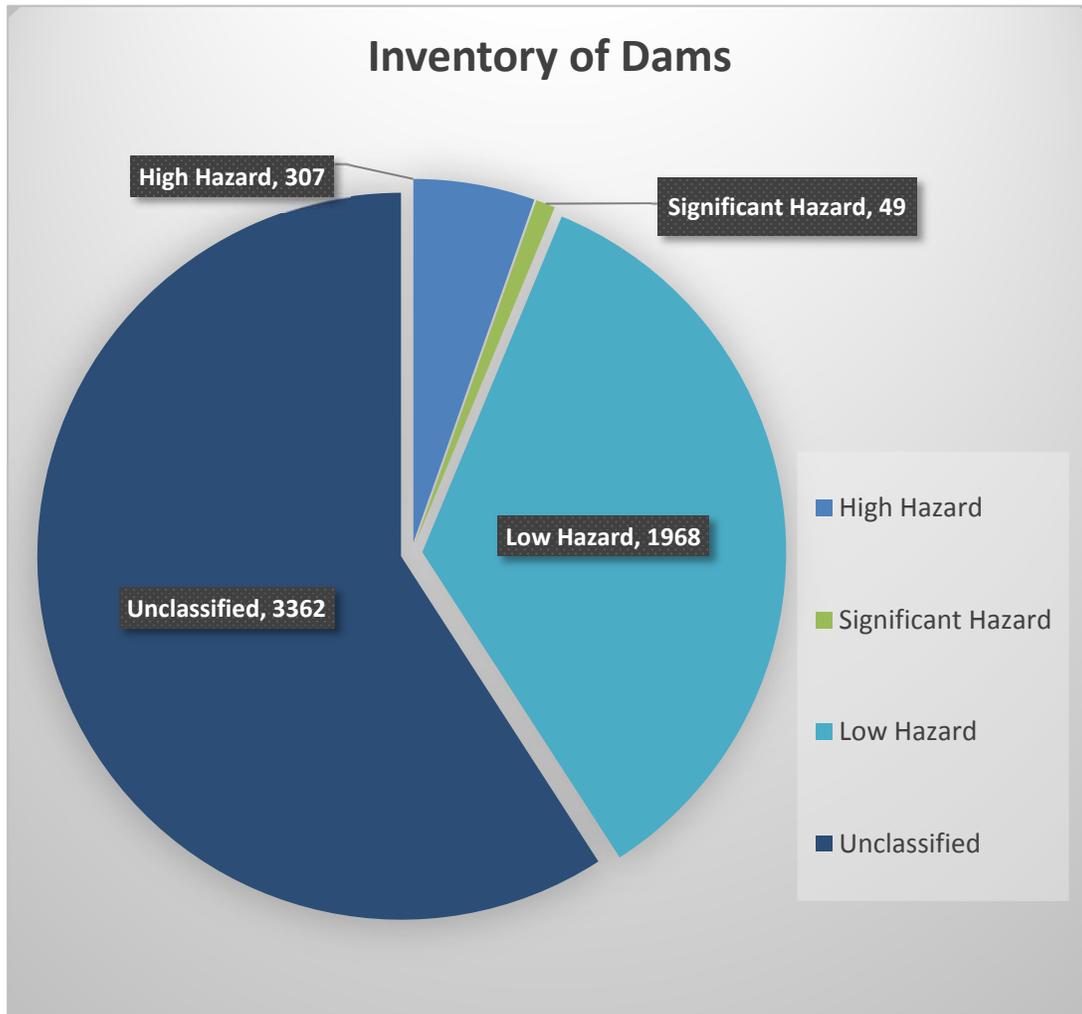
EMERGENCY OBJECTIVE – Protect downstream lives and property by ensuring that dams are properly classified, inspected, and maintained and include a current Emergency Action Plan (EAP) as required.

inspections performed by a registered professional engineer. Dam owners are required to address any deficiencies noted during inspections resulting in applications for modification and/or rehabilitation. MDEQ also performs inspections to verify that the condition of dams are being accurately reported in submitted inspection reports.

MDEQ's Dam Safety Division reviews plans for repairs or modifications to existing dams, reviews plans for the construction of new dams, conducts and reviews dam inspections, performs engineering analyses of dams, and reviews and approves Emergency Action Plans (EAPs) for High Hazard dams. There are currently 307 High Hazard dams, 49 Significant Hazard dams, 1,968 Low Hazard dams, and 3,362 unclassified dams on the state's inventory. Unclassified dams are dams upon which preliminary engineering analysis shows that the dam could potentially be either High or Significant Hazard but further analysis is needed for proper classification.

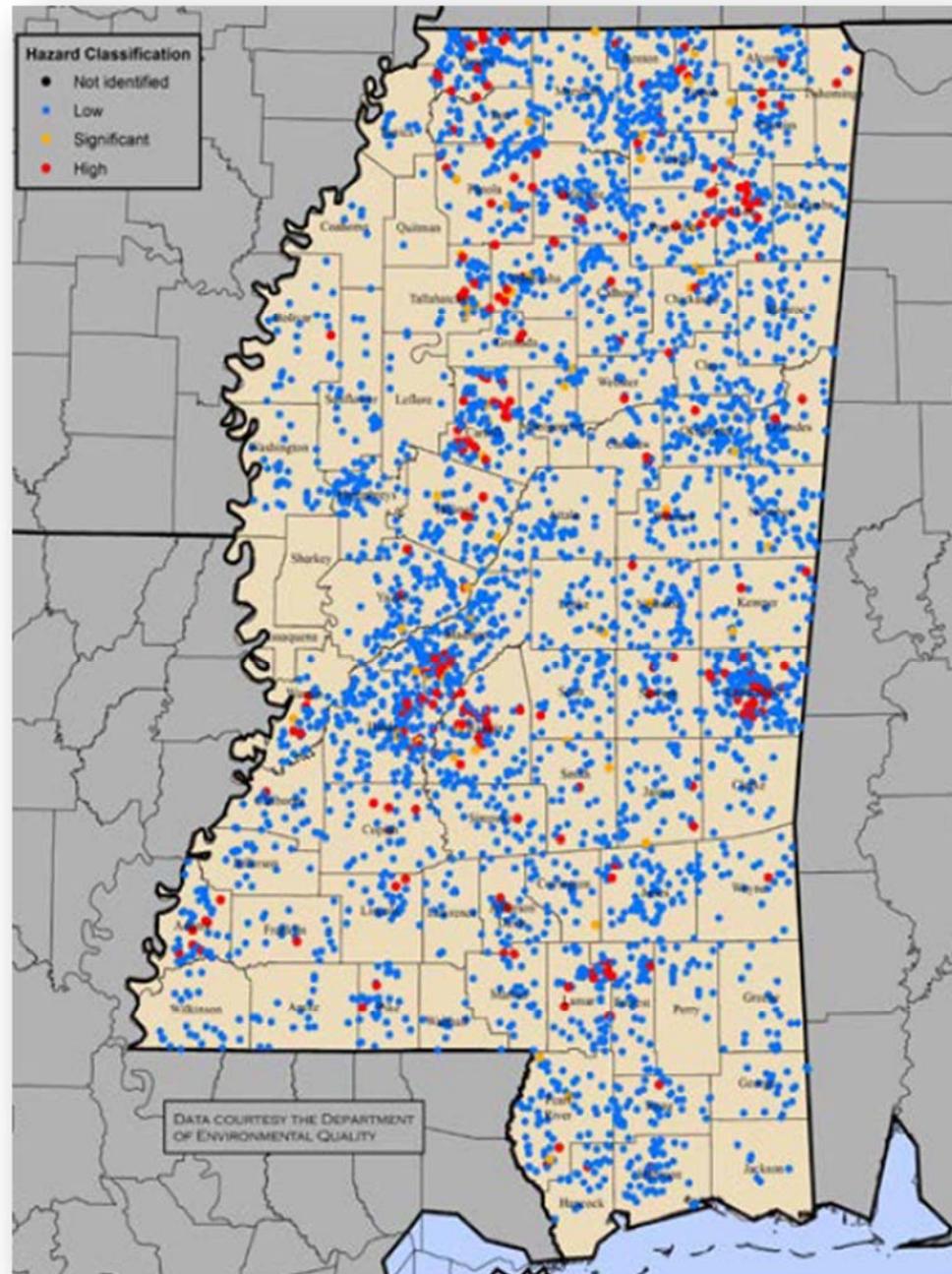
During Fiscal Year 2016, 309 dams were inspected and information produced by these inspections resulted in dam owners initiating repairs or rehabilitation on four High Hazard dams and one Significant Hazard dam. In addition, two High Hazard dams were breached and completely removed. The Dam Safety Division also reviewed and approved applications to

construct eight new Low Hazard dams and four new High Hazard dams.



All owners of High Hazard dams are required to submit EAPs for review and approval, and there are currently 245 EAPs on file. Compliance with this goal presently stands at approximately 80 percent. The approval process includes review and approval at the county level by local Emergency Management Agencies and all first responders that would be required to execute the plans. Involvement of local officials in EAP development greatly enhances the value of the plans in safe-guarding lives and property in the event of a dam failure.

In addition, staff have been working to identify dams that have been constructed in the past thirty years or more without proper authorization that should be included on the state's inventory of dams. Since 2013, MDEQ has collected basic inventory data and performed hazard class assessments for 2,410 dams that were not previously on the state's inventory. There are still approximately 1,200 existing dams that have not been assessed. When the inventory work is complete, the state's inventory of dams will number around 7,000.



One of the other major duties of the Dam Safety Division is to respond to dam incidents and failures. Staff members responded to seven dam incidents/failures in Fiscal Year 2016 and were able to mitigate each emergency successfully. During emergencies, the Dam Safety Division provides on-site response and technical assistance to county emergency managers and dam owners.

X. RESTORATION

A. Background

MDEQ continues to lead the state's efforts to restore and enhance Mississippi's natural resources following the *Deepwater Horizon* oil spill in 2010. Executive Director Gary Rikard serves as Mississippi's Trustee on the *Deepwater Horizon* Natural Resource Damage Assessment (NRDA Council) Trustee Council and the Gulf Coast Ecosystem Restoration Council (RESTORE Council), and serves as the state's representative for the National Fish and Wildlife Foundation (NFWF) Gulf Environmental Benefit Fund (GEBF). Together these bodies, comprised of federal agencies, Gulf states, and a congressionally mandated non-governmental organization are working to implement multiple projects and initiatives to restore the natural resources of the Gulf of Mexico region.



Governor Phil Bryant announces restoration projects in December 2015. Secretary of State Delbert Hosemann, Governor Bryant, and MDEQ Executive Director Gary Rikard.

Office of Restoration

MDEQ's Office of Restoration oversees and manages the implementation of the state's restoration efforts stemming from the *Deepwater Horizon* oil spill. The office manages all aspects of restoration including programs and projects resulting from the Natural Resource Damage Assessment process, the RESTORE Act, and the National Fish and Wildlife Foundation. Using a team of scientists and other subject matter experts, MDEQ works with state and federal agencies, local governments, non-governmental organizations (NGO's), residents, industries, and business owners.

MDEQ continues to engage the public throughout the restoration process. Mississippi's citizens have the opportunity to submit restoration project ideas into the state's project idea portal at its website, www.restore.ms. Near the end of Fiscal Year 2016, the project idea portal consisted of over 937 submissions across the coastal landscape ranging from ecological projects, to economic development, to infrastructure projects. Additionally, MDEQ and Executive Director Rikard disseminate information about the agency's upcoming projects, public meetings, and other information concerning restoration work using a direct texting service, email, the website, and Twitter, among other outreach methods.

Mississippi Restoration Funds

As a result of the *Deepwater Horizon* oil spill, Mississippi will receive a total of approximately

\$2.174 billion to support the state's recovery and restoration efforts. These funds are allocated to Mississippi from civil and criminal penalties levied against the responsible parties under the Clean Water Act, penalties levied against the responsible parties under the Oil Pollution Act, and from the state's economic losses claim. Mississippi's restoration funds come from three primary funding sources:

- RESTORE Act - \$688 million
 - Bucket 1 – \$364 million
 - Bucket 2 – TBD*
 - Bucket 3 – \$297 million
 - Bucket 5 – \$26 million
- NFWF Gulf Environmental Benefit Fund - \$356 million
- Natural Resource Damage Assessment - \$295 million

Mississippi also received \$85.168 million in Initial Response Injury funding. Additionally, Mississippi will receive \$750 million over the next 15 years as settlement for the state's economic damages claim.

GoCoast 2020

In 2012, Governor Phil Bryant created GoCoast 2020 to serve as the official advisory body for the allocation of funds received by the State of Mississippi under the RESTORE Act. The RESTORE Act directs 80 percent of certain penalties assessed as a result of the *Deepwater Horizon* oil spill be directed to the five Gulf Coast states impacted by the spill. GoCoast 2020 was established to set a foundation and road map of priorities for Mississippi so the state will be better prepared as the final federal guidelines and regulations are set forth under RESTORE.



The GoCoast Committee Chairs were reconvened July 18, 2016, to review projects previously recommended and new portal project submissions to formulate a list of priority projects for amounts available in the next round of funding.

**Under the RESTORE Act, approximately \$1.594 billion will be administered under Bucket 2 (Comprehensive Plan Component). Each member of the RESTORE Council is eligible to receive funding for projects under Bucket 2. There is a competitive process whereby members of the RESTORE Council may receive funds for restoration projects.*

B. The RESTORE Act

The RESTORE Act makes available 80 percent of Clean Water Act (CWA) civil penalties paid by the responsible parties for the oil spill (*i.e.* BP and Transocean) for programs, projects, and activities that restore and protect the environment and economy of the Gulf Coast through the Gulf Coast Restoration Trust Fund. Within the RESTORE Act, there are five funding components (commonly referred to as “buckets”), which make funds available to each of the Gulf States in accordance with certain legal parameters:

- Direct Component (Bucket 1)
- Comprehensive Plan Component (Bucket 2)
- Spill Impact Component (Bucket 3)
- National Oceanic and Atmospheric Administration (NOAA) Science Program (Bucket 4)
- Centers of Excellence Research Grants Program (Bucket 5)

The Direct Component and the Centers of Excellence Research Grants Program Component are administered by the U.S. Department of the Treasury. The Comprehensive Plan Component and the Spill Impact Component are administered by the Gulf Coast Ecosystem Restoration Council. The NOAA Science Program is administered by NOAA.

The Gulf Coast Ecosystem Restoration Council was established by the RESTORE Act to develop and oversee implementation of a comprehensive plan to help restore the ecosystem and economy of the Gulf Coast Region in the wake of the *Deepwater Horizon* oil spill.

The Council is comprised of governors from the five affected Gulf States, the Secretaries from the U.S. Departments of Interior, Commerce, Agriculture, and Homeland Security as well as the Secretary of the Army and the Administrator of the U.S. Environmental Protection Agency. The Gulf States selected and President Obama appointed, the Secretary of Commerce as the Council’s Chair. MDEQ’s Gary Rikard serves for Governor Phil Bryant on the Council.

RESTORE Act in Mississippi

Direct Component (Bucket 1)

In May 2016, the U.S. Department of the Treasury accepted Mississippi’s initial Multiyear Implementation Plan (MIP). The MIP describes the projects, programs, and activities for which Mississippi will spend “Bucket 1” funds available to the state. Mississippi’s initial MIP includes eleven projects totaling \$54.1 million:

- Stennis International Airport Hanger
- Port Bienville Trans-Loading Terminal Facility Completion
- Improved Fiber Optic Infrastructure
- Mississippi Aquarium
- Jackson County Corridor Connector Road – Phase I

- Work Ready Community Program
- Accreditation Support for William Carey University School of Pharmacy
- Off-Bottom Oyster Aquaculture Program
- Strategic Stream Restoration
- Planning Assistance – Project Management System
- Planning Assistance – MIP Amendment Development

Council Selected Component (Bucket 2)

In December 2015, the RESTORE Council approved the Funded Priorities List (FPL) totaling approximately \$156.6 million in restoration activities across the Gulf. Mississippi has four projects on the approved FPL. The projects are:

- **Strategic Land Protection, Conservation, and Enhancement of Priority Gulf Coast Landscapes** - A coordinated multi-state strategy for land protection, conservation and enhancement of priority lands across the Gulf (\$15.5 Million).
 - The components of the Strategic Land Protection, Conservation, and Enhancement of Priority Lands within Mississippi involve planning, strategy development, environmental compliance, and, where appropriate, acquisition of eligible properties. Priority areas for planning and environmental compliance for potential acquisitions could include: Graveline Bay, and Pascagoula/Escatawpa River systems (Jackson County); Turkey Creek, Wolf River (Harrison County); and Hancock County Marsh (Hancock County). Initial priority areas for acquisition were chosen by engaging state agency leads (Mississippi Department of Marine Resources as well as the Secretary of the State), and overlapping those priorities with several other vision and strategy documents, including the conservation vision of U.S. Fish and Wildlife Service, and the Partnership for Gulf Coast Land Conservation to create priority state acquisitions. Three focal areas were prioritized: 1) Gulf Islands National Seashore with the National Park Service; 2) the Grand Bay National Wildlife Refuge complex; and 3) the upper reaches of the Tuxachanie /Tchoutacabouffa River in the DeSoto National Forest.
- **SeaGrant Education and Outreach** – A project to undertake education and outreach activities to describe the values of land protection for habitat, water quality improvement and for securing the future of the Gulf of Mexico (\$750,000).
 - Extension, Outreach and Education (EOE) for land protection and conservation education is important to ensure conservation and restoration of coastal systems. This project will provide an EOE program in Mississippi that will ensure that the objectives and purposes of land conservation towards habitat stewardship and water quality improvement are being met by funding EOE activities with interested groups that have critical roles in land conservation and restoration. This project will serve as a pilot project for the Council to consider expanding Gulf-wide when future funds become available.

- **The Mississippi Sound Estuarine Program** (\$2.27 million)
 - This activity will establish the Mississippi Sound Estuarine Program (MSEP) that bridges critical upland/terrestrial habitats to open blue water, connects research priorities with restoration goals, and will be able to engage the community of the Mississippi Sound that tailors Mississippi's conservation needs with community benefits. Furthermore this activity will create a coordinated and collaborative effort to create a coupled river – to Mississippi Sound hydrodynamic model as a foundation for sustainable coastal restoration. The MSEP in the future would be an organization that could manage restoration priority outcomes, and direct restoration objectives such as education and outreach in the state.
- **Enhancing Opportunities for Beneficial Use of Dredge Sediment** (\$2.18 Million)
 - Coastal retreat (caused by land subsidence, lack of sediment accretion, sea-level rise and storm-related erosion) is resulting in a loss of coastal habitat. Sediments from dredging activities are readily available and if properly managed, can be beneficially used as a sediment source for coastal wetland restoration, specifically for marsh creation. This project will provide funding for beneficial use (BU) planning, design, engineering, feasibility, and permitting to get sites construction ready so that a significant amount of habitat can be created when additional funds become available.

Spill Impact Component (Bucket 3)

In November 2015, Penny Pritzker as Chair of the Gulf Coast Ecosystem Restoration Council, approved Mississippi's Planning State Expenditure Plan (SEP). A five-phase process was approved to develop the Mississippi's SEP:

- Phase I: Establishing a Foundation: Aims and Targets
- Phase II: Project Contribution, Benefit, and Coordination
- Phase III: Project Filtering
- Phase IV: Project Vetting
- Phase V: MSEP Development

Under Phase I: Establishing a Foundation, MDEQ was tasked with identifying the AIMS, or goals, of Mississippi's initial SEP (MSEP). The RESTORE Act says that a state's SEP should be complementary to, and consistent with, the RESTORE Council's Comprehensive Plan. Therefore, the AIMS of the MSEP would be identified as one or more of the goals identified in the Initial Comprehensive Plan. As part of Phase I, MDEQ met with various stakeholder groups to gather input on what the designed AIMS of this MSEP should be. The majority responded that the MSEP should focus on two of the goals identified in the Initial Comprehensive Plan: RESTORE WATER QUALITY and RESTORE AND REVITALIZE THE GULF ECONOMY. Under Phase II: Project Contribution, Benefit, and Coordination, the CONTRIBUTIONS and BENEFITS a project should make in order to be included on this MSEP will be identified. A CONTRIBUTION is defined as an

action that a project can take to meet the prioritized AIMS. A BENEFIT is the outcome of a contribution.

Under the next phases of the planning grant, MDEQ will identify potential projects to be included on the MSEP.

Centers of Excellence Component (Bucket 5)

Mississippi's Center of Excellence was selected in July 2015. The Mississippi Based Restore Act Center of Excellence (MBRACE), a partnership among Jackson State University, Mississippi State University, University of Mississippi, and University of Southern Mississippi, will serve as the state's Center of Excellence focusing on science, technology, and monitoring in the Gulf Coast Region.

C. National Fish and Wildlife Foundation

Mississippi will receive \$356 million for restoration as a result of the criminal settlement. The National Fish and Wildlife Foundation (NFWF) administers these funds through the Gulf Environmental Benefit Fund (GEBF), and Mississippi has been awarded grants for eleven projects under this program.

MDEQ initially invested in three broad scoped projects that will begin the restoration process in Mississippi:

- **Coastal Streams Initiative with The Nature Conservancy and the Audubon Society-Mississippi**

- The \$2.6 million Coastal Stream Habitat Initiative project was awarded in November 2013 by the National Fish and Wildlife Foundation Gulf Environmental Benefit Fund. Through a partnership with Audubon and The Nature Conservancy (TNC), strategies and restoration designs for nine coastal streams from the three coastal counties in Mississippi were developed. These streams included: Watts Bayou and Magnolia Bayou in Hancock County; Turkey Creek, Brickyard Bayou, Bear Point Bayou, Oyster Bayou, and Coffee Creek in Harrison County; and Rhodes Bayou and Bayou Chicot in Jackson County.

TNC worked together to engage the public during the planning and execution of this project. Public meetings were held for each of the streams to support the development of the Coastal Streams and Habitat Initiative Conservation Action Plan. Additionally, this project involved Rapid Stream Assessments (RSAs), as well as invasive species identification and watershed sampling. MDEQ Field Services Division provided both field and laboratory support for this project.

- **Coastal Bird Stewardship Program with the Audubon Society-Mississippi**

- This \$1.6 million project will improve Mississippi beach-nesting bird habitat negatively affected during the *Deepwater Horizon* oil spill through nesting habitat

enhancements and stewardship activities that will result in successful nesting, hatching, and rearing of chicks. Audubon's Coastal Bird Stewardship program focuses on supporting and expanding the long-standing protection and stewardship of bird nesting sites on mainland beaches, bays, and barrier islands in coastal Mississippi. Audubon performed stewardship services throughout the summer of 2016, with a focus on the 4th of July weekend. The ACBS report, which includes information gathered during monitoring, was finalized.

- **Coastal Preserves Invasive Species Program with the Mississippi Department of Marine Resources**
 - This \$3.3 million project will restore and improve management of the State of Mississippi's system of Coastal Preserves to enhance the ecological value of these important coastal habitats. These actions are needed to maintain native habitats and to provide appropriate transition zones for inland migration of coastal marshes in the face of sea level rise. Actions on 26 Coastal Preserve sites will utilize invasive species control and native vegetation plantings to restore ecological function to these unique and important habitats. MDMR completed planting native species on Deer Island. A contractor has been procured to perform treatment on invasive species on Coastal Preserves lands and treatment will begin in the fall of 2016.

Off-Cycle Planning Project

NFWF funded a critical coastwide planning effort in 2014, and Mississippi has conducted robust vision mapping through innovative upstream stakeholder engagement by soliciting the views and visions of the people of the Gulf Coast. The planning process also includes the review of relevant planning documents, current restoration efforts, and stakeholder input which is merged with science-based data to help determine the most effective, and comprehensive plan for restoring the Gulf Coast.

In October 2015, Mississippi released the first version of the Mississippi Gulf Coast Restoration Plan and two science-based planning tools: the Mississippi Comprehensive Ecosystem Restoration Tool and the Decision Support Tool. The Plan is a community-driven, science-based product that provides an opportunity for an iterative planning process to optimize coastal and marine restoration. The plan will help guide decision-making for investments in coastal restoration in Mississippi. The Mississippi Coastal Restoration Plan is only a portion of ecological restoration efforts in Mississippi. MDEQ has worked diligently to develop projects to leverage and coordinate restoration efforts. MDEQ has set forth the following tenets to guide restoration: 1) thinking long-term, 2) being transparent, 3) being flexible to maintain momentum, 4) learning from outcomes, and 5) leveraging restoration efforts wherever possible. From an overarching perspective, regardless of what projects get funded, the Mississippi Gulf Coast Restoration Plan follows a simple paradigm where ecosystem benefits will accrue downstream. Through investments in land conservation and water resources across the coastal landscape, commensurate increases of ecosystem function, ecological integrity, and connectivity will occur in our marine systems. By

supplying and ensuring sustainable and resilient water quality and quantity through these upstream investments, MDEQ is enhancing, stabilizing, and sustaining living marine resources in perpetuity.

In November 2014, Governor Phil Bryant announced that Mississippi had been awarded more than \$28 million dollars under the NFWF GEBF program for three restoration projects spanning across Harrison, Hancock, and Jackson counties:

- **Reef Fish Assessment**

- The expansion of a Reef Fish Assessment Program was funded with \$4 million to bolster the fishing industry. This two-year project gathers vital data on abundance, distribution and life-history characteristics of red snapper and other reef fish occurring at the more than 16,000 acres of permitted offshore artificial reef sites.

- **Marsh Restoration and Creation**

- More than \$21 million will be used for vital marsh creation and restoration in three priority bay systems along the Gulf Coast including St. Louis Bay, Back Bay of Biloxi, and the



Pascagoula - Escatawpa system. Over many decades, these priority bays have experienced significant impacts due to shoreline erosion, storm damage, and alterations to sediment transport contributing to the loss of thousands of acres of tidal marsh habitat. This project will advance Mississippi's beneficial use program to facilitate a cost-effective, sustainable approach to restoring and protecting significant coastal marsh and bay shorelines.

- In the fall of 2015, a unique opportunity became available to the State of Mississippi. The U.S. Army Corps of Engineers (USACE) announced plans to perform a maintenance dredge and deepening of the Pascagoula River channel at the Port of Pascagoula. With more than 3,000,000 cubic yards of material needing a new home, the Port Authority and MDMR were hoping to use a site at Round Island. MDEQ was able to step in at this point and, using a grant from NFWF, constructed a protective berm capable of accepting more than two million cubic yards of dredge material from the USACE project. Once the material is in place, Round Island will be host to more than 200 acres of coastal wetlands including salt water marsh and beach dune habitat.

- **State Lands Invasive Species Management**

- The third project, totaling more than \$2.6 million, will continue enhancement of habitat value of state lands in coastal Mississippi through improved management of invasive species. This project is an expansion of the 2013 Gulf Environmental Benefit Fund awarded to address invasive species management on land within Mississippi's Coastal Preserves Program. In addition, this project engages with the Mississippi Department of Wildlife, Fisheries, and Parks. Invasive species management work will take place in Buccaneer and Shepard State Parks as well as in the Ward Bayou Wildlife Management Area. An invasive species assessment will take place in the Pascagoula River Wildlife Management Area. Work to control persistent invasive species will include prescribed burning, mechanical and chemical control of invasive vegetation, and feral hog control. This project will focus on improving significant coastal marsh and transitional upland habitat through the control and eradication of non-native and invasive plant species and the improved tidal connectivity of these habitats to the Mississippi Sound.

In 2015, Mississippi was awarded more than \$29 million for four projects funded under the NFWF GEBF program:

- **Habitat Restoration on Federal Lands Program – Phase I**

- This \$9.9 million project will enhance and restore habitat on federal lands in coastal Mississippi. Anticipated outcomes for key focal habitats include restoration of over 30,000 acres through invasive species removal, forest thinning and prescribed burning on lands contained within Grand Bay National Wildlife Refuge, Gulf Islands National Seashore and the DeSoto National Forest (Tchoutacabouffa River/Tuxachanie Creek watershed). The project also includes control of non-native mammals on Horn, Sand, and Petit Bois Islands within the Gulf Islands National Seashore. This work expands efforts funded under previous GEBF awards that are conducting invasive species removal and fire management on state lands along the Mississippi Coast. This project focuses on restoring and conserving coastal habitat on federal lands to improve and maintain their benefit to fish and wildlife, enhance water quality to coastal bays through improved forest management, and promote resilience within coastal ecosystems.

- **Habitat Restoration and Conservation in Turkey Creek – Phase I**

- This \$7.5 million project seeks to conserve important habitat and enhance water quality in the 30,000 acre Turkey Creek watershed through habitat conservation and restoration and stream restoration. The Turkey Creek watershed encompasses a mix of rural and urban land use areas in greater Gulfport and has significant ecological and recreational value. However, the watershed faces development pressures that threaten its ecological benefits. The project will use fee simple land and easement acquisition, focused in the lower reaches of the Turkey Creek watershed, to protect key wetland and riparian habitats. Restoration

on these and other previously protected lands will include hydrologic restoration of wetlands, riparian buffers, invasive species management, debris removal and stream bank stabilization. The restoration efforts will maintain and improve water quality and floodwater storage capacity and will enhance the hydrologic connectivity of Turkey Creek to Bernard Bayou and the Back Bay of Biloxi. This project represents the first phase of a comprehensive watershed conservation initiative that seeks to maintain and enhance the ecological function of Turkey Creek, one of the primary tributaries to the Back Bay of Biloxi. A watershed action plan has been previously developed for Turkey Creek, and restoration activities enjoy strong community support.

- **Oyster Restoration and Management – Phase I**

- This \$11.7 million project seeks to improve oyster populations and sustainability in coastal Mississippi by conducting several studies to better understand why oyster populations are not more resilient and how productivity can be improved. This project will provide managers with information needed to undertake future large-scale oyster restoration projects and improve the cost-effectiveness and sustainability of such efforts. The studies include an assessment of cultch-type, research into the effects of contaminated oyster shell on recruitment, and baseline water quality and benthic habitat assessments in the Mississippi Sound to identify preferred locations for future restoration. The project also includes a pilot nearshore ‘oyster gardening’ program to produce oysters for conservation purposes.

- **Design Challenge for Improvement of Water Quality from Beach Outfalls**

- The design challenge will encourage individuals and teams to compete to create innovative “green” solutions to address the water quality impacts of beach outfalls. The winning design is expected to be implemented and replicated at a larger scale across the Mississippi Coast. Finalists chosen in 2017 will have their proposed restoration solutions peer reviewed by key stakeholders and technical experts, with additional input from the public. Design challenge implementation locations are expected to be based on proximity and net benefit to coastal resources such as oyster reefs, artificial reefs and marshes. This \$544,000 project will fund a design competition to find innovative eco-solutions for water quality impairments associated with beach outfalls in Mississippi. A major threat to water quality in the Mississippi Sound is associated with outfall areas that drain untreated stormwater directly into the Sound. Numbering well in excess of 200 and found throughout all three coastal counties, these outfalls provide an important municipal stormwater function but currently provide minimal treatment. The untreated effluent adds significant sediment and nutrient loading to the Sound.

D. Natural Resource Damage Assessment (NRDA)

The *Deepwater Horizon* Natural Resource Damage Assessment (NRDA) is the legal process for developing the public's claim for natural resource damages against the party or parties responsible for the oil spill and to seek compensation for the harm done to natural resources and those services they provide. It also provides for the development of a restoration plan or a series of plans to restore or replace those resources as well as the structure by which Mississippi and others will plan and implement restoration of the Gulf of Mexico and/or compensation for damages.

Working with trustees from the National Oceanic and Atmospheric Administration (U.S. Department of Commerce), the U.S. Department of the Interior, EPA, U.S. Department of Agriculture as well as the four other Gulf States, MDEQ is determining how the oil spill affected the Gulf of Mexico's natural resources, ecosystems, and the associated human uses. On October 5, 2015, BP, the United States Trustees, and the five Gulf states announced a settlement resolving claims for federal civil penalties and natural resource damages related to the *Deepwater Horizon* oil spill. The Natural Resource Damage Assessment Settlement is \$297,557,000 which funds the following restoration initiatives and project types:

Category	Funding Amount	Description
Phase 1 Early Restoration	\$13,600,000	Oyster cultch and nearshore artificial reefs.
Phase 3 Early Restoration	\$68,957,000	Living shorelines, subtidal reefs, recreational loss projects.
Phase 4 Early Restoration	\$30,000,000	Living shorelines, intertidal and subtidal reefs in four bays in the Mississippi Sound.
Additional Early Restoration Funding	\$18,443,000	Early Restoration Settlement Remaining from \$1 billion.
Long Term Restoration Projects	\$166,557,000	Money to restore and conserve habitat; restore water quality, replenish and protect living coastal and marine resources, and provide and enhance recreational opportunities, and for monitoring, adaptive management and administrative oversight.

The full NRDA process will continue until the trustees have determined the extent of damages caused by the *Deepwater Horizon* oil spill. At the end of the damage assessment process, the Trustees will take into account any benefits that were realized from these early restoration projects. In addition to funding early restoration projects, BP will continue to fund the damage assessment and, together with other responsible parties, is obligated to compensate the public for the entire injury.

The NRDA process provides clear guidelines for assessing damages by calculating the value of the restoration required to return the injured resources to their pre-spill conditions and to compensate for interim losses. From the early days of the spill, and continuing even now, NRDA teams collected data related to a wide range of natural resources. Mississippi, in partnership with the federal Trustees, will work in a Trustee Implementation Group (TIG) to generate future restoration plans that identify specific restoration projects. These restoration plans will be consistent with the Final Programmatic Damage Assessment and Restoration Plan (PDARP) and Final Programmatic Environmental Impact Statement (PEIS), and each plan will be integrated with the appropriate analysis of tiered environmental impacts. TIG decisions will be made by consensus and documented through a public Administrative Record. The Trustees will ensure that the public is involved through public notice of proposed restoration plans, opportunities for public comment, and consideration of all comments received.

Early Restoration

Under a NRDA, plans for the implementation of early restoration projects prior to the final quantification of injury may be developed to achieve restoration faster. In 2011, the Trustees announced the Framework for Early Restoration Addressing Injuries Resulting from the *Deepwater Horizon* oil spill (Framework Agreement), in which BP agreed to fund \$1 billion in Early Restoration projects. Under the agreement, DOI, NOAA, and the five spill-affected Gulf states each will receive \$100 million dollars to implement early restoration projects. The remaining \$300 million will be allocated by NOAA and DOI for early restoration projects proposed by state trustees.

- **Phase I**
 - Mississippi's projects from Phase I included the laying of the largest oyster cultch in the history of the Mississippi Sound totaling \$11 million, and \$2.6 million on a near shore artificial reef(s) enhancement project. Construction activities for both projects are complete and monitoring activities are ongoing. Completed projects brought jobs to the Mississippi Gulf Coast as local contractors were hired to perform this work.
- **Phase II:** There was no Phase II project for Mississippi in Fiscal Year 2016.

- **Phase III:** Mississippi has four Phase III projects totaling \$68.957 million.

- **Hancock County Marsh Living Shoreline**

The project provides for construction of up to six miles of living shoreline. Benefits would include reduction of erosion, re-establishment of oyster habitat, and enhanced fisheries resources and marsh habitat.

Approximately 46 acres of marsh would

be constructed to protect and enhance the existing shoreline near Heron Bay. In addition, 46 acres of sub-tidal oyster reef would be created in Heron Bay to protect the shallow bay and increase oyster production in the area. The estimated cost of this project is approximately \$50 million of which NOAA is funding a portion. Construction activities began in mid-2016 and will continue through 2017.



- **Restoration Initiatives at the INFINITY Science Center**

INFINITY is a state-of-the-art interactive science research, education, and interpretive center located in Hancock County. Early restoration funds are being used to develop interactive exhibits at the INFINITY Science Center. These enhancements would replace lost recreational opportunities through enhanced visitors' access to coastal

natural resources. The estimated cost of this project is approximately \$10.4 million. Completed enhancements include the approximate three mile portion of the Heritage Trail-Possum Walk, boardwalk and walkway improvements, and construction of the native landscape areas are underway.

- **Popp's Ferry Causeway Park**

The project in Harrison County would provide for construction of an interpretive center, trails, boardwalks, and other recreational enhancements. This project would replace lost recreational opportunities by enhancing existing amenities allowing visitors to fish, crab, and observe nature. The estimated cost of this project is approximately \$4.7 million. Engineering and design is currently underway with construction anticipated to begin in 2017.

- **Pascagoula Beachfront Promenade**

Early restoration funds for this project would be used to help complete a two-mile, ten foot wide lighted concrete pathway complete with amenities. The purpose would be to restore the loss of recreational opportunities by enhancing access to the Mississippi Sound and its natural resources. The estimated cost of this project is approximately \$3.8 million. Construction activities are underway.



- **Phase IV Project**

- **Restoring Living Shorelines and Reefs in Mississippi Estuaries** – This Phase IV Early Restoration project includes restoration of intertidal and subtidal reefs and the use of living shoreline techniques including breakwaters. Projects will be implemented at locations in Grand Bay, Graveline Bay, Back Bay of Biloxi and vicinity, and St. Louis Bay in Jackson, Harrison, and Hancock counties, respectively. The project builds on recent collaborative projects implemented by MDMR, the National Oceanic and Atmospheric Administration, and The Nature Conservancy. When completed at all locations, the project will provide for construction of over four miles of breakwaters, five acres of intertidal reef habitat and 267 acres of subtidal reef habitat at four locations across the Mississippi Gulf Coast. For the Grand Bay and Graveline Bay project locations, intertidal and subtidal reefs will be created in a number of sites. Over time, the breakwaters, intertidal and subtidal restoration areas will develop into living reefs that support benthic secondary productivity, including, but not limited to oysters/bivalve mollusks, annelid worms, shrimp, and crabs. Breakwaters will reduce shoreline erosion as well as marsh loss. Engineering and design activities are currently underway.

Long Term Restoration

In early 2016, Mississippi and the other NRDA trustees completed the Final Programmatic Damage Assessment and Restoration Plan and Programmatic Environmental Impact Statement. It includes an assessment of the injury to natural resources caused by the oil spill and the types of restoration needed to compensate the public. The plan is being funded from the settlement of up to \$8.8 billion with BP. The plan includes \$183 million for Mississippi restoration funds in the following categories:

Restoration Goals and Project Types	Remaining Restoration Funding
Goal 1: Restore and Conserve Habitat	
Wetlands, Coastal and Nearshore Habitats	\$55,500,000
Habitat Projects on Federally Managed Lands	\$5,000,000
Goal 2: Restore Water Quality	
Nutrient Reduction (non-point source)	\$27,500,000
Goal 3: Replenish and Protect Living Coastal and Marine Habitats	
Sea Turtles	\$5,000,000
Marine Mammals	\$10,000,000
Birds	\$25,000,000
Oysters	\$22,500,000
Goal 4: Provide and Enhance Recreational Opportunities	
	\$5,000,000
Goal 5: Monitoring, Adaptive Management, Administrative Oversight	
Monitoring and Adaptive Management	\$7,500,000
Administrative Oversight and Comprehensive Planning	\$22,500,000

XI. OUTREACH, RESEARCH, AND EDUCATION

Environmental laws, rules, and programs can be complex and difficult to understand. MDEQ's public outreach efforts are aimed at helping citizens, schools, businesses, and communities learn about required and recommended actions to protect the environment and public health and encouraging them to make healthy, sustainable choices.

Environmental Outreach, Research, and Education Strategic Goal:

Encourage and empower citizens, businesses, and communities to engage in behaviors to protect public health and preserve Mississippi's environment.

A. Key Pollution Prevention Activities

The Pollution Prevention (P2) Program coordinates multiple activities focusing on the reduction of waste streams that can impact the environment.

OUTREACH OBJECTIVE – Maintain an adequate level of outreach so that citizens, businesses, and communities engage in behaviors that protect health and preserve Mississippi's environment.

The purpose of MDEQ's Pollution Prevention Program is to:

- Provide information and technical assistance to local government officials, federal officials, industrial officials, consulting engineers, and system operators on hazardous and non-hazardous waste management and pollution prevention practices.
- Support Economy, Energy, and Environment (E3) programs—an initiative designed to focus on sustainability and the triple bottom line of energy, environment, and the economy.
- Review, manage, and monitor the waste minimization plans, annual waste minimization certified reports, and the EPA/Mississippi Pollution Prevention Grant (P2G).
- Coordinate and partner with both state and the federal government and non-governmental entities to promote effective pollution prevention practices.

During Fiscal Year 2016, the MDEQ Pollution Prevention Program accomplished the following program elements:

- Developed a strong partnership with the Manufacturing Extension Partnership (MEP) of Mississippi to provide a well-rounded P2 focus to manufacturers.
- Conducted three P2 enHance site visits and two E3 multi-day sustainability audits coordinated with multiple agencies.
- Hosted two P2 workshops.
- Reviewed and monitored 198 annual waste minimization certified reports; seven P2

- plans were reviewed and one approved.
- Met all conditions of the 2015 to 2016 EPA/Mississippi Pollution Prevention (P2G) grant.
 - Processed applicants for the new class of members in the enHance program.
 - Updated the Energy, Economy, Environment (E3) Framework to better serve Mississippi manufacturers and branded the new framework as ME3.

B. enHance Recognition Program

Since 2009, the enHance program has grown to 38 members representing top environmental performers throughout the state. The objective of this program is to recognize those business, industrial, manufacturing, and governmental facilities that go beyond compliance and to promote energy efficiency efforts, provide networking and training resources for pollution prevention, and encourage the use of environmental management systems and continuous improvement.



In April 2016, a new tier called Environmental Star for non-regulated entities was introduced and one member was accepted into this tier.

Members have implemented projects resulting in the reduction of one ton of hazardous waste and over 700 tons of solid waste diverted from landfills. More than six million gallons of wastewater are now being reduced, reused and recycled each year. Energy conservation efforts have resulted in reduced air pollution as well as significant

economic savings of over \$1 million. This has been done through changes in operating procedures, redesign of products or packaging, beneficial reuse of materials, and installation of more efficient equipment, recycling, and other similar alternatives. The enHance program promotes these best management practices to encourage more widespread implementation through training sessions, mentoring, and participation in the program.

The annual training workshop and luncheon was held in April 2016 to recognize new members and provide environmental training and networking opportunities. The workshop's theme was "Environmental Policies, Planning, and Economics." Presentations included: What's New in Air, Energy Opportunities with Entergy, Plant Master Planning: Efficiency and Energy Case Studies-Center for Advanced Vehicular Systems (CAVS), Rankin County Energy Project, High Voltage: A Powerful Case Study-Hol-Mac Corporation, and Continuous Improvement from Toyota.

C. Energy Efficiency and Energy Star

Energy Star outlines a seven-step continuous improvement process to improve the energy performance of buildings. MDEQ's Pollution Prevention program continues to work with state agencies, schools, and hospitals to benchmark energy usage and develop a plan to reduce energy consumption.

Energy use in the MDEQ main office buildings has been reduced by 50 percent in five years, saving hundreds of thousands of dollars in annual utility cost. MDEQ's efforts have been recognized by the Mississippi Development Authority and the Mississippi Department of Finance and Administration.

Starting in 2012, MDEQ began implementing energy efficiency measures such as employee education, de-lamping, and temperature control to be better stewards of public funds. MDEQ has developed Energy Management Plans for its main building as well as regional offices. Since MDEQ energy program's inception, the agency's Amite Street building has reduced its energy use by 31.5 percent. The energy cost index has been reduced from \$2.17/sqft/yr to \$1.70/sqft/yr. The State Street building, has had impressive gains as well, reducing its energy usage by 19.7 percent and its energy use index from \$1.98/sqft/yr to \$1.77/sqft/yr. This effort has saved over \$235,000 since 2012.

Additional state office buildings are evaluating opportunities with the Energy Star Portfolio Manager benchmarking tool. Technical assistance tools, geared toward these target groups, are being developed to assist with energy efficiency project implementation.

Nineteen of the twenty-seven Rankin County schools were awarded the Energy Star Label. In 2014 to 2015 and portion of 2016 the Rankin County School District showed a savings of \$402,623. Since starting the energy management plan in 2006 the school district has saved \$3,533,341.00 even while adding more students and portable classrooms.

C. Office of Community Engagement

The Office of Community Engagement continues to support existing partnerships and engage new partners in conserving and improving the environment. In 2014, the merger of the Office of Community Engagement (OCE) and the Small Business Environmental Assistance Program served to sustain and strengthen MDEQ's relationship with communities, elected officials, industry, small businesses, government agencies, and civic and community groups.

The OCE Environmental Justice Program has the responsibility of incorporating community engagement and environmental justice principles into agency processes and programs. This program focuses on two key areas: 1) working with agency management and staff to develop approaches to address environmental justice issues; completing identified environmental justice projects; and, further developing practices and guidelines to sustain gains and 2) engaging directly with vulnerable communities to learn about environmental issues around them and bring their issues of concern back to the agency.

Working with Partners:

- **Pascagoula Community Collaboration**

Comprised of industry representatives, community residents, local government officials, and state agencies, the Pascagoula Community Collaboration has continued to address the concerns of residents living in close proximity to the Bayou Cassotte Industrial Park. In 2016, MDEQ developed and implemented an investigative air sampling plan for the Cherokee neighborhood.

- **Office of Surplus Property and Itta Bena**

In partnership with General Services Administration, a tour of the Office of Surplus Property was provided to government officials of Itta Bena. Local government officials received information about the Federal Surplus Personal Property Donation Program and had face-to-face discussions with staff about the assistance available to the town.

- **Other Activities**

In addition to hosting and assisting in numerous face-to-face meetings, conference calls and public availability meetings, the Office of Community Engagement participated in multiple national and state conferences, workshops and on various federal workgroups including:

- National Environmental Justice Advisory Council (NEJAC) Work Group
- Southern Section Air & Waste Management Association (A&WMA) Annual Conference
- MDEQ's Class 1 Rubbish Disposal Site Operator Training
- Environmental Benefits Mapping and Analysis Program - Community Edition Training
- Community Rating System
- Delta Communities: Identifying Challenges and Opportunities through Data and Dialogue
- Public Health Emergency Preparedness Senior Advisory Committee
- Discovering Steps to Safeguard our People and the Places They live: A Climate Adaptation Training for Coastal Communities
- Evacuation Re-Entry Planning
- Mississippi Development Authority – Small Biz Incubators
- Education, Economics, Environmental, Climate & Health Organization Roundtable
- Federal Reserve – Community Development
- Lead Inspector Training



National Environmental Justice Advisory
Council Workgroup
(Photo source: WLOX)

- C-FERST (Community-Focused Exposure and Risk Screening Tool)
- Gulf of Mexico Alliance - Education and Engagement Priority Issue Team
- Mississippi Municipal League 2016 Small Town Conference in Natchez

Small Business Environmental Assistance Program

The Small Business Environmental Assistance Program (SBEAP) continues to provide education and assistance to small businesses and municipalities to ensure understanding and compliance with environmental laws and regulations.

Authorized through Section 507 of the 1990 Clean Air Act Amendments, the Mississippi's Small Business Environmental Assistance Program provides education and assistance to small businesses and municipalities to ensure understanding and compliance with environmental laws and regulations. Mississippi SBEAP has three components: a small business compliance assistance program, a small business ombudsman (SBO) and a compliance advisory panel. These components work together and are monitored by the EPA Asbestos and Small Business Ombudsman.

The SBEAP 2016 activities include the following:

• General Assistance Calls	1,722
• Complaint Calls Entered into CTS	346
• Technical Assistance Requests	9
• Onsite Technical Assistance Visits	5
• Meetings/Conferences Attended	17
• Webinars	12
• Conference/Outreach Calls	72
• SBEAP Outreach Publications	32
• SBEAP Regulatory Assistance Documents	6
• Compliance Assistance Tools	5
• SBEAP Mailings	638
• Environmental Workshops Hosted/Attended	4

J. Geology Outreach and Education

MDEQ's Office of Geology staff regularly meet with the public and student groups to discuss Mississippi's unique geology and identify fossils, rocks, gems, and minerals.

- **The Mississippi Gem and Mineral Society Annual Rock Show**

The Mississippi Gem and Mineral Society Annual Rock Show was held in February at the Jackson Trade Mart. MDEQ Office of Geology operated a booth showing the office's geologic work and answered questions from the public.



- **Madison Elementary Earth Day Program**

David Dockery and James Starnes gave an Earth Day presentation to Madison Upper Elementary in Madison County on April 22, 2016. Students learned about earthquake waves, the work that geologists do, and got to learn how to identify rocks and fossils from Mississippi gravel.



- **Mississippi Museum of Natural Science Annual Fossil Road Show**

The Fossil Road Show was held March 5, 2016, at the Mississippi Museum of Natural Science. MDEQ's Office of Geology staff identified fossils for the public. Pictured: Alexis Ammons of Bentonia with her rare Ice-age *Paramylodon* jaw from Yazoo County.



- **NRCS Teacher's Workshop**

Tyler Berry gave a presentation about the state's geology to Mississippi science teachers in Vicksburg on June 9, 2016.

- **National Science Foundation-Mississippi Association of Science Teachers Reunion Workshop**

On June 8, 2016, James Starnes led a field trip of Mississippi science teachers to limestone outcrops in Smith County to learn about geology, stratigraphy, depositional environments, and paleontology.

- **Paleontology talk for St. Joseph High School 7th Grade Science**

St. Joseph High School's seventh grade science classes learned about Mississippi's rich fossil history in a talk given by James Starnes in the school's gymnasium on November 20, 2015.



- **National Geologic Map Day**

As part of Earth Science Week the Office of Geology staff celebrated National Geologic Map Day by giving a lunchtime program to MDEQ staff about geologic maps and mapping efforts in Mississippi.

- **Online Outreach**

Surface Geology Division staff daily answer questions, identify rocks and fossils, and share the Office of Geology's maps and literature to citizens across the state through social media such as Facebook and Twitter.

- **Mississippi Universities Outreach**

David Dockery gave a talk on the geology of Mississippi in Dr. Lou Zachos's geology class at Ole Miss on April 28, and also gave the Brown Bag Lunch Lecture on the

geology of Mississippi for the Mississippi State University's Geosciences Department on May 29, 2016.

E. Solid Waste and Recycling Outreach Efforts

The Solid Waste and Recycling Programs conduct a variety of outreach efforts throughout the year on various aspects of proper solid waste management and waste reduction and recycling:

- MDEQ conducted Solid Waste Enforcement Officer Training in Jackson, to train local solid waste enforcement officers. Training topics at this year's event included state solid waste laws and regulations, open burning laws, disaster debris management, public outreach and education, conducting clean-up events and electronics waste recycling.
- MDEQ joined the Mississippi Recycling Coalition (MRC) to promote Recycling Awareness Day to the state's elected leadership at the State Capitol. "Recyclers of the Year" were recognized in categories for local governments, educational institutions, business and industry, non-profits, and state and federal agencies.
- Solid Waste staff conducted presentations to the fifth grade participants of the Neshoba County Soil and Water Conservation District "Conservation Carnival" in Philadelphia about the importance of proper waste management and recycling.
- MDEQ participated in and supported the Keep the Rez Beautiful Recycling Fashion Show where participants modeled outfits made from recycled materials.
- MDEQ also participated in the Earth Day Fairs at the University of Southern Mississippi and Hinds Community College to promote the benefits of recycling and composting.
- MDEQ staff traveled to DeSoto County with officials of the Mississippi Recycling Coalition to present the DeSoto County Board of Supervisors with the state award for Local Government Recycler of the Year.
- MDEQ assisted in hosting the state Solid Waste Association of North America Conference in Biloxi. MDEQ conducted presentations on updated solid waste and recycling regulatory and assistance programs and addressed the conference with an update on electronics waste management issues.
- MDEQ conducted site visits of the FV Recycling facility in Sumrall and the material recovery facility operated by the Mississippi Army National Guard on the base at Camp Shelby near Hattiesburg.
- Solid Waste staff visited Tallahatchie County to meet with county and municipal officials to discuss the development of the updated comprehensive local solid waste

management plan. The meeting also included a discussion on grant opportunities and opportunities for joint efforts on managing solid wastes.

- MDEQ staff spoke and participated in a state college and university sustainability meeting hosted by Hinds Community College at the Eagle Ridge Conference Center in Raymond. The meeting included reports from the University of Southern Mississippi, the University of Mississippi, Hinds Community College, MDEQ, and Allen's Recycling.
- Staff addressed the Southeast Regional Conference of the Air and Waste Management Association in Biloxi and attended a meeting with the Keep Mississippi Beautiful Board of Directors in Bay St. Louis.
- MDEQ staff participated in the Madison County Soil and Water Conservation District's Conservation Day and the Great Delta Bear Affair providing presentations and exhibits to help educate students on the importance of recycling in their community.
- MDEQ staff spoke to the Mississippi Code Enforcement Officer's Association in October focused on the management of scrap tires at business locations in the state.
- MDEQ staff assisted in sponsoring the Mississippi Recycling Coalition's State Recycling Conference held at the Beau Rivage Resort and Casino in Biloxi. The conference included sessions on initiatives being conducted in the state, region, and nation to support recycling; new opportunities for plastics, cartons and food waste recycling, recycling at colleges and institutions, use of digital media and branding to promote recycling and other methods for engaging the public.
- MDEQ staff participated in the Southeastern Recycling Development Council Summit held in Atlanta.
- MDEQ staff attended the EPA Region 4 Solid Waste and Recycling Manager's Meeting in Atlanta. The meeting focused on a number of state, regional and national issues related to solid waste management including the new Coal Combustion Residuals Regulations, integration of sustainable materials management into state and local solid waste planning, disaster debris management, measurement of recycling and a host of other solid waste regulatory and assistance issues. This meeting, while not an actual outreach event, is a key meeting for MDEQ staff. Staff gains ideas and information from other states and EPA, and uses the information to help in the development of outreach goals.
- Solid Waste staff also helped to sponsor the State SWANA Conference in Natchez. This conference provides required Continuing Education Units for landfill and rubbish site operators to meet their re-certification requirements.

- Staff attended the Resource Recycling Conference in New Orleans. This national recycling organization conference included sessions on addressing contamination, measurement, markets for recycled materials, public outreach and education, glass recycling, and recycling of organics materials. In addition, this conference provided the opportunity to network with state and local government representatives, recycling businesses and non-profit organizations and others in the recycling community from all over the country.

In addition to these efforts, MDEQ also partners with various organizations to provide outreach and education on a variety of solid waste management issues. Some of these outreach efforts are through grants to local governments who conduct outreach with local schools, community groups, and residents. Throughout the year, MDEQ's solid waste programs also helped to organize and host conferences and meetings for the Mississippi Recycling Coalition and the Mississippi Chapter of the Solid Waste Association of North America. In addition, the Solid Waste programs participated in conferences, conventions and training sessions of various organizations including the Mississippi Municipal League, the Mississippi Manufacturers Association, Keep Mississippi Beautiful, Mississippi State University Extension Service, the Jackson Metro Chamber Partnership, the Southeast Recycling Development Council, and various other state and local organizations and agencies.

F. Nonpoint Source Education and Outreach

The primary objective of the Nonpoint Source (NPS) Educational Program is to increase public awareness of NPS pollution and to induce behavior changes that will reduce NPS pollution impacts.

The outreach efforts for the program include:

- **Environmental Teacher Workshops**

Teacher workshops are a major environmental education component of MDEQ's NPS education program each year. During Fiscal Year 2016, 42 teacher workshops were held in all regions of Mississippi with approximately 800 educators participating. The teacher workshops included interactive classroom activities and field trips instructing the classroom teachers and environmental educators. About half of this work was carried out through the *Project Learning Tree (PLT)* curriculum with the help of a program coordinator and facilitators. PLT work included 25 workshops for 456 educators with most of the workshops being held at Mississippi universities and community colleges. Other workshops were held at various venues in counties throughout the state. These workshops included sessions on water quality, NPS



pollution prevention, green infrastructure, low-impact development, water chemistry, macro-invertebrates, and hands-on, water-related activities.

- **Train-the-Trainer and Teacher Training Workshops**

Eight educator workshops that included new teaching modules were held for 242 educators statewide in Fiscal Year 2016. Six of these workshops were held for teachers in each of the coastal counties and the three counties to their north (Jackson, Harrison, Hancock, Stone, George, and Pearl River counties). In addition, workshops were held at William Carey University in Hattiesburg and at the statewide Mississippi Environmental Education Alliance workshop in Jackson. These teaching modules included interactive environmental lesson plans for teachers and students and consisted of written lesson plans, a video on how to conduct the lessons, as well as supplies and equipment to carry out the lessons. Project coordinators presented the teaching-modules to decision makers, county Soil and Water Conservation District Clerks, Earth Team volunteers, and others so they could use the teaching materials with their constituents for classroom presentations, in-service teacher training, and conservation field days.

- **Adopt-A-Stream**

Adopt-A-Stream is an environmental education training program for adults and students that focuses on aquatic ecosystems and the effects of NPS pollution on water quality. During Fiscal Year 2016, the program trained at 97 different venues and reached 9,600 people with water quality and NPS information, hands-on activities, workshops, and events. One two-day workshop and nine one-day workshops were conducted. A total of 185 adults were taught water-quality subjects. The coordinator for Adopt-A-Stream, through a sub-grant with the Mississippi Wildlife Federation (MWF), provided other water-quality training in Fiscal Year 2016. This training included: 1) educating citizens about water-quality issues and solutions in their own local watersheds; 2) conducting Envirothon team training on aquatic subjects in 28 high schools; 3) presenting 12 aquatic-ecology programs in classrooms; 4) leading three stream clean-ups and eight storm drain marking projects; and, 5) reaching over 9,000 people through large-venue events, teacher-workshop training sessions, summer environmental camps, and setting up displays at conferences and similar events.



- **Envirothon Competition**

The Envirothon High School Competition tests students' knowledge about water, soils, forestry, wildlife, and current environmental issues each year. The focus in 2016 was "Invasive Species." The competition measures success by oral presentations made to a panel of judges where each team applies their knowledge and field experiences to a real-life environmental problem as well as by written and field tests. The

Mississippi competition is sponsored by MDEQ's NPS Program and the Mississippi Association of Conservation Districts and is coordinated by the Mississippi Soil and Water Conservation Commission. In Fiscal Year 2016, 265 high-school students (53 teams) and their advisors participated in four area competitions. A total of about 100 students (20 teams) participated at the state competition which was held at Roosevelt State Park on May 6, 2016. The Oxford High School Envirothon Team won the state's competition and traveled to Peterborough, Ontario, Canada to compete in the National Conservation Foundation Envirothon.



- **Make-A-Splash**

Make-A-Splash, a water education event, is held each September at the Mississippi Museum of Natural Science in Jackson where students visit up to 14 water-related interactive booths and guided museum exhibits to learn about polluted runoff, wildlife, water use, groundwater, surface water, and macro-invertebrates.

- **Student Environmental Day Camps**

In 2016, the NPS program sponsored five one-week summer camp sessions at the University of Mississippi Demonstration Technology Transfer Building where 84 students were trained. These camps train students on environmental topics such as water quality, land use, forestry, wildlife, and NPS pollution.

- **Enviroscape and Groundwater Models**

The Enviroscape and Groundwater Models continue to enhance NPS educational activities and are widely used by organizations all over the state due to their widespread distribution by MDEQ. Hundreds of presentations are made each year by various environmental organizations, natural-resource agencies, and non-profit organizations that use these models at conservation carnivals, schools, civic clubs, workshops, summer camps, and Earth Day events.

- **Storm Drain Marking**

The Storm Drain Marking Program is a cooperative program between MDEQ and the Mississippi Wildlife



Federation (MWF). MDEQ provides MWF funding for this through one of its Section 319 subgrant agreements to promote awareness of the water quality impacts of polluted runoff in urban communities. Small plastic disks are placed by local volunteers on storm drains with the message “No Dumping, Drains to River.” Volunteers glue the markers to storm drains and distribute door hangers to homes. Students and scouts also talk with residents about stormwater runoff and the need to prevent pollutants from entering storm drains.

- **Field Days**

Field days have been arranged as part of the NPS Watershed Demonstration Projects conducted with the USDA Natural Resources Conservation Service, the Mississippi Soil and Water Conservation Commission, and various water-management district staff. Additional field trips are included in Teacher Workshops and Adopt-A-Stream Workshops and are a part of the Storm Drain Marking program.



G. Geological Data Collection Activities

Geologic Mapping



Geologic maps of Mississippi made by MDEQ staff are fundamental to characterizing the environment and have applications in water resources, pollution prevention, mineral resources, and protecting property from geologic hazards such as landslides, swelling clays, and floods.

MDEQ’s geologic mapping program for Fiscal Year 2016 was funded in part by a USGS State Geologic Survey Mapping (STATEMAP) grant of \$69,990 in 2015. The primary objective of the STATEMAP component is to establish the geologic framework of areas that are vital to the welfare of individual states. Each State Geologist determines the state's mapping priorities in consultation with a State Mapping Advisory Committee. These priorities are based on state requirements for geologic map information in areas of multiple-issue need or compelling single-issue need and in areas where mapping is required to solve critical Earth science problems.

Deliverables for the STATEMAP grant include the Pascagoula North, Three Rivers, and Harleston 7.5-minute quadrangles in southeastern Mississippi published in color at a scale of 1:24,000. A "quadrangle" refers to a USGS 7.5-minute quadrangle map which are usually named after a local

physiographic feature. Geologic units mapped, and correlated in the subsurface on the map cross section, include the Miocene age Pascagoula Formation, the Pliocene-age Graham Ferry Formation, Pleistocene-age coastal terraces, and Holocene age alluvium. Geologic mapping in Fiscal Year 2017 will be funded in part by the 2016 STATEMAP grant off \$61,327.

Flood Mapping

The Geospatial Resources Division focused its emphasis on remote sensing (RS) and geographic information systems (GIS) activities. The division manages the Mississippi Flood Map Modernization Initiative (MFMMI) and the Mississippi Risk MAP Program. This program develops and updates digital flood insurance rate maps (DFIRMs) for the 82 counties under funding by the Federal Emergency Management Agency (FEMA).

FEMA began its new Risk MAP (Risk Mapping, Assessment and Planning) program in 2010. The program has shifted to Hydrologic Unit Code 8 (HUC 8) sub-basin flood studies and added flood risk assessment and flood hazard mitigation and planning activities and products. As of mid-2016, there are nine HUC 8 Risk MAP projects and one LAMP (Levee Analysis and Mapping Procedure) project on the Tennessee-Tombigbee Waterway in northeastern Mississippi. This project is one of 25 pilot LAMP projects for mapping de-accredited levee systems chosen by FEMA from across the nation.

A web site for the MFMMI is available for the public and local government officials to learn the status of each county's DFIRM mapping project. Also, when a county's new preliminary flood maps are available, the public and local government officials will be able to download and review individual DFIRM map panels.

Subsurface Geological and Geophysical Data

The Environmental Geology Division gathers, studies, and archives subsurface geological and geophysical data for ongoing projects and other studies within MDEQ. Focused research is being done with regard to groundwater and other environmental issues. The division also provides support to other state agencies and academia. A Environmental Geology Division's geologist answers requests for information on groundwater availability, depth of wells, and potential yield of wells from water well contractors, engineering firms, consultants, and private individuals.

Central U.S. Earthquake Consortium

MDEQ staff continue to be involved in the Central U.S. Earthquake Consortium (CUSEC) comprised of eight states working on disaster planning regarding the New Madrid Earthquake Zone. Northwestern Mississippi is at risk of significant damage to roads, bridges, utility systems, power grids, and other infrastructure along this active fault zone. Geologists from the Office of Geology are in contact with and involved in meetings regarding future projects and studies over the next few years.

Environmental Geology

Since the 1950s the agency has been collecting subsurface geological information by sending scientific instruments down test holes and water wells to record data on the rocks and groundwater (wireline logging). The Environmental Geology Division's geologists wireline logged a total of 40 test holes and water wells in 26 Mississippi counties in Fiscal Year 2016, and total footage logged was 21,456 feet. Eleven water well contractors, two state agencies, and one federal agency took advantage of this essential program. The Office of Geology drilled the shallowest test hole wireline logged for the OLWR as part of the ongoing Delta water resources project in Leflore County. Total depth of this hole was 130 feet. The deepest test hole wireline logged was drilled to a total depth of 1,168 feet for the City of Houston. Private wells comprised almost half of those logged while industrial and commercial wells came in second. The log files are an essential reference for investigations of geology, water resources, potential for contamination, and mineral resources.



Two test holes were drilled to core the Eocene-Oligocene boundary in Wayne County and for geologic mapping in the Vicksburg National Military Park: the #1 LSU Hiwannee, Wayne County, core hole to a depth of 214 feet, and the #1 Patrick Vinzant, Warren County, to a depth of 430 feet. As part of the ongoing Delta water resources project, the Environmental Geology Division drilled and completed four monitoring wells for the OLWR. These wells had a total footage of 480 feet and were drilled for the purpose of monitoring interaction between the Tertiary aquifers and the Mississippi River Valley Alluvial Aquifer. Additionally, as part of a joint project between the Agricultural Research Service and the OLWR, six monitoring wells totaling 570 feet, four vadose wells totaling 160 feet, and one production well totaling 90 feet were drilled and completed. This project's purpose was to determine viability of injection as a form of recharge for the Mississippi River Valley Alluvial Aquifer. Both projects were undertaken to further the goals of the Governor's Delta Sustainable Water Resources Task Force.

The Environmental Geology Division's technicians pulled, shipped and refiled samples for six geoscientists during Fiscal Year 2016. These visitors to the Core and Sample Library looked at approximately 210 boxes of cores and cuttings. Staff re-boxed 314 boxes of cores. Fifteen boxes of whole cores were slabbed and archived. Sample splits were done on eight wells amounting to approximately 1,185 feet. Numerous requests were made for digital copies of wireline data. Technicians scanned 75 new wells into the system, copied eight DVDs of wireline data, and copied a number of DVDs of data from oil and gas log files.

Mississippi Digital Earth Model

MDEQ is also involved with the Mississippi Coordinating Council for Remote Sensing and Geographic Information Systems (Council) that sets policies and standards that promote the

sharing of information, as well as facilitate the cost-sharing potential. The Council is also charged with oversight of the development of the Mississippi Digital Earth Model (MDEM). The Office of Geology is responsible for MDEM's development, and the Geospatial Resources Division handles the assignment. MDEM consists of developing digital geographic information that will serve as the state base map. MDEM consists of eight layers of digital information that will be available online: (1) geodetic control, (2) elevation and bathymetry, (3) orthoimagery, (4) hydrography, (5) transportation, (6) government boundaries, (7) cadastral, and (8) the Gazetteer. MDEQ is responsible for the management and monitoring of MDEM data development contracts and the Quality Assurance of the MDEM mapping products that result from this work. Products from this work may be used by state and local governments, engineering firms, and construction companies involved in planning, development, construction, or regulatory work throughout the state.

During Fiscal Year 2016, MDEQ continued monitoring and managing contractors completing work on MDEM data sets. These data included hydrography and elevation / topography Lidar data in different areas of the state. All data developed are of MDEM quality and will be made available for distribution through the Mississippi Geospatial Clearinghouse website.

Publications

Thirty geologic papers and books were published by MDEQ staff in Fiscal Year 2016, including *The Geology of Mississippi* by University Press of Mississippi and MDEQ in April 2016, 10 articles in *Environmental News*, nine articles in the *Mississippi Geological Society Bulletin*, three abstracts in the *Journal of the Mississippi Academy of Sciences*, two articles in the *Mississippi Archaeological Society Newsletter*, two abstracts in the Geological Society of America, Southeastern Division, *2016 Abstracts with Programs*, and three geologic quadrangle maps.

XII. GULF REGION WATER & WASTEWATER PLAN

In the aftermath of the devastation of Hurricane Katrina, this program has transformed much of the Gulf Coast public service infrastructure. Of the \$5 billion Mississippi obtained from the federal government for long-term recovery assistance, about \$650 million was devoted to building and upgrading water and wastewater systems on the Gulf Coast. MDEQ was assigned the responsibility for carrying out this task under the auspices of the Mississippi Development Authority and with the approval of the U.S. Department of Housing and Urban Development.

Applying the lessons from the aftermath of the Hurricane Camille experience, and building this infrastructure so it would be better than ever meant adopting the following principles:

- New water and wastewater infrastructure would be built in areas less vulnerable to damage from future hurricanes in order to encourage growth to these areas.
- This new infrastructure would be built in such a way that it could recover quickly from a major hurricane and facilitate the rapid recovery of water and wastewater systems in high impact areas.
- Focus on the Gulf Coast region, rather than individual units of government, encourage centralization and consolidation to save money, increase efficiencies, eliminate duplication, and foster cooperation.
- Creation of economic development opportunities would be a chief criterion in the selection of projects.
- Projects would be identified and prioritized within the framework of a comprehensive regional plan.

These principles led a “backbone” network of regional water and sewer systems submitted by local governments (treatment facilities, pump stations, elevated water tanks, water supply wells, and the interconnecting pipelines) that allow municipalities and developers to connect to these networks at a fraction of the cost of constructing stand-alone systems. In addition, this new infrastructure fosters development away from the coastline and creates water and wastewater systems less vulnerable to future hurricanes. The plan, developed in consultation with local officials and hundreds of concerned citizens, has funded 67 projects across five counties.

The plan was completed under budget and achieved all its goals in Fiscal Year 2016. The Gulf Coast region now has a significant amount of new water and wastewater facilities including:

- 620 miles or more new water and sewer lines.
- 31 new water tanks.
- 32 new water wells.
- 59 new wastewater pumping stations.
- 17 new wastewater treatment facilities.



XIII. CHARITABLE CONTRIBUTIONS

Employees throughout all areas of MDEQ volunteer their time to increase awareness and raise funds for local charities. Committee members plan and organize fundraising events such as bake sales, luncheons, raffles, silent auctions, and designing and selling t-shirts.



The following is a list of the events that MDEQ's employees participated in throughout Fiscal Year 2016:

The Fight For Air Climb -- a fundraiser for the American Lung Association (ALA). It is 3.1 miles long and includes climbing stairs. In 2016, it was held at the C Spire and ButlerSnow building in Ridgeland. The committee members were Melissa Fortenberry and Jessica Forbus. Overall, "Team MDEQ" raised \$336.

United Way -- the MDEQ committee collected \$2,125. The committee was comprised of: John Banks, Marquita Johnson, Dennis Kelly, Jennifer Milner, Kelty Puckett, and Erica Scarbrough.

Making Strides Against Breast Cancer -- in October 2015, the MDEQ Making Strides Against Breast Cancer team raised about \$2,700, which placed it fourth among all teams in the Jackson event. Committee members included: Charlie Bock, Laura James, Tyler Berry, Charity Rockingham, Taaka Bailey, Kelty Puckett, Presley Stiglets, Sherryl Couch, Alina Young, and Mandy Purvis.

November -- MDEQ raised more than \$6,100 in November 2015 for Prostate Cancer research. Committee members: Jay Barkley, Robbie Wilbur, Mandy Purvis, Sherry Pyron, Jill Bailey, Tyler Hardy, Lisa Luckey, Robert Mills, and Thomas Tynes.

2015 Christmas Committee -- donations were collected for Community Animal Rescue and Adoptions (CARA) and We Will Go. Committee members: Mandy Purvis, Lisa Luckey, Sherry Pyron, Kelty Puckett, and Presley Stiglets.

MDEQ CHARITABLE CONTRIBUTIONS



MOVEMBER
\$6,100

**MAKING STRIDES
AGAINST BREAST CANCER**
\$2,700

UNITED WAY
\$2,125

**THE FIGHT
FOR AIR CLIMB**
\$336



CARA

25 bags of dog food
20 cans of pedigree
6 stainless steel food bowls
5 new small and medium collars
10 new leashes
15 bags of cat food
10 bags of cat litter
4 packs of paper towels
7 bottles of bleach
2 string mops
1 broom with dust pan
8 bottles of Clorox/Lysol wipes

WE WILL GO

25 Blankets
5 sleeping bags
100 cans of food
20 packages of toothpaste
15 toothbrushes
2 boxes of hand warmers
60 bottles of water

XIV. COMMISSION ON ENVIRONMENTAL QUALITY

The Commission on Environmental Quality is comprised of seven members appointed by the Governor for each of the “old” five congressional districts and two “at-large” districts. The appointments are made with the advice and consent of the Mississippi State Senate. The commissioners serve seven-year staggered term. The Commission meets on the fourth Thursday of each month.

Chair: W. J. (Billy) Van Devender - At-Large
 Vice Chair: Jack Winstead - Third District
 R. B. (Dick) Flowers - First District
 Brenda Lathan - Second District
 Ted Kendall IV - Fourth District
 John Dane III - Fifth District
 Chat Phillips - At-Large

XV. MISSISSIPPI ENVIRONMENTAL QUALITY PERMIT BOARD

The Mississippi Environmental Quality Permit Board takes action on permits administered through MDEQ. Seven members serve by virtue of the state office they hold. Two additional members are appointed by the Governor for a term concurrent with the term of the Governor. These two members must be a retired professional engineer and a retired water well contractor, and they may only vote on matters related to water supply/withdrawal permits. The Permit Board meets the second Tuesday of every month.

Chair: Michael Bograd - Mississippi Department of Environmental Quality - Office of Geology
 Vice Chair: Dennis Riecke - Mississippi Department of Wildlife, Fisheries, & Parks
 Leslie Royals - Mississippi State Department of Health
 Jennifer Wittmann - Mississippi Department of Marine Resources
 Howard Leach - Mississippi State Oil & Gas Board
 Julie McLemore - Mississippi Department of Agriculture and Commerce
 James Hoffmann - Mississippi Department of Environmental Quality - Office of Land and Water Resources

