

MISSISSIPPI

Department of Environmental Quality



2019 Annual Report



TABLE OF CONTENTS

03 STRATEGIC GOALS

04 AIR QUALITY

12 WASTE MANAGEMENT

26 REMEDIATION

32 RECLAMATION

34 WATER QUANTITY

40 WATER QUALITY

56 PERMITTING

57 COMPLIANCE AND ENFORCEMENT

58 EMERGENCY PREPAREDNESS AND RESPONSE

62 OIL SPILL RESTORATION

74 OUTREACH, RESEARCH, AND EDUCATION

90 CHARITABLE CONTRIBUTIONS

91 COMMISSION AND PERMIT BOARD

Message from the Executive Director

The programs and initiatives administered 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 C. Rikard
Executive Director
MDEQ



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 2019.

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

Waste Management: Protect Mississippi's soil and water resources through proper nonhazardous solid waste and hazardous solid waste management.

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

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

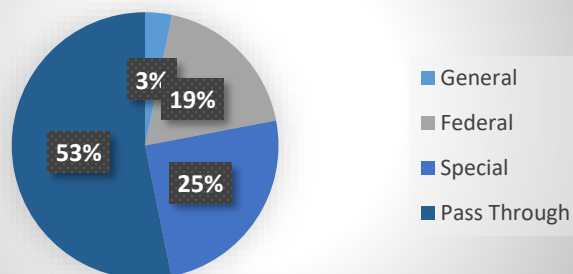
Water Quantity: Maintain sustainable quantities of surface and groundwater in Mississippi.

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

Emergency Preparedness and Response: Prevent, prepare for, and respond to public health, safety, and environmental emergencies.

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

FY 19 APPROPRIATION



AIR QUALITY

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

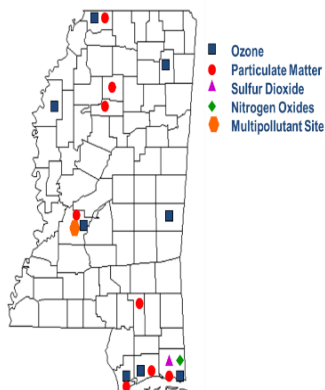
Air Monitoring

MDEQ operates a network of automated continuous air analyzers and 24-hour manual samplers for measuring ambient air quality.

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 impairments
- 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. Additionally, MDEQ, in association with the Memphis-Shelby County Health Department, issues air quality forecasts for DeSoto County.

MDEQ makes these forecasts available through e-mail, the MDEQ website, and Twitter. MDEQ uses the forecasts to keep the public informed about the status of air quality, to issue health advisories, and to notify the members of ozone reduction programs to implement actions if necessary.

In 2012, the U.S. Environmental Protection Agency (EPA) designated all Mississippi counties in attainment for the nitrogen dioxide standards. EPA retained the current standards for carbon monoxide, and Mississippi is meeting those standards.

Also in 2012, EPA implemented the final standards for annual mean fine particulate matter. EPA reduced the primary standard from 15 micrograms

Air Quality Objective: Maintain Compliance with Federal Air Quality Standards

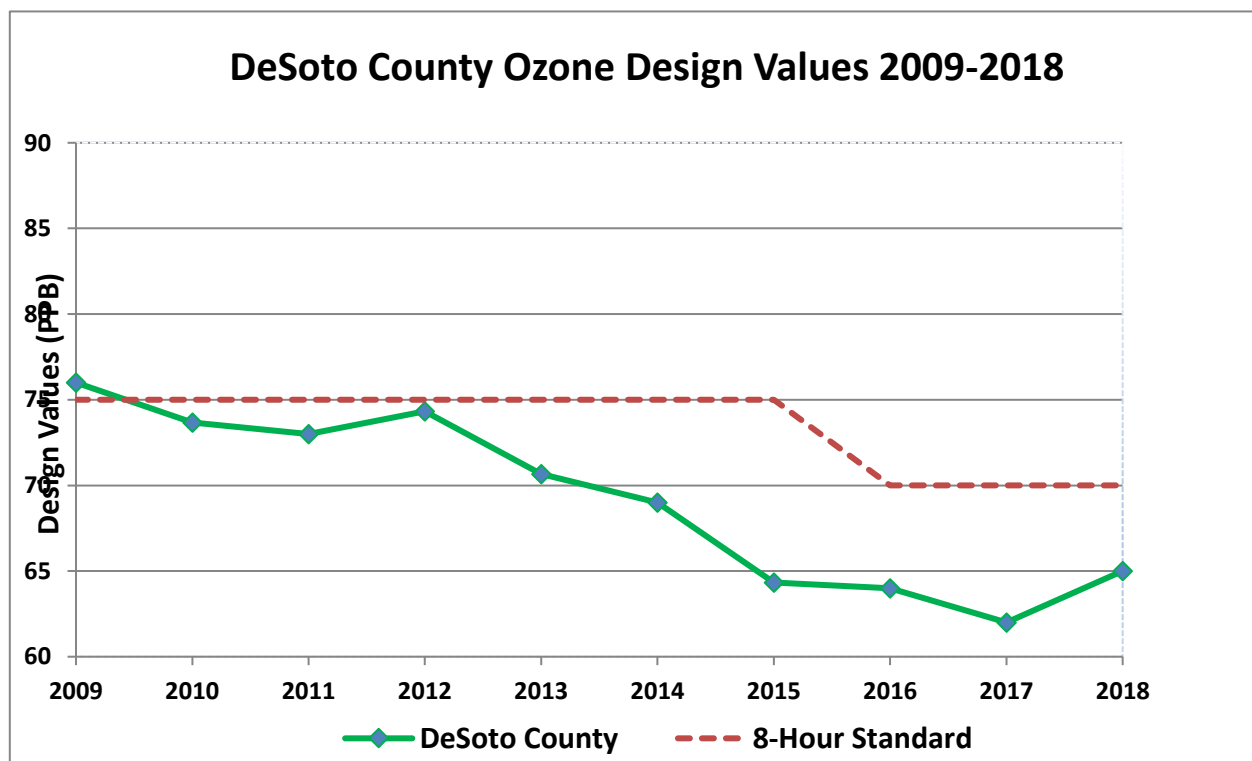
per meter cubed ($\mu\text{g}/\text{m}^3$) to $12 \mu\text{g}/\text{m}^3$. EPA made final designations of the standard in December 2014 showing attainment for all particulate matter monitoring sites in Mississippi. The 24-hour average standard remained at $35 \mu\text{g}/\text{m}^3$. Mississippi is in attainment with both standards.

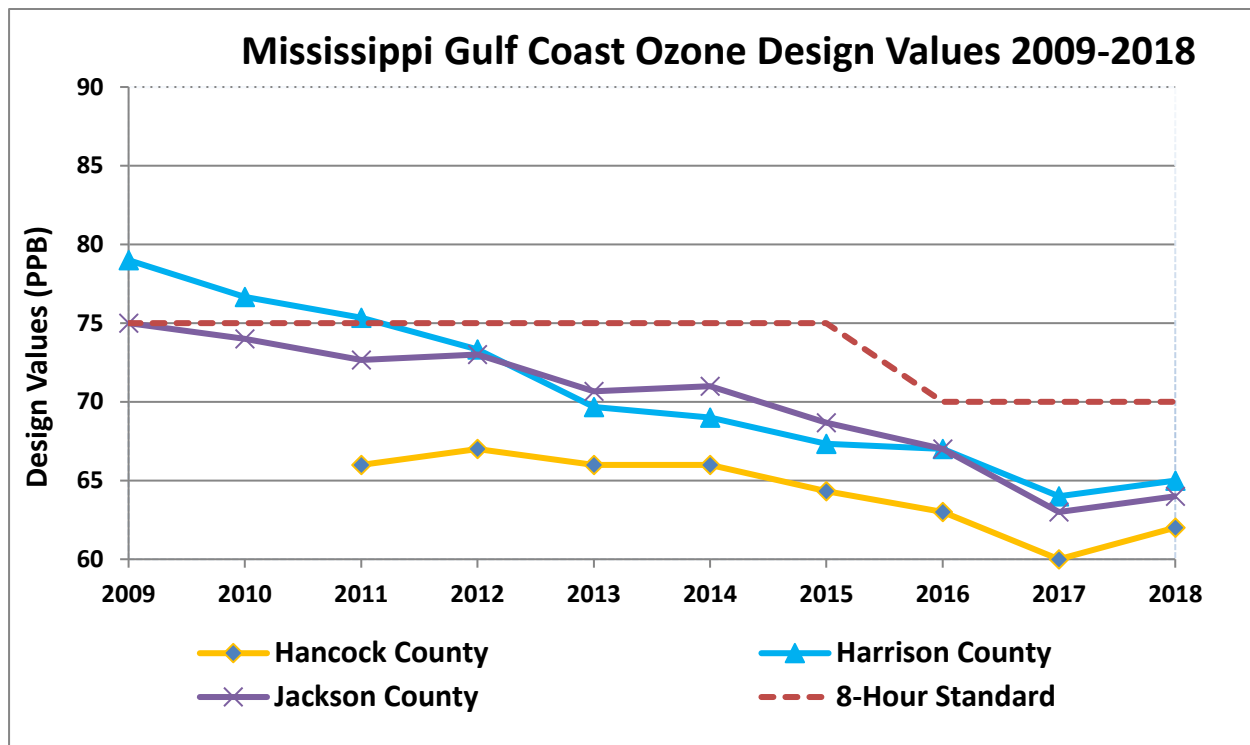
In August of 2017, EPA designated all counties in Mississippi as attainment/unclassifiable for the 2010 sulfur dioxide (SO_2) standard. MDEQ worked in cooperation with affected facilities to complete the assessments needed to achieve this designation.

Emissions reductions in Mississippi and adjoining states, as well as favorable

meteorological conditions, resulted in a recent downward trend in ground level ozone (O_3) concentrations. In 2015, EPA lowered the standard for ozone to 70 parts per billion (ppb). The Governor submitted a recommendation of attainment for all counties in the state in August of 2016.

In November of 2017, EPA designated all of Mississippi as attaining the 2015 ozone standard. MDEQ is continuing a voluntary ozone-precursor reduction program in partnership with government and business leaders on the Mississippi Gulf Coast and in DeSoto County to prevent or mitigate future nonattainment.





Regional Haze Planning

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

Mississippi is working with nine other southeastern states and tribal associations known as the Visibility Improvement State and Tribal Associations of the Southeast (VISTAS) to address the EPA Regional Haze Rule. MDEQ staff participates with the VISTAS group to analyze regional haze impacts to Federal Class I areas in the southeast. Mississippi does not have any designated Federal Class 1 Visibility areas; however, the Breton National Wildlife Refuge (Chandeleur Islands) in Louisiana and the Sipsey Wilderness area in northern Alabama are close enough to Mississippi that air emissions from sources in Mississippi must be evaluated for visibility impacts. The Southeastern States Air Resource Managers (SESARM) manages the VISTAS effort using contractors to perform air quality

modeling, with the states providing technical support, to measure visibility impacts. States will use the results of this modeling to support the development of Regional Haze state implementation plans (SIPs). Mississippi will be developing a Regional Haze SIP due in 2021.

Title V Program

The Clean Air Act amendments of 1990 established the Title V Operating Permit program. The program requires each major source of air pollution 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. Sources subject to the program are required to pay an annual fee to cover the program costs. Mississippi received full approval from EPA in 1995 to administer the Title V Operating Permit program. The MDEQ Environmental Permits Division (EPD) handles all aspects of Title V permitting while the MDEQ Environmental Compliance and Enforcement Division (ECED) handles all compliance certifications and demonstrations. The MDEQ Air Division is responsible for managing the fee portion of the Title V program.

Mississippi law requires the establishment of the Title V Advisory Council (Council) to evaluate the costs of the program, to recommend an equitable fee system, and to conduct an annual program review. MDEQ staff reports the results of the annual review to the

Commission on Environmental Quality (Commission). MDEQ staff meets regularly with the Council to provide updates on Title V program activities. Air Division staff annually develops a work plan for the upcoming year that includes all functional areas of the Title V program. During that time, Air Division staff compiles data on projected and actual program revenue, expenditures, and pollutant emission rates. Air Division staff provides this data, along with the work plan, to the Council for their use in recommending an adequate Title V permit fee. The Commission considers the recommendation and sets the Title V fee for the upcoming fee year. The annual permit fees are due September 1 of each year.

During Fiscal Year 2019, there were 57 Title V permits issued, including initial issuances, renewals, and modifications. There were also 20 new Synthetic Minor Operating Permits issued to facilities that would have otherwise been required to obtain a Title V permit, except that the owner or operator elected to take federally enforceable permit restrictions to limit allowable emissions below Title V major source thresholds. There were 116 Title V inspections conducted.

Air Emission Inventory Branch

The MDEQ Air Division develops an inventory each year that quantifies the air emissions from larger sources. This work involves gathering the emissions data from the emissions sources and

submitting it to EPA. The inventory quantifies emissions for over 200 air pollutants and includes emissions-related information such as control devices, exhaust stack parameters, and fuel type. Every third year, EPA requires a complete, much larger, inventory. The complete inventory includes emissions from all major Title V sources on a detailed level, estimated emissions from smaller stationary sources, and emissions from mobile sources. Calendar year 2017 was a complete inventory year and that submittal was due in January 2019. The Emission Inventory Branch completed and submitted the 2017 major source inventory in January 2019. The Emission Inventory Branch has also started compiling inventory data for Calendar Year 2018 and submitted a request for the data from all affected facilities in 2019.

Diesel Emission Reduction Project State Grants

MDEQ utilized Diesel Emissions Reduction ACT (DERA) grant funds from EPA for the replacement of older school buses with newer, cleaner, and more efficient ones. In 2018, after receiving applications from 22 school districts, MDEQ worked with 17 school districts to replace 20 school buses, with a total of \$295,920 in rebate allocations. In 2019, after receiving applications from 21 school districts, MDEQ is working with 13 school districts to replace 24 school buses, with a total of \$355,489 expected in rebate allocations. Due to the success of this program, MDEQ expects to continue with a new DERA State Grant from EPA.

Asbestos

Asbestos is a potential danger when disturbed during the course of a building demolition or renovation. State regulations require affected facilities to inspect for asbestos before work begins. The regulations also specify work practices and procedures to prevent asbestos fiber emissions during building demolition and renovation activities. MDEQ assists project owners and operators in understanding the requirements of the regulations and performs demolition and renovation project inspections to ensure safe and compliant operations. Additionally, MDEQ aids homeowners by providing information in dealing with the hazards of asbestos for non-regulated activities they may perform.

EPA regulations require that schools inspect all buildings for asbestos materials and monitor the condition of any asbestos material not previously removed. Each Mississippi school district must address regulatory requirements and school activities in an asbestos management plan. MDEQ performs asbestos management plan inspections to ensure that the requirements are being satisfied and that the plan is protective of students, teachers, and school employees.

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 2019, MDEQ inspected 348 demolition and renovation projects, investigated 19 complaints, certified 1,211 applicants to perform asbestos activities, and inspected 36 school districts with asbestos management plans.

Air Toxics

The term “air toxics” refers to air pollutants that EPA has listed as Hazardous Air Pollutants (HAP). These air pollutants may cause acute or chronic health conditions and 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. These standards and emission limitations utilize best-demonstrated technology and very high emission control efficiency to achieve reductions.

MACT standards affect 174 different source categories of major HAP emitting facilities and 70 source categories of smaller area HAP emitting facilities. The universe of affected facilities is quite large and varying making it difficult to monitor sources for regulatory compliance. The affected facilities range from large chemical and industrial facilities to small dry cleaning facilities, gasoline stations, and even small auto painting shops.

MDEQ’s air toxic activities include the implementation of accidental release prevention regulations. These regulations apply to facilities with chemicals that pose a danger to the public 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 occur. A regulated facility outlines its planning, techniques, and procedures to prevent chemical accidents in a Risk Management Plan (RMP). MDEQ monitors the ever-changing universe of regulated sources and evaluates the RMP as part of compliance inspections. During Fiscal Year 2019, there were 146 active regulated facilities and staff completed 46 compliance inspections.

Greenhouse Gases

On December 7, 2009, the EPA Administrator signed the Endangerment Finding for greenhouse gases from mobile sources. EPA used this finding as the basis to expand its regulatory efforts to regulate large stationary sources of greenhouse gas emissions. Initial regulatory efforts of greenhouse gases included regulations for the power sector, oil and natural gas industries, and landfills. The most significant of these regulations to date was the release of the Clean Power Plan in August of 2015. However, in March of 2017,

President Donald Trump issued Executive Order 13783 requiring EPA to review the Clean Power Plan and other rules associated with greenhouse gases. The review was to ensure that the rules do not unduly burden the development of the nation's energy resources beyond what is necessary. Based on this review, on July 8, 2019, EPA repealed the Clean Power Plan and replaced it with the Affordable Clean Energy (ACE) Rule. As required by the ACE rule, MDEQ will begin in Fiscal Year 2020 developing a state plan to address all affected sources. EPA continues to review other rules associated with greenhouse gases in accordance with Executive Order 13783. MDEQ will continue to monitor these efforts and will participate in the regulatory process where necessary to support reasonable and effective regulation.

Lead-Based Paint Program

Mississippi's Lead-based Paint Program is an EPA-approved and delegated state certification program that determines the requirements for the certification of persons and firms engaged in lead-based paint activities. It also establishes work practice standards for performing such activities and the procedures and requirements for the accreditation of lead-based paint training programs. The regulations are applicable to all persons engaged in lead-based paint abatement and renovation activities in targeted housing and child-occupied facilities.

In addition to certifying individuals and firms engaged in lead-based paint activities, MDEQ performs audits of training courses, inspections of job sites, desktop reviews of lead abatement reports, and file reviews of companies involved in renovation activities to ensure compliance with the regulations. During Fiscal Year 2019, the MDEQ Lead-based Paint Section performed six training course audits, 14 desktop reviews of lead abatement reports, 12 paperwork review inspections, 69 site inspections (including investigations at nine complaint sites), and certified 618 individuals and firms involved in lead-based paint activities.

The Lead-based Paint Program is working with the Mississippi State Department of Health, the Mississippi Board of Contractors and the Mississippi Department of Archives and History – Historical Preservation Division to identify areas of concern regarding lead hazards.

Volkswagen Settlement

In 2017, Governor Phil Bryant designated MDEQ to administer the state's portion of the funds resulting from the Volkswagen (VW) Diesel Settlement. The state allocation was \$9.87 million out of the \$2.7 billion Environmental Mitigation Trust. The state's allocation was based on the number of offending vehicles registered in the state. VW established the Mitigation Trust Fund to settle claims under the Clean Air Act that it sold vehicles with "defeat devices" designed to cheat emissions tests for its diesel vehicles.

Mississippi will use the funds to support mitigation projects to replace older diesel emission sources with cleaner technology to reduce excess nitrogen oxide (NO_x) reclamation emissions and improve air quality. MDEQ will award funds in accordance with the trust agreement and the state's Beneficiary Mitigation Plan (BMP). MDEQ developed the draft BMP and held three public hearings for comment in 2019. MDEQ will submit the final BMP to the Trustee and will initiate the project development process in Fiscal Year 2020.



WASTE MANAGEMENT

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

MDEQ is responsible for ensuring that solid waste generated in the state is managed in a manner that is protective of the environment and human health. 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 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 in an environmentally safe manner. MDEQ has been designated as the lead agency in implementing this policy to reduce wastes, to reuse and recycle wastes and to safely dispose of wastes. 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.

An important part of MDEQ's solid waste regulatory efforts involves regulation of those solid wastes that are considered hazardous. MDEQ has delegation from EPA to oversee and implement most of the federal Hazardous Waste Management program in Mississippi for discarded materials that have characteristics that make the waste potentially more dangerous or harmful to human health or the environment if managed improperly. MDEQ also has delegation from EPA to regulate certain waste disposal activities that are conducted through underground injection control wells.

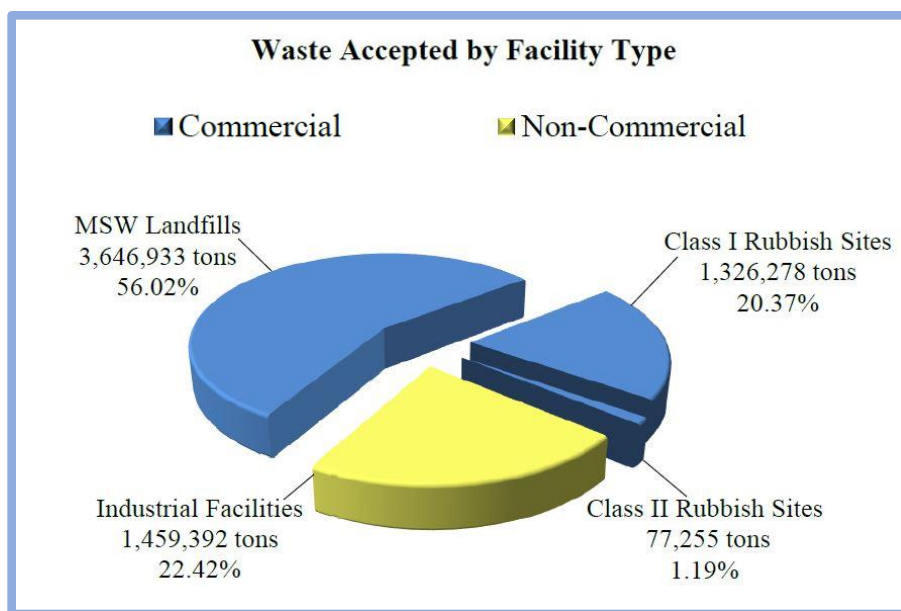
Mississippi Solid Waste Management and Disposal

MDEQ's Nonhazardous Solid Waste programs 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. To measure the success of the state's waste management efforts, MDEQ collects reports annually from the owners or operators of permitted solid waste management facilities on activities conducted during the preceding calendar year.

In early 2019, MDEQ collected annual reports from facility owners for the solid waste management activities conducted during Calendar Year 2018. These reports indicate that close to 6.5 million tons of wastes were disposed at permitted landfills and rubbish sites in Mississippi in 2018. Approximately 5.05 million tons were disposed at commercial facilities with approximately 3.6 million tons (56 percent) disposed at commercial landfills and 1.4 million tons (22 percent) at commercial rubbish sites. Approximately 1.5 million tons (or 22 percent) of the total wastes were disposed at non-commercial disposal facilities. Solid waste disposal facilities received just over 966,000 tons of waste from out-of-state sources representing approximately 15 percent of the total.

In addition, a total of approximately 17,000 dry tons of wastes were applied at permitted land application sites, and about 23,000 tons of material were received at solid waste composting facilities. The annual reports also indicated that approximately 98,000 tons of material was received for management at solid waste processing facilities and approximately 865,000 tons of wastes was managed by solid waste transfer stations.

In early 2019, MDEQ launched a new electronic reporting system to assist solid waste management facilities with filing the required annual reports. MDEQ partnered with Emerge Knowledge Design, Inc. (Emerge) to employ the new electronic reporting system, provided



through Emerge's Re-TRAC Connect Software platform. This initial year of electronic reporting was optional for solid waste facility owners. However, more 7 percent of the reporting facilities used the electronic reporting system in this initial year.

MDEQ plans to transition towards mandatory use of the electronic system for all annual report submittals beginning with the reporting for Calendar Year 2019.

Recycling and Waste Reduction

Mississippi's recycling programs and recycling industry have experienced challenging market conditions during the past year due to international market conditions that have affected exports of significant amounts of recyclables. MDEQ's recycling program has continued to work to promote and grow recycling in the anticipation that market conditions will recover as domestic recycling markets continue to develop.

In early 2019, MDEQ implemented a Statewide Recycling Reporting and Measurement Program through a new electronic reporting format. Mississippi state law sets a waste reduction goal of 25 percent for the state and mandates that local governments develop and implement a waste reduction strategy as a part of local solid waste plans. Historically Mississippi has had no formal means of measuring recycling rates; however, with the launch of this new measurement program, MDEQ anticipates being able to collect statewide data to measure Mississippi's progress toward

reaching the 25 percent waste reduction goal. In addition, local governments will have information and tools to determine the success of their recycling programs and to build more sustainable and efficient solid waste and recycling services for their citizens.

This initial recycling data collection effort was conducted on a voluntary basis with future plans to transition towards required reporting of recycling program information. To gather the data needed in an easy and convenient manner for all parties, MDEQ partnered with Emerge Knowledge Design, Inc. (Emerge) and The Recycling Partnership to employ a newly developed electronic reporting system, the Municipal Measurement Program (MMP). The MMP is provided through Emerge's Re-TRAC Connect Software platform. The MMP was launched in early 2019 for reporting 2018 Calendar Year data which provided a convenient fit for Mississippi's reporting needs. Prior to the launch, MDEQ reached out to those cities and counties which are known to have active recycling programs and about a third of those communities participated in the MMP reporting system. MDEQ is in the process of reviewing and verifying the information that has been reported. MDEQ plans to build on this initial year of reporting with plans to use the data to measure the state's progress in meeting the statutory 25 percent waste reduction goal. The information may also be used in evaluating how state recycling grant funds may be distributed for cooperative projects by local governments to collect, transport, process, and market recyclable materials.

In addition to the Statewide Recycling Measurement and Reporting Program, the agency continues to measure access and availability of local recycling services to the state's residents. Given the challenging market conditions for many recyclables, the state did experience the loss of several local recycling programs as well as the closure of recycling businesses. MDEQ anticipates that the access to community recycling will likely drop. The most recent access rate has been measured at around 60 percent of the state's population having access to community recycling program. Of this 60 percent, approximately half of the residents with recycling access are provided curbside recycling services with the remaining half having access to drop-off recycling services. The 40 percent or more 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.

In order to improve recycling conditions, MDEQ has continued to promote local government recycling programs and encourage cooperative efforts among local governments to collect, process, and market recyclables. During Fiscal Year 2019, the Waste Division has worked on the conditions and plans for the release of a Funding Opportunity Announcement (FOA) for a second round of grant funding under the Regional Recycling Cooperative Grants (RRCG) program. Grant funding in excess of \$1 million was previously awarded in 2014 to cooperative recycling efforts led by the Cities of Oxford, McComb, Greenwood, and Natchez. These grants helped to develop new and

upgrade existing local recycling programs. The opportunity for the grant funding will be announced by MDEQ in the future, upon finalizing the terms of the FOA.

In addition, MDEQ is working to increase public participation in local recycling programs and efforts by expanding information available to the public on how, where, and what they can recycle in their community. The Recycling and Waste Reduction Program staff continues to maintain and update the State Recycling Directory on the MDEQ website which provides information to residents seeking recycling opportunities and services in their area. The directory identifies those local governments, businesses, institutions and other organizations that provide recycling services to the public for paper, plastics, metals and glass. The Recycling and Waste Reduction program staff have plans to continue to enhance the directory information for various types of special wastes that may not be collected through traditional recycling programs.

Leading by example, MDEQ has also continued to update and expand the agency's Office Recycling Program. These internal efforts have focused on making recycling more convenient for agency employees to ensure both increased quantity and quality of recyclables. Recycling guides and signage have been developed for MDEQ facilities providing clear instructions on the materials accepted and not accepted for recycling and on the proper handling and placement of these materials. Recycling staff have also spoken at various

employee meetings to answer questions on recycling. In addition, MDEQ recycling staff also work with numerous other state agencies to start, revive, and enhance agency recycling programs and will continue to assist state agencies and institutions to fulfill the statutory responsibility each agency has to implement a recycling program.

MDEQ's Waste Division continued efforts over the past year to work 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. One of the key partners is the Mississippi Recycling Coalition (MRC), 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 in the agency's recycling efforts include Keep Mississippi Beautiful and its local affiliates, the Mississippi Beverage Association, the Mississippi Municipal League, the Southeast Recycling Development Council, the Mississippi Manufacturers Association and various other local, state, regional and national organizations.

Pollution Prevention Program

The Pollution Prevention (P2) Program is coordinated by MDEQ's Waste Division with the various environmental air, water and waste media programs in the agency. The P2 programs coordinate multiple activities focusing on the reduction of wastes that can impact the environment. The Mississippi P2 program efforts are supported in part by EPA's Pollution Prevention Grant which provides the state with additional resources to assist industries, businesses and government agencies and institutions with pollution prevention and waste minimization efforts. The purposes of MDEQ's Pollution Prevention Program include the following:

- Provides information and technical assistance to businesses and industries, environmental consultants, local governments, state and federal agencies, and system operators on hazardous and non-hazardous waste management and pollution prevention practices.
- Supports the Economy, Energy, and Environment (E3) initiative which includes projects, programs and efforts designed to focus on sustainability and the triple bottom line of energy, environment, and the economy.
- Reviews, manages, and monitors the waste minimization plans, annual waste minimization certified reports, and generation of annual P2 fees calculation information for Toxic Release Inventory Form Filers and

Hazardous Waste Generators.

- Provides administration and implementation of the Envision Heightened Awareness Nurturing Conservation and Environmental Excellence (enHance) stewardship program.
- Coordinates and partners with both state and the federal government agencies and non-governmental entities to promote effective pollution prevention practices.

During Fiscal Year 2019, the MDEQ P2 Program accomplished the following program elements:

- Continued the strong partnership with the Mississippi Manufacturing Association (MMA) through a contract with MMA's Manufacturing Extension Partnership (MMA-MEP) to coordinate the provision of a well-rounded P2 and E3 technical assistance program for Mississippi manufacturers.
- Reviewed and monitored 198 annual waste minimization certified reports submitted by various industries and facilities around the state.
- Met all of the conditions and commitments of the 2017-2018 Mississippi/EPA Pollution Prevention grant.
- Reviewed and processed applications for the 2019 class members for the enHance environmental stewardship

recognition program. There were nine renewing members and one new member for the program this year.

- Worked with MEP to update the Energy, Economy, and Environment (E3) Framework to better serve Mississippi manufacturers and branded the new framework as ME3. The P2 program, with assistance from MMA-MEP conducted four P2 enHance site visits, hosted two P2 workshops, conducted four presentations, conducted three E3 site assessments, conducted four webinars, conducted three workshops and conducted a 10-year review of the enHance program's pollution prevention achievements.

Solid Waste and Waste Tire Grants Programs

The Waste Division manages various solid waste assistance grant program funds. MDEQ awarded almost \$3.86 million in Fiscal Year 2019 for solid waste management and recycling projects, solid waste planning projects, and waste tire projects. Of that total, over \$2.0 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, provide household hazardous collection programs, conduct public information efforts on solid waste and recycling programs, and for other waste management activities. 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.

Grant Awards for Fiscal Year 2019

- 60 counties were awarded just over \$1 million.
- \$1,001,317 in non-competitive, allocated solid waste assistance grants.
- 31 municipalities, counties, and solid waste authorities were awarded just over \$1 million in competitive and supplemental grant funds.
- 36 municipalities, counties, or solid waste authorities were awarded \$1 million to fund local waste tire collection and clean-up programs.
- One county government was awarded \$41,850 to update and develop local comprehensive solid waste management plans.

Solid Waste Planning

The MDEQ Solid Waste program works with local governments to develop and implement long-range local solid waste management plans. Each local government is required by state law to

develop and implement these comprehensive local, solid waste management plans for a 20-year period. The original local government solid waste plans in Mississippi were adopted in the early 1990s; consequently, many of these plans have reached the end-of-life and have been or are in the process of being updated.

Over the past year, updated comprehensive local solid waste plans have been finalized for the Northeast Mississippi Regional Solid Waste Management Authority, Leflore County, Tallahatchie County, and Tunica County all of which are expected to be granted final approval by the Commission on Environmental Quality in Fiscal Year 2020. Solid waste plans have also been drafted for the Golden Triangle Solid Waste Authority and the Counties of Hancock, Lauderdale, Warren, and Holmes. In addition, efforts to comprehensively update solid waste plans were initiated or continued in State Fiscal Year 2019 for the Counties of Coahoma, Grenada, Neshoba, and Smith.

Often local governments make decisions to significantly alter or amend their plans to add new facilities or to alter the direction of programs and services. MDEQ also reviews amendments to existing local plans to assure adequate disposal services and capacity and consistency with state law. Communities that completed modifications in Fiscal Year 2019 include the Three Rivers Regional Solid Waste Authority (service area expansion for North MS Recycling Solutions Class I Rubbish Site – November 2018); Simpson County (addition of new land application sites – December 2018); Forrest County (expansion of Fairley Tire and Rubber disposal site – December

2018); Three Rivers Regional Solid Waste Authority (expansion of City of Bruce Class II Rubbish Site – June 2018); and Marion County (addition of a new waste processing facility). Additionally, the MDEQ is continuing review of requests for plan amendments submitted in State Fiscal Year 2019 for Lamar County, Neshoba County, and Rankin Counties.

Waste Tire Management Program

The Waste Tire Management Program develops, implements, and promotes the state's strategy to recycle waste tires. The program's success is reflected in the most recent annual program information collected at the end of 2018 indicating an overall waste tire recycling rate of over 96 percent for all tires collected for processing. The recycling rate for waste tires generated in the state was over 92 percent. It is anticipated that the state's waste tire recycling and reuse rates for waste tires will continue to exceed the current national average of approximately 81 percent. Overall, waste tire processors managed nearly 5.9 million waste tires with approximately 53 percent of the tires being imported from out-of-state.

The Waste Tire Program also processes various applications for waste tire management permits and authorizations for the collection, transportation, storage, processing, recycling, and disposal of waste tires. The state's network of waste tire transporters and waste tire management facilities consists of 118 licensed waste tire haulers, 145 local

government waste tire collection sites (managing over 917,000 waste tires), and nine commercial waste tire processing and collection facilities. Collectively, approximately 7.9 million passenger tires were managed through the state waste tire management program during calendar year 2018.

MDEQ also manages the 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 removed approximately 2.5 million waste tires from historic and random dumpsites. MDEQ maintains abatement contracts with qualified firms that can assist in removal of the unauthorized tire dumps. Over 1,200 tires were removed from illegal dumpsites in State Fiscal Year 2019, and MDEQ is reviewing information regarding several other dumpsites containing thousands of tires that may be eligible for abatement.

Electronic Waste Management

Electronic waste (or E-waste) continues to be one of the fastest growing waste streams nationally, often presenting management and disposal problems. MDEQ assists communities, businesses, and private citizens with the proper methods for recycling and disposing of E-waste. Including a directory of electronic recycling companies and other options for managing and recycling discarded electronics.

MDEQ also provides information and resources to support the implementation of the provisions of the state's Certified Electronics Recyclers Law which requires all state agencies to use a certified electronics recycler for the end of life management of electronic assets 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. MDEQ maintains a listing of certified electronics recyclers for the reference and use of state agencies on the agency's website.

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 recycling businesses that collect and recycle used electronic products in a safe and responsible manner. MDEQ 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. At least four businesses in the state, Magnolia Data Solutions of Jackson, Advanced Micro, LLC of Olive Branch,

NexTech Operations, LLC of Pearl, and Logista Solutions of Columbus, are all certified to the R2-standard.

MDEQ also assists with or sponsors various community 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 larger household hazardous waste collection events. MDEQ joins 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, which collected nearly 15 tons of electronic waste over the last year.

The agency also continued its support for the 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, or 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.

Medical Waste Management

Medical Wastes

MDEQ shares regulatory authority with the Mississippi State Department of Health (MSDH) for medical waste management. The MSDH 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. Two existing commercial autoclave facilities are actively operating for the treatment of infectious medical wastes. Three additional commercial autoclave facilities have been permitted but are not currently operating.

While MDEQ has not developed specific medical waste regulations, the agency continues to offer web-based resources to better communicate proper management conditions for various types of medical wastes, particularly those originating from health care facilities. The state 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.

Household Medical Sharps

In order to facilitate and promote the proper management and disposal of medical sharps and devices generated in the home, MDEQ oversees a statewide sharps collection program and an associated educational program for the safe disposal of medical syringes, needles, lancets and other devices. MDEQ operates a collection network for these household medical sharps that includes community drop-off locations at pharmacies, fire stations, and other business locations. During Fiscal Year 2019 there was a decrease in the number of drop-off locations, due primarily to a business decision of a major corporate pharmacy chain to close many of its stores that were participating in the program. MDEQ started the fiscal year with 381 drop-off locations and closed the year with 337 drop-off locations. Even with this decrease, Mississippi continues to lead the nation in the number of locations per capita. Only New York, California, and Wisconsin have more locations.

In spite of the decrease in the number of drop-off locations available for the public to use, there was a significant increase in public participation in the program. During Fiscal Year 2019, the public dropped off approximately 11,342 pounds of household medical sharps. This represents a 29 percent increase from the previous fiscal year.

In tandem with the sharps collection program, MDEQ conducts public outreach efforts placing educational material in medical offices and informing medical

professionals about the program. MDEQ also promotes the program by speaking and exhibiting at numerous stakeholder meetings and local health fairs.

Pharmaceutical Wastes

A continued area of environmental concern 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 a toilet or sink. MDEQ promotes the biannual collection events sponsored by the U.S. Drug Enforcement Administration (DEA) and the Mississippi Department of Public Safety's ongoing medication collection efforts. The DEA works with numerous local law enforcement agencies throughout the country to host local one-day collection events for prescription drugs and other pharmaceuticals. The October 27, 2018, collection event involved 49 law enforcement agencies in the state with 42 different collection sites and collected 5,113 pounds of unused medications. The April 27, 2019, event involved 44 law enforcement agencies with 43 collection sites and collected 3,753 pounds of unused medications.

In addition, MDEQ promotes the Mississippi Department of Public Safety's medication collection program which 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 drop-off locations are

available on the MDEQ website and distributed at health fairs and public events. Many local law enforcement offices have also developed ongoing medication collection programs.

Organic Wastes

MDEQ promotes the reduction and recycling of organic wastes in the state. Organic wastes originate from plants or animals and are biodegradable such as grass clippings, leaves, limbs and woody debris, food wastes, biosolids and other organic sludges, animal manure, and certain commercial and industrial woody or plant-based wastes. The reuse or recycling of organic wastes involves processes such as composting, mulching, anaerobic digestion, and land application of the wastes for soil amendment purposes.

Composting and Mulching

MDEQ's Waste Division continued efforts to promote composting and mulching of organic waste over the past year by continuing the agency's streamlined approval process for start-up composting and mulching sites. Guidance for this process is available on the MDEQ website for persons interested starting businesses that create compost and mulch products from organic wastes. In addition, MDEQ has continued to work towards streamlining and simplifying the state's composting and processing facility regulations and permitting process.

Biosolids Land Application

MDEQ staff also has continued to provide streamlined regulatory mechanisms for

the use of biosolids. The Waste Division's permitting staff continue to utilize the statewide Biosolids Land Application General Permit to issue permit coverage for various projects. This general permit provides for a more efficient permitting process while at the same time maintain appropriate environmental safeguards on the use of these materials. In addition, MDEQ's Beneficial Use program allows for the soil amendment use of Exceptional Quality (EQ) Biosolids. Although a number of Beneficial Use requests have been approved in the past, MDEQ did not receive any requests for new beneficial use determinations in Fiscal Year 2019 for use of EQ biosolids.

Landfill Methane Outreach Program

Over the past year, 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. Mississippi currently has six active landfill gas-to-energy projects, including direct industrial use, at Waste Management's Pecan Grove Landfill (Pass Christian); the landfill gas-to-electricity projects at the Golden Triangle Regional Landfill (West Point), Three Rivers Regional Landfill (Pontotoc), Waste Management's Prairie Bluff Landfill (Houston); the renewable natural gas project operated by Air Liquide Advanced

Technologies US using landfill gas from the Northeast Mississippi Regional Landfill; Ripley and, the landfill gas-powered leachate evaporator also at Prairie Bluff.

The agency continues to update and maintain an inventory listing of LMOP candidate landfills as well as information on operational projects on the agency's website and works to connect landfill operators with project developers and end users.

By-Product Beneficial Use Program

The MDEQ Waste Division 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 and other waste generators 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) that exempts the specific use of the material from solid waste management permitting requirements. Annual report figures provided to MDEQ indicated that BUD holders distributed 935,282 tons of byproduct materials for beneficial uses in calendar year 2018. Just over 90 percent of the byproducts distributed were used for construction purposes while approximately 9.5 percent of materials

were used in soil amendment applications and a small fraction used in other types of beneficial uses.

MDEQ works with generators and suppliers of these byproducts throughout the region who provide byproduct materials for uses in construction, agricultural soil amendment and other applications. The agency also works with industries and waste generators to authorize beneficial use “demonstration projects” that 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 Fiscal Year 2019, MDEQ approved five new BUD’s for new by-product materials with proposed uses including soil amendments, mining reclamation materials, and construction materials.

MDEQ is currently in the process of evaluating additional requests for beneficial uses including proposals for the use of egg hatchery waste, pulp/paper mill wastewater treatment residuals, and EQ biosolids for soil amendment uses. The agency is evaluating whether the proposed uses of these materials meet the state’s minimum criteria for a beneficial use determination.

Solid Waste Training and Certification Programs

MDEQ’s Waste Division offers two certification programs for commercial landfill and Class I rubbish disposal site operators and provides training opportunities to other solid waste professionals.

MDEQ partners with the state and national chapters of the Solid Waste Association of North America (SWANA) to provide training and certification to commercial solid waste landfill operators. MDEQ works with the state SWANA chapter to sponsor training opportunities at the organization’s two state conferences that help certified operators to meet the continuing education requirements of the MDEQ certification program.

MDEQ also offers a state-developed certification program for the commercial class I rubbish site operators. A training course and examination is offered approximately every nine months. MDEQ conducted two rubbish operator training classes in State Fiscal Year 2019 in the Jackson area in August 2018 and another in April 2019. MDEQ issued certificates for 31 new operators and 14 renewals for existing operators this past year. MDEQ also works with the state SWANA chapter to provide continuing education opportunities through the chapter’s spring and fall conferences for rubbish site operators as well.

MDEQ also offers periodic training events to support to local solid waste enforcement officers. Many local solid waste enforcement officers’ salaries are partially funded through the Solid Waste Assistance Grant Program, and MDEQ ensures these officers have the knowledge needed to properly address solid waste issues in their local area. Training topics include state solid waste laws and regulations, open burning laws, disaster debris management, public outreach and education, conducting clean-up events and electronics waste recycling.

Hazardous Waste Management Program

MDEQ's Hazardous Waste Management Program ensures that hazardous wastes are managed, treated and disposed of in a manner which protects communities and the environment. MDEQ is authorized by EPA to manage and implement the Hazardous Waste Program, and EPA exercises oversight of the state's program to ensure it is implemented in accordance with federal regulations--the 2020 Resource Conservation and Recovery Act (RCRA) Grant Work Plan and the 2015 Memorandum of Agreement for the RCRA Hazardous Waste Management Program. Hazardous waste program elements of permitting, compliance and enforcement and regulation adoption are consolidated in the Hazardous Waste Management Program which resides in the Waste Division.

Currently, there are five permitted operating facilities in the state which treat or store hazardous wastes. There are also 17 permitted facilities conducting remediation and post-closure activities for historic hazardous waste units. In addition to the oversight of the permitted facilities, MDEQ also provides compliance oversight, as well as outreach, for hazardous waste generators. Currently, approximately 138 large quantity generators and 310 small quantity generators are operating in Mississippi. During the 2019 Federal Fiscal Year, the department conducted 67 inspections of hazardous waste management facilities.

As a part of the oversight of permitting and compliance and enforcement for hazardous waste activities, MDEQ is

25

required to maintain our authorization status with EPA. In April 2019, EPA approved MDEQ's authorization of all adopted hazardous waste regulations.

Underground Injection Control Program

Certain nonhazardous and hazardous aqueous industrial wastes are disposed in the state by deep well injection practices. MDEQ is the designated regulatory authority by EPA in Mississippi responsible for the protection of underground sources of drinking water through the regulation of Class I, III, IV, and V Underground Injection Control (UIC) wells. Class II wells are regulated by the Mississippi State Oil and Gas Board. The MDEQ UIC program is managed by the Geotechnical Programs Branch in the Waste Division.

The UIC program responsibilities in the protection of underground sources of drinking water in the state include the regulation of 11 permitted Class I UIC wells and over 7,500 class V wells. MDEQ also has regulatory authority over Class III and Class IV wells, but no wells of these classifications exist in the state. The UIC program did oversee the opening of the first commercial nonhazardous underground injection control well facility now operating in Amite County for the disposal of nonhazardous municipal landfill leachate and other wastewaters from oil and gas exploration and production. The UIC program also is in the process of evaluating a new proposed UIC well operation for an industrial facility in Kemper County.

REMEDIATION

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

Brownfields

A “brownfield” is real property which may be complicated by the presence of a hazardous substance, pollutant, or contaminant that affects the expansion, redevelopment, or reuse of the property. MDEQ created the Voluntary Brownfield Program which allows prospective purchasers and developers, along with existing companies, to assess, remediate, and revitalize brownfield sites. Through the program, companies can coordinate with MDEQ and the Mississippi Development Authority (MDA) to participate in a redevelopment incentive program to defray the remediation costs associated with cleaning up contaminated properties. To date, 52 companies have participated in the program. This fiscal year, MDEQ provided technical support to the Cities of Canton, Clarksdale, Crystal Springs, Greenville, Greenwood, Hernando, Louisville, Vicksburg, and Yazoo City along with the Golden Triangle Planning and Development District and the East Central Planning and Development District to conduct assessments and cleanups for site redevelopment for locations that have potential or perceived environmental issues. These cities and development authorities received EPA grants to conduct brownfield revitalization projects. The agency is working with the

26

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 the ability to advance property development and re-vitalization opportunities.

In 2019, two voluntary Brownfield Program Sites underwent major property renovations to allow for revitalization and redevelopment. The former Whirlpool manufacturing site in Oxford was transformed into the University of Mississippi's new South Campus Recreation Center (see photos). Additionally, the Kuhn Memorial Hospital site in Vicksburg completed remedial activities while also recycling or reusing approximately 90 percent of the materials abated and demolished. This leaves the property ready for redevelopment (see photos).

Remediation Objective: Ensure contaminated sites are properly assessed, remediated, and redeveloped in a manner protective of human health and the environment.

Uncontrolled Sites and Voluntary Evaluation Program

During Fiscal Year 2019, Groundwater Assessment Remediation Division (GARD) staff actively oversaw 201 assessments and/or cleanups with the total number of sites at 2,119. These sites cover all the known and suspected contaminated site reported to the state since 1967. Also, MDEQ issued “No Further Action” letters for six of these sites that were evaluated and remediated to levels protective of human health and the environment.

MDEQ issued four Restrictive Use Agreed Order/Environmental Covenants, 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. To date, 456 sites have participated in the VEP program, approximately 20 percent of GARD’s total number of sites. Through the VEP, more innovative and advanced remediation technologies are recommended and implemented leading to faster, more

effective cleanups.

Superfund and Federal Facilities Cleanup and Redevelopment

Oversight of the assessment and remediation process at five federal Superfund sites, seven Department of Defense Facilities, a NASA Facility (Stennis Space Center) and several Formerly Used Defense Sites (FUDS) continue to be a large portion of the work involving the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Branch of MDEQ. This oversight work is funded through agreements with EPA, the Department of Defense, and NASA. Through these agreements, CERCLA staff perform preliminary assessments, site investigations and site inspections at hazardous waste sites for National Priority List (NPL) consideration, coordinate with EPA on emergency/removal projects, and assist EPA with the oversight of the remediation of seven Superfund sites: American Creosote (Louisville), Kerr-McGee/Tronox (Columbus), Southeastern Wood (Canton), Sonford Products (Flowood), Picayune Wood Treating (Picayune), Mississippi Phosphates (Pascagoula), and Rockwell International Wheel & Trim/Grenada Manufacturing (Grenada).

At the present time, it is estimated that the remediation costs for three of the five active NPL sites is approximately \$75 million. The state will pay 10 percent of these remediation costs or \$7.5 million. In addition, remedial

investigations have been completed at Red Panther Chemical (Clarksdale), Kerr-McGee/Tronox (Columbus), and Southeastern Wood (Canton). The Southeastern Wood site does not have a potentially responsible party and will require a 10 percent state match for the remediation costs. An estimate of remedial costs for the Southeastern Wood site is \$14 million with the state's 10 percent being \$1.4 million. The Red Panther Chemical site is a potential responsible party (PRP) site and the responsible party(s) has funded the remediation and assessment activities under the oversight of MDEQ staff. In Fiscal Year 2019, the conclusions of the final Remedial Investigation sampling event resulted in the completion of the Red Panther Site Record of Decision (ROD) which concluded that no further remedial action was necessary at the site. The Red Panther site will be considered for NPL removal in the near future. The Kerr-McGee/Tronox 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. Once the Superfund sites are remediated, MDEQ assumes the responsibility of long term monitoring with the CERCLA staff conducting the semi-annual and annual groundwater monitoring and maintenance.

In 2018, two additional sites, Mississippi Phosphates (Pascagoula) and Rockwell International (Grenada), were added to the National Priorities List (NPL). Both sites are early in the assessment process, which could last up to five years. The state will be required to pay 10 percent of

the remedial costs if a viable potential responsible party is not identified. No estimate of future remedial costs have been given to date. EPA is proceeding with ongoing wastewater treatment during cleanup and closure of the East Gypsum Stack with an engineered geosynthetic turf at Mississippi Phosphates.

In Fiscal Year 2019, MDEQ and EPA were able to remove Davis Timber Company (Hattiesburg) from the NPL with the cleanup work finishing under budget and ahead of schedule. This former NPL site now hosts a community center and an animal welfare facility.

EPA recognizes MDEQ's collaboration to support and encourage the appropriate reuse of Superfund sites across the state 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 the state 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.

Underground Storage Tanks

MDEQ manages the state's Underground Storage Tank (UST) Program, which prevents and detects leaks of petroleum products and hazardous substances and

protects groundwater from leaking tanks. The UST Program registers all USTs in the state, conducts operator training, certifies contractors to work on UST equipment, and conducts inspections and compliance assistance at petroleum storage facilities. The program is also responsible for the assessment and remediation of UST facilities and the management of the Mississippi Groundwater Protection Trust Fund if a confirmed release of petroleum product is identified at a facility.

The compliance program inspects UST facilities (see insert) and are responsible for ensuring approximately 8,075 tanks at nearly 3,003 facilities have the appropriately maintained equipment. In Fiscal Year 2019, there were 1,050 inspections conducted. Further, 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 96 licenses were issued through the MDEQ UST Certification Program, and there are currently 285 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 with no additional costs for eligible tank owners and operators. The fund began in 1987, and in May 2019 it reached an overall payout of \$200 million dollars to reimburse eligible tank owners for the assessment and clean up of sites

contaminated from leaking USTs. The average fund commitment per site is \$167,000. At the end of this fiscal year, MDEQ was working on 602 sites that have had a confirmed or non-confirmed release and Trust Fund eligibility may or may not have been determined. During Fiscal Year 2019, \$6.3 million was used to assess and remediate leaking underground storage tanks.

Fiscal Year 2019 saw significant changes to both the UST certified contractor regulations and the UST Technical Regulations. Modifications to the UST certified contractor regulations added two more licensure classifications to aide tank owners and operators in finding qualified contractors to conduct necessary UST testing, repairs, and modification. The UST Technical Regulations were updated to meet the first major federal UST regulation updates since 1988. MDEQ and its stakeholders worked together closely to ensure responsible and reasonable regulations were created to address the new federal regulations.

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 21 years. During the 2018 Legislative Session, a bill was passed to increase the cap on the annual tank regulatory fee and created the UST Advisory Council which will allow the five member council to conduct an independent study of the costs related to the UST Program to make recommendations to the Commission on

Environmental Quality on an equitable fee system. The newly created Mississippi UST Advisory Council held its first meeting in 2019, and will complete the first independent study by January 2020.



Figure 1 - former Whirlpool Cleanup



Figure 2 - Kuhn Memorial Before Pic 1



Figure 3 - Kuhn Memorial Before Pic 1



Figure 4 - Kuhn Memorial After Pic

RECLAMATION

Reclamation Objective:
Ensure lands impacted
by mining activities are
restored to reclamation
standards that are
protective of human
health and the
environment.

Surface Mining and Reclamation of Surface-Mined Lands

MDEQ regulates 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 complaints, overseeing the reclamation performed by operators, and enforcing the law as per the promulgated Rules and Regulations and Commission orders. Additionally, 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).

In Fiscal Year 2019, the Mining and Reclamation Division performed 687 inspections (of which 114 were bond release inspections), recommended to the Permit Board the issuance of 26 initial and 12 amended permits, and received 60 Notices of Exempt Operations (operations less than four acres in size). A total of 2,125 exempt operations are on file, covering approximately 8,500 acres. A total of 1,390 bonded acres were completely reclaimed as a result of the

division's efforts to oversee reclamation. The state currently has 624 permits covering approximately 34,547 acres. The Office of Geology's Mining and Reclamation Division continues to update the mining database that provides valuable mining information in a GIS format so 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 2019, staff provided training to 119 miners and 65 contractors working in the mining industry.

The Mining and Reclamation Division continues 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 a permitted 6,090 acres. This permit was initially issued in 1998, and was renewed in February 2017 for its fourth five-year term. The planned life of the mine is 30 years.

The Liberty Fuels, LLC mine permit in southwestern Kemper County was issued in December 2011 for 2,299 acres. This permit was renewed in 2016. The Liberty Mine was to produce an average of 2.2 million tons of lignite per year for the initial five-year term, and 4.5 million tons per year for the planned 40-year life of mine. In 2017, Mississippi Power Company discontinued the coal gasification process and elected to operate the power plant exclusively on natural gas. The Liberty Mine has ceased all mining activities and has scheduled meetings with Mining Division staff to discuss permanent closure and reclamation of the mine. In 2018, MDEQ approved a modification to the surface coal mining permit, fostering the reclamation of the site. Reclamation activities at the site are ongoing in Fiscal Year 2019.

Staff inspections of both coal mines are conducted at least monthly. One or more joint inspections of each mine are conducted annually with OSM. It is anticipated that at least three applications for permit revisions will be submitted during Fiscal Year 2020, at least two bond release applications are anticipated during Fiscal Year 2020. One Surface Coal

Mining Application is anticipated in Fiscal Year 2019.

Work under Mississippi's Abandoned Mine Land Program to identify and locate abandoned historic coal mines has identified four sites--two in Choctaw County and one each in Winston and Lauderdale counties. All of these sites are believed to have been active sometime in the period from the mid to late 1800s to the late 1920s. Necessary reclamation work at the sites was completed in June 2018. In Fiscal Year 2019 the division shifted focus to the reclamation of "non-coal" sites. During Fiscal Year 2019 a non-coal inventory was established.

Water Quantity

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

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 ...” 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.

The 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 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 2019, the OLWR continued to engage large water use in industry, agriculture, public drinking suppliers, and the energy sector to balance water use and economic development. In the Mississippi Delta, the OLWR is developing innovative approaches to studying and addressing water sustainability in the heavily utilized alluvial aquifer.

Water Quantity Objective: Increase the efficiency of water use to improve sustainability of groundwater and surface water in Mississippi.

The 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.

Water Resource Permitting and Management

The OLWR primary objective 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 by the inventorying and the assessment of the availability of water from fresh water aquifers and major fresh water streams in Mississippi. The OLWR issued 4,005 groundwater permits and 358 surface water diversion permits in Fiscal Year 2019 and 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.

The office's Certification and Compliance Branch was created for the purposes of handling compliance and enforcement actions associated with water well driller's licensing, terms and conditions associated with groundwater and surface

water withdrawal permits, and any other compliance issues. Since that time, the Branch has worked with industry, public suppliers, water well drillers, and other members of the regulated community to bring those entities into compliance with state laws and regulations. In addition, the Branch continued working with producers in the Mississippi Delta to verify compliance of the appropriate amount of conservation practices as required by the terms and conditions of groundwater withdrawal permits.

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. The 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, the OLWR conducts in-depth regional hydrologic investigations of 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 2019, a project to research the water resources of the Gordo aquifer in northeast Mississippi was completed. Water levels and samples were taken from wells in the Gordo aquifer, which is used by the cities of Starkville and West Point, in addition to numerous other public water supply systems in the area. Cross-sections were completed to illustrate the location and depth of the aquifer interval available in the area.

MDEQ staff completed a similar project to evaluate the water resources available in the Eutaw-McShan aquifer. New Albany and Aberdeen are two of the cities withdrawing water from the Eutaw-McShan for public water supply. Water levels were taken at wells throughout the region where the aquifer is used. In addition, water quality samples were taken to determine raw water characteristics.

Water-level data from wells in the Mississippi River Valley Alluvial (MRVA) Aquifer is being collected and evaluated to monitor the effects of pumping and to assist in development of water management practices. The OLWR is also working with the United States 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.

Staff completed projects to evaluate the water resources available in the Ripley aquifer and the Coffee Sand aquifer found in parts of northeast Mississippi in Fiscal Year 2019. Water levels and samples were collected from wells in to determine the baseline water quality. Cross-sections and potentiometric maps were created to show the subsurface geology and water level elevations in each aquifer.

In the coastal region of the state, an investigation of the fresh water aquifers in Jackson County was completed. Water level measurements and water samples were 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 have been developed to better identify where

these strata may be located. Stratigraphic holes were drilled and logged to help refine the surface geology map completed as part of the project.

MDEQ staff performed 58 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 the 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.

The OLWR assisted MDEQ's Office of Geology to ascertain discharge measurements on Turkey Creek near Hazelhurst, downstream of an expanding gravel mining operation. The OLWR also assisted the Office of Geology in collection and evaluation of discharge data at the Red Hills Mine Lignite facility, in accordance with the Cumulative Hydrologic Impact Assessment being prepared for their proposed facility expansion.

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 18,500 permitted irrigation wells screened in the shallow MRVA 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 2017, the OLWR adopted 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. In Fiscal Year 2019, 3,543 permits and certificates of coverage under the general permit were issued with conservation requirements as part of the special terms

and conditions of the permit/certificate of coverage. An online reporting portal developed by OLWR specifically designed to receive meter reading data from participants continues to yield valuable information that will be critical to improving total pumpage estimates and model accuracy.

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 1,369 Public Water Systems, consisting of approximately 2,750 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.

Drillers Licensing

The OLWR manages and maintains the testing and licensing of water well drillers. Applications for licenses are received along with verification that applicants meet basic requirements through testing in accordance with state law and state regulations. These measures ensure that current license holders are in compliance with regulations. During Fiscal Year 2019, the Drillers Licensing Program issued or renewed 208 licenses for drillers or pump installers and data for all water wells drilled in the state were added to a database management system. MDEQ staff taught a continuing education course regarding Mississippi drilling laws and regulations at three drilling conferences in Mississippi and one in Tennessee.

Mississippi Agricultural Chemical Groundwater Monitoring Program

More than 90 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 2019, the OLWR staff sampled 69 water wells in a continuing effort to ascertain if agricultural practices 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. As of Fiscal Year 2019, the program has sampled over 2,876 groundwater sources throughout the state, and to date, results indicate that no significant impacts to groundwater quality are directly attributable to agricultural practices.

WATER QUALITY

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

Water Quality Monitoring

MDEQ monitors the quality of surface water throughout the state. Data collected as part of the water quality monitoring program are compared to the state's water quality standards, and determinations are made about the health and safety of Mississippi's surface waters. The results of the determinations can be found in the state's biennial Clean Water Act Section 305(b) Water Quality Inventory report. Waterbodies not meeting their water quality standards are placed on the state's Clean Water Section 303(d) List of Impaired Water Bodies for action. Data collected through water quality program are publically available on request or through EPA's Water Quality Portal

Ambient Recreational Monitoring Network

MDEQ maintains a monitoring network for fecal coliform for flowing waters in the state that are used for primary contact recreation. Monitoring is done at these locations to collect five samples within a 30-day period. This sample frequency allows for the calculation of a geometric mean for the fecal coliform data. In 2019,

348 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. For the latest 305(b) report, approximately 45 percent of the assessed perennial rivers and streams are attaining their use and 55 percent are not. Of the recreational rivers and streams that are not attaining their use, 221 miles of the rivers and streams have completed a Total Maximum Daily Load (TMDL) and only two miles of rivers and streams need a TMDL.

Ambient Lake Monitoring

In 2009, MDEQ began collecting chemical, physical and biological samples from public lakes throughout the state. The lakes selected are greater than 100 acres in size and without nutrient enrichment. Since the program's inception, MDEQ has selected 20 lakes per year so that over a

Water Quality Objective: Maintain compliance with federal water quality standards and requirements.

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.

five-year cycle approximately 100 lakes will be sampled. Of the lakes assessed during the latest five-year cycle, 92 percent were attaining their use and eight percent were not attaining. In addition, three percent have a completed TMDL and five percent require a TMDL. The lakes that are in need of a TMDL were primarily impaired due to nutrients along with organic enrichment and low dissolved oxygen.

State of Mississippi Water Quality Assessment 2019 Section 305(b) Report

MDEQ is responsible for generating the Water Quality Assessment Report under Section 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. The 305(b)

report is an overview of how the waters are assessed and what the overall results of these assessments are. The 2019 305(b) report is based on data collected from January 2012 through December 2016. The report also touches on public health concerns such as fish tissue advisories and beach advisories. At the end of the report is an appendix that lists each site sampled between 2012 to 2016 and whether it is attaining or not attaining its designated use or uses.

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 2019 MDEQ staff sampled 130 streams.

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 agency's three regional offices.

There are currently 41 stations statewide, and laboratory analyses for the samples are carried out monthly by MDEQ's laboratory. Several stations in the sampling network are historical stations that have monitoring data dating back to the 1970s. Fixed Station Ambient Monitoring data can be obtained by contacting MDEQ staff or online at waterqualitydata.us.

Mississippi Ambient Bridge Monitoring



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 2019 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 investigated many fish kills throughout the state, and these biologists are on-call 24 hours a day to respond to fish kill reports and to assist if needed with water sampling and wildlife damages.

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 Laboratory and the Mississippi Department of Marine Resources to continue a very similar

sampling program--the Mississippi Coastal Assessment Program (MCA). This monitoring evaluates 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 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. The sites are selected using a probabilistic site selection methodology, and 33 sites were sampled in Fiscal Year 2019. At the end of a five-year cycle, a total of 125 sites will be sampled for the coastal monitoring program.

Beach Monitoring Network

MDEQ conducts routine bacteria and water chemistry sampling at 21 beach stations located along Mississippi's Gulf Coast as part of the Mississippi Beach Monitoring Program. MDEQ is a partner within the multi-agency Beach Monitoring Task Force with the EPA Gulf of Mexico Program, the Mississippi Department of Marine Resources, the Mississippi Secretary of State's Office, the Mississippi State Department of Health, Hancock County, Harrison County, and Jackson County. This Task Force oversees the program and issues beach advisories when needed. MDEQ and the Task Force rely on data collected to assess health and safety issues for users of Mississippi's recreational beaches. When *Enterococcus* bacteria concentrations reach unsafe levels, beach advisories are issued. In

addition, the monitoring data provide information concerning the seasonal water quality conditions of the immediately accessible waters along the public bathing beaches. Beach water quality conditions are made available to the public via a website, Twitter, by public email and text notification, and press releases to local media.

During Fiscal Year 2019, a total of 82 advisories and 21 closures (due to Hurricane Nate) were issued for elevated bacteria detected through routine sampling. Hurricane Nate caused all 21 beach stations to close, per standard operating procedure in preparation of Nate's landfall accounting for 183 beach action days. The 82 bacteria advisories and 21 hurricane closures covered 897 beach days or 12 percent of the 7,665 beach days available in the year.

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. The last modifications to Mississippi's Water Quality Standards were completed as part of the 2015 triennial review, and these modifications were approved by EPA in January 2017. The 2019 triennial review is currently underway. A public comment period and public hearing will be held regarding any draft revisions to Mississippi's Water Quality Criteria for Intrastate, Interstate,

and Coastal Waters. The public comment period and public hearing is expected to occur in early 2019.

Mississippi's Numeric Nutrient Criteria Development Activities

MDEQ develops scientifically defensible criteria that are appropriate and protective of Mississippi's surface waters. MDEQ continues development of numeric nutrient criteria for each of Mississippi's various water body types: lakes/reservoirs, rivers/streams, coastal waters, and waters of the Mississippi Alluvial Plain. The criteria developed for each water body type will be coordinated with the water quality criteria 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 2019 include:

- Continued criteria development efforts across all water body types as described in the most recent version of Mississippi's Nutrient Criteria Development Plan.
- Stakeholders updated regarding the progress and status of nutrient criteria development. These updates promote open communication between staff and stakeholders. MDEQ will continue updates throughout the numeric nutrient criteria derivation process.
- Continued development of the plan for numeric nutrient criteria implementation. In addition to developing the numeric nutrient

criteria themselves, MDEQ also focused efforts into exploring concerns and questions raised by both MDEQ staff and stakeholders. MDEQ will continue to work concurrently on both criteria development and implementation planning.

- Continued to collect data and conduct studies to support nutrient criteria development across the state.
- Continued the development of site-specific numeric nutrient criteria for segments of the Leaf and Pearl Rivers. It is the agency's intention to incorporate the site-specific criteria established for the Leaf and Pearl Rivers into Mississippi's Water Quality Standards as part of the 2019 triennial review process.

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 pollutant of concern. Under Section 303(d) of the CWA, 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 in June 2016. This list was updated again in 2019 and is in the approval process. MDEQ has completed work on stressor identification (SI) analysis for five water bodies that have been identified as biologically impaired in the Big Black River Basin. The SI process identifies the stressors to water quality for individual water bodies that have been identified as biologically impaired. TMDLs for those water bodies are currently in progress.

Little Tallahatchie River Nutrient Model Calibration Study

The upper portion of the Little Tallahatchie River was targeted for model development to better inform permitting decisions for facilities that discharge to this portion of the Little Tallahatchie River. A water quality study on the Little Tallahatchie River, located in Northwest Mississippi, was performed in the fall of 2017. 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 Little Tallahatchie 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 several locations that were selected to provide representative data on the Little Tallahatchie River. The water quality model will be used to establish TMDLs and WLAs for the Little Tallahatchie 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.

Development of the Priority Framework

MDEQ has developed a new collaborative framework for implementation of the Clean Water Act known as the Priority Framework. This new framework coordinates and focuses efforts to advance the effectiveness of the water program. Various environmental factors were adjusted based on professional judgment of the importance of each for characterizing watershed value. Once these factors were developed, standardized, and weighted, a relative ranking of every watershed within the state was produced. This ranking was used to screen watershed for activities that will address the water program goals, and a total of 21 watersheds were chosen as targeted watersheds. This framework does not change regulation, policy, or issue new mandates. It is intended to provide focus for MDEQ water programs to better manage the activities and 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 or conservation work, and engaged stakeholders all of which greatly increase the chances of success.

MDEQ will review the selection process and screening criteria annually to gauge success and evaluate potential candidate watersheds for a 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. As part of this review, MDEQ identified an opportunity to leverage the work being done by several water programs. As a result, the Big Black River Basin will be evaluated as a priority area.

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 2019, 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.

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 increased nutrients in the Gulf of Mexico and coordinate activities to reduce the size, severity, and duration, and mitigate the effects of hypoxia. The Task Force is a partnership of 12 states, five federal agencies, and a tribal that work collaboratively to reduce nutrient pollution in the Mississippi/Atchafalaya River Basin (MARB). 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.

The Task Force is updating committee reports as well as the bi-annual report to Congress. The report provides an accounting of accomplishments completed over the last two years within the MARB and is scheduled for completion in 2019. The Task Force continues its work addressing evolving research needs, better ways to track conservation practices, opportunities for cooperative federalism, and the critical role partnerships play in achieving success.

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, and agricultural 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 29 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 2019, MDEQ received approximately \$3.049 million in Section 319 Grant funds. Of this amount, nine percent is allocated for administrative work, 29 percent for program operation and statewide education and public outreach projects, 11 percent for NPS watershed planning, 35 percent for NPS watershed project implementation, and 17 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 2014 to 2019. 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 2019, the NPS Branch managed a total of 33 projects and activities totaling \$1.95 million 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.

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.

In Fiscal Year 2019, MDEQ took the following stormwater permitting actions:

- The Environmental Permits Division (EPD) issued general permit coverages for 289 large construction projects (five acres or greater) under the Large Construction Stormwater General Permit.
- EPD issued general permit coverages for 38 regulated industrial facilities under the Baseline Stormwater General Permit.
- EPD received and processed 43 “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 coverages for 253 regulated surface mining sites under the Mining Stormwater General Permit.
- EPD reissued the statewide Mining Storm Water, Dewatering, and No Discharge General Permit (MSR32) on May 20, 2019. The Small Construction General Permit authorizes storm water discharges from construction activities disturbing one acre to less than five acres, or less than one acre if part of a “larger common plan of development or scale,” where the total acreage is based on cumulative planned disturbance of less than 5 acres. This permit replaced the previous Small Construction general permit that expired on March 31, 2019, initially associated with the 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 regulations include a requirement for continuing education during each three-year certification period.

Environmental Operator Training

The Environmental 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 41 days of agency-sponsored training classes. Of these training days, 33 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 300 operators, utility managers,

and engineers, and certification exams were administered to 193 prospective operators with a total number of 194 new and renewal certificates issued. There were 26 wastewater training requests approved for wastewater continuing education credits in the classroom and online. There are currently 854 certified pollution control operators in the state.

The training program staff participated in energy conservation studies with EPA Region 4 and a wastewater expert in order to save energy costs for facilities while remaining in compliance with their National Pollutant Discharge Elimination System (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 the Mississippi Rural Water and the Mississippi Water Pollution Control Operators Association to speak at functions for the 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 provides "no cost" assistance in returning to or maintaining compliance with their wastewater permit

Water Pollution Control Revolving Fund

The Water Pollution Control Revolving Loan 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. Additional subsidy funding is also currently available for "Small and Low Income Community" WPCRLF projects. During Fiscal Year 2019, MDEQ funded five new WPCRLF projects totaling \$16.8 million.

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

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 currently has approximately \$2.1 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 three new WPCELFF loans awarded in Fiscal Year 2019.

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. Each basin group has a basin team comprised of the representatives from federal, state, and local government agencies, non-governmental organizations, and other stakeholders. This program implements strategies that target priority watersheds throughout the state. Prioritization of these watersheds is an evolving process identified in coordination with resource agency partners as part of the Basinwide Approach to Water Quality Management. The Basin Management and NPS Programs are implemented in cooperation with several agencies, organizations, and groups at all levels of government and in the private sector. A great focus is given to activities that promote consensus building and partnering to increase the overall effectiveness. One key partnership to increase this overall effectiveness is with the USDA Natural Resources Conservation Service (NRCS). MDEQ and NRCS work collaboratively using Section 319 funds for assessment and monitoring of National Water Quality Initiative (NWQI) sites where the NRCS has or will implement various conservation practices

such as cover crops, filter strips, and terraces. In addition, information from the Mississippi Watershed Characterization and Ranking Tool (MWCRT) is used to help identify priority watersheds for targeted funding under the National Water Quality Initiative as well as other NRCS funding initiatives.

National Water Quality Initiative

The National Water Quality Initiative (NWQI) was introduced by the NRCS in 2012 as a collaborative effort with EPA and state water quality agencies including MDEQ. NWQI strives to reduce nonpoint sources of nutrients, sediment, and pathogens related to agriculture in small priority watersheds within each state. The watersheds within Mississippi that received funding for Best Management Practices (BMP) implementation in Fiscal Year 2019 included North Tippah Creek (Basin Group II) and Porter Bayou (Basin Group II). Porter Bayou is also an active Section 319 project watershed. Mississippi also had watersheds selected for pilot programs. As part of this NWQI pilot, watershed plans will be developed prior to BMP implementation which will follow the next year. Watershed plans were developed this year for Hudson Creek-Clear Creek (Basin Group II) and Tilda Bogue-Bear Creek (Basin Group III). Two more watersheds were selected in Fiscal Year 2019 for plan development. Those watersheds were Lynn Creek-Homochitto River (Basin Group III) and Booths Creek-Bayou Pierre (Basin Group III).

Basin Group I

Catalpa Creek

A major accomplishment for Basin Group I was the formation of the Catalpa Creek Watershed Team in the Tombigbee River Basin in March of 2019. 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 being submitted to many agencies to leverage funding. MDEQ has funded Phase I of the project by using a Section 319 grant. Pre-monitoring has been completed and BMP installation has begun.

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.

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 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, 97 acres of cover crops were planted in Fiscal Year 2019.

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. BMPs installed in Upper Porter Bayou include: 25 water control structures, eight low grade weirs, approximately 19,695 feet of two-stage ditches, and 300 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, 194 acres of cover crops were planted in Fiscal Year 2019.

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 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. In 2017, Burrell Bayou and Beaver Bayou-Mound Bayou (located in Bolivar and Sunflower counties) were added as new watersheds to receive funding through the MRBI initiative. All these watersheds

combined received \$5.747 million in funding in Fiscal Year 2019.

Jasper Creek

The Jasper Creek Watershed is located in Union and Tippah Counties in the Northeastern part of the Yazoo Basin. The land uses in this watershed are comprised primarily by agricultural lands. Jasper Creek Watershed was selected as a priority watershed because the partners felt a great impact on water quality could be made within this watershed. The watershed is listed on the 303 (d) list of impaired waters for biological impairment. The final draft of the watershed-based plan is under development and Best Management Practices have begun installation. For Fiscal Year 2019, the following BMPs have been installed: 21 Grade Stabilization Structures, one Tank/Trough, one Heavy Use Area Protection, one Underground Outlet, 150 feet of Streambank and Shoreline Protection, and four Peak Stone Dikes.

Little Topashaw Creek

This watershed is located in Webster and Chickasaw counties in North Mississippi. Cropland and pastureland are the primary land uses within the watershed. By implementing BMPs within the watershed, it was determined by MDEQ and the partners that a significant impact could be made on the water quality within the watershed. A watershed-based plan is in development for the watershed and is nearing completion. In Fiscal Year 2019, the following BMPs have been installed: 17 Grade Stabilization Structures, 150 feet of Streambank and Shoreline Protection, 25 acres of Forage and Biomass Planting, one Pond, 1.5 acres

of Critical Area Planting, two Heavy Use Area Protections, 1,000 feet of Fencing, and one Diversion.

Basin Group III

Ross Barnett Reservoir

The Ross Barnett Reservoir has been an irreplaceable resource for Central Mississippi since its construction in the 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.

Rezonate

In a continuing effort to leverage resources and to promote the message of protecting and restoring the Reservoir and the Pearl River Watershed, 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 seventh annual Project Rezway Recycle Fashion show that took place on March 1, 2019, 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 the Pearl River Valley Water Supply District.

In 2019, MDEQ's Nonpoint Source Management Branch submitted a Success Story update to EPA for Limekiln Creek as part of the program's annual grant requirements. The success story was approved and published on EPA's website. The update is being reviewed and is expected to be approved and published as well.

Basin Group IV

MDEQ continues to support watershed teams which have developed watershed implementation plans and have installed BMPs to mitigate pollution and protect and restore water quality. These watersheds continue to have active stakeholder groups.

Chunky River

MDEQ supports the East Mississippi Foothills Land Trust in an advisory role for the Chunky River watershed. Basin management staff worked with the East Mississippi Foothills Land Trust and other partners to develop a Chunky River Watershed Implementation Plan in 2009 and continues to meet routinely with the watershed team and support ongoing initiatives.

Piney Woods Chapter of the Land Trust for the Mississippi Coastal Plain

MDEQ staff have been working with the Piney Woods Chapter of the Land Trust

for the Mississippi Coastal Plain since 2015. Basin Management has an advisory role on the Piney Woods Committee, specifically regarding watershed implementation plans, Basin management approaches, and Section 319 grant initiatives. The Piney Woods Committee was founded in 2014 to protect the lands around the Lake Thoreau property, owned by the University of Southern Mississippi, and has expanded since then to include the entire Leaf River Watershed. In 2019, the Piney Woods Chapter of the Land Trust for the Mississippi Coastal Plain, and their partners, opened the Pinebelt Blueway Leaf River, Phase 1, a 10.8 mile one-way trip from the Church Street launch point to the takeout point at Chain Park in downtown Hattiesburg.

Turkey Creek

The Basin Management Branch works in partnership with other agencies and the Turkey Creek Steering Committee on improving water quality and community engagement in the Turkey Creek watershed. The Coastal Streams Basin Coordinator is a member of the Technical Committee, which was established to assist the Turkey Creek Watershed Implementation Steering Committee in an advisory role. The Turkey Creek Watershed Implementation Steering Committee was founded to address concerns of landowners and citizens in the Turkey Creek Community and help them to connect with local, state, and government officials and professionals to address environmental conditions in and around their community.

Wolf River

MDEQ supports the Wolf River Conservation Society by attending meetings and offering advisory support. Basin Management worked with the Wolf River Conservation Society and other partners to develop a Watershed Implementation Plan for Wolf River in 2010.

WaterFest

In April 2019, MDEQ partnered with Celebrate the Gulf and Art in the Pass to bring WaterFest to the Mississippi Gulf Coast. At the event, staff from MDEQ presented water models, groundwater models, and information on air quality. They also talked with participants about protecting the state's environmental resources and what they can do to help protect and restore the environment.

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 (GEO) manages permitting activities under the Surface Mining Control and Reclamation Act. The Office of Land and Water Resources manages permitting activities under the water resources control laws. The Environmental Permits Division (EPD) is responsible for Air Construction and Air Operating permits, Air Title V Operating permits, Wastewater - State No Discharge permits, Wastewater - NPDES permits, Wastewater - Pretreatment permits, Stormwater Construction and Operating permits, and Wetlands Impacts permits. In July 2016, the Waste Division was formed which is responsible for Solid Waste, Hazardous Waste, and Tire Program permits. In Fiscal Year 2019,

GEO issued 28 initial and amended permits; EPD issued and renewed 118 air permits, 303 water discharge permits, and 666 statewide general permit coverages; the Waste Division issued 13 formal permit actions, six authorized for mulch/composting/concrete crushing operations, three permits for emergency staging and chipping locations, and one lagoon closure exemption; and, the OWLR issued, 4,054 groundwater permits, and 63 surface water use permits.

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

Additional permitting information can be found throughout this report.

COMPLIANCE AND ENFORCEMENT

The Environmental Compliance and Enforcement Division (ECED) of the Office of Pollution Control implements and oversees the majority of MDEQ's air and water compliance and enforcement activities and is responsible for the regulation of sites for compliance with applicable air and water 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 its permit(s) or regulations, appropriate enforcement action is taken to promptly return the site to compliance.

During State Fiscal Year 2019, the following number of air and water on-site inspections were performed by ECED and the Field Services Division:

- 181 for compliance with air pollution regulations/permits.
- 1031 for compliance with water pollution regulations/permits.

During State Fiscal Year 2019, ECED actions resulted in 32 orders being issued

for non-compliance with air and water regulations and permits, and 27 of these orders contained provisions for a penalty with a total assessed amount of \$917,235. 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. There was one order utilizing a SEP during State Fiscal Year 2019.

ECED, in conjunction with the Field Services Division, is also responsible for responding to citizen complaints regarding air and water matters. During State Fiscal Year 2019, MDEQ received and investigated 628 complaints related to air and water matters. When citizens report an environmental problem, they are asked to explain the nature of the problem and give the location of the problem, including directions to the site. A name is not required; however, if a name and contact information is provided, MDEQ either contacts the complainant during the investigation or provides the results of the investigation after the investigation is complete.

EMERGENCY RESPONSE AND PREPAREDNESS

Emergency Preparedness and Response Strategic Goal: Prevent, prepare for, and respond to public health, safety, and environmental emergencies.

Emergency Objective: Maintain staff that is adequately trained and equipped to conduct an environmental emergency response.

Emergency Objective: Protect downstream lives and property by ensuring that dams are properly classified, inspected, and maintained and include a current Emergency.

Emergency Response Division

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. In Fiscal Year 2019, contractor expenditures for response actions were \$385,000 and the agency was reimbursed approximately \$345,000 from responsible parties. The Emergency Response staff handled approximately 910 calls for assistance in Fiscal Year 2019.

MDEQ's Emergency Response staff are on-call statewide 24 hours a day and seven days a week. MDEQ and the Mississippi Emergency Management Agency (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

emergency occurs. This readiness is accomplished by training alongside regional response teams, and state agencies such as Mississippi Emergency Management Agency (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.

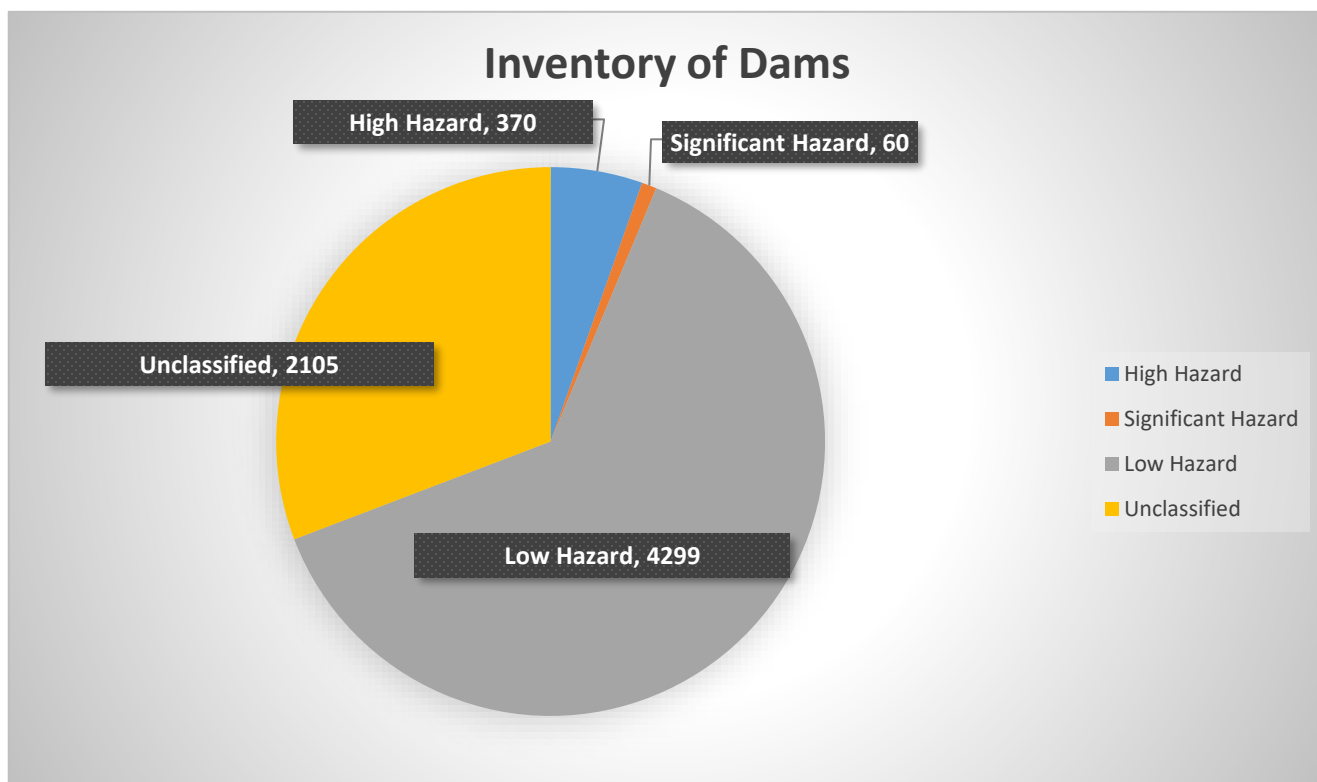
Baseline curriculum courses (IS-700 and ICS-100) are required for emergency operation center personnel and field personnel working within the affected area. On-Scene Coordinators are required to have ICS-300 plus baseline curriculum courses. Emergency Coordinating Officers are required to have ICS-400, 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.

Dam Safety

The state's dam safety regulations were implemented to protect life and property downstream of manmade dams. Dams in the state are classified as either High Hazard, Significant Hazard, or Low Hazard in accordance with the state's Dam Safety Regulations.

The 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 in addition to other duties. There are currently 370 High Hazard dams, 60 Significant Hazard dams, 4,299 Low Hazard dams, and 2,105 unclassified dams, totaling 6,834 dams on inventory in Mississippi. Unclassified dams are dams upon which preliminary engineering analysis shows that it could potentially be either High or Significant Hazard, but further analysis is needed for proper classification.

MDEQ requires that dam owners perform annual inspections of their High and Significant Hazard dams and also have periodic inspections performed by a registered professional engineer. Dam owners are required to address any deficiencies noted during inspections resulting in applications to MDEQ for modification and/or rehabilitation. MDEQ also performs random inspections to verify that the conditions of the dams are being accurately reported in submitted inspection reports.



During Fiscal Year 2019, 218 dams were inspected and the information produced by these inspections resulted in dam owners initiating repairs or rehabilitation on six High Hazard dams. The Division also reviewed and approved applications to remove one Low Hazard dam, to modify one Low Hazard dam, and to construct 18 new Low Hazard dams and two new High Hazard dams.

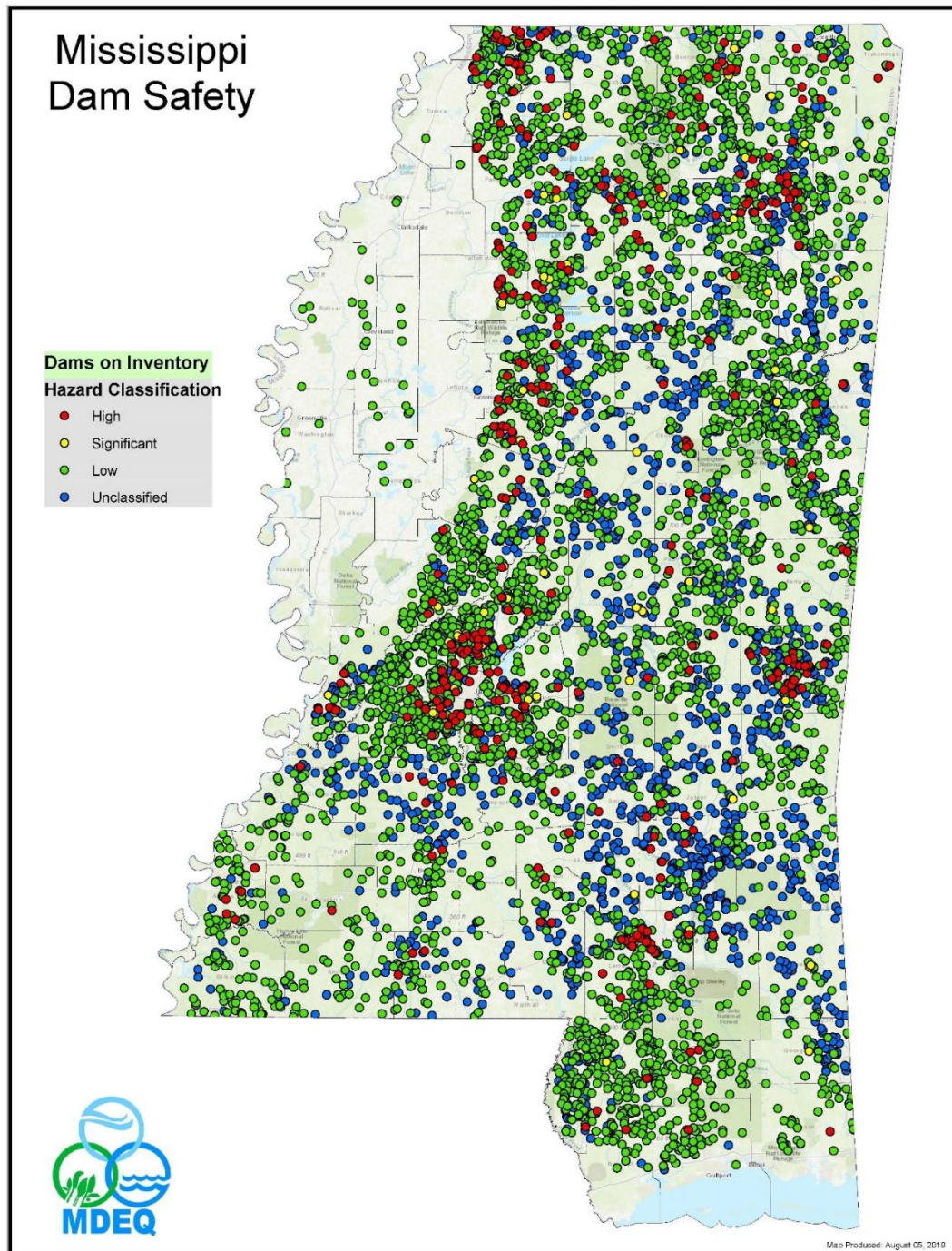
There are currently 259 Emergency Action Plans (EAPs) on file for High Hazard dams, and the Division’s goal is to have all owners of High Hazard dams submit EAPs for review and approval. Compliance with this goal presently stands at approximately 69 percent due a number of dams being recently reclassified to High Hazard. The approval process includes review and approval at the county level by the local Emergency

Management Agency and all first responders that would be required to implement the plans. This procedure has extended the anticipated schedule for completing the documents, but the involvement of local agencies in the plan development greatly enhances the value of the plans in safeguarding 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 30 years or more without proper authorization that should be included on the state’s inventory of dams. To date, the Division has collected basic inventory data and performed hazard class assessments for over 3,500 dams that were not previously on the state’s inventory. In Fiscal Year 2019, more than 1,100 dams were located and added to the state’s inventory.

One of the other major duties of the Dam Safety Division is to respond to dam incidents and failures. Staff members responded to four dam incidents or failures in Fiscal Year 2019 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.



RESTORATION

MDEQ continues to lead the state's efforts to restore and enhance Mississippi's natural resources following the 2010 *Deepwater Horizon* oil spill. Executive Director Gary Rikard serves as Mississippi's Trustee on the Deepwater Horizon Natural Resource Damage Assessment Trustee Council (NRDA Trustee Council), the Governor's designee for The Resources and Ecosystems Sustainability, Tourist Opportunities and Revived Economies of the Gulf States Act (RESTORE Act) purposes which includes being the Mississippi designee on the Gulf Coast Ecosystem Restoration Council (RESTORE Council), and serves as the state's designee for the National Fish and Wildlife Foundation (NFWF) Gulf Environmental Benefit Fund (GEBF) purposes. Together these bodies, comprised of federal agencies, the five 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.

Mississippi Restoration Funds

As a result of the 2010 *Deepwater Horizon* oil spill (Oil Spill), and settlement of claims arising from the Oil Spill, Mississippi will receive in excess of \$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. The economic claims funds are not implemented by MDEQ, restoration funds that MDEQ manages for implementing restoration projects under come from three primary funding sources:

- RESTORE Act - \$668 million
 - Direct Component (Bucket 1) - \$364 million
 - Comprehensive Plan Component (Bucket 2) - TBD (Under the RESTORE Act, approximately \$1.59 billion will be administered under Bucket 2. Each member of the RESTORE Council is eligible to receive funding in a competitive process.)
 - Spill Impact Component (Bucket 3) - \$297 million
 - Centers of Excellence Research Grants Program (Bucket 5) - \$26 million
- NFWF GEBF - \$356 million
- Natural Resource Damage Assessment (NRDA) - \$380 million

Office of Restoration

MDEQ's Office of Restoration oversees and manages the implementation of the state's restoration efforts stemming from the Oil Spill. The office manages all aspects of restoration funded through the NRDA process, the RESTORE Act, and the NFWF GEBF for the State of Mississippi.

Using a team of scientists, engineers and other subject matter experts, MDEQ works with state and federal agencies, local governments, non-governmental organizations (NGOs), residents, industries, and business owners to develop and implement restoration projects.

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 on the agency's website. Since its inception in October 2013, the project idea portal has received more than 1,000 submissions ranging from ecological projects, to economic development, to infrastructure projects. Additionally, MDEQ disseminates information about the agency's upcoming projects, public meetings, and other information concerning restoration work using a direct texting service, email, the agency's website, and Twitter, among other outreach methods, including the annual Mississippi Restoration Summit.

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 RESTORE Council. The NOAA Science Program is administered by NOAA.

The RESTORE 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 Oil Spill.

The RESTORE Council is comprised of governors from the five affected Gulf States, the Secretaries from the U.S. Departments of the Interior, Commerce, Agriculture, and Homeland Security as well as the Secretary of the Army and the Administrator of the EPA. MDEQ's Executive Director Gary Rikard serves as the designee for Governor Phil Bryant on the RESTORE Council.

RESTORE Act in Mississippi

Direct Component (Bucket 1)

GoCoast 2020

In 2012, Governor Phil Bryant created GoCoast 2020 to serve as the official advisory body for the allocation of civil penalties received by the State of Mississippi under Bucket 1 of the

RESTORE Act.

The GoCoast Committee Chairs were reconvened in July 2016, April 2017, April 2018, and April 2019 to review projects previously recommended and new portal project submissions to formulate a list of priority projects for the governor for amounts available in the next round of funding.

Multiyear Implementation Plan

In June 2019, the U.S. Department of the Treasury accepted Amendment No. 3 to Mississippi's Multiyear Implementation Plan (MIP). The MIP describes the projects, programs, and activities, announced at the annual Mississippi Restoration Summit, for which Mississippi will spend "Bucket 1" funds available to the state. Mississippi's MIP Amendment No. 3 included the following eleven projects totaling approximately \$20.9 million:

- Additional Funding to the Mississippi Aquarium (\$1.35 million in additional funding)
- Additional Funding to the Jackson County Corridor Connector Road (\$4.8 million in additional funding)
- Additional Funding to the Mississippi Gulf Coast Community College Work Ready Community Program (\$5 million in additional funding)
- Modification to the University of Southern Mississippi Oyster Hatchery and Research Center Project (No change to funding)
- Modification to the Salvation Army Community Centers of Hope Project (No change to funding)
- Additional Funding to the Mississippi Coast Coliseum and Convention Center Site Capacity Improvements (\$1.35 million in additional funding)

- Additional Funding to the Pearl River Community College Workforce Center (\$4 million in additional funding)
- Harrison County Rail Line Repair and Upgrades (\$2.3 million)
- Gulf Seafood Marketing Program (\$400,000)
- Mississippi Gulf Coast Air Service Growth Project (\$1.2 million)
- Planning Assistance – MIP Amendment Development (\$500,000 in additional funding)

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 (\$15.5 million) - A coordinated multi-state strategy for land protection, conservation and enhancement of priority lands across the Gulf.
- SeaGrant Education and Outreach (\$750,000) – 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.
- The Mississippi Sound Estuarine Program (\$2.27 million) – A project to establish the Mississippi Sound Estuarine Program to bridge critical upland/terrestrial habitats to open blue water, connect research priorities with restoration goals, and engage the community of the Mississippi Sound to tailor 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 (\$15.5 million) - A coordinated multi-state strategy for land protection, conservation and enhancement of priority lands across the Gulf.
- SeaGrant Education and Outreach (\$750,000) – 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.
- The Mississippi Sound Estuarine Program (\$2.27 million) – A project to establish the Mississippi Sound Estuarine Program to bridge critical upland/terrestrial habitats to open blue water, connect research priorities with restoration goals, and engage the community of the Mississippi Sound to tailor Mississippi’s conservation needs with community benefits.
- Enhancing Opportunities for Beneficial Use of Dredge Sediment (\$2.18 million) – A project to 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 April 2019, EPA Administrator Andrew Wheeler, as Chair of the RESTORE Council, approved Mississippi’s State Expenditure Plan (SEP) Amendment. The

SEP describes the project, programs and activities for which Mississippi will spend “Bucket 3” funds available to the state. The SEP Amendment includes three projects totaling approximately \$18.65 million:

- Mississippi Sound Oyster Shell Recycling Program (\$650,000) This project will evaluate and implement an oyster shell recycling program for the Mississippi Gulf Coast with the intent of using the recycled oyster shells as cultch material for new oyster reefs.
- Beneficial Use of Dredge Material for Marsh Creation and Restoration in Mississippi (\$12 million) This project will maximize and accelerate marsh creation and restoration by pairing the use of BU materials with local dredging needs in each of the three coastal counties.
- Hancock County Marsh Living Shoreline (\$6 million) This project will mitigate the loss of the Hancock County marsh complex by extending the current living shoreline to Bayou Caddy as well as potentially building additional marsh back in certain areas.

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, the University of Mississippi, and the University of Southern Mississippi focusing on science, technology, and monitoring in the Gulf Coast Region. In May 2017, MDEQ executed a sub-award agreement with the University of Southern Mississippi, as the lead university for the MBRACE consortium, for implementation of the

Center of Excellence program. The Center is currently conducting restoration-related research under its core research program. MDEQ is in the process of finalizing the Center's Competitive Research Program with Treasury which will further the restoration-related research occurring among the five universities.

National Fish and Wildlife Foundation

Mississippi will receive \$356 million for restoration as a result of the criminal settlements resulting from the Oil Spill. The National Fish and Wildlife Foundation (NFWF) administers these funds through the Gulf Environmental Benefit Fund (GEBF), and Mississippi has been awarded grants for twenty projects thus far under this program. While Mississippi did not pursue any projects during NFWF's 2018 standard funding cycle, one project was announced and awarded using off-cycle procedures during Fiscal Year 2019:

- Reef Fish Assessment, Phase III (\$2.3 million) - This project funds continuing assessments of reef fish in coastal Mississippi and nearshore Gulf waters. Collection of biological, environmental, and fishery-dependent data will help to reduce the scientific uncertainty around several key factors influencing red snapper and other reef fish population structures and stock assessments. Prior to implementing an earlier phase of this project with funding from the GEBF, Mississippi did not utilize a standardized reef fish sampling protocol to obtain vital fishery data on abundance, distribution and life-history characteristics of red snapper and other reef fish in coastal Mississippi. As such, the state's ability to assess its

reef fish populations and thereby contribute to regional management decisions was limited. This proposal represents Phase III (year four of sampling and analysis) of the Mississippi effort to address the GEBF funding priorities associated with improving red snapper and reef fish data collection to promote sustainable fisheries management.

Previously awarded projects Funding Cycle 2018 (Fiscal Year 2019)

- Reef Fish Assessment, Phase II (\$2.3 million)
 - Second phase (year three of sampling and analysis) of a project to bolster the fishing industry).
 - Status: Implementation on going; sampling completed in Fall 2018; analyses of samples on going.
- Pascagoula River Corridor Land Acquisition (\$11.8 million) - This project supports the potential acquisition of more than 3,400 acres of floodplain habitat and riparian buffer along the Pascagoula River corridor to benefit various wading birds, waterfowl, and fish, as well as downstream water quality. Current status: Implementation on going; in 2018, the State of Mississippi acquired over 1,100 acres of the Pascagoula River Corridor in Jackson and George Counties. The approximate \$1.9 Million acquisition was funded by a Mississippi Forestry Commission through a Forestry Legacy Grant (\$1.32 million) and the MDEQ through Gulf Environmental Benefit Funds provided from the National Fish and Wildlife Foundation (\$600,000). Project partners include the MDEQ, the Mississippi Forestry Commission, the Mississippi Department of Wildlife, Fisheries and Parks and the Nature

Conservancy. The Griffith Tract has become a part of the Pascagoula Wildlife Management Area. MDEQ has initiated due diligence on another potential acquisition of approximately 2,400+/- acres near the confluence of Red and Black Creeks with similar project partners as in the 2018 acquisition under the project.

- Utilization of Dredge Material for Marsh Restoration, Phase II (\$23.6 million) - This second phase of the Mississippi beneficial use (BU) of dredge material project provides additional funding for continued utilization of material from various maintenance dredging activities to restore and create additional marsh habitat. Status: Implementation on going; MDEQ is investigating potential containment methods for various sites along the Coast
- Mississippi Comprehensive Restoration Planning, Phase II (\$1.5 million) – This follow-up planning project continues efforts under the Mississippi's Gulf Coast Restoration Plan.
- Status: Implementation on going: Additional geospatial and other data continues be collected and integrated into the Mississippi Comprehensive Ecosystem Restoration Tool (MCERT); MDEQ has used this tool and the Decision Support System to propose a new slate of projects to NFWF.
- Coastal Headwaters Protection Due Diligence (\$1.3 million) - This project will undertake a technical assessment of the water quality and quantity benefits to coastal bays of significant potential acquisition.
- Status: Implementation on going; Technical analyses of approximately 48,000 acres was completed for NFWF to perform a plea compliance evaluation sites.

Funding Cycle 2016 (Fiscal Year 2017)

- Coastal Bird Stewardship, Phase I (\$6.3 million.
 - A project to expand on earlier NFWF GEBF bird stewardship project by continuing shorebird assessment and monitoring and adding marsh bird assessment, monitoring and habitat restoration.
 - Current status: Implementation; marsh bird plan completed; Audubon completed spring, summer and fall surveys, stewarded colonies across the Mississippi Gulf Coast through spring and summer 2019; Delta Wildlife was added to the project and began implementing management activities.
- Marine Mammal and Sea Turtle Conservation, Recovery, and Monitoring Program, Phase I (\$9.9 million)
 - A project to bolster the capacity of Mississippi's marine mammal and sea turtle stranding network through improved response to injured or dead animals, development of scientific understanding, and increased enforcement of appropriate avoidance measures.

Project status: Implementation. Mississippi State University and Institute for Marine Mammal Studies continued responding to strandings (which were greatly increased during the 2019 season) and live, incidental catches, have rehabilitating and releasing many turtles, and participating in or conducting numerous necropsies with their colleagues at NOAA; MSU also complete it first efforts in data analysis of stranding trends; MDMR has continued its enforcement of TED compliance, and coordination with stranding partners and

has identified a contract employee to focus on protected species and the University of Southern Mississippi is planning its Off-Cycle 2016.

Off-Cycle 2016 (Fiscal Year 2017)

- Acquisition of Priority Tracts for Coastal Habitat Connectivity (\$2.4 million)
 - (Fiscal Year 2016) A project to acquire parcels within the Coastal Preserves boundaries to enhance the connectivity of coastal habitats.
 - Status: Implementation on-going; MDEQ has continued to identify and pursue potential acquisitions.

Funding Cycle 2015

- Habitat Restoration on Federal Lands Program – Phase I (\$9.9 million)
 - A project to enhance and restore habitat on federal coastal lands through invasive species management.
 - Current status: Implementation; MDEQ sub-grant awards to federal partners were executed. USGS installed its monitoring station and began collecting water quality samples. USFS began formulating site specific workplan.
- Habitat Restoration and Conservation in Turkey Creek – Phase I (\$7.5 million)
 - A project to conserve important habitat and enhance water quality in the Turkey Creek watershed.
 - Current status: Implementation; hydrographic survey of Turkey Creek and design of streambank stabilization BMPs nearing completion; Land Trust for Mississippi Coastal Plan began

baseline assessment of affected sites and restoration activities for sites already accessible; USGS installed its monitoring station and began collecting water quality samples.

- Oyster Restoration and Management – Phase I (\$11.7 million)
 - A project to conduct studies to help scientifically inform efforts to improve oyster populations and sustainability.
 - Current Status: Implementation; MDEQ continues quarterly and continuous water quality sampling; permitting for experimental cultch deployment issued; experimental cultch contract documents in process; modeling of western Mississippi Sound nearing completion; modeling of Lower Pearl River completed; oyster gardening reached its participant goal participants and retrieved more than 40,000 oysters to set on active reefs; sampling and analysis of contaminated oyster cultch completed.

Funding Cycle 2014 (Fiscal Year 2015)

- Marsh Restoration and Creation (\$21 million)
 - A project to conduct vital marsh restoration through beneficial use of dredge material.
 - Current status: Implementation; Mississippi Sound Sand Berm (at Round Island) underwent circulation analysis to determine tidal influence and needed changes to enhance marsh habitat; design work for Wolf River and Beardslee Lake sites nearing completion; permit applications were submitted to MDMR and U.S. Army Corps of Engineers.

- State Lands Invasive Species Management (\$2.6 million)
 - A project to enhance habitat value of state coastal lands through management of invasive species.
 - Current status: Implementation; Mississippi Department of Wildlife, Fisheries and Parks adopted management plans for state park sites and awarded contract for assessment of Ward Bayou WMA. Mississippi Department of Marine Resources awarded contracts for further treatment on 10 Coastal Preserves sites and will undertake treatment of four other sites using MDMR staff.
- Current Status: Closed
- Coastal Streams Initiative with The Nature Conservancy (\$2.4 million awarded; \$1.7 million expended)
 - A project to develop strategies and restoration designs for nine coastal streams.
 - Current Status: Closed.
- Reef Fish Assessment (\$4 million awarded; \$3.4 million expended)
 - First phase (Years 1 and 2 of sampling and analysis) of an assessment project to bolster the fishing industry.
 - Current status: Implementation complete; in close out.
- Design Challenge for Improvement of Water Quality from Beach Outfalls (\$556k awarded; \$556k expended)
 - A project which funded a competition among individuals and teams to create innovative solutions to address water quality impacts from beach stormwater outfalls.
 - Current status: Closed.

Funding Cycle 2013 (Fiscal Year 2014)

- Coastal Preserves Invasive Species Program with the Mississippi Department of Marine Resources (\$3.3 million)
 - A project to restore and improve management in the Coastal Preserves.
 - Current Status: Implementation; monitoring has continued; MDMR is considering treatment of additional vegetative invasive species.

Completed Projects

- Mississippi Coastal Restoration Plan (\$3.6 million awarded; \$2.6 million expended)
 - A project to fund critical coastwide restoration planning.
 - Current Status: Implementation complete, including final End of Year report; in close out.
- Audubon Coastal Birds Stewardship (\$1.9 million awarded; \$1.7 million expended)
 - A project to enhance Audubon's stewardship efforts for shorebirds.

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. The NRDA Settlement for Mississippi is \$297.56 million which funds the following restoration initiatives and project types:

Early Restoration

On April 20, 2011, BP agreed to provide up to \$1 billion toward Early Restoration projects in the Gulf of Mexico to address injuries to natural resources caused by the Oil Spill. This Early Restoration agreement, entitled “Framework for Early Restoration Addressing Injuries Resulting from the Deepwater Horizon Oil Spill” (Framework Agreement), represents a preliminary step toward the restoration of injured natural resources. The Framework Agreement was intended to expedite the start of restoration in the Gulf in advance of the completion of the injury assessment process. The Framework Agreement provided a mechanism through which the Trustees and BP can work together “to commence implementation of Early Restoration projects that will provide meaningful benefits to accelerate restoration in the Gulf as quickly as practicable” prior to the resolution of the Trustees’ natural resource damages claims that were subsequently settled in April of 2016. Under the Framework Agreement, DOI, NOAA, and the five spill-affected Gulf states each received \$100 million dollars to implement early restoration projects. The remaining \$300 million was allocated by NOAA and DOI for early restoration projects proposed by state trustees.

- Phase I
 - Mississippi’s projects from Phase I include the laying of the largest oyster cultch in the history of the Mississippi Sound totaling \$11 million, and included \$2.6 million on a near shore artificial reef enhancement project. Construction activities for both projects are complete. Monitoring activities are complete for the artificial reef project and monitoring activities will continue for the oyster cultch project through 2020. 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.
- Phase III: Mississippi has four Phase III projects (\$68.957 million)
 - Hancock County Marsh Living Shoreline (\$50 million) This project, which is included construction, of six miles of living shoreline. Benefits include reduction of erosion, re-establishment of oyster habitat, and enhanced fisheries resources and marsh habitat. Approximately 46 acres of marsh will be constructed to protect and enhance the existing shoreline near Heron Bay. In addition, 46 acres of sub-tidal oyster reef were 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 2019 or 2020.
 - Restoration Initiative at the INFINITY Science Center (\$10.4 million)
INFINITY is a state-of-the-art interactive science research, education, and interpretive center located in Hancock County. Approximately \$10.4 million of early restoration funding was used to develop state of the art interactive exhibits at the INFINITY Science Center. Completed in 2018, these enhancements are intended to replace lost recreational opportunities through enhanced visitors’ access to coastal natural resources. Completed

enhancements to date include the approximate three mile portion of the Possum Walk Heritage Trail and associated electric tram tour, the Biome Boardwalk showcasing natural habitats of native landscaping, construction of a new 3-D Theater, refurbishment of the Xsperience theater, and the construction of 11 new interior science exhibits used for learning about the environment.

Construction was completed in 2019 and monitoring is on going.

- Pop's Ferry Causeway Park (\$4.7 million)

This project in Harrison County provides for construction of an interpretive center, trails, boardwalks, fishing piers, bait shop, ADA kayak launch and other recreational enhancements. This project will replace lost recreational opportunities by enhancing existing amenities allowing visitors to fish, crab, and observe nature.

- Pascagoula Beachfront Promenade (\$3.8 million)

Early restoration funds for this project are being used to help complete a two-mile, ten foot wide lighted concrete pathway complete with amenities. The purpose is to restore the loss of recreational opportunities by enhancing access to the Mississippi Sound and its natural resources.

- Phase IV Project

- Restoring Living Shorelines and Reefs in Mississippi Estuaries (\$30 million).

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 and

Graveline Bay (Jackson County), Back Bay of Biloxi and vicinity (Harrison County), and St. Louis Bay (Hancock County). The project builds on recent collaborative projects implemented by MDMR, NOAA, and The Nature Conservancy. When completed at all locations, the project will provide for construction of breakwaters, intertidal and subtidal reef habitat across the Mississippi Gulf Coast. 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. The project is in final design and permitting and construction is anticipated to begin in 2019.

Post Settlement 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 includes \$183 million for projects in the following categories:

The Mississippi Trustee Implementation Group (MS TIG) is responsible for ensuring these funds are used to restore the natural resources and services in Mississippi that were injured by the Oil Spill. The MS TIG is comprised of MDEQ

and the following four federal trustee agencies:

- The United States Department of Commerce, represented by National Oceanic and Atmospheric Administration (NOAA).
- The U.S. Department of the Interior (DOI) represented by the U.S. Fish and Wildlife Service, the National Park Service, and the Bureau of Land Management.
- The United States Department of Agriculture (USDA).
- Environmental Protection Agency (EPA).

The MS TIG develops plans for, chooses, and implements specific restoration actions that are consistent with the Final Programmatic Damage Assessment and Restoration Plan (PDARP) and Final Programmatic Environmental Impact Statement (PEIS). 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.

The first plan developed by the MS TIG was released in June 2017, and fulfills the restoration plan requirement under the Oil Pollution Act and the implementing regulations, and the environmental assessment requirement for compliance with the National Environmental Policy Act. The plan includes two projects designed to meet the following PDARP/PEIS Restoration Goals: Restore and Conserve Habitat (Wetlands, Coastal and Nearshore Habitats) and Replenish and Protect Living Coastal and Marine Resources (Birds):

- Mississippi TIG Restoration Plan I
 - Graveline Bay Land Acquisition and Management Project (\$11.5 million)
The Graveline Bay Land Acquisition and Management project will include acquisition, preservation, and habitat management on parcels on publicly-owned lands in the Graveline Bay Coastal Preserve, Jackson County. Implementing Trustees for the project are MDEQ working with the Department of the Interior, and the Mississippi Department of Marine Resources is a project partner. The project will preserve and enhance up to 1,410 acres of habitat. Acquisition and preservation will include the purchase of land from willing sellers and preservation in perpetuity in order to protect natural habitats. Habitat management will include a combination of mechanical, chemical, and prescribed fire treatments as well as debris removal and/or road repair and/or removal and culvert replacement to help restore habitats. Target habitat will include estuarine marsh, shoreline (beach), and other coastal riparian habitats which provide foraging, loafing, and nesting for bird species that were injured in the spill. Restoration measures will serve to decrease habitat fragmentation and increase habitat connectivity to other large conservation parcels in the area. They will also help restore injuries to coastal, wetland, and nearshore habitats in Mississippi, as well as provide benefits to wading birds and other bird species injured by the spill. Acquisition and management will be implemented

with available funding for up to 10 years. Priority tracts have been identified and landowner conversations are being initiated.

- Grand Bay Land Acquisition and Habitat Management Project (\$6 million).

The Grand Bay Land Acquisition and Habitat Management project will result in a combination of acquisition and habitat management within the Grand Bay National Wildlife Refuge (NWR), Grand Bay National Estuarine Research Reserve (NERR), and Grand Bay Savanna Coastal Preserve boundaries in Jackson County. MDEQ and the Department of the Interior are Implementing Trustees for the project. The Mississippi Department of Marine Resources and the U.S. Fish and Wildlife Service are project partners. The project will include preservation of up to 8,500 acres and enhancement of up to 17,500 acres of habitat. Habitats within the project area include coastal marsh, beach, freshwater marsh, pine savannas and flatwoods, forested freshwater scrub-shrub, and open water including tidal creeks and bayous. Acquisition and preservation will include the purchase of land from willing sellers and preservation in perpetuity in order to protect natural habitats. Habitat management will include a combination of mechanical, chemical, and prescribed fire treatments to help restore habitats. These actions will help restore injuries to wetlands, coastal and nearshore habitats in Mississippi injured by the spill, as well as provide benefits to wading birds and other bird species injured by the spill. Acquisition

and management will be implemented with available funding for up to 15 years. In December 2018, over 1,500 acres were acquired by the State of Mississippi under the project and will be jointly managed by staff at the Grand Bay National Estuarine Research Reserve/Grand Bay National Wildlife Refuge in Jackson County. Management activities including invasive species mapping, fire lane construction and prescribed fire are underway.

A third project is designed to meet the Restore Water Quality Restoration Type (Nutrient Reduction (Nonpoint Source)).

- Upper Pascagoula River Water Quality Enhancement Project (\$4 million).

The Upper Pascagoula River Water Quality Enhancement project will include development and implementation of conservation plans to reduce nutrient and sediment contributions in the watershed. The USDA (lead), EPA, and MDEQ are Implementing Trustees for the project. The Natural Resources Conservation Service is a project partner. The project includes an extensive outreach program to landowners. Conservation practices will be planned and implemented on. Property throughout the watershed with emphasis given to properties bordering rivers and streams. Conservation actions for the project will include: natural resource inventories; soil, water and nutrient conservation measures; habitat restoration; and erosion control. USDA has targeted the priority watersheds conducted public meetings, and reached out to potential participating landowners. EPA has initiated in-stream monitoring of the project.

OUTREACH, RESEARCH AND EDUCATION

Environmental laws, rules, and programs can be complex, and MDEQ's public outreach efforts are aimed at helping citizens, schools, businesses, and others learn about required and recommended actions to protect the environment and public health.

Pollution Prevention Outreach Activities

MDEQ's Pollution Prevention (P2) program in the waste Division conducts outreach and technical assistance activities in partnership with the agency's P2 technical services contractor, the Mississippi Manufacturers Association's Manufacturing Extension Partnership (MMA-MEP). In conjunction with MMA-MEP, MDEQ conducted a number of outreach and technical assistance activities to assist industry with implementing pollution prevention practices. In the past Fiscal Year, the P2 program conducted one P2 enHance site visit for the new enHance member, hosted the 2019 Fall Leadership Roundtable, hosted two P2 workshops, including the enHance annual workshop in April, and Food and Beverage Manufacturers' sustainability workshop. For Fiscal Year 2019, in partnership with the Mississippi Manufacturers Association, a series of regional

workshops were held across the state. The workshops, Helping Employers Link to Programs and Skills (HELPS), were designed to provide information to manufacturers about programs available to help with sustainability and growth. Each workshop featured an overview on the Pollution Prevention program and E3 assessments, conducted three E3 site assessments at Max-Home Plant 1 and Plant 3, and Siemens Energy, conducted one P2 webinar on the "Utility-Provided Energy Efficiency Rebate Programs for Industrial Customers."

enHance Environmental Stewardship Program

The P2 program sponsors the agency's environmental stewardship program, enHance. The 2019 enHance Annual Workshop and Awards Luncheon in April marked the eleventh year that the enHance stewardship program has recognized state environmental leaders. The enHance program has grown to 35 active members representing top environmental performers throughout the state. The program recognizes those business, industries, and institutional and governmental organizations that go beyond standard compliance actions to promote energy efficiency efforts, provide networking and training resources for

pollution prevention, and encourage the use of environmental management systems for continuous environmental improvement.

As enHance reached its eleventh year, a review of the program's accomplishments indicates just how substantial the program has been in eliminating waste, preventing pollution and advancing sustainable practices:

- Elimination of over a quarter million pounds of hazardous waste,
- Reduction, reuse or recycling of tens of thousands of tons of solid waste;
- Conservation of more than 250 million gallons of water annually through reduction efforts;
- Reduction in more than 73 million kilowatt hours of annual energy use;
- Savings of nearly 18 million MMBTUs of total annual energy use; and,
- Significant reductions in air emissions and the carbon footprint of participating organizations.

These results have been achieved 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.

Office of Community Engagement

The Office of Community Engagement (OCE) is committed to ensuring that communities across the State of Mississippi are informed and engaged concerning issues that impact their environment. In Fiscal Year 2019, the office has increased engagement in significant ways by providing training and technical assistance to municipalities, grassroots organizations, and small businesses to protect Mississippi's natural resources. The OCE also worked through mutually beneficial partnerships to respond to the needs of communities.

Project WISH Summer Internship Tour MDEQ's Lab

The Hinds Community College-Utica Campus (HCCUC), Project WISH (*Women Interested in STEM at Hinds*) teamed up with the Office of Community Engagement (OCE) and MDEQ's Lab to introduce high school students to Science, Technology, Engineering and Mathematics (STEM) careers.

Project WISH works to provide long-range improvement in science and engineering education at HCCUC and to increase and prepare underrepresented ethnic minorities, particularly women, for scientific and technological careers.

Before the tour started, MDEQ's Lab Director provided an overview of the lab responsibilities and its benefits to the agency. During the tour, students performed a mock oil and grease analysis in the chemistry lab. This analysis is used for the determination of n-hexane extractable material found in surface and saline water as well as industrial and domestic wastewater. The aqueous

samples the students extracted were mock samples that Environmental Scientist, Allison Messemore, made with water and food coloring.

Students also visited the biology lab with Environmental Scientist Will Green. There students learned the processes used to determine water quality in Mississippi's streams and lakes. Students viewed collected samples and looked at living organisms under the microscope that were present in the water to determine the water quality.

Empowering Childcare Centers for a Healthy Mississippi Workshop

In August 2018, the Office of Community Engagement (OCE) – Small Business Environmental Assistance Program (SBEAP) hosted an “Empowering Childcare Centers for a Healthy Mississippi” workshop in Hattiesburg. This workshop provided information to childcare facility owners, directors, and staff and focused on increasing their knowledge of environmental and health requirements that could potentially impact the welfare and well-being of the children and staff in their facility.

The goal of the SBEAP was not only to increase health and environmental awareness of those attending the workshop, but for them to share the information with parents, caretakers, and the community, thereby making homes and communities environmentally healthy and safe.

The topics covered during the workshop included childcare licensure, healthy and safe childcare facilities, Common Issues with On-Site Wastewater, Eliminating Childhood Exposure to Asbestos and

Lead, and Proper Waste Management and Recycling.

Dental Office Category Rule Outreach

The Office of Community Engagement (OCE) – Small Business Environmental Assistance Program (SBEAP) strives to make small businesses aware of new regulations that affect them. In June 2017, EPA promulgated the final Dental Office Category Rule (40 CFR Part 441), under the Clean Water Act, which requires the installation of amalgam separators at most dental offices. Those subject to the Rule are also required to submit a one-time compliance form certifying such to MDEQ by October 12, 2020.

Even though the compliance date is not until 2020, OCE wanted to ensure the providers had ample time to purchase and install the amalgam separators, if required, and submit the compliance form prior to the deadline. In an effort to reach out to dental offices throughout of Mississippi, the SBEAP mailed materials to over 1,500 providers, fielded phone calls with questions specific to their practices, and responded to emails to ensure that they were aware of and compliant with the rule.

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.

Mine Safety and Health Training

The Mining and Reclamation Division offers Mine Safety and Health Training (annual eight-hour Refresher and New Miner Training) to the mining community throughout the state. This training is required by the Mine Safety Health Administration and provide by Geology staff.

Arbor Day Activities

The Mining and Reclamation Division participates, at the request of the Mississippi Lignite and Mining Company, in the annual Arbor Day activities for the 4th grade students of Choctaw County and surrounding area.

Central United States Earthquake Consortium (CUSEC)

Geology staff participated in Shaken Fury 2019 National Earthquake Exercise by attending pre-exercise workshops, attending webinars, and submitting earthquake feature recognition data to a national data repository during an eight-day earthquake disaster simulation from May 29th to June 7th of a 7.7 Magnitude earthquake in the southwest segment of the New Madrid Seismic Zone.

Mississippi Academy of Sciences

Several staff presented abstracts and posters at the 83nd Annual Meeting of the Mississippi Academy of Sciences (MAS) held at the University of Southern Mississippi. The meeting was a great success with a near-record 32 presentations, six division student awards

given, and 4 students receiving recognition for poster presentations by the Academy. At the Annual Meeting, attended by more than 800 scientists and students from across the state, the state geologist received the Dudley Peeler Award for Contributions to MAS and a former MDEQ geologist received the Horizon Lifetime Achievement Award.

Belhaven Historical District Geology Markers

The President of the Mississippi Geological Society, helped to establish two historical geological markers in the Belhaven District of Jackson. One marker was for the Jackson Dome/Jackson Volcano, and the other was for the type locality of the Moodys Branch Formation.

Bienville National Forest Archaeologist staff lithic materials identification in house seminar

Geology staff taught the new team of archaeologists for the Bienville National Forest about lithic materials identification on Mississippi's pre-historic sites to better help them document cultural resources on the Forest Service properties both in the field, laboratory, and existing collections.



Archaeologists with the Bienville Natural forest examine lithic materials at MDEQ Office of Geology.

Mississippi Museum of Natural Science Annual Fossil Road Show

The Annual Fossil Road Show was held in March at the museum in Jackson. Office of Geology staff identified fossils for the public.

The Mississippi Gem and Mineral Society Annual Rock Show

The Mississippi Gem and Mineral Society Annual Rock Show was held in February 2019 at the Mississippi Trade Mart in Jackson. The Office of Geology operated a booth showing the office's geologic work and exhibited three educational displays: Mississippi's Opal Gemstones, Mississippi Fossils, and Mississippi's Geoarchaeology. Staff also answered questions from the public, identified rocks and fossils, and distributed literature on the state's geology and mineral resources.



MDEQ Office of Geology booth at the
Annual Rock Show.

Mississippi Gem and Mineral Society

In May of 2019, Geology staff presented a lecture on the significance, origin, and distribution of the state's gravel resources and identified gravel fossil for attendees afterwards.

Online Outreach

Staff of the Office of Geology's Surface Geology and Environmental Geology Divisions daily respond to questions, identify rocks and fossils, and share maps and literature to citizens across the state through social media such as Facebook, Twitter, and Instagram with posts such as #FossilFriday and #MicroscopeMonday and also through a "Ask A Geologist" portal on the MDEQ website.

Partnering with Universities

Office of Geology staff led a University of Southern Mississippi Geology Department class on a collecting trip to the Smith County Lime Pit for Lower Oligocene age fossils and to learn about stratigraphy in Mississippi.

Waste Division Outreach

The Waste Division's solid waste, recycling and pollution prevention programs conducted a variety of outreach efforts throughout the Fiscal Year 2019 on various aspects of proper solid waste management and waste reduction and recycling. Some of these outreach efforts included the following events and efforts:

- Waste Division staff attended the July 2018 ribbon cutting ceremony for the recently constructed landfill gas project at the Northeast Mississippi Regional Landfill involving the processing of captured landfill gas from the adjacent landfill to pipeline-quality natural gas for pipeline distribution.

- Staff participated in the “Breakfast with the Regulators” event sponsored by the State Air and Waste Management Association Chapter in July 2018. The event included presentations on the re-organizational efforts of the Office of Pollution Control, as well as a regulatory briefing and a question and answer session with industry attendees.
- Waste Division staff conducted a Rubbish Site Operator Training Class in August 2018 in Jackson. The class is a day and a half of training followed by a written examination that provides an opportunity for new operators to receive certification and current operators to receive Continuing Education Units to meet recertification requirements.
- Recycling and Waste Reduction Branch staff presented at the “Empowering Childcare Centers for a Healthy Mississippi Workshop” in Hattiesburg, sponsored by the MDEQ Office of Community Engagement in August 2018.
- Waste Division staff addressed the Southeast Regional Conference of the Air and Waste Management Association in Huntsville, Alabama in September 2018 providing an update on the agency’s reorganization of the solid and hazardous waste programs as well as a regulatory update on various state waste management issues.
- Staff from the Recycling and Waste Reduction Branch participated in the Madison County Soil and Water Conservation District’s Conservation Day in October 2018 providing presentations and exhibits to help educate students on the importance of recycling in their community.
- The Waste Division’s Recycling and Waste Reduction Program staff presented information to Elementary Education students at Mississippi College in October 2018 on how to incorporate recycling, reuse, composting and proper waste management lessons in the classroom.
- Waste Division staff hosted the Mississippi Recycling Coalition’s Board of Directors Meeting in November of 2018 to help develop plans and goals for the upcoming calendar year for the recycling organization.
- Staff from the Policy, Planning, and Special Programs Branch attended the 2018 Colorado Waste Tire Conference in Denver, Colorado in October 2018. The conference included sessions on waste tire management issues and best practices, recycling market conditions, and updates from regional state waste tire programs.
- MDEQ helped sponsor and staff the E-waste collection event with the Greater Jackson Chamber Partnership, Keep Mississippi Beautiful, Keep Jackson Beautiful, and Magnolia Data Solutions in November 2018 and in

April 2019 at the Farmer's Market in Jackson.

- Waste Division staff attended the Southeast Recycling Development Council's Recycling Summit in Charleston, South Carolina in November 2018. This meeting focused on addressing the challenges facing the recycling industry including contamination of materials and declining markets.
- Waste Division staff participated with the Southeast Recycling Development Council's annual Board retreat at Lake Lanier, Georgia, in January 2019 to plan the work of the organization to promote recycling throughout the southeast region.
- Grant Program staff participated in a Grants Panel at the Mississippi Municipal League's Mid-Winter Meeting in Jackson in January 2019.
- Recycling and Waste Reduction Program staff presented information on recycling and proper waste management to childcare center faculty and staff as part of the Jackson Association On Children Under Six (JACUS) Workshop held in Brandon, Mississippi in January 2019.
- Staff from the Waste Division's Policy, Planning, & Special Programs Branch held help sessions across the state in February 2018 regarding the newly launched electronic solid waste annual reporting system. The new system is intended to streamline the

annual reporting process, and the help sessions allowed the regulated community to learn more about the new system and get help with program registration.

- Waste Division recycling and planning program staff announced the Statewide Recycling Measurement and Reporting Program in February 2019 through a new electronic reporting system. MDEQ partnered with Emerge Knowledge Design, Inc. (Emerge) and The Recycling Partnership to employ its electronic reporting system, the Municipal Measurement Program (MMP), provided through Emerge's Re-TRAC Connect Software platform. The MMP launched for reporting 2018 calendar year data for use by the state's municipal and county governments.
- The Waste Division's Recycling and Waste Reduction Program staff again presented information to the Elementary Education students at Mississippi College in February 2019 on how to incorporate recycling, reuse, composting and proper waste management lessons in the classroom.
- In February 2019, Recycling and Waste Reduction Branch staff conducted presentations to elementary school students and teachers on litter prevention, proper waste management and recycling at the "Conservation Carnival" sponsored by the Neshoba County Soil and Water Conservation District.
- Waste Division staff participated in

Keep Mississippi Beautiful's Legislative Awareness Day in February 2019 at the Mississippi State Capitol Building to raise awareness to the impacts and problems of litter and illegal dumping.

- Waste Division staff participated in the EPA Region 4 Solid Waste and Recycling State Manager's meeting in Lexington, Kentucky, in March 2019 focusing on various regional and national issues related to solid waste management. This exchanging, is a key meeting for ideas and information with other states and EPA, and the Waste programs use information and ideas gleaned from the meeting to help in the development of outreach goals.
- In March 2019, Recycling and Waste Reduction Branch staff presented information on recycling to the Florence Women's Club.
- The Waste Division's Recycling and Waste Reduction Branch staff conducted an interactive exhibit to promote recycling to attendees of the Celebrate the Gulf/WaterFest event held in Pass Christian in April 2019. Additional MDEQ program staff participated promoting environmental stewardship through various agency programs.
- Waste Division staff attended the Keep Mississippi Beautiful Annual Awards Luncheon held in Jackson in April 2019.
- Waste Division staff participated in

the Earth Day Fair in April 2019 at the University of Southern Mississippi to promote the benefits of recycling and composting.

- Recycling and Waste Reduction Branch staff presented information on recycling, composting and proper waste management to elementary school students and teachers as part of the Tippah County School District Science Field Day in April 2019.
- Waste Division staff helped sponsor and staff the e-waste collection event with the Greater Jackson Chamber Partnership, Keep Mississippi Beautiful, Keep Jackson Beautiful, and Magnolia Data Solutions in April 2019 at the Farmer's Market in Jackson.
- Waste Division staff hosted the Mississippi Recycling Coalition's Board of Directors Meeting in April of 2019 to discuss the organization's various programs and projects as well as challenges facing the recycling industry in the state.
- Recycling and Waste Reduction Branch Manager/State Recycling Coordinator, Jennifer Milner, attended Waste 360's Waste Expo Conference in Las Vegas in May of 2019 where she was recognized as one of Waste 360's top 40 under 40 in the Waste and Recycling industry.
- Waste Division staff assisted the State Magnolia Chapter of the Solid Waste Association of North America (SWANA) with providing their Annual Spring Training Conference in May

2019 in Bay St. Louis.

- Recycling and Waste Reduction Branch staff presented information on how to incorporate recycling, composting and proper waste management in the classroom to Itawamba County K-12 teachers as part of teacher workshops conducted in Belden in June 2019.
- The State Recycling Coordinator hosted a meeting in June 2019 in Brookhaven with City of Natchez, Wilkinson County and City of Brookhaven recycling program leaders to discuss potential uses for Regional Recycling Cooperative Grant funds in efforts to grow recycling in these communities.
- Recycling and Waste Reduction Branch staff presented and conducted activities on the importance of recycling, composting and proper waste management as part of series of themed events held during the summer for children at the Saucier Children's Library in June 2019.
- Waste Division staff organized and attended the Mississippi Recycling Coalition's Board of Directors Meeting in June of 2019 on the campus of Mississippi State University. During this meeting the Board met with the J.M. Hughes Group regarding management of the organization and with the City of Starkville recycling committee to discuss ideas for growing the city's recycling program.

- During Fiscal Year 2019, Waste Division staff worked to develop displays representing the various program areas of the division. These displays are designed to be used in conjunction with public outreach and education efforts conducted by division staff.

Nonpoint Source Education and Outreach

The Nonpoint Source (NPS) Educational Program increases public awareness of NPS pollution and encourages behavior changes that will reduce pollution impacts.

The outreach efforts for the program include:

Environmental Teacher Workshops

Each year, teacher workshops play an integral part of MDEQ's NPS educational program. Teachers learn ways to incorporate conservation into daily lessons and promote stewardship of our irreplaceable natural resources. There were 16 workshops held across the state. Teachers are given an opportunity to earn continuing education credits (CEUs) for participating.

Adopt-A-Stream

Adopt-A-Stream is an environmental education training program for adults and students focusing on aquatic ecosystems and the effects of NPS pollution on water quality. The coordinator for Adopt-A-Stream, through a sub-grant with the Mississippi Wildlife Federation, educates citizens about water-quality issues within their watersheds, conducts Envirothon

team training on aquatic subjects at high schools, presents aquatic-ecology programs in classrooms, leads stream clean-ups and storm drain marking projects. In addition, the coordinator also reaches people through large-venue events, teacher-workshop training sessions, summer environmental camps, and displays at conferences.

Make-A-Splash

Make-A-Splash is a water education event hosted annually at the Mississippi Museum of Natural Science. Students across the state get an opportunity to visit multiple water-related interactive booths and guided museum exhibits to learn about polluted runoff, wildlife, water conservation and management, groundwater, surface water, macro-invertebrates, protecting watersheds and endangered species.

Enviroscape and Groundwater Models

The Enviroscape and Groundwater Models enhance NPS educational activities and are widely used by organizations all over the state. The EnviroScape model demonstrates the sources and effects of water pollution and the best management practices needed for NPS pollution prevention, while the groundwater model is used to simulate and predict aquifer conditions. Hundreds of presentations are made each year by various environmental organizations, natural-resource agencies, and non-profit organizations. These models are used 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 through one of its Section 319 sub-grant agreements to promote awareness of the water quality impacts of polluted runoff in urban communities. Volunteers participating in the Storm Drain Marking Program glue decals onto storm drains inlets with the message “No Dumping, Drains to River.” Storm drain markers inform the public that only rain should go down the storm drain, not unwanted paint, grass clippings, or other waste. Volunteers also distribute door hangers to educate the community about their connection to streams and lakes.

Conservation Field Days

Nonpoint Source Conservation Field Days are conducted all over the state where students participate in hands on activities and learn exciting topics from natural resource experts. Presentations have ranged from the impacts of NPS pollution on water quality, invasive species, wetlands, and wilderness survival to groundwater, forestry, and energy conservation. These field days are 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.

WaterFest

MDEQ in conjunction with Celebrate the Gulf and Art in the Pass brought WaterFest to the Mississippi Gulf Coast through a family-oriented festival. The

event provides an opportunity for outdoor hands-on learning on topics such as the importance of clean water, wildlife, and land conservation. In an effort to educate the public about various environmental issues that may potentially impact our state, MDEQ staff conducted presentations on stream table education, EnviroScape Watershed/NPS education, ground water models, recycling, and air quality. This year, Celebrate the Gulf received the Gulf Guardian Award from the EPA in the category of partnerships through the Gulf of Mexico Program.

Project Learning Tree

Project Learning Tree (PLT) conducts workshops through a sub-grant with Mississippi Forestry Foundation. Project Learning Tree's workshops emphasize the importance of water conservation and water pollution control to educators. The participants learn the importance of water conservation and how their activities can impact water quality. Participants receive a PLT manual for lessons and a resource for future classroom use.

Project Rezway

Project Rezway is a recycle fashion show hosted by Keep the Reservoir Beautiful (KRB) an affiliate of Keep America Beautiful and Keep Mississippi Beautiful. KRB is dedicated to litter prevention, litter cleanup, waste reduction, recycling and beautification. Now in its eighth year, this KRB event allows students and other amateurs to design stylish creations out of 75 percent or more of recyclable materials. MDEQ through the *Rezonate Initiative*, designed to protect and

enhance the Ross Barnett Reservoir, is a major sponsor of this event. The events primary purpose is to educate the public on the importance of putting waste in its proper place and not in our rivers, lakes and streams. During the event, Rezzy awards are presented to winners. One Rezzy award known as *Rezonate! Environmental Education Award*, is presented to a dedicated Reservoir area teacher who has worked to educate young minds about the Reservoir and to promote the principles of Keep America Beautiful and Rezonate, a campaign through MDEQ and partner agencies and organizations.

Mobile Classroom

Mobile Classroom is an educational program with two formats geared for children in grades kindergarten through second grade, and another specifically for grades third through fifth. The K-2 grade program entitled *The River Town Story* introduces children to water quality through audience participation, music and theater. Programs for grades 3rd-5th engages children in an interactive water quality unit of study known as *All the Water in the World* and includes discussions of the water cycle, properties of water and the watershed specific to their community. The Mobile Classroom received the Gulf Guardian Award for Youth Education in 2018 through the Gulf of Mexico Program.

Envirothon

The Mississippi Envirothon, a program of the Mississippi Association of Conservation Districts, is a program sponsored through a sub-grant from

MDEQ Nonpoint Source 319 Grant. Envirothon is a hands-on natural resource competition designed to challenge students in grades 9 through 12 to explore the natural world around them. Competitors are tested in the categories of: aquatics, forestry, soils, wildlife and current environmental issues. Local soil and water conservation districts, volunteers and resource personnel from state and federal natural resource agencies and organizations work with educators and students sharing environmental expertise to prepare the teams for this competition. Winners from each area compete at the State Competition in Raymond, Mississippi. The winning team, Oxford High School Team A, placed fifth at the National Conservation Foundation Competition and placed first in the Current Issues category at the International Competition this year.

Gator Bait Hatchling Race

The Gator Bait Hatchling Race is a kayak race for kids ages 5 to 13. The race is sponsored by MDEQ through a partnership with the Mississippi Wildlife Federation. The goal of the event is to introduce kids to the sport of kayaking, foster a love for the outdoors, and instill a desire to protect their environment for generations to come.

Pearl River Clean Sweep

The Pearl River Clean Sweep is an annual river cleanup event hosted by the Pearl River Keeper, a citizen based group that advocates for improved water quality, educating the public and promoting educational opportunities in the Pearl

River Watershed. The Pearl River cleanup covers the entire Pearl River Basin across 15 Mississippi counties, 2 Louisiana parishes and over 490 miles of river. This event celebrates drinkable, swimmable, fishable water. MDEQ is a major sponsor of the event and staff also participate in the event. Cleanup teams are deployed along the Pearl River Watershed from its headwaters in Nanih Waiya, downriver through the Ross Barnett Reservoir, along the border of Mississippi and Louisiana, all the way to Pearlington on the Gulf Coast.

Geological Data Collection Activities

Geologic Mapping

Geologic maps of Mississippi created by Office of Geology 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.

The geologic mapping program for Fiscal Year 2019 was funded in part by a USGS State Geologic Survey Mapping (STATEMAP) grant. The STATEMAP component establishes 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 needs or compelling single-issue needs 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 typically named after a local physiographic feature. Geologic units mapped and correlated in the subsurface on the maps associated cross sections, include the Miocene age Pascagoula Formation, the Pliocene-age Graham Ferry Formation, Pleistocene-age coastal and river terraces, and Holocene age alluvium.

A composite geologic map of Jackson County, including portions of George, Stone and Harrison counties was published compiling the last three years of STATEMAP grant work in Southeast Mississippi in cooperation with MDEQ's Office of Land and Water Resources.

Flood Mapping

The Office of Geology's Geospatial Resources Division is focused on remote sensing and geographic information systems activities for the State of Mississippi. The division manages the Mississippi Flood Map Modernization Initiative (MFMMI) and the Mississippi Risk Mapping, Assessment and Planning (Risk MAP) Program.

The Federal Emergency Management Agency (FEMA) began its new Risk MAP program in 2010. The Risk Map program develops and updates digital flood insurance rate maps (DFIRMs) for the 82

counties under funding by FEMA. The program has shifted to Hydrologic Unit Code 8 (HUC_8) sub-basin flood studies, while adding flood risk assessment, flood hazard mitigation, and planning activities and products. As of mid-2019, there are twelve HUC_8 Risk MAP projects active in the State and four LAMP (Levee Analysis and Mapping Procedure) projects active in the Mississippi Delta. In FY19, Preliminary Flood Insurance Rate Maps (FIRMs) covering portions of 17 counties were released to the local communities for community review. Two county-wide FIRM projects (Monroe and Itawamba Counties) became effective February 2019, for FEMA's National Flood Insurance Program (NFIP).

A website for the MFMMI is available for the public and local government officials to learn the status of each county's DFIRM mapping project. In addition, 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 Office of Geology gathers, studies, and archives subsurface geological and geophysical data for ongoing projects and other studies within MDEQ. Focused research is being performed with regard to groundwater and other environmental issues. The Office of Geology also provides support to other state agencies and academia. Geologists respond to requests for information on stratigraphy, groundwater availability, depth of wells, and potential yield of wells from water

well contractors, engineering firms, consultants, and private individuals.

Environmental Geology

Since the 1950s, the Office of Geology has been collecting subsurface geological information by sending scientific instruments down test holes and water wells to record data on rocks and groundwater (i.e. wireline logging). In Fiscal Year 2019, geologists wireline logged a total of 54 test holes and water wells in 27 Mississippi counties (total footage logged of 25,870 feet). Eleven water well contractors, two state agencies, one water management district, and two federal agencies have taken advantage of this essential program. The shallowest test hole wireline logged (total depth of 110 feet below ground surface) was drilled in coordination with the Office of Land and Water Resources as a Mississippi River Valley Aquifer (MRVA) monitoring well. The deepest test hole wireline logged was drilled to a total depth of 1,930 feet for Mid-South Water. Private wells comprised almost half of those wire line logged, followed by wells for industrial and commercial entities. The log files produced by these wireline logging activities are an essential data reference for investigations of geology, water resources, potential for contamination, and mineral resources.

This year, the Environmental Geology Division's drilling program assisted two MDEQ offices, a federal agency, and a local water management district in attaining subsurface geological and hydrological data. Nine test holes were drilled by the division's drilling crew in support of

mapping activities for Surface Geology Division's USGS STATEMAP grant in Jackson county and for the Office of Land and Water Resources and their continuing Delta Drilling Project. The nine test holes were drilled to a cumulative depth of 1,770 feet and were all logged by the Division's wireline logging program. Three of the drill holes in the Delta had monitoring wells installed with 500 feet of casing set in these wells.

Staff analysts pulled, shipped, and refiled samples for seven geoscientists during Fiscal Year 2019. Visitors to the Core and Sample Library included three in-state universities as well as members of the oil and gas industry. These researchers looked at approximately 320 boxes of cores and cuttings that comprised of 66 different boreholes totaling 72,350 feet of samples. Staff re-boxed 85 boxes of cores samples representing 13,620 ft. of core and cuttings, received two pallets and archived 45 boxes of new core samples. In addition, sample splits were provided to researchers amounting to approximately 9,300 feet representing 21 wells.

Mississippi Digital Earth Model

MDEQ is a member of 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).

Resources Division is responsible for MDEM's development. MDEM develops digital geographic information that will serve as the state base map and consists of eight layers of digital information: geodetic control, elevation and bathymetry, orthoimagery, hydrography, transportation, government boundaries, cadastral, and the Gazetteer. MDEQ manages and monitors the MDEM data development contracts and the Quality Assurance of the MDEM mapping products that result from this work. Products will 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 2019, MDEQ continued monitoring and managing contractors completing work on MDEM data sets. These data included hydrography, elevation / topography LiDAR data, and high-resolution orthoimagery covering different areas of the state. In Fiscal 2019, the Geospatial Resources Division took delivery of new high-resolution county-wide orthoimagery for 10 counties. Additionally, Fiscal Year 19 work included development of high-resolution local scale hydrography which will be added to the National Hydrography Dataset when completed. All data developed are of MDEM quality and will be made available for distribution through MARIS (Mississippi Automated Resource Information System).

MDEQ's Office of Geology staff published twenty-seven geologic papers in Fiscal Year 2019. These include five articles in *Environmental News*, nine articles in the *Mississippi Geological Society Bulletin*, seven abstracts in the *Journal of the Mississippi Academy of Sciences*, a paper in *Southeastern Geology*, two abstracts in the Botanical Society of America, and three geologic quadrangle maps as Open-File Reports OF 287-289.

Great progress was made this year in continued efforts to scan existing Office of Geology literature that either is out of print or only exists as paper copies. Much of this important, but previously unavailable, literature is essential for site characterization, groundwater aquifer assessments, and geological background and is now available to download from the MDEQ website in a high-quality searchable PDF format



CHARITABLE CONTRIBUTIONS



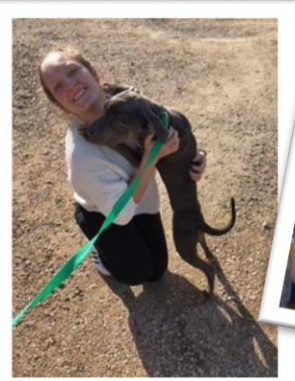
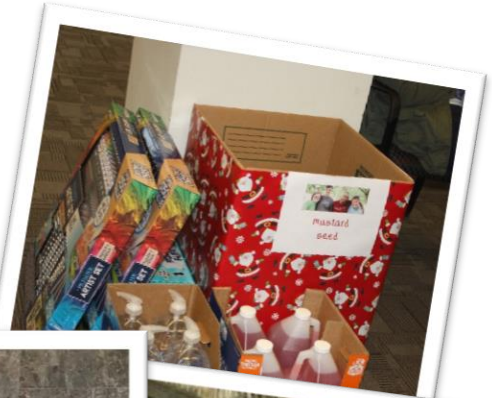
AMERICAN CANCER ASSOCIATION \$ 9,240

AMERICAN HEART ASSOCIATION \$1,935

MUSTARD SEED \$310 AND NUMEROUS GIFTS AND SUPPLIES

ANIMAL RESCUE FUND OF MS \$153 AND NUMEROUS GIFTS AND SUPPLIES

TOTAL: \$11,638



Commission on Environmental Quality

The Commission on Environmental Quality is empowered to formulate department policy, enforce rules and regulations, receive funding, conduct studies for using the state's resources, and discharge duties, responsibilities and powers as necessary.



Chairman
John Dane III



Vice Chairman
Brenda Lathan



Jack Winstead



W.J. (Billy) Van Devender



Jamie Martin



Patrick L. Johnson, Jr.



Chat Phillips

The Mississippi Environmental Quality Permit Board

The Mississippi Environmental Quality Permit Board takes action on permits administered through MDEQ. The Permit Board issues, reissues, modifies, denies, transfers, and revokes Mississippi 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.



Chairman
Chris McDonald



Vice Chairman
Jennifer Wittmann



Jess New



David Dockery



Dennis Riecke



Les Herrington



Chris Hawkins