



MISSISSIPPI
DEPARTMENT OF ENVIRONMENTAL QUALITY

2018 ANNUAL REPORT

BUILDING
ENVIRONMENTAL

TABLE OF CONTENTS



002 STRATEGIC GOALS

003 AIR QUALITY

012 WASTE MANAGEMENT

029 REMEDIATION

034 RECLAMATION

038 WATER QUANTITY

045 WATER QUALITY

067 PERMITTING

068 COMPLIANCE AND ENFORCEMENT

069 EMERGENCY PREPAREDNESS AND RESPONSE

074 OIL SPILL RESTORATION

094 OUTREACH, RESEARCH, AND EDUCATION

110 NUNNELEE BUILDING DEDICATION

111 CHARITABLE CONTRIBUTIONS

112 COMMISSION ON ENVIRONMENTAL QUALITY PERMIT
BOARD

Message from the Executive Director

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



Gary 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 2018.

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.

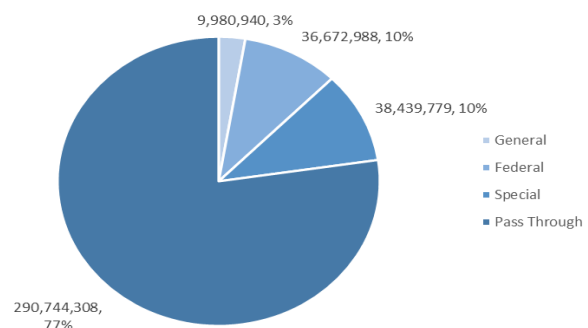
Water Quantity: Maintain sustainable quantities of surface and groundwater in Mississippi.

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 18 APPROPRIATION



AIR QUALITY

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



Air Quality Objective: Maintain Compliance with Federal Air Quality Standards.



AIR QUALITY

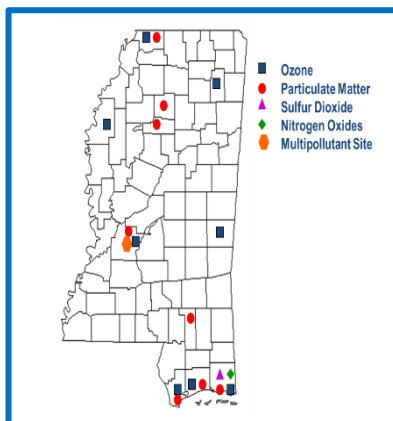
Air Monitoring

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

This monitoring network serves several purposes:

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

Mississippi Ambient Air Quality Monitoring Sites



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

Air Quality Index

| 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 |

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

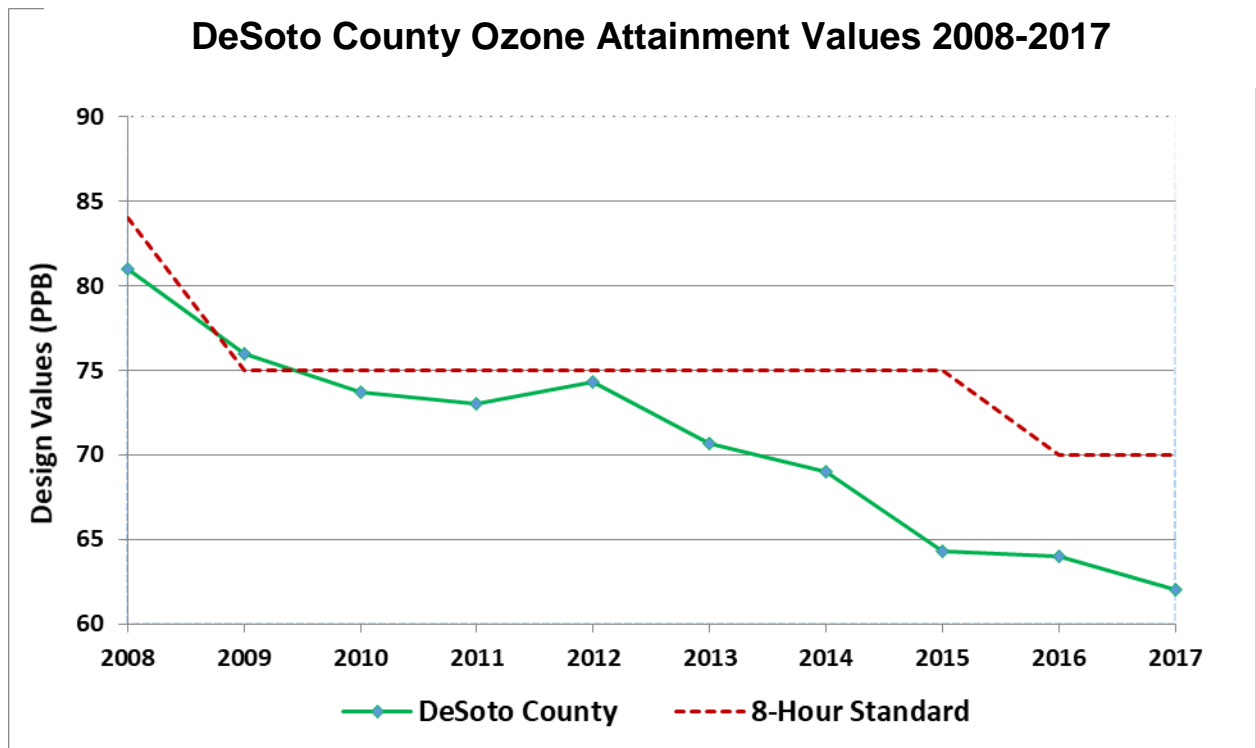
when they should implement their emissions reduction plans.

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.

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

In August of 2017, EPA designated all counties in Mississippi as attainment/unclassifiable for the 2010 sulfur dioxide (SO_2) standard. MDEQ and the facilities worked cooperatively to meet the requirements 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. Although DeSoto County met the 2008 ozone standard, most of the county was designated as part of the Memphis Nonattainment Area in 2013. In April 2016, EPA approved MDEQ's recommendation for all of DeSoto County to be in attainment. . Although In 2015, EPA lowered the standard for ozone to 70 parts per billion (ppb). The

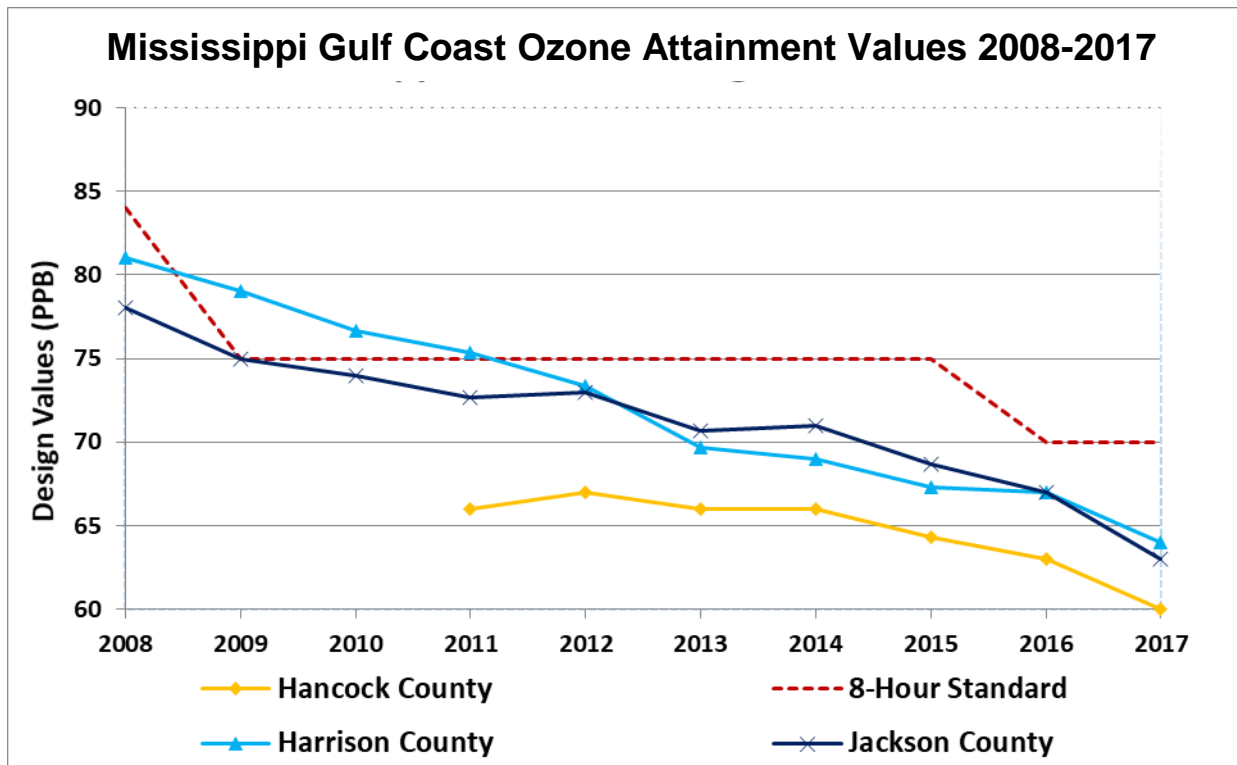


Governor’s recommendation for all counties in the state to be designated as attainment was submitted to EPA in August of 2016. Using the design values from 2014 to 2016 and 2015 to 2017, all monitors in Mississippi are meeting the 2015 ozone standard. In November of 2017, EPA indicated that all of Mississippi would be designated as attaining the 70 parts per billion (ppb) ozone standard. MDEQ is continuing a voluntary ozone precursor air pollution control program in partnership with governmental and business leaders on the Coast and in DeSoto County to prevent or mitigate future nonattainment.

quality standards that have or will be established in a more efficient and effective way through the Visibility Improvement State and Tribal Association of the Southeast (VISTAS). The VISTAS group, which includes several MDEQ staff members, is addressing the new standards from a regional perspective. This is necessary because air emissions from Mississippi may have an impact on air quality in other states, and other states can have an impact on Mississippi’s air quality. Collectively it is also more efficient and cost effective for the group to hire contractors to develop inventories and perform air quality modeling and analysis than for each state to do so on their own. The Southeastern States Air Resource Managers (SESARM) handle the administrative tasks for the group with the states providing technical expertise. Over the past year, the group

Regional Haze Planning

Mississippi is working with nine other southeastern states to address the EPA Regional Haze Rule, and other new air



has been working to develop emissions inventories required for modeling that is necessary for the Regional Haze Rule. Mississippi will be developing a State Implementation Plan (SIP) revision that will be submitted in 2021.

Title V Program

The Title V Operating Permit program was established by amendments to the Clean Air Act enacted in 1990. It 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. Major sources subject to the program are also required to pay an annual fee to cover the program costs. Mississippi received full approval from EPA in January 1995 to administer the Title V Operating Permit program. All aspects of Title V permitting are handled by the MDEQ Environmental Permits Division while all compliance certifications and demonstrations are handled by the MDEQ Environmental Compliance and Enforcement Division. The MDEQ Air Division is responsible for managing the fee portion of the Title V program. Mississippi law required the establishment of the Title V Advisory Council (Council) to evaluate the costs of the program, recommend an equitable fee system, and conduct an annual program review. The results of the annual review are reported to the Commission on Environmental Quality

(Commission). The Air Division meets regularly with the Council to provide updates on Title V program activities. The Air Division annually develops a work plan for the upcoming year that includes all functional areas of the Title V program. During that time, data on projected and actual program revenue, expenditures, and air pollutant emission rates are also compiled. This data, along with the work plan, is provided to the Council for their use in recommending an adequate Title V permit fee, to be set by the Commission, for the upcoming fee year. The annual permit fees are due September 1 of each year.

During Fiscal Year 2018, there were 57 Title V permits issued, including initial issuances, renewals, and modifications. There were also fourteen 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 166 Title V inspections conducted during this time.

Air Emission Inventory Branch

Every third year, EPA requires a complete inventory that quantifies emissions from all major Title V sources on a detailed level and estimated emissions from smaller stationary and mobile sources. The MDEQ Air Division develops an inventory each year that quantifies the air emissions from larger

sources. The inventory quantifies emissions for over 200 air pollutants and includes emissions-related information such as control devices, exhaust stack parameters, and fuel type. This work involves gathering the emissions data from the emissions sources and submitting it to EPA. The Air Division's Emission Inventory Branch completed and submitted the 2016 major source inventory due January 2018. The inventory for all Title V facilities will be processed and submitted to EPA in January 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 2017, after receiving applications from 14 school districts, MDEQ worked with nine school districts to replace 18 school buses, with a total of \$267,972 in rebate allocations. 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. 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. The regulation requirements and school activities must be addressed in an asbestos management plan required of each Mississippi school district. MDEQ performs asbestos management plan inspections to ensure that the requirements are being satisfied and that students, teachers, and other school employees are being protected from exposure to asbestos.

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

During Fiscal Year 2018, MDEQ inspected 362 demolition and renovation

projects, investigated 26 complaints, 1,204 applicants received certification to perform asbestos abatement activity, and 36 school districts were evaluated with asbestos management plan inspections.

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 are based upon the application of best demonstrated technology and very high emission control efficiency.

MACT standards affect 174 different source categories of major HAP emission facilities and 70 source categories of smaller HAP emitting facilities called area sources. There is a significant number of different, and often changing, HAP regulations to implement, and the universe of regulated facilities to assist and monitor for regulation compliance is quite large. The 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 also include the implementation of accidental release prevention regulations. These regulations apply to facilities with certain chemicals that could be very dangerous to public health and the environment in the event of a chemical accident or an uncontrolled release. Facilities that have or use these chemicals in amounts above the minimal levels must employ appropriate process safety measures or controls and must be prepared to mitigate the consequences should a release of one of the listed chemicals occur. A regulated facility’s actual planning, techniques, and procedures to prevent chemical accidents must be outlined and submitted in a Risk Management Plan for agency review. Activities also include monitoring the ever-changing regulated source population and completing compliance monitoring inspections of regulated facilities. During Fiscal Year 2018, there were 149 active, regulated facilities, and staff completed inspections at 64 of these sources.

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 final 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 and to take appropriate action to ensure they do not unduly burden the development of the nation's energy resources beyond what is necessary. As a result of their review, in October of 2017, EPA proposed the repeal of the Clean Power Plan and in August of 2018 proposed to replace it with the Affordable Clean Energy Rule. EPA continues to review other rules associated with greenhouse gases in accordance with Executive Order 13783. MDEQ continues to monitor these efforts associated with the regulation of greenhouse gases 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, and file reviews of companies involved in renovation activities to ensure compliance with the regulations. During Fiscal Year 2018, the MDEQ Lead-based Paint Section performed five training course audits, eight paperwork review inspections, 52 site inspections (including investigations at five complaint sites), and certified 603 individuals and firms involved in lead-based paint activities.

The Lead-based Paint Program entered into a memorandum of understanding with the Mississippi State Department of Health in Fiscal Year 2018 to provide information concerning children identified with elevated blood lead levels (EBLL). This information will assist MDEQ in identifying areas of concern regarding lead hazards.

VW Diesel Settlement Funds

In 2017, Governor Phil Bryant designated MDEQ to administer the state's portion of the funds resulting from the Volkswagen Diesel Settlement. The state has been allocated \$9.87 million out of the \$2.7 billion Environmental Mitigation Trust to implement air emissions reduction projects. Each of the states involved in the litigation will receive settlements


based on the number of offending vehicles registered in that state. VW established the Mitigation Trust Fund, in part, to settle claims under the Clean Air Act that it sold vehicles with “defeat devices” designed to cheat emissions tests for its diesel vehicles.

The funds from the trust will be used to fund mitigation projects to replace older diesel emission sources with cleaner technology to reduce excess nitrogen oxide (NOx) emissions and improve air quality in Mississippi. MDEQ held three public meetings in 2018 to receive input on how these funds will be used and to help craft a state plan.

WASTE MANAGEMENT

MDEQ is responsible for ensuring the state manages solid wastes in an environmentally protective manner. 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 and should be conducted in an environmentally safe manner. MDEQ has been designated as the lead agency in implementing this policy to reduce wastes, reuse and recycle wastes and to safely dispose of wastes. 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 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.



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

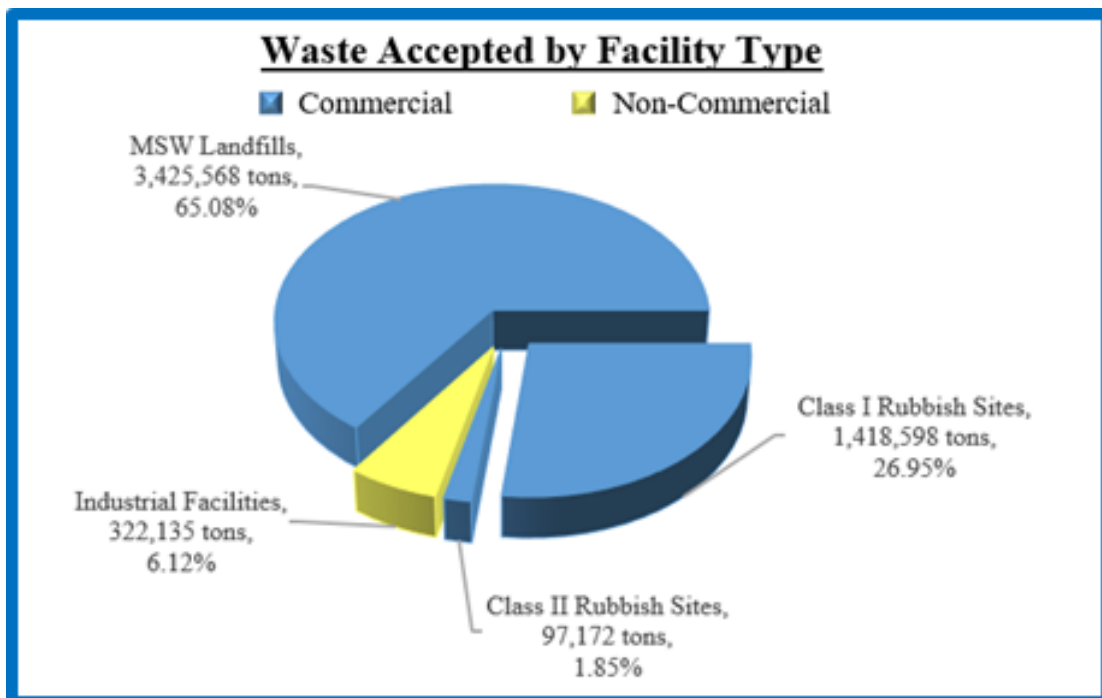
Mississippi Solid Waste Management and Disposal

MDEQ's Non-hazardous Solid Waste programs direct the state's efforts to ensure the proper management of solid wastes, to promote the reduction and recycling of solid wastes, and to plan for the future solid waste management needs. 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 2018, MDEQ collected annual reports from facility owners for the solid waste management activities conducted during Calendar Year 2017. These reports indicate that close to 5.3 million tons of wastes were disposed at permitted landfills and rubbish sites in Mississippi. Approximately 4.92 million tons were disposed at commercial facilities with

about 3.4 million tons (65 percent) disposed at commercial landfills and 1.52 million tons (29 percent) at commercial rubbish sites. 322,000 tons (or 6 percent) of the total wastes were disposed at non-commercial disposal facilities. Solid waste disposal facilities in the state received just over 810,000 tons of waste from out-of-state sources representing approximately 15 percent of the total.

In addition, a total of approximately 32,700 dry tons of wastes were applied at permitted land application sites, and about 27,000 tons of material were received at solid waste composting facilities. The annual reports also indicated that approximately 104,000 tons of material was received for management at solid waste processing facilities and 934,000 tons of wastes was managed by solid waste transfer stations.



In the latter part of State Fiscal Year 2018, MDEQ began the process of developing an electronic reporting system to assist facilities with filing the required annual solid waste reports. The agency plans to implement the electronic reporting system in early 2019.

Recycling and Waste Reduction

Although MDEQ does not currently collect detailed recycling information from local governments or recycling businesses, the agency measures the access and availability of local recycling services to the state's residents.

MDEQ's analysis indicates that close to 60 percent of the state's population has access to local government-sponsored recycling programs. This percentage represents continued growth; however, this rate still falls short of the national access rate to recycling. Growth in new programs has slowed somewhat due to recent challenging market conditions for recyclables which has been caused by global material market issues.

Approximately half of residents with recycling access are provided curbside recycling services with the remaining half having access to drop-off recycling services. The 40 percent of the state's population that does not have access to community-based programs may still have access to other commercial recycling businesses or to non-profit recycling programs.

In order to continue to promote the growth of recycling in the state, MDEQ

emphasizes local government recycling programs and has been working to encourage cooperative efforts among local governments to collect, process, and market recyclables. The Waste Division has recently begun the process of developing 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 the Cities of Oxford, McComb, Greenwood, and Natchez to work cooperatively with nearby counties and cities to develop new and upgrade existing local recycling programs. MDEQ plans to release its second RRCG Funding Opportunity Announcement in early 2019.

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 recently updated and enhanced 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 programs and locations that provide recycling services to the public for paper, plastics, metals and glass. The directory includes local government recycling programs and facilities as well as programs offered by universities, colleges, state agencies and private businesses that offer collection of recyclables from the public.

In addition to new funding opportunities for recycling and new public information tools, MDEQ is also working to develop new reporting and measurement systems for local recycling programs in the state. Currently, Mississippi 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 the local solid waste plans to meet the state goal. However, there has been no means of measuring the state's progress on meeting this statutorily-mandated goal. Over the past year, the Waste Division has been working on an electronic system for the reporting and collection of recycling and waste disposal volumes and plans to implement it in early 2019, initially on a voluntary basis.

Leading by example, MDEQ has also worked to update and expand its own Office Recycling Program. These internal efforts have focused on making recycling more convenient for agency employees to ensure the collection of both increased quantity and quality of recyclables. New recycling guides have been developed for each office providing clearer instructions on the materials accepted and not accepted for recycling and on the proper handling and placement of these materials. In addition to new guidance, new signage was added to recycling bins as well as informative posters on recycling in breakrooms and common areas in these buildings. Recycling staff have also spoken at various employee meetings to

answer questions on recycling. 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. Through these partnerships, MDEQ conducts outreach on the importance of recycling to various ages and groups around the state. This outreach includes presentations to organizations and schools and exhibits on recycling and solid waste at various public events.

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 waste streams that can impact the environment. Mississippi P2 programs efforts are supported in part by EPA's Pollution Prevent 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 local government officials, federal officials, industrial officials, consulting engineers, 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 (TRI's) Toxic Release Inventory Form Filers and Hazardous Waste Generators.

- Provides coordination for 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 and non-governmental entities to promote effective pollution prevention practices.

During Fiscal Year 2018, the MDEQ P2 Program accomplished the following program elements:

- Continued the strong partnership with the Mississippi Manufacturing Association (MMA) and contracted with MMA's Manufacturing Extension Partnership (MMA-MEP) to coordinate the provision of a well-rounded P2 and E3 technical assistance program for Mississippi manufactures.
- 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 2018 class of members for the enHance environmental recognition program. There were nine renewing members for the program this year.
- Worked with MEP to update the Energy, Economy, 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 \$3.3 million in Fiscal Year 2018 for solid waste management and recycling projects, solid waste planning projects, and waste tire projects. Of that total, over \$1.7 million was awarded in Solid Waste Assistance Grants to local governments. These grants are used by local governments to clean up illegal dumps, establish collection programs for bulky wastes and recyclables, fund the hiring of a local solid waste enforcement officer, 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 2018

- 54 counties were awarded \$665,730 in non-competitive, allocated solid waste assistance grants.

- 28 municipalities, counties, and solid waste authorities were awarded \$1.02 million in competitive and supplemental grant funds.
- 28 municipalities, counties, or solid waste authorities were awarded \$1.18 million to fund local waste tire collection and clean-up programs.
- Seven municipal and/or county governments were awarded \$212,150 to fund efforts 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, comprehensive local solid waste plans have been granted final approval by the Commission on Environmental Quality for Simpson County and the Cities of Magee and Mendenhall, the Town of D'Lo, and the Village of Braxton (December 2017); for Washington County and the Cities of Hollandale, Greenville, and Leland and the Towns of Arcola and Metcalfe (September 2017) and for Rankin County and the Cities of Brandon, Florence, Flowood, Pearl, and Richland, the Town of Pelahatchie, and the Village of Puckett (April 2018). In addition, an updated local solid waste plan has been finalized for the City of Canton (which should be approved in early Fiscal Year 19) and for Lauderdale County and the City of Meridian. Solid waste plans have also been drafted for the Golden Triangle Solid Waste Authority and the Counties of Hancock, Tallahatchie, Warren, and Holmes. In addition, new efforts to comprehensively update solid waste plans were initiated in State Fiscal Year 2018 for the Counties of Coahoma, Leflore, Neshoba, Smith, and Tunica as well as the Northeast Mississippi Regional Solid Waste Authority (Benton, Prentiss, and Tippah counties).

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 2018 include Golden Triangle Solid Waste Authority (addition of new industrial rubbish site – October 2017), Copiah County (addition of land application sites – September 2017), Hinds County (expansion of Class I rubbish site – July 2017), Pine Belt Regional Solid Waste Authority (expansion of Jefferson Davis County Class I rubbish site – September 2017), Hancock County Solid Waste Authority (addition of medical waste processing facility – March 2018), and Three Rivers Regional Solid Waste Authority (expansion of Monroe County class I rubbish site).

Waste Tire Management Program

The Waste Tire Management Program is tasked with developing, implementing, and promoting the state's strategy to achieve statewide recycling of waste tires. The program's success is reflected in the most recent annual program information collected at the end of 2017 indicating an overall waste tire recycling rate of 95 percent for tires collected and processed. The recycling rate for waste tires generated in the state was just over 91 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

5.2 million waste tires with approximately 50 percent of the tires being imported from out-of-state.

The Waste Tire Program reviews or otherwise handles the processing of 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 115 licensed waste tire haulers, 149 local government waste tire collection sites (managing over 815,000 waste tires), and nine commercial waste tire processing and collection facilities. Collectively, Mississippi waste tire facilities and transporters managed approximately 5.44 million passenger tires during calendar year 2017.

In addition to the infrastructure addressing the proper management of waste tires, MDEQ also initiates compliance and clean up actions involving facilities or persons and the unauthorized or improper management of waste tires. MDEQ 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. As an example, an estimated

10,000 waste tires were removed in December 2017 from an illegal dumpsite in Hattiesburg through this program.

MDEQ also worked with the Mississippi State University Extension Service to collect tires from farms and agricultural sources at agricultural pesticide collection events held in Sharkey County in February of 2018 and in Quitman County in March of 2018. The counties used MDEQ grant funds to provide waste tire collection services in conjunction with the agricultural pesticide collection event. These cooperative efforts have been successful in past years, and MDEQ hopes to continue this opportunity to assist the agricultural community.

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 for the state. MDEQ assists communities, businesses, and private citizens with the proper methods for recycling and disposing of E-waste. MDEQ maintains various web resources 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 three businesses in the state, Magnolia Data

Solutions of Jackson, Advanced Micro, LLC of Olive Branch, 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 approximately 13 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 in the state. 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. Two additional commercial autoclave facilities have been permitted but are not currently operating, while a permit application for a fifth commercial autoclave facility is currently under review by the agency.

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 home-generated 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 2018, MDEQ worked to increase the number of drop-off locations from 355 to 381 sites throughout the state. Based upon a national database of household sharps collection locations, Mississippi leads the nation in the number of locations per capita. Only New York, California, and Wisconsin have more locations. In tandem with the sharps collection program, MDEQ conducts public outreach efforts throughout the state 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.

The public has continued to take advantage of MDEQ's program during the past fiscal year by dropping off approximately 8,850 pounds of household medical sharps. The volume of medical sharps collected has increased each year as more people become educated about proper disposal of these devices.

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 2017 collection event involved 46 law enforcement agencies in the state with 47 different collection sites and collected 3,914 pounds of unused medications. The April 2018 event involved 60 law enforcement agencies with 46 collection sites and collected 4,455 pounds of unused medications.

In addition, MDEQ promotes the

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 organic waste reduction and recycling. 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 issue any new biosolids beneficial use determinations in Fiscal Year 2018 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 seven 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), and the landfill gas-powered leachate evaporator also at Prairie Bluff. In 2017, Air Liquide Advanced Technologies US, in partnership with the Northeast Mississippi Regional Landfill, became the seventh landfill to launch an active landfill gas to energy project. The company was issued the necessary environmental permits from MDEQ to construct a landfill gas processing unit that would treat and process landfill gas to pipeline quality for sale to a natural gas pipeline. This treatment system came online in mid-2018.

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 811,581 tons of byproduct materials for beneficial uses in calendar year 2017. Almost 85 percent of the byproducts distributed were used for construction purposes while around nine 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 2018, MDEQ approved two new BUD’s for new material uses in the state and one demonstration project. The two new BUD’s propose the beneficial use of by-product materials as soil amendments.

MDEQ is currently in the process of evaluating additional requests for beneficial uses including proposals for the use of coal combustion fly ash as cement supplement, pozzolan, and road base material, coal combustion bed ash for soil stabilization, and a mineral wool by-product 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. In 2017, there were 31 active certified commercial landfill operators in the state. MDEQ works with

the state SWANA chapter to sponsor training opportunities at the organization’s two state conferences.

MDEQ offers a state-developed certification program for the commercial Class I rubbish site operators in the state. A training course and examination is offered approximately every nine months and MDEQ did offer its rubbish operator training class in the Jackson area in late November 2017. In Calendar Year 2017, there were 138 active certified Class I rubbish site operators, and this past year, MDEQ issued certificates for 20 new operators and issued 26 renewals for existing operators. MDEQ offered its rubbish operator training course in December of 2017 in the Jackson area. MDEQ also worked 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 at this event 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 2019 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 185 large quantity generators and 300 small quantity generators are operating in Mississippi. During the 2018 Federal Fiscal Year, the Department conducted sixty-seven inspections of hazardous

waste management facilities across the state.

As a part of our oversight of permitting and compliance and enforcement for hazardous waste activities in the state, MDEQ adopts regulations governing hazardous waste management in conjunction with state law and our obligations under our delegation from EPA. In this past Fiscal Year, MDEQ had two rule making actions, adopting various corrections to the State Hazardous Waste Regulations in November 2017 as a part of the agency's efforts to maintain state authorization status and also adopting the Federal Hazardous Waste Generator Improvements Rule in May of 2018. MDEQ also has worked to ensure that provisions were in place for EPA to implement the Federal e-Manifest system in the State of Mississippi in June 2018.

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 was transferred to the Waste Division through the reorganization of the Office of Pollution

Control in late 2016 and in continued reorganization this year is now a key part of the division's Geotechnical Programs Branch. 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 7500 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. In February of 2018, MDEQ issued the first permit for a commercial nonhazardous underground injection control well for an operation in Amite County.

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 waste streams that can impact the environment. Mississippi P2 programs efforts are support in part by EPA's Pollution Prevent 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 local government officials, federal officials, industrial officials, consulting engineers, 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 (TRI's) Toxic Release Inventory Form Filers and Hazardous Waste Generators.
- Provides coordination for 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 and non-governmental entities to promote effective pollution prevention practices.

During Fiscal Year 2018, the MDEQ P2 Program accomplished the following program elements:

- Continued the strong partnership with the Mississippi Manufacturing Association (MMA) and contracted with MMA's Manufacturing Extension Partnership (MMA-MEP) to coordinate the provision of a well-rounded P2 and E3 technical assistance program for Mississippi manufactures.
- 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 2018 class of members for the enHance environmental recognition program. There were nine renewing members for the program this year.
- Worked with MEP to update the Energy, Economy, 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.



REMEDIATION

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



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

REMEDIATION

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 that 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 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.

Uncontrolled Sites and Voluntary Evaluation Program

During Fiscal Year 2018, Groundwater Assessment Remediation Division (GARD) staff actively oversaw 192 assessments and/or cleanups with the total number of sites at 2,081. These sites cover all the known and suspected contaminated site reported to the state since 1967. Also, MDEQ issued “No Further Action” letters for five of these sites that were evaluated and remediated to levels protective of human health and the environment.

MDEQ issued 11 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, 452 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. In February 2018, the first in-situ thermal remediation (ISTR) project (as featured on the cover page) was installed at a VEP site in Holly Springs using steam-enhanced extraction through a network of soil vapor extraction and multi-phase extraction wells with ex-situ treatment and recovery of chemicals of concern.

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 three Superfund sites: Sonford Products (Flowood), American Creosote (Louisville), and Wood Treating (Picayune).

At the present time, it is estimated that the remediation costs for the three 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) will be paying for the further assessment and remediation of this site. 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) (see insert on cover) and Rockwell International (Grenada), were added to the National Priorities List. 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 launched the Superfund Task Force in May 2017 to provide recommendations for improving and expediting site cleanups and promoting redevelopment. As part of the Superfund Task Force one year Anniversary, EPA, MDEQ, the City of Columbus, and members of the Community Advisory Group highlighted the expediated clean-up efforts at the Kerr-McGee/Tronox site.

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, 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 and are responsible for ensuring approximately 8,105 tanks at nearly 3,010 facilities have the appropriately maintained equipment. In Fiscal Year 2018, there were 1,122 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 124 licenses were issued through the MDEQ UST Certification Program, and there are currently 256 certified individuals that perform tank installations, alterations, testing, and/or permanent closures.

In the event of a release, the Mississippi Groundwater Protection fund is used by MDEQ to assess and clean up contamination resulting from leaking USTs. The fund began in 1987 and has paid \$195 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 \$163,700. At the end of this fiscal year, MDEQ was working on 555 sites that have had a confirmed or non-confirmed release and Trust Fund eligibility may or may not have been determined. During Fiscal Year 2018, \$6.3 million was used to assess and remediate leaking underground storage tanks.

Throughout this fiscal year, MDEQ in conjunction with the Mississippi Department of Agriculture and

Commerce Petroleum Testing Division and the Mississippi Petroleum Marketers and Convenience Stores Association hosted the Underground Storage Tank (UST) Owner Conferences. During these conferences, owners and operators of USTs were able to meet their Department of Agriculture Inspectors and MDEQ UST inspectors, ask questions regarding upcoming regulatory changes for dispenser labeling and operation of UST systems while getting the chance to catch up with their colleagues. The continued success of these conferences has been beneficial to all.

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 20 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.



RECLAMATION



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



RECLAMATION

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 2018, the Mining and Reclamation Division performed 711 inspections (of which 106 were bond release inspections), recommended to the Permit Board the issuance of 14 initial and 14 amended permits, and received 61 Notices of Exempt Operations (operations less than four acres in size). A total of 2,065 exempt operations are on file, covering approximately 8,260 acres. A total of 1,162 bonded acres were completely reclaimed as a result of the division's efforts to oversee reclamation. The

state currently has 651 permits covering approximately 35,010 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 2018, staff provided training to 110 miners and 63 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 2013 for its fourth five-year term. The planned life of the mine is 30 years.

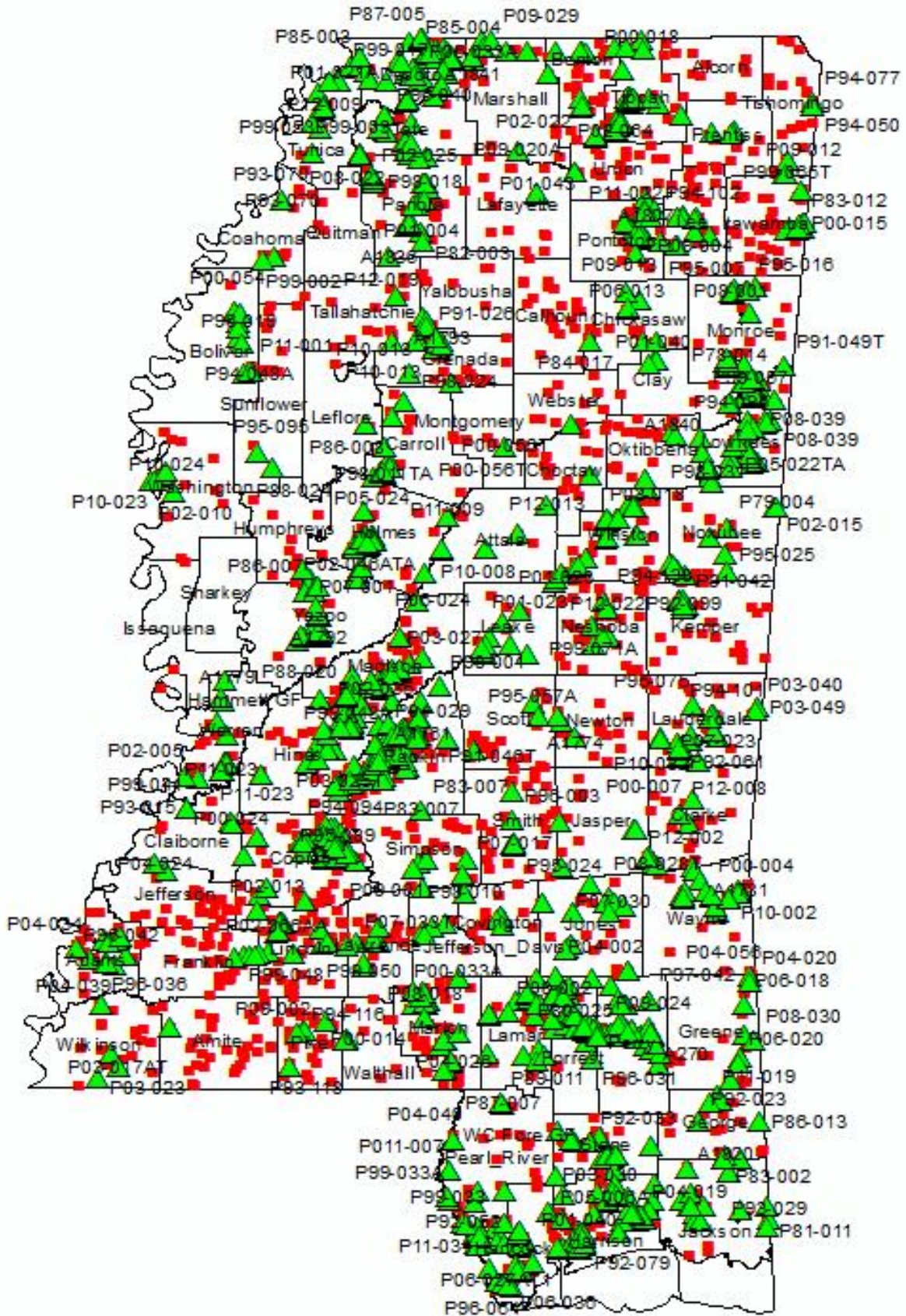
The Liberty Fuels, LLC mine permit in southwestern Kemper County was issued in December 2011 for 2,299 acres. This permit was renewed in 2016. The Liberty Mine was to produce an average of 2.2 million tons of lignite per year for the initial five-year term, and 4.5 million tons per year for the planned 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 the Summer of 2018, MDEQ approved a modification to the surface coal mining permit, fostering the reclamation of the site.

Staff inspections of both coal mines are conducted at least monthly. One or more joint inspections of each mine are conducted annually with OSM. One permit

revision and one permit modification were finalized during Fiscal Year 2018. It is anticipated at least three applications for permit revisions will be submitted during Fiscal Year 2018, at least two bond release applications are anticipated during Fiscal Year 2019, and at least two bond release applications are anticipated during Fiscal Year 2019. 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. The division will now shift focus reclamation efforts to "non-coal" sites.





WATER QUANTITY

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



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

WATER QUANTITY

The Office of Land and Water Resources (OLWR) is responsible for the management of the water resources in Mississippi. Mississippi code requires that “the water resources of the state be put to beneficial use to the fullest extent of which they are capable, that the waste or unreasonable use, or unreasonable method of use, of water be prevented, that the conservation of such water be exercised ...” 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 2018, 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. 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 Office of Land and Water Resources' 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. As the entity responsible for managing the water withdrawal permits of the state, the OLWR issued over 4,054 groundwater permits and 63 surface water diversion permits in Fiscal Year 2018. 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 on farm, as required by the terms and conditions of their groundwater withdrawal permit.

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 2018, a project to research the water resources of the City of Hattiesburg was completed. Water levels and samples were taken from wells in the primary aquifers used by the City of Hattiesburg and other public water supply systems in the area: the Citronella and the Grand Gulf aquifer system. Cross-sections were completed to illustrate the location and depth of aquifer intervals available in the area.

MDEQ staff completed a project to evaluate the water resources around the City of Clinton with water levels taken at wells throughout the area. In addition, water quality samples were collected to determine raw water characteristics from wells screened in the Cockfield and Sparta aquifers.

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 a project to evaluate the water resources available in the Massive Sand aquifer found in parts of northeast Mississippi in Fiscal Year 2018. Water levels were measured in wells in Calhoun, Webster, Lowndes, Noxubee, and Kemper Counties. Water samples were collected from wells in Lowndes, Noxubee, and Kemper Counties to determine the baseline water quality of the Massive Sand Aquifer.

In the coastal region of the state, an investigation of the fresh water aquifers in Jackson County is close to completion. 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 79 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 measured flow conditions of Oakahay Creek throughout the entire year during periods of low to high flow to evaluate changes in stream characteristics. This study began in July of 2017 and continued through the water year which ended on September 30, 2018. During this project, biweekly measurements were made at three stream crossings, as well as measurements after heavy rain events. As of June 30, 2018, 74 measurements have been made on Oakahay Creek. The OLWR also worked in conjunction with MDEQ's Office of Pollution Control to ascertain discharge calculations at four locations along the Big Sunflower River as part of a modeling study and also at five locations along the Little Tallahatchie River as part of a stream relocation study.

Water Resources in the Mississippi Delta

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

depends on abundant, accessible water of sufficient quality. Over 19,602 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 2018, 2,888 general permits were issued. 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 2018, the Drillers Licensing Program issued or renewed 211 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 2018, the OLWR staff sampled 38 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 2018, the program has sampled over 2,807 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 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.



WATER QUALITY

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 (mdeq.ms.gov/water-quality-assessment). 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 (www.waterqualitydata.us).

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 2018, 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 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 2018 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 2018 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. The 305(b) reports are available at mdeq.ms.gov/water-quality-assessment.

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

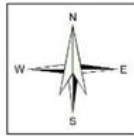
wadeable streams located in the Mississippi Alluvial Plain. Monitoring efforts completed as part of this effort have greatly increased the number of biological assessments conducted on state waters. The M-BISQ sampling program and the established sampling and analytical methodology contained therein 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 2018 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 is not available publicly on the MDEQ website, but can be obtained by contacting MDEQ staff or online at waterqualitydata.us.

Mississippi Ambient Bridge Monitoring



Legend

- Ambient Bridge Network
- ▲ Fecal Monitoring Site
- Major River
- Large Waterbody
- County

This map produced by the Department of Environmental Quality (MDEQ), Office of Pollution Control, on 5/5/2017.

All map data are from MDEQ.

Map Projection: Mississippi Transverse Mercator

The Mississippi Department of Environmental Quality makes no warranties, expressed or implied, as to the accuracy, completeness, currentness, reliability, or suitability for any particular purpose of the data contained on this map.



MISSISSIPPI
Department of Environmental Quality



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 2018 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

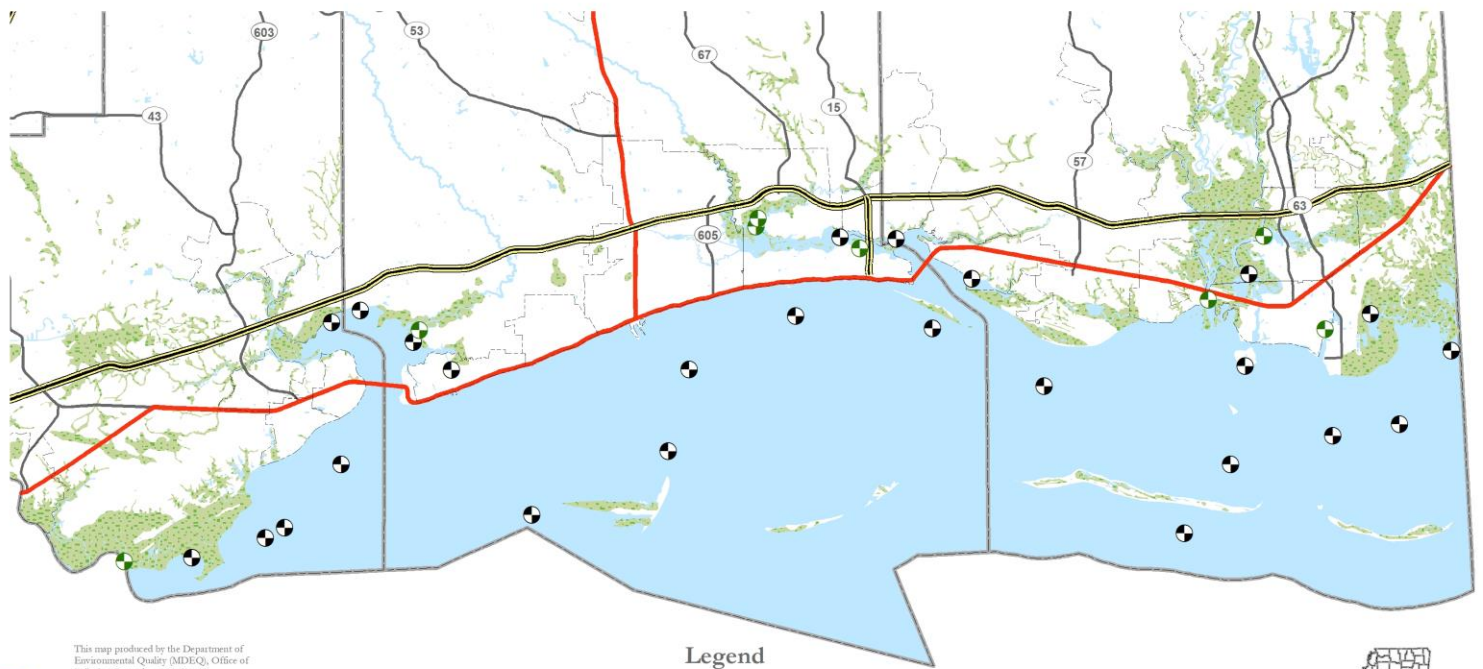
MDEQ participated in the EPA National Coastal Assessment (NCA) Program from its inception in 2000 through 2006. When EPA suspended funding for the NCA program, MDEQ partnered with the Gulf Coast Research Laboratory and the Mississippi Department of Marine Resources to continue a very similar sampling 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 2018. 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

Mississippi Coastal Assessment Sites 2018

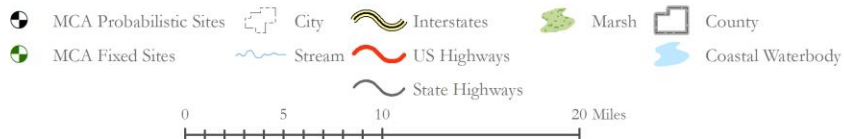


This map produced by the Department of Environmental Quality (MDEQ), Office of Pollution Control, on 03-Dec-18.

All map data are from MDEQ

Map Projection: Mississippi Transverse Mercator

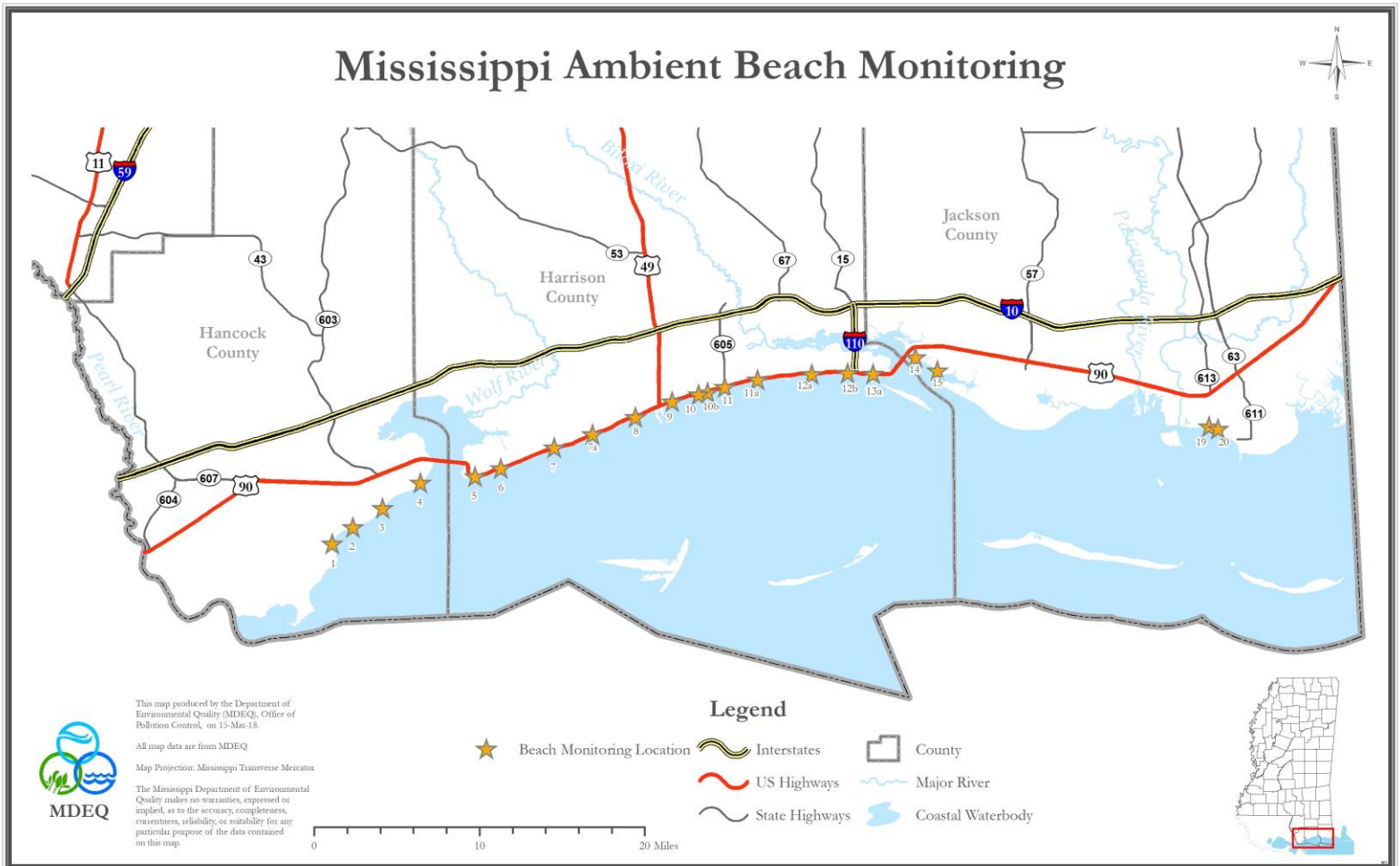
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Gulf of Mexico Program, the Mississippi Department of Marine Resources, the Mississippi Secretary of State's Office, the Mississippi State Department of Health, Hancock County, Harrison County, and Jackson County. This Task Force oversees the program 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 2018, 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 2018 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 2018 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 2018 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 2018 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.

Modeling for NPDES Permit Limits

MDEQ's TMDL Program also establishes Waste Load Allocations (WLAs). As a part of this process, the Modeling and TMDL Branch uses water quality models to replicate conditions of a stream and determine the appropriate loads that are allowed from dischargers as a result of those conditions. The Modeling and TMDL Branch completed approximately 113 WLAs from October 2017 to September 2018 to assist the permitting branch in meeting their permitting goals.

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 2018, 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 2018, 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 2018. 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 2018, 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 2018, MDEQ took the following stormwater permitting actions:

- The Environmental Permits Division (EPD) issued general permit coverages for 373 large construction projects (five acres or greater) under the Large Construction Stormwater General Permit.
- EPD issued general permit coverages for 32 regulated industrial facilities under the Baseline Stormwater General Permit.

- EPD received and processed 34 “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 170 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 April 3, 2018. The Mining General Permit authorizes the discharge of mining storm water and dewatering discharges to state waters and operation of wastewater recirculation systems with no discharge. The permit is reissued for a five-year period until March 31, 2023. This general permit replaces the previous Mining General Permit that expired on August 31, 2017.



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 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 2018, MDEQ funded four new WPCRLF projects totaling \$18.1 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

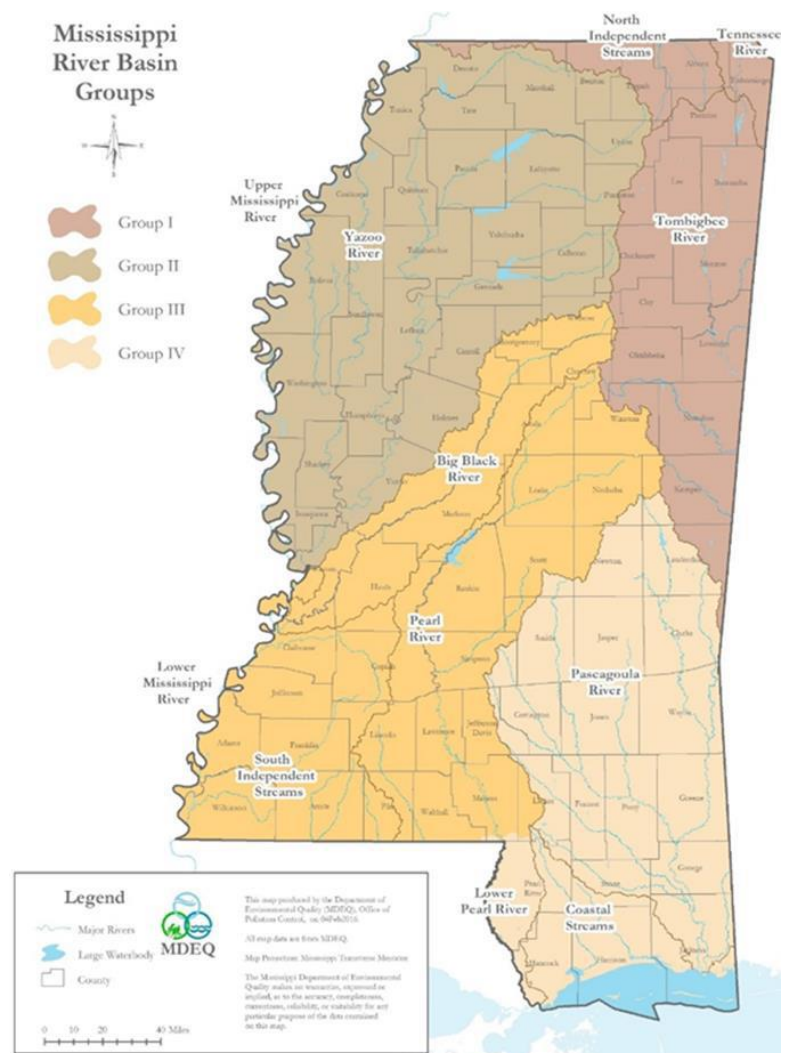
The Water Pollution Control Emergency Loan Fund (WPCELF) program provides loans to communities for the emergency construction, repair, or replacement of wastewater collection and treatment facilities. The WPCELF currently has approximately \$3 million available for such emergency projects. MDEQ encourages communities throughout the state to utilize this program whenever funds for emergency wastewater projects are needed. There was one new WPCELF loan awarded in Fiscal Year 2018 to the City of Greenville.

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 2018 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 2018 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 2018. 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 2018.

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 2018.

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 2018.

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 2018, 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

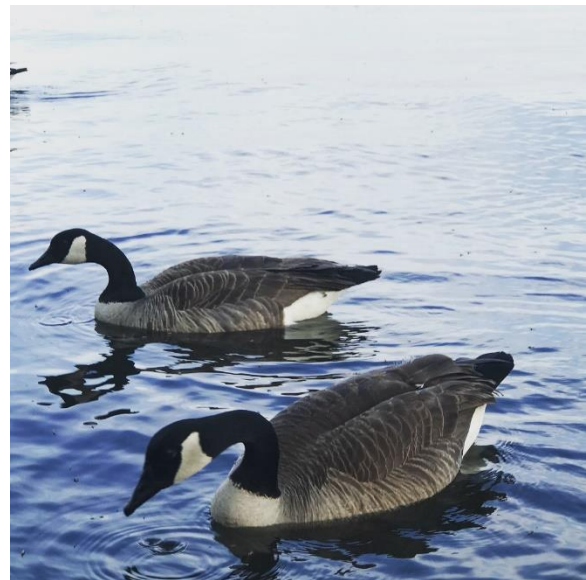
This watershed is located in Webster and Chickasaw counties in North Mississippi. Cropland and pastureland are the primary land uses within the watershed. By implementing BMPs within the watershed, it was determined by MDEQ and the partners that a significant impact could be made on the water quality within the watershed. A watershed-based plan is in development for the watershed and is nearing completion. In Fiscal Year 2018, 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, 2018, 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.

Rezonate, through MDEQ, also collaborated with the City of Ridgeland to increase awareness of project mission and goals by reaching more defined targeted audiences and to teach citizens about the importance of protecting drinking water sources especially in the Ross Barnett Reservoir watershed.

During the 2018 project period the following projects were completed:

- Composting toilets upriver at Flag Island to reduce the impact of potential bacteria and

pathogens entering the Reservoir.

- Lakeshore Park Rain Garden rehab to reduce stormwater runoff entering the Reservoir.
- *Rezonate* kiosks about watershed protection and restoration installed at Old Trace Park and Lakeshore Park.

In 2018, 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.

Dry Creek

In 2017, a Nine Key Element Watershed Plan was developed for Dry Creek and submitted to EPA. Partners in the Dry Creek Watershed began working on implementation of the watershed-based plan for Dry Creek, in the Pascagoula River Basin, in January 2018.

Old Fort Bayou

In May 2018, partners in the Old Fort Bayou Watershed formed a Watershed Team to begin the development of a Watershed Based Plan for the Old Fort Bayou Watershed.

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 2018, 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.

Rotten Bayou

MDEQ supports the Rotten Bayou Watershed Partnership in an advisory role. MDEQ Basin Management worked with the Rotten Bayou Watershed Partnership to develop the Rotten Bayou Watershed Implementation Plan in 2015 and continues to participate in watershed team initiatives. In 2018, The City of Diamondhead adopted the Rotten Bayou Watershed Implementation Plan.

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 2018, 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.

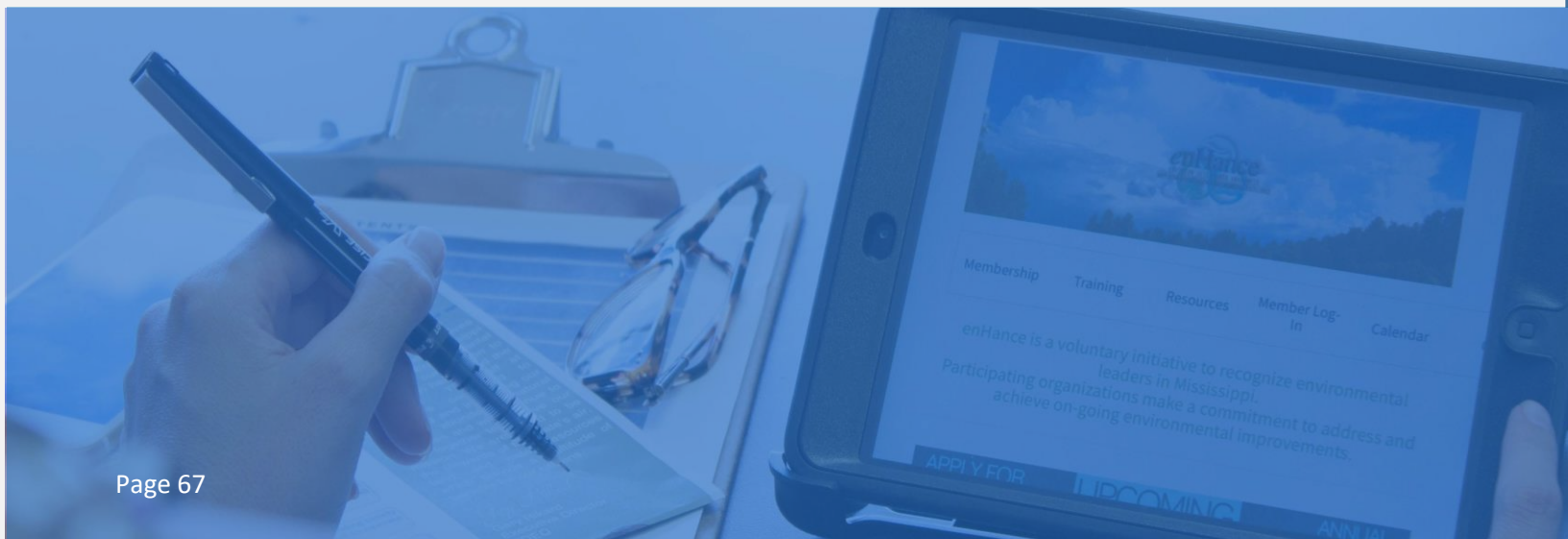


PERMITTING

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 2018, GEO issued 28 initial and amended permits; EPD issued 103 air permits, 386 water discharge permits, and 998 statewide general permit coverages; the Waste Division issued 13 formal permit actions, six authorizations for mulch/composting/concrete crushing operations, three permits for emergency staging and chipping locations, and one lagoon closure exemption; and, the OLWR 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.



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 Fiscal Year 2018, the following number of air and water on-site inspections were performed by ECED and the Field Services Division:

- **231 for compliance with air pollution regulations/permits.**
- **913 for compliance with water pollution regulations/permits.**

During Fiscal Year 2018, ECED actions resulted in 32 orders being issued for non-compliance with air and water regulations and permits, and 25 of these orders contained provisions for a penalty with a total assessed amount of \$621,575. 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 were no orders utilizing a SEP during Fiscal Year 2018.

ECED, in conjunction with the Field Services Division, is also responsible for responding to citizen complaints regarding air and water matters. During Fiscal Year 2018, MDEQ received and addressed 808 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 PREPAREDNESS AND RESPONSE



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 Action Plan (EAP) as required.



EMERGENCY PREPAREDNESS AND RESPONSE

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 2018, contractor expenditures for response actions were \$1.42 million and the agency was reimbursed approximately \$911,510 from responsible parties. The Emergency Response staff handled approximately 955 calls for assistance in Fiscal Year 2018.

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

environmental or public health emergency occurs. This readiness is accomplished by training alongside regional response teams, and state agencies such as MEMA, the Mississippi State Department of Health, the Mississippi Department of Public Safety, and federal agencies such as EPA, the Department of Defense, U.S. Department of Homeland Security, and the Federal Emergency Management Agency. Additionally, MDEQ maintains expertise in handling hazardous, radioactive materials and biohazard emergencies by participating in advanced-level courses and exercises.

Baseline curriculum courses (IS-700 and ICS-100) are required for emergency operation center personnel and field personnel working within the affected area. On-Scene Coordinators are required to 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 376 High Hazard dams, 54 Significant Hazard dams, 3,954 Low Hazard dams, and 2,444 unclassified dams on the state's inventory.

Unclassified dams are dams upon which preliminary engineering analysis shows that the dam could potentially be either High or Significant Hazard but further analysis is needed for proper classification.

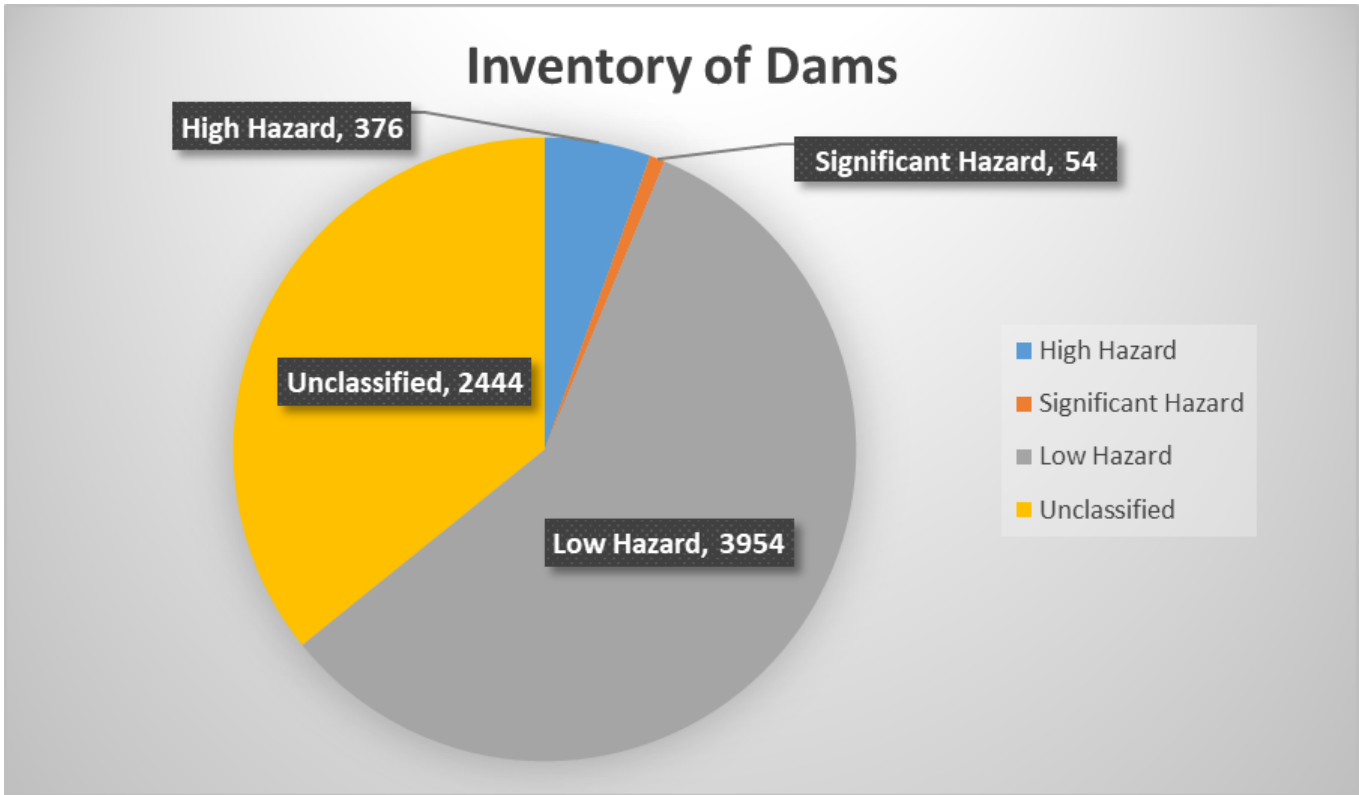
MDEQ requires that dam owners perform annual inspections of their High and Significant Hazard dams and also have periodic inspections performed by a registered professional engineer.

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 2018, 188 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.



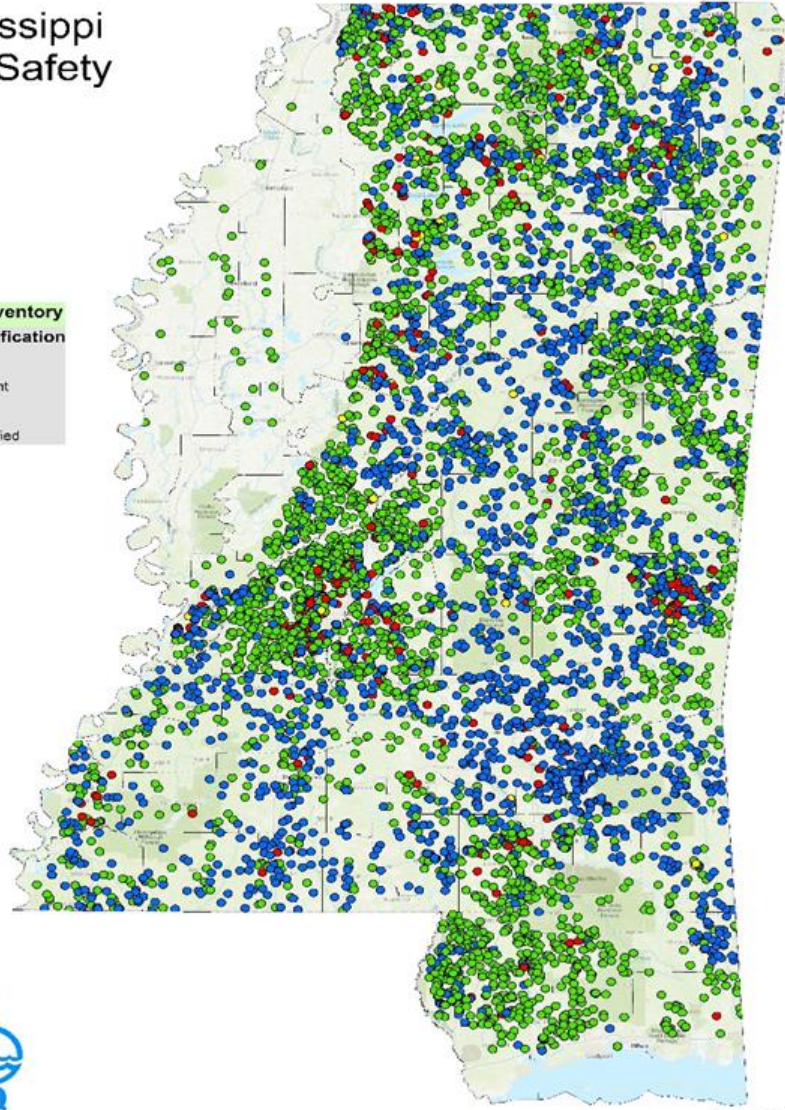
In addition, staff have been working to identify dams that have been constructed in the past 30 years or more without proper authorization that should be included on the state’s inventory of dams. To date, the Division has collected basic inventory data and performed hazard class assessments for over 3,500 dams that were not previously on the state’s inventory. In Fiscal Year 2018, 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 2018 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.

Mississippi Dam Safety

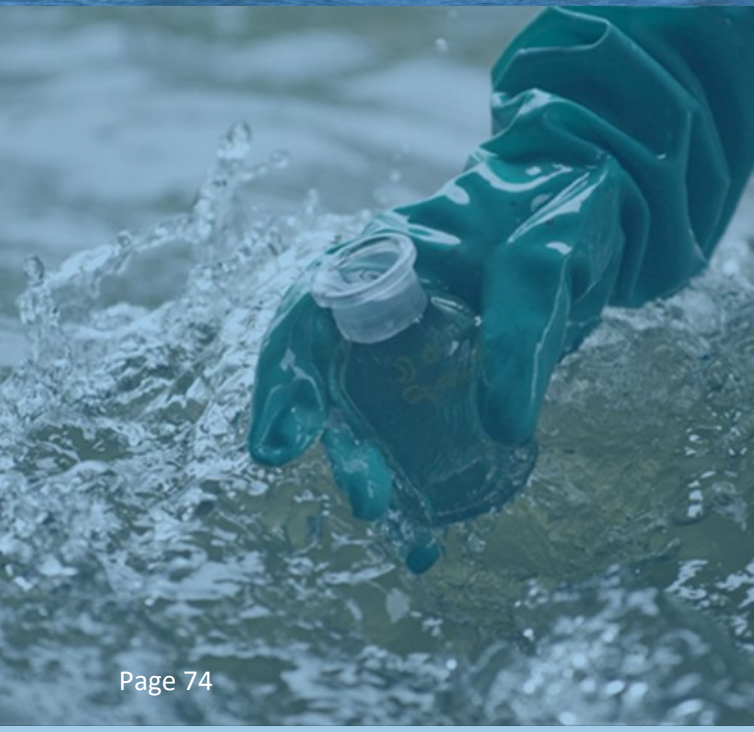
**Dams on Inventory
Hazrd Classification**

- High
- Significant
- Low
- Unclassified



Map Provided, October 18, 2018





RESTORATION

MDEQ continues to lead the state's efforts to restore and enhance Mississippi's natural resources following the *Deepwater Horizon* oil spill in 2010. Executive Director Gary Rikard serves as Mississippi's Trustee on the *Deepwater Horizon* Natural Resource Damage Assessment Trustee Council (NRDA Council) and the Gulf Coast Ecosystem Restoration Council (RESTORE Council), and serves as the state's representative with report to the National Fish and Wildlife Foundation (NFWF) Gulf Environmental Benefit Fund (GEBF). 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 *Deepwater Horizon* 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.

Mississippi's restoration funds come from three primary funding sources:

- RESTORE Act - \$668 million
 - Bucket 1 - \$364 million
 - 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.)
 - Bucket 3 - \$297 million
 - Bucket 5 - \$26 million
- NFWF Gulf Environmental Benefit Fund - \$356 million
- Natural Resource Damage Assessment - \$297 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 including programs and projects funded through the NRDA process, the RESTORE Act, and the NFWF GEBF. 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 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:

74

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

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

The 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 *Deepwater Horizon* oil spill.

The Council is comprised of governors from the five affected Gulf States, the Secretaries from the U.S. Departments of Interior, Commerce, Agriculture, and Homeland Security as well as the Secretary of the Army and the Administrator of the EPA. MDEQ’s Executive Director Gary Rikard serves for Governor Phil Bryant on the 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, and April 2018 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 July 2018, the U.S. Department of the Treasury accepted Amendment No. 2 to Mississippi's Multiyear Implementation Plan (MIP). The MIP Amendment No. 2 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. 2 included the following eight projects totaling approximately \$18.4 million:

- **Trent Lott International Airport Runway Improvements** (\$6.85 million)
- **Harrison County Bulkhead and Dock Construction** (\$3.4 million)
- **Pearl River Community College Workforce Center – Hancock County** (\$3 million)
- **Bayou Casotte Industrial Buffer Concept** (\$550,000)
- **Gulf Coast Tourist Wayfinding and Informational Signage** (\$1.1 million)
- **University of Southern Mississippi Marine Research**

Center (\$2.3 million)

- **Gulf Coast Small Business Incubator Capacity Enhancement** (\$700,000)
- **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 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.

MDEQ is in the process of working with the RESTORE Council staff to get grants awards in place to implement these projects.



Spill Impact Component (Bucket 3)

In April
Spill Impact Component
(Bucket 3)

In April 2018, then-EPA Administrator Scott Pruitt, 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 seven projects totaling approximately \$26.6 million:

- **Mississippi Gulf Coast Water Quality Improvement Program** (\$4 million in additional funding) – This program will support the restoration and protection of natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches and coastal wetlands of the Gulf Coast Region through the

implementation of water quality improvement projects.

- **Pascagoula Oyster Reef Complex Relay and Enhancement** (\$600,000 in additional funding) – This project will support the restoration and protection of natural resources, ecosystems, fisheries, marine and wildlife habitats in the Gulf Coast Region by relaying oysters from the currently non-harvestable Pascagoula Oyster Reef Complex (ORC) to harvestable reefs.
- **Gulf of Mexico Citizen Led Initiative** (\$1.9 million) - This project will support the restoration and protection of natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast Region through data collection efforts to yield information that resource management agencies can use to inform decisions regarding water quality, economically viable fish stocks, and ultimately track changes in the overall coastal ecosystem. The Gulf of Mexico Citizen Led Initiative will develop a mobile phone application for marine assessment that will be used to recruit citizens to gather coastal ecosystem health assessment data.
- **Remote Oyster Setting Facility** (\$9.4 million) - This project will

support the restoration and protection of natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast Region by constructing and operating a remote oyster setting facility.

- **Coastal Headwaters Land Conservation Program** (\$8 million) - This program will support the restoration and protection of natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast Region by conserving lands adjacent to, and/or targeted around, existing conserved lands that would have water quality and quantity benefit to downstream receiving estuarine systems.
- **Round Island Living Shoreline Demonstration and Protection Project** (\$2.2 million) - This project will provide planning, engineering and design, and permitting of living shoreline structures at the Round Island Beneficial Use (BU) site to protect the newly created sand berm and marsh from erosion, as well as expansion of the footprint of the current Round Island BU site.
- **Compatibility, Coordination and Restoration Planning** (\$500,000 in additional funds) – This project will provide planning

assistance to support MDEQ's coordinated restoration planning effort to maximize the effectiveness of coordination of restoration in the Gulf Coast Region and the development of new and/or amended State Expenditure Plans.

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.

National Fish and Wildlife Foundation

Mississippi will receive \$356 million for restoration as a result of the criminal settlements resulting from the *Deepwater Horizon* 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 fourteen projects thus far under this program. The projects announced during Fiscal Year 2018 include the following:

- **Reef Fish Assessment, Phase II** (\$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 II 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.
- **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. The properties are located in Jackson County along the Lower Pascagoula River corridor near the confluence of the Red and Black Creeks and include significant riparian habitat and bottomland hardwood wetlands on the eastern and western sides of the Pascagoula River floodplain. Much of the Lower Pascagoula River corridor is already protected and these parcels represent some of the remaining unprotected lands within the floodplain in Jackson County. Land conservation through fee simple acquisition continues to play an important role in restoration of the Mississippi coastal landscape.

- **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. This effort will enhance the ecological functioning of priority bays and estuaries along the Mississippi Gulf Coast. Specifically, Phase II proposes the construction of two additional beneficial use sites and the expansion of two existing sites. Under its Coastal Restoration Plan, the State of

Mississippi has established a goal of protecting and restoring over 6,000 acres of coastal marsh across its coast. Coastal marshes not only play a vital role in the ecological integrity of open shoreline habitats but also, and perhaps more critically, are integral components of ecosystem health within a broader landscape context of coastal ecosystems. Marsh sustainability will be a key focal component of containment structure design, which will have benefits to associated benthic communities in bays and estuaries.

- **Mississippi Comprehensive Restoration Planning, Phase II** (\$1.5 million) – This follow-up planning request will expand Mississippi's Gulf Coast Restoration Plan (Plan) to include establishing additional conservation goals for living coastal and marine resources including Gulf Coast birds and water quality. Additional geospatial and other data will be collected and integrated into the Mississippi Comprehensive Ecosystem Restoration Tool (MCERT) and will assist MDEQ in improving recommendations for priority habitat restoration and protection projects. The Plan is designed to serve as the overarching framework for the continued development and implementation of projects that restore, enhance and conserve

key Gulf Coast natural resources in the state. Restoration and conservation of coastal Mississippi's unique habitats, along with the replenishment and protection of living resources, are being assessed through a comprehensive approach to planning, design, and development. The Plan serves as the framework to identify priority resources and areas for restoration that have been affected by the *Deepwater Horizon* oil spill. At its core, the Plan is a community-driven, science-based effort that informs and provides feedback to prioritize restoration projects that are designed to be sustainable and successful. This project will build on the framework to maximize restoration success by providing additional resource restoration endpoints, building a data management system that houses coastal project monitoring data and technical information, continuing the refinement of MCERT, and creating a platform for project ideation and refinement.

- **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. Diminished water quality and

quantity are noted impediments to the ecological function of high priority coastal bays and estuaries. Land conservation and restoration actions in headwater watersheds are recognized practices to ensure the sustainable delivery of improved water quality and quantity to receiving bays and estuaries. In total, the potential conservation footprint of the project is anticipated to be approximately 48,000 acres. The target property includes significant upland portions of the Wolf and Little Biloxi Rivers, major tributaries of St. Louis Bay and Biloxi Bay, respectively. In addition, MDEQ will conduct real estate due diligence, including appraisals and title searches and will develop a long-term management plan for the property.

Previously awarded projects

Funding Cycle 2013 (Fiscal Year 2014)

- **Coastal Streams Initiative with The Nature Conservancy** (\$2.6 million)
 - A project to develop strategies and restoration designs for nine coastal streams.
 - Current Status: Closed.
- 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; second year of treatment complete; monitoring ongoing.

▪ **Mississippi Coastal Restoration Plan** (\$3.6 million)

- A project to fund critical coastwide restoration planning.
- Current Status: Implementation; Version 1 of the Plan published in 2015; update to plan drafted in 2017; Restoration Endpoints developed in 2016 and 2017; End of Year report complete; transitioning to closeout.

year of data collection complete; analysis and reporting for second year data near completion.

▪ **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) previously constructed and filled with dredge materials from Port of Pascagoula; fill materials allowed to dry; dune grasses installed on berm to prevent erosion; design work for Wolf River and Beardslee Lake sites continued, including geotechnical analysis of existing soils.

Funding Cycle 2014
(Fiscal Year 2015)

- **Reef Fish Assessment** (\$4 million)
- A project to bolster the fishing industry.
 - Current status: Implementation; first year of data collection and analysis complete; second



▪ **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 completed assessment of state parks, continued progress in assessing Wildlife Management Area sites; and drafted management plans for parks. Mississippi Department of Marine Resources identified treatment strategy and initiated procurement of treatment.

Funding Cycle 2015 (Fiscal Year 2016)

- **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 in process. Federal partners collaborated to determine site for monitoring station.

- **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; MDEQ sub-awards and contracts executed; hydrographic survey of Turkey Creek commenced; Land Trust for Mississippi Coastal Plan began procurement process for baseline assessment of affected sites.

- **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; benthic mapping for Back Bay and Western Mississippi Sound completed; permitting for experimental cultch deployment in process; modeling of Western Mississippi Sound and Lower Pearl

River continued; oyster gardening reached goal of 50 participants and retrieved more than 6,000 oysters to set on active reefs; sampling and analysis of contaminated oyster cultch completed.

- **Design Challenge for Improvement of Water Quality from Beach Outfalls** (\$544,000)
 - 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 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.

- **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 consistently responded to strandings and live, incidental catches, have rehabilitated many turtles, many of which have already been released, and have participated in or conducted numerous necropsies with its colleagues at NOAA; MDMR has increased its

enforcement of TED compliance, along with adding dedicated duties to two employees to coordinate Mississippi's protected species efforts; and the University of Southern Mississippi is planning its observer program, including receiving training at NOAA's Galveston lab.

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:

Natural Resource Damage Assessment (NRDA)

The *Deepwater Horizon* Natural Resource Damage Assessment (NRDA)

| Category | Funding Amount | Description |
|--------------------------------------|------------------|--|
| Phase I Early Restoration | \$13.6 million | Oyster cultch and nearshore artificial reefs. |
| Phase 3 Early Restoration | \$68.96 million | Living shorelines, subtidal reefs, recreational loss projects. |
| Phase 4 Early Restoration | \$30 million | Living shorelines, intertidal and subtidal reefs in four bays in Mississippi Sound. |
| Additional Early Restoration Funding | \$18.44 million | Early Restoration Settlement Remaining from \$1 billion. |
| Long Term Restoration Projects | \$166.56 million | Money to restore and conserve habitat; restore water quality, replenish and protect living coastal and marine resources, and provide and enhance recreational opportunities, and for monitoring, adaptive management and administrative oversight. |

Under NRDA, plans for the implementation of early restoration projects prior to the final quantification of injury were developed to achieve restoration faster. In 2011, the Trustees announced the Framework for Early Restoration Addressing Injuries Resulting from the *Deepwater Horizon* oil spill (Framework Agreement), in which BP agreed to fund \$1 billion in Early Restoration projects. Under the agreement, DOI, NOAA, and the five spill-affected Gulf states each 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 \$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 in Fiscal Year 2016.
- **Phase III: Mississippi has four Phase III projects (\$68.957 million)**
 - **Hancock County Marsh Living Shoreline (\$50 million)** This project, which is construction, provides for up to 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 Xsphere theater, and the construction of 11 new interior science exhibits used for learning about our environment.
- **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 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.

| Restoration Goals and Project Types | Remaining Restoration Funding |
|--|-------------------------------|
| Goal 1: Restore and Conserve Habitat | |
| Wetlands, Coastal and Nearshore Habitats | \$55.5 million |
| Habitat Projects on Federally Managed Lands | \$5 million |
| Goal 2: Restore Water Quality | |
| Nutrient Reduction (non-point source) | \$27.5 million |
| Goal 3: Replenish and Protect Living Coastal and Marine Habitats | |
| Sea Turtles | \$5 million |
| Marine Mammals | \$10 million |
| Birds | \$25 million |
| Oysters | \$22.5 million |
| Goal 4: Provide and Enhance Recreational Opportunities | \$5 million |
| Goal 5: Monitoring, Adaptive Management, Administrative Oversight | |
| Monitoring and Adaptive Management | \$7.5 million |
| Administrative Oversight and Comprehensive Planning | \$22.5 million |

Long Term Restoration

In early 2016, Mississippi and the other NRDA trustees completed the Final Programmatic Damage Assessment and Restoration Plan and Programmatic Environmental Impact Statement. It includes an assessment of the injury to natural resources caused by the oil spill and the types of restoration needed to compensate the public. The plan 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 *Deepwater* Horizon 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 (lead) working with the Department of the Interior. 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

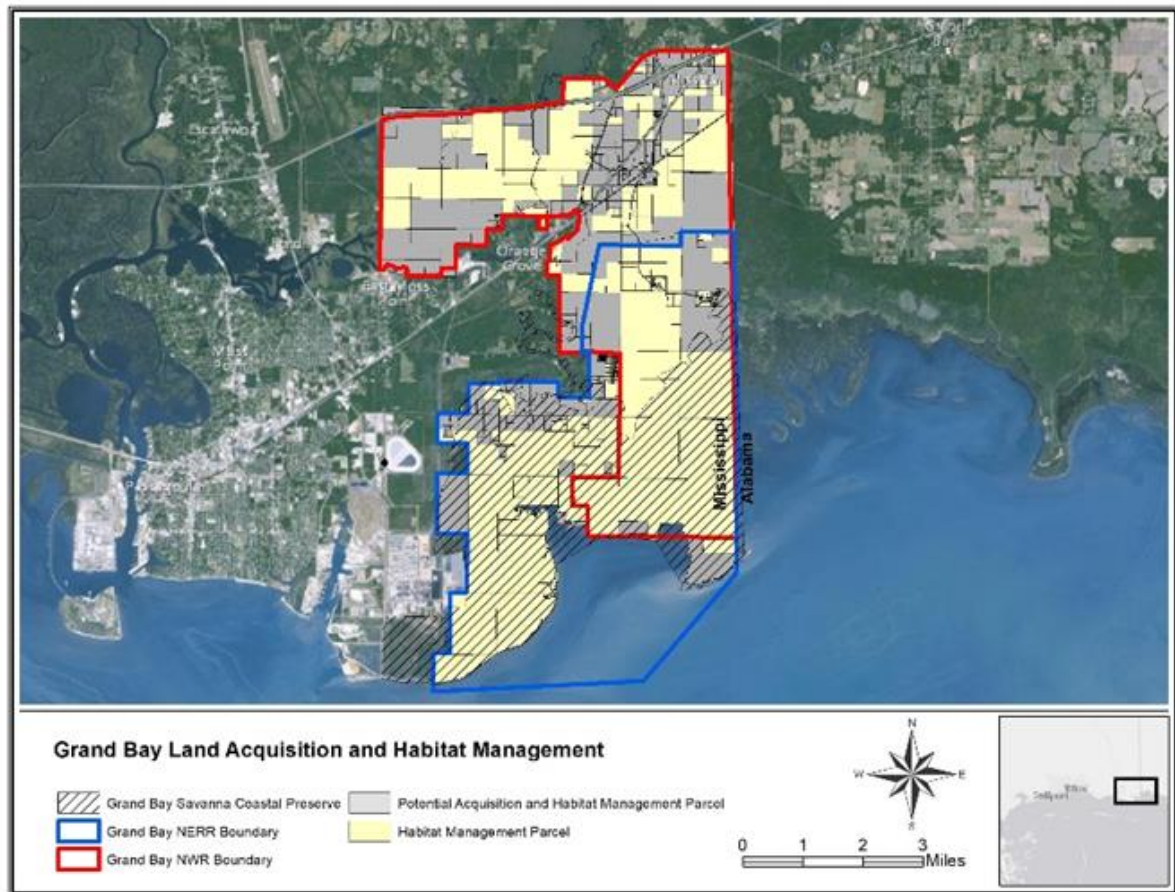
restore injuries to coastal, wetland, and nearshore habitats in Mississippi, as well as provide benefits to wading birds and other bird species injured by the spill. Acquisition and management will be implemented with available funding for up to 10 years. Priority tracts have been identified and landowner conversations were 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



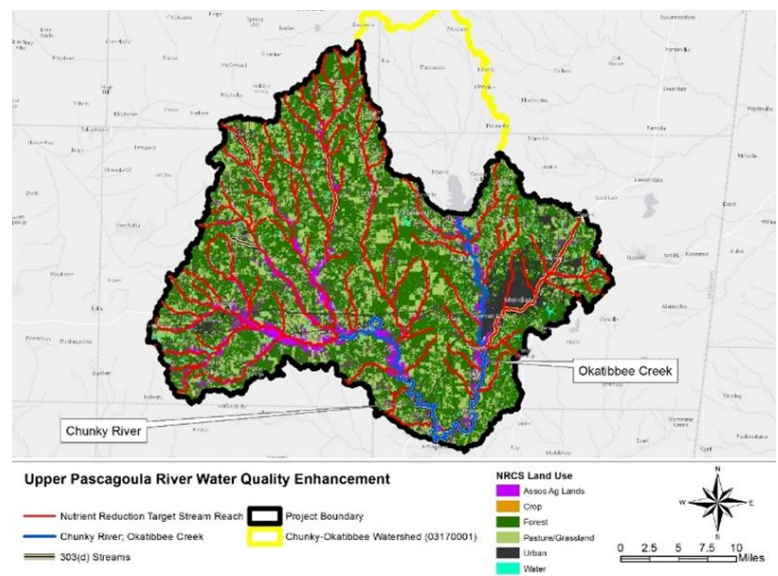
restore injuries to wetlands, coastal and nearshore habitats in Mississippi injured by the spill, as well as provide benefits to wading birds and other bird species injured by the spill. Acquisition and management will be implemented with available funding for up to 15 years. Acquisition activities should begin in late 2018 and management activities are scheduled to commence in 2019.

A third project is designed to meet the Restore Water Quality Restoration Goal (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 land owners. 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 difficult to understand. 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's outreach and technical assistance activities are coordinated out of the Waste Division in partnership with the agency's P2 contractor, the Mississippi Manufacturer's 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 four P2 enHance site visits with renewing enHance members, hosted the enHance Steering Committee Roundtable, hosted two P2 workshops including the enHance Annual workshop in April and a Food and Beverage Manufacturers' sustainability workshop; conducted four technical presentations including presentations at the Workforce Environmental and Safety Association (WESA) meeting, the MMA Environmental and Safety Conference and Expo, the College/University Sustainability Directors at the Mississippi Recycling Coalition meeting, and the Mississippi Energy Coordinators Association meeting, conducted three E3 site assessments at Peco Foods, Hago Automotive, and Max Home facilities, conducted P2 webinars on the Value of P2 and Safer Choice and Energy Efficiency and Conservation; and, conducted a 10-year review of the

enHance program's pollution prevention achievements in observation of the 10 year anniversary of the program.

enHance Environmental Stewardship Program



The 2018 enHance Workshop and Awards Luncheon marked the tenth year that the enHance stewardship program has recognized state environmental leaders for those organizations who voluntarily go above and beyond what is required. The enHance program has grown to 35 active members representing top environmental performers throughout the state. The program recognizes those business, industrial, institutional and governmental organizations and facilities 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 and continuous improvement.

As enHance has reached its tenth-year anniversary, a review of the program's

accomplishments indicates just how substantial the program has been in eliminating waste, preventing pollution and advancing the sustainable practices of the state's industry.

This review indicates that the benefits realized from the enHance program efforts include:

- Over a quarter million pounds of hazardous waste eliminated.
- Tens of thousands of tons of solid waste reduced, reused, or recycled.
- More than 250 million gallons of water saved annually through reduction efforts.
- More than 73 million kilowatt hours of annual energy use reductions.
- Nearly 18 million MMBTUs of total annual energy savings, and
- Significant reductions in air emissions and carbon footprint.

These results are strong evidence of the value and impact of enHance and the facilities' collective efforts to reduce pollution and enhance sustainability. This has been done through changes in operating procedures, redesign of products or packaging, beneficial reuse of materials, and installation of more efficient equipment, recycling, and other similar alternatives. The enHance program promotes these best management practices to encourage more widespread implementation through training sessions, mentoring, and participation in the program.

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. Over the last year, 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.

Mississippi Environmental Education Training

OCE in conjunction with EPA's Office of Air Quality, Planning, and Standards, held the Mississippi Environmental Education Training in Biloxi in August 2017. This training brought together regulators, industries, community organizations, and students to understand the efforts underway to help improve and protect the environment. Presentations and panel discussions covered a wide range of topics including: Restoration; Air Pollution, Environmental Justice, and Environmental Health Risks; Going Above and Beyond the Regulatory Requirements; Overview of Mississippi's Air Quality; Recipients of Gulf of Mexico Alliance Grant Awards; Turkey Creek Watershed Steering Committee Update; Federal Panel; Land, Air, and Water; Gulf Coast Waters; Cleanup, Assessment, and Redevelopment; Youth Leaders' Involvement in

Environmental Projects; and, What Happens When Communities Collaborate.

Municipal Environmental Workshop

In August 2017, OCE held a Municipal Environmental Workshop in the Mississippi Delta. This voluntary program is a resource for municipalities to help understand state and federal environmental regulations with which they must comply. It provided local officials with the tools and knowledge needed to be effective stewards of environmental resources. Workshop topics are carefully selected and developed ensuring that the information presented is relevant to the responsibilities of elected officials.

Small Business Contractors Workshop

In partnership with the Office of Restoration, OCE hosted a free contracting workshop in July 2017 in Gulfport designed to help prospective and existing small businesses understand the basics about pursuing contracting opportunities. The workshop included an overview of Restoration programs and requirements for procurement participation.

Region 4 Small Business Environmental Assistance Program (SBEAP) Annual Meeting

In October 2017, Mississippi Small Business Environmental Assistance Program staff attended the Region IV SBEAP Annual Meeting in Nashville.

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.

Choctaw County Library Summer Reading Program

Paul C. Parrish of the Environmental Geology Division gave a volcano and fossil presentation to 20 children at the Choctaw County Library in Ackerman.

Central United States Earthquake Consortium (CUSEC)

Paul Parrish of the Environmental Geology Division participated in an earthquake and emergency management workshop. The March workshop was held CUSEC in conjunction with Kentucky EMA to bring together states that would be affected by New Madrid Seismic Zone events.

Mississippi Academy of Sciences

Several staff presented abstracts and posters at the 82nd Annual Meeting of the Mississippi Academy of Sciences held at the University of Southern Mississippi. Paul C. Parrish was elected chair of the Geology and Geography section of the Mississippi Academy of Sciences.

Geological Society of America's South-Central Section

Paul C. Parrish and Andrew Newcomb attended the South-Central GSA meeting in Fayetteville, Arkansas, and presented a poster detailing the new Environmental Geology Borehole webpage. Parrish also gave a presentation on the Mississippi Office of Geology's emergency management role in the event of a New Madrid Seismic Zone earthquake.

Southwest Community College Drilling School

Andrew Newcomb, of the Environmental Geology Division, logged wells in the spring and fall semesters for the drilling school students. In addition, he gave a short instructional session on reading and understanding geophysical log data. Southwest Community College has the only drilling school in the State of Mississippi.

The Mississippi Gem and Mineral Society Annual Rock Show

The Mississippi Gem and Mineral Society Annual Rock Show was held in February 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 Geoarchology. Office of Geology's staff also was on-hand to

answer questions from the public, identify rocks and fossils, and distribute literature on the state's geology and mineral resources.

Mississippi Museum of Natural Science Senior Naturalist Camp

James Starnes of the Surface Geology Division helped lead a field trip with staff of the Mississippi Museum of Natural Science for Mississippi high school students on the lower Pascagoula River and the Sand Hill Crane National Wildlife refuge. These areas were recently geologically mapped by staff under the USGS StateMap Grant Program.

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.



Mississippi Gem and Mineral Society

In May of 2018, James Starnes presented a lecture on the significance, origin, and distribution of the state's gravel resources and identified gravel fossil for attendees afterwards.

Tellus Science Museum

James Starnes gave a lecture on geologic mapping and the discovery of the state's first gemstone at a symposium entitled "*Minerals of the Southeast*" at the Tellus Science Museum in Cartersville, Georgia. Specimens of Mississippi Opal and gem-quality fossil palm are on loan for display at Tellus for a yearlong exhibition.

35 Million Years Down the Chickasawhay River



James Starnes of the Office of Geology's Surface Geology Division joined paleontologists from the Mississippi Museum of Natural Science and the University of Southern Mississippi as participating experts in the Mississippi Public Broadcasting television special, *35 Million Years Down the Chickasawhay River* which aired in 2018.

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

James Starnes and paleontology staff at the Mississippi Museum of Natural Science collected rare Lower Pliocene age paleobotanical specimens from the Graham Ferry Formation in Stone County for scientific study by University of South Alabama paleontologists.

James Starnes, Paul Parrish, and Andrew Newcomb led University of Memphis Geology Department staff on a sampling trip in Yazoo, Warren, Claiborne, and Franklin counties to sample the Pleistocene age ancestral

Mississippi River Pre-loess Terrace Deposits for a Beryllium/Argon dating method funded by Duke University.

James Starnes, Paul Parrish, and Andrew Newcomb helped a University of Wisconsin graduate student working for the National Park Service on a field trip to better understand the geologic history and resources of the Vicksburg National Military Park in Warren County.

James Starnes worked with a Palynologist at Delta State University on sampling fossil-rich sites in the upper Oligocene Catahoula Formation in Wayne County and the lower Oligocene age Bucatunna Formation in Smith County. The findings were published by the Botanical Society of America.

Office of Geology staff James Starnes, Paul Parrish, and Andrew Newcomb, along with Mississippi Museum of Natural Science paleontologist George Phillips, led a University of Southern Mississippi Geology Department group 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 2018 on various aspects of proper solid waste management and waste

reduction and recycling. These outreach efforts included the following events and efforts:

- Waste Division staff addressed the Southeast Regional Conference of the Air and Waste Management Association in Nashville in July 2017 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 participated in the "Breakfast with the Regulators" event sponsored by the State Air and Waste Management Association Chapter in July 2017. 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.
- The Waste Division's Grants Program staff presented at a Municipal Environmental Workshop in Charleston, Mississippi, sponsored by the MDEQ Office of Community Engagement in August 2017.
- The Waste Division's Grants Program staff presented at the Mississippi Environmental Education Training Conference in Biloxi in August 2017.

- Staff from the Policy and Planning Branch participated in the Madison County Soil and Water Conservation District's Conservation Day and the Great Delta Bear Affair in September 2017 providing presentations and exhibits to help educate students on the importance of recycling in their community.
- Recycling and Waste Reduction Program staff served on the "Recycling" and "Food, Water, Energy" panels for discussions at the Southeastern Environmental Conference held in October 2017 in Orange Beach, Alabama.
- Recycling and Waste Reduction Program staff presented information on recycling of wood waste and vegetative debris at the Mississippi Urban Forestry Council's Green Infrastructure Educational Summit held at the Mississippi Agriculture and Forestry Museum in Jackson in October 2017.
- MDEQ Waste Division staff assisted in planning and sponsoring the Mississippi Recycling Coalition's (MRC) State Recycling Conference held at Holmes Community College in Ridgeland in October 2017. The conference included sessions on initiatives in the state, region, and nation to support recycling, better options for recycling infrastructure allowing for more efficient and cost effective collection and transportation of materials, the importance of measuring recycling rates, and how MDEQ is working to incorporate measurement in Mississippi. In addition, the MRC celebrated the organization's 20-year anniversary at the conference.
- MDEQ Recycling program staff hosted a meeting in October 2017 with The Recycling Partnership and Jackson metropolitan area local government recycling program and public works coordinators to discuss opportunities to increase recycling efforts in the metro area and opportunities to work cooperatively.
- Waste Tire Program staff provided a presentation to the Mississippi Code Enforcement Officers Association in October 2017 on the proper management of scrap tires.
- MDEQ helped sponsor and staff the E-waste collection event with the Greater Jackson Chamber Partnership, Keep Mississippi Beautiful, Keep Jackson Beautiful, Magnolia Data Solutions in November 2017 at the Farmer's Market in Jackson.
- The Waste Division's Solid Waste Planning staff conducted a solid

waste planning workshop with local officials with Leflore County, the City of Greenwood and other municipalities in the county on the local efforts to update and comprehensively rewrite the local solid waste management plan.

- Waste Division staff conducted the Rubbish Site Operator Training Class in November 2017. This training provided an opportunity for new operators to receive certification and current operators to receive Continuing Education Units to meet recertification requirements.
- Waste Division staff hosted the Mississippi Recycling Coalition's Board of Directors Meeting in December of 2017 to help develop plans and goals for the upcoming calendar year for the recycling organization.
- Waste Division staff participated with the Southeast Recycling Development Council's annual Board retreat in January 2018 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 2018.
- Waste Division staff participated in the EPA Region 4 Solid Waste

and Recycling State Manager's meeting in Chattanooga 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.

- Waste Division staff participated in the Southeast Recycling Development Council's Measurement Matters Summit also in Chattanooga immediately following the State Manager's meeting. This meeting focused on data collection and the measurement of recycling rates. The meeting was an important meeting for the solid waste programs for the launch of the electronic reporting system in early 2019.
- The Waste Division's Recycling and Waste Reduction Program staff conducted outreach site visits to Allen's Recycling a material recovery facility in Canton in February 2018, the City of Oxford Recycling Facility in March 2019 and the University of Mississippi Composting Facility in March 2018 to learn more about the operations to determine how MDEQ may best assist material recovery facilities.

- Staff joined the Mississippi Recycling Coalition (MRC) and Keep Mississippi Beautiful for a Recycling Awareness Day and Litter Prevention Day to the state's elected leadership at the State Capitol. MRC recognized the "Recyclers of the Year" in categories for local governments, educational institutions, business and industry, non-profits, and state and federal agencies.



MDEQ Executive Director received the State Agency Recycler Award on behalf of the agency.

- Waste Division staff conducted presentations to elementary school students and teachers on litter prevention, proper waste management and recycling at two "Conservation Carnival" events held in the Philadelphia in March and near DeKalb in April 2018. These events were sponsored by the Neshoba and Kemper County Soil and Water Conservation Districts respectively.
- Waste Division staff participated in and supported the Keep the

Reservoir Beautiful Recycling Fashion Show where participants modeled outfits made from recycled materials in April in Ridgeland.

- Hosted and presented the Tenth Annual enHance workshop sponsored in partnership with the Mississippi Manufacturers Association in downtown Jackson in April 2018.
- The Waste Division's Recycling and Waste Reduction Program staff presented information to Elementary Education students at Mississippi College in March 2018 on how to incorporate recycling, reuse, composting and proper waste management lessons in the classroom.
- Recycling program staff were interviewed by the *Everyday Tech* radio program on Mississippi Public Broadcasting to promote recycling and E-waste collection.
- Waste Division staff attended the Keep Mississippi Beautiful Annual Awards Luncheon held in Jackson in April 2018.
- The Waste Division's Recycling and Waste Reduction Program staff participated in the Earth Day Fair in April 2018 at the University of Southern Mississippi to promote the benefits of recycling and composting.

- Waste Division staff helped sponsor and staff the e-waste collection event with the Greater Jackson Chamber Partnership, Keep Mississippi Beautiful, Keep Jackson Beautiful, Magnolia Data Solutions in April 2018 at the Farmer's Market in Jackson.
- Waste Division staff assisted in hosting the joint Solid Waste and Recycling Conference sponsored by the Mississippi "Magnolia" Chapter of the Solid Waste Association of North America (SWANA) and the Mississippi Recycling Coalition (MRC) in Bay St. Louis in May. MDEQ conducted presentations on updated solid waste and recycling regulatory and assistance programs, addressed a meeting of state university and college sustainability directors and managers, and moderated a panel discussion on local government waste and recycling contract proposals.
- The Waste Division's Recycling and Waste Reduction Program staff presented information to teachers at a workshop in Grenada held in June 2018 on how to incorporate recycling, reuse, composting and proper waste management lessons into the classroom.

MDEQ partners with various organizations in the state to provide outreach and education on a variety of solid waste management issues. Some of these outreach efforts are through grants to local governments who conduct outreach with local schools, community groups, and residents. Throughout the year, MDEQ's solid waste programs also helped to organize and host conferences and meetings for the Mississippi Recycling Coalition and the Mississippi Chapter of the Solid Waste Association of North America.

Helping Girl Scouts Achieve

Several MDEQ staff volunteered their time and expertise to help Girl Scouts earn their engineering badges at Camp Wahi in Brandon. Using hands-on activities, these women helped the girls learn basic engineering principles such as momentum, kinetic energy, and friction in a fun environment.



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

Teacher workshops are a major component of MDEQ's NPS educational program each year. There were 21 workshops held across the state in Fiscal Year 2018.

Adopt-A-Stream

Adopt-A-Stream is an environmental education training program for adults and students that focuses on aquatic ecosystems and the effects of NPS pollution on water quality. The coordinator for Adopt-A-Stream, through a sub-grant with the Mississippi Wildlife Federation, educates citizens about water-quality issues and solutions in their own local watersheds, conducts Envirothon team training on aquatic subjects at 28 high schools, presents 12 aquatic-ecology programs in classrooms, leads three stream clean-ups and eight storm drain marking projects, and reaches people through large-venue events, teacher-workshop training sessions, summer

environmental camps, and displays at conferences.

Make-A-Splash

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

Enviroscape and Groundwater Models

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

Storm Drain Marking

The Storm Drain Marking Program is a cooperative program between MDEQ and the Mississippi Wildlife Federation (MWF). MDEQ provides MWF funding through one of its Section 319 subgrant agreements to promote awareness of the water quality impacts of polluted runoff in urban communities. Small plastic disks are placed by local volunteers on storm drains with the message "No Dumping, Drains to

River.” Volunteers glue the markers to storm drains and distribute door hangers to homes.

Field Days

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

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 2018 was funded in part by a USGS State Geologic Survey Mapping (STATEMAP) grant of \$63,555. 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 were 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-2017, there are ten HUC_8 Risk MAP projects and one LAMP (Levee Analysis and Mapping Procedure) project on the Tennessee-Tombigbee Waterway in northeastern Mississippi. Preliminary mapping for Monroe and Itawamba Counties were released to the local communities in December of 2016 and are expected to become effective in early 2018. This project is one of 25 pilot LAMP projects for mapping de-accredited levee systems chosen by FEMA from across the nation.

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 2018, 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 2018. 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).

The Office of Geology's Geospatial 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 2018, 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 2018, the Geospatial Resources Division took delivery of new high-resolution orthoimagery for 19 counties and approximately 7,151 square miles of new LiDAR elevation data covering all or portions of 22 different counties. All data developed are of MDEM quality and will be made available for distribution through the MARIS (Mississippi Automated Resource Information System).

Publications

MDEQ's Office of Geology staff published twenty-seven geologic papers in Fiscal Year 2018. 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



MDEQ Building Named for Nunnelee

On January 11, 2018, a building dedication ceremony and plaque unveiling was held for MDEQ's building in downtown Jackson. A bill was passed by the Mississippi Legislature in the 2017 session to rename the MDEQ building on East Amite Street after former Congressman Alan Nunnelee. Alan Nunnelee represented the citizens of Mississippi's First Congressional District from 2011 until his passing in 2015. He served on the House Appropriations Committee and the Agriculture, Energy and Water and Military Construction and Veterans Affairs Subcommittees.

Before joining the 112th Congress, Nunnelee represented Lee and Pontotoc counties in the Mississippi State Senate from 1995 to 2010. He served as chairman of the Appropriations Committee, the Public Health Committee, and the Environment Protection, Conservation and Water Resources Committee.

Speakers for the event included Governor Phil Bryant, Lieutenant Governor Tate Reeves, and Speaker Philip Gunn who all paid tribute to Congressman Nunnelee. Other elected officials in attendance were Secretary of State Delbert Hosemann, State Treasurer Lynn Fitch, then Agriculture Commissioner Cindy Hyde-Smith, Transportation Commissioner Dick Hall, Tupelo Mayor Jason Shelton, and Gulfport Mayor Billy Hewes along with many members of the Mississippi State Senate and House of Representatives. In addition, members of the Nunnelee family and a host of their friends attended the ceremony.

The plaque resides in the building's lobby and lettering was added to the exterior of the building



CHARITABLE CONTRIBUTIONS

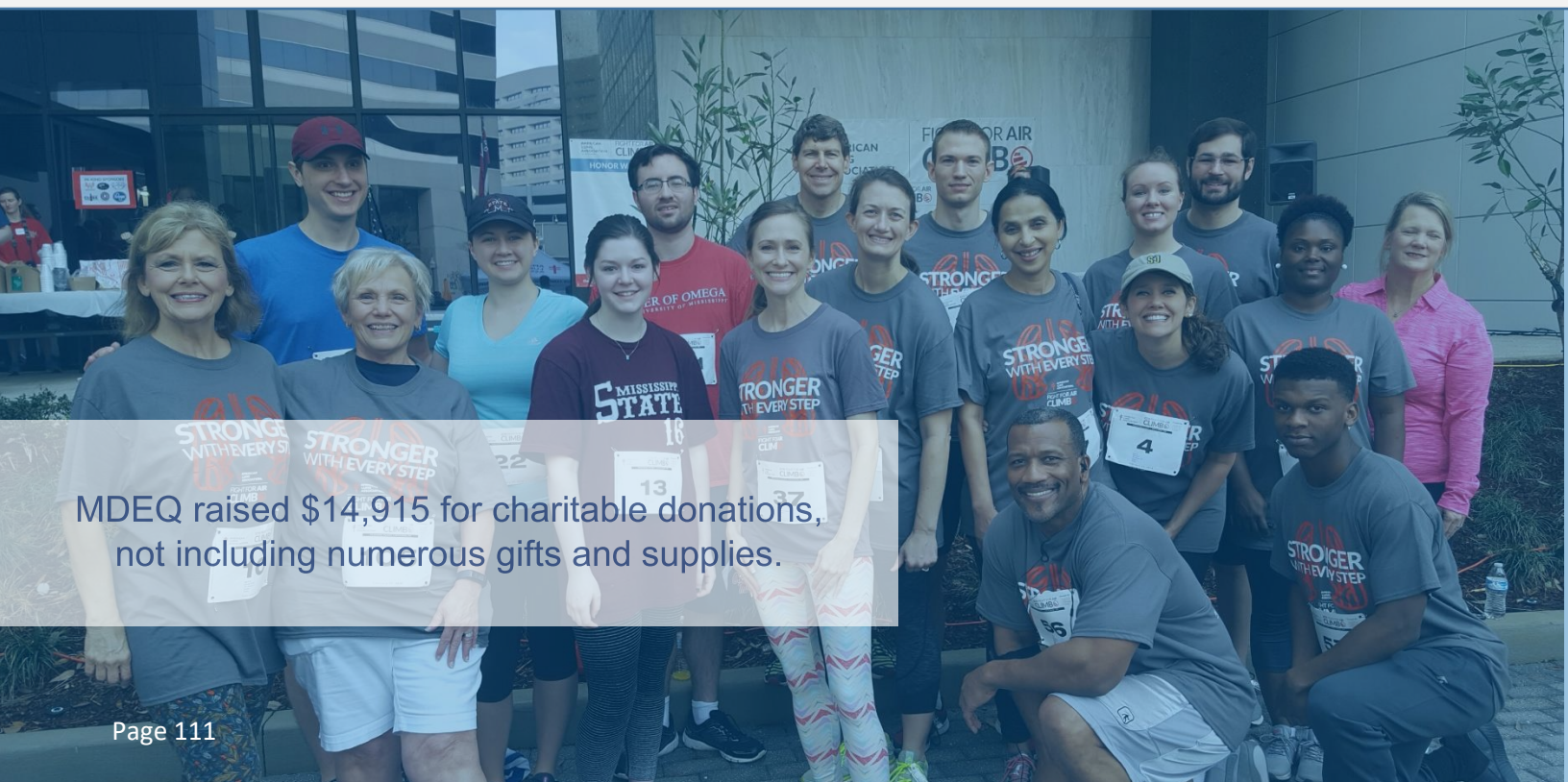


AMERICAN CANCER ASSOCIATION \$ 8,850

AMERICAN LUNG ASSOCIATION – FIGHT FOR AIR CLIMB \$4,084

JACKSON ZOO – MDEQ ADOPTION OF BIG MIKE \$1,981

TOTAL - \$14,915



MDEQ raised \$14,915 for charitable donations, not including numerous gifts and supplies.

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
Jack Winstead



Vice Chairman
John Dane III



Brenda Lathan



W.J. (Billy) Van Devender



Patrick L. Johnson, Jr.



Chat Philips

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
James Hoffman



Vice Chairman
Chris McDonald



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David Dockery



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Les Herrington