

OKLAHOMA

DEPARTMENT OF ENVIRONMENTAL QUALITY

LAND REPORT



2015



DEQ

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First Ever Tribal Led Remediation

Far northeastern Oklahoma has a rich history that includes the childhood home of baseball legend Mickey Mantle, the home of the Quapaw Tribe, and was home to a part of the Tri-State Mining district, at one time the nation's leader in lead and zinc mining. The hard rock mining provided raw materials for two world wars and was an economic engine in the area. Today, the Oklahoma portion of the mining district, Tar Creek, is 35 years into cleanup under the Superfund Program.

Historic mining activities contaminated areas in Ottawa County and polluted Tar Creek so badly it flows red. This site spans more than 40 square miles in northeastern Oklahoma. Those 40 square miles are dotted with mountains of mine tailings, known as chat, that resulted



Before

in numerous cleanups over the past three decades. Work completed includes diverting mine water from streams, residential yard cleanup, and the voluntary relocation of residents at risk from cave-ins. Now that most residents are out of harm's way, the focus on removing the large chat piles began in 2010 to protect rural residents and the water that flows through the land. In 2015, the priority was removal of chat from the watersheds to reduce metals from entering nearby creeks.

In 2013, the Quapaw Tribe assumed the lead role to clean up its culturally significant tribal property known as the Catholic 40. This is the first ever clean-up in Superfund Program



history conducted by a tribe working with the EPA. The Catholic 40, Quapaw Trust land, once housed a Catholic church and a boarding school and has a cemetery. The Quapaw Tribe's goal was to remove mining waste and to preserve this historic and cultural property.

Chat removal on the Catholic 40 is now complete. Approximately 108,000 tons of chat were removed and 15 acres restored. In another first, DEQ is partnering with the Quapaw Tribe, which is working as a cleanup contractor on non-tribal projects at Tar Creek. DEQ is the first state agency in the country to contract with an Indian tribe for Superfund cleanups. This intergovernmental partnership

means that labor is locally sourced. This helps to boost Oklahoma's economy, as well as improve accountability and civic involvement. DEQ and the Quapaw Tribe are working on the cleanup of nine



After

different areas of Tar Creek. The first property addressed under this partnership is directly north of the Catholic 40. Chat removal on this site is now complete. Approximately 83,000 tons of chat was removed and 20 acres restored. The progress the Quapaw Tribe has made has led to interest from other tribes to perform similar work in their communities and may serve as a model for future cleanup opportunities.



Right: Hauling Chat

Chat About Chat in 2015

The gravel-like material, locally known as chat, are the residuals left after processing the ore. Chat has had significant impact on the Tri-State mining area for many years. Chat is known to contain lead, which, if ingested, can lead to serious health risks and developmental issues in children. Large chat piles contaminated with lead also pose a potential health hazard to anyone that climbs them, mainly children and adolescents. Female adolescents may absorb the lead which can potentially be transferred to their fetuses during pregnancy later in life. Significant testing, review, pilot tests and risk analysis of chat in transportation projects led to the federal Chat Rule. This rule provides for the beneficial reuse of chat as aggregate in asphalt and asphalt concrete roads.



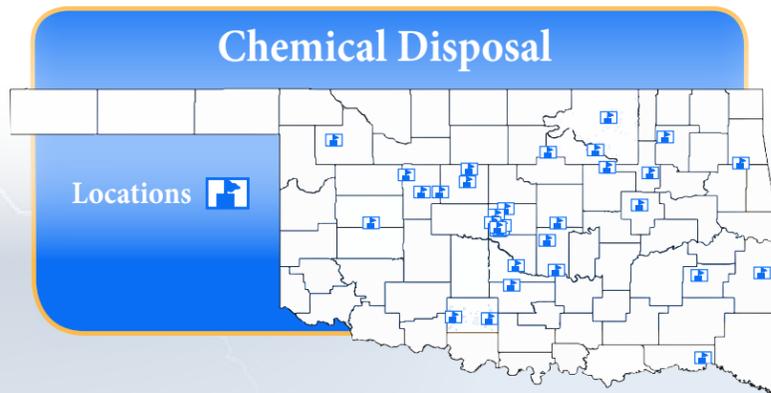
Above: photo and map of the Catholic 40

Improving Response to Emergencies

Oklahomans are no strangers to natural and man-made disasters. Sharing information during emergencies is critical to the response. DEQ collects information on chemicals stored by businesses explicitly to guide local emergency responders across the state. Emergency Responders use this information to plan for and respond when disaster strikes. DEQ maps critical locations such as hazardous chemical sites, solid waste facilities, regional drinking water and wastewater sites, and facilities that have hazardous chemicals.

Mapping software allows responders and emergency planners to pinpoint information specific to their communities. Locations of hospitals, schools, daycares and nursing homes are mapped in relation to chemical storage and other sites.

DEQ provides training to ensure that emergency managers can use this information to respond. DEQ also reaches out to Oklahoma companies required to report hazardous chemicals to make sure data they provide is accurate.



When tornados, floods, and wildfires happen, DEQ uses this information to map the locations with chemical storage. This gives emergency response staff quick ability to assess potential dangers and to

These maps help responders to identify impacted areas and assist in evacuations if needed.

focus on the worst first. In emergencies, information is power and can be the difference between life and death.



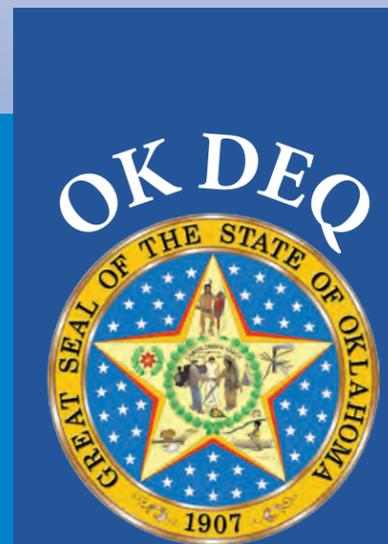
The DEQ Staff Establishes Excellence

DEQ staff works closely with the public. Two staff members were recognized in 2015 for their contributions and expertise. Clifton Hoyle, Environmental Programs Manager, was recently elected chairman of the Oklahoma Hazardous Materials Emergency Response Commission. This commission is the umbrella agency that coordinates emergency response during disasters. In this role, Hoyle facilitates communications regarding hazardous materials and emergency planning between state agencies, first responders, and stakeholders across Oklahoma. This includes

finding valuable resources to provide equipment and training for safety and risk professionals, such as volunteer first responders. "This commission would not be effective without the hard work and dedication of staff from many agencies who work together to protect Oklahomans during and after disasters" said Hoyle. The commission hosts quarterly meetings where the public is welcome, and encouraged, to attend.

Another rising star in the DEQ is Matthew Wormus. In 2015, Matthew Wormus received a

Special Achievement in GIS Award (SAG) from the Environmental Systems Research Institute (ESRI). The award was accepted at the ERSI International Conference in Redlands, CA in July. ESRI President, Jack Dangermond, stated, "They deserve recognition for their invaluable contributions to their communities and the continued evolution of geographic science." Wormus is an asset to the Agency where he assists several Divisions with GIS-related projects. Many of these projects include maps that have been made available for the public.



In the past year, DEQ trained more than 300 emergency responders across the state. In association with other state and federal agencies, DEQ also sponsored six workshops to train local emergency planners.



Electronic Waste Program Benefits Oklahomans

When computers, monitors, tablets, netbooks, and other electronics are improperly disposed, the materials inside can pose a risk to people. Oklahoma is one of 25 states that have laws focused on computer equipment recovery. In our state, disposal of some electronics is the shared responsibility of DEQ, manufacturers, retailers, and consumers.

All registered manufacturers in Oklahoma offer mail-back

programs for citizens. Several companies also offer drop-off locations for consumers. A group of state recyclers collect the discarded electronics and ensure proper disposal or reuse. This effort provides more business, job, and collection opportunities for Oklahoma.

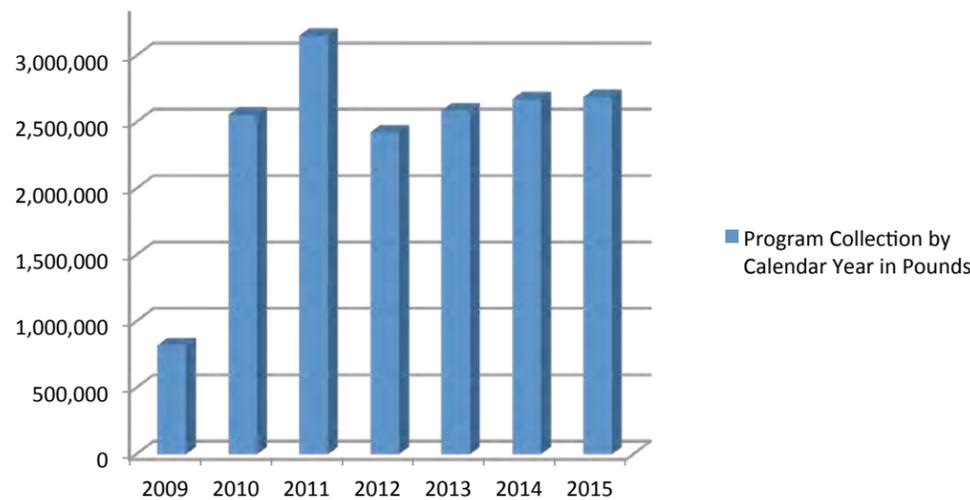
Electronic waste is a rapidly growing waste stream both here and nationwide. When thrown away, electronics end up in valuable landfill space.

Community outreach has increased awareness regarding free disposal options for Oklahomans and many are participating in, and benefiting from, this product stewardship program. Through this outreach, DEQ has been able to quadruple manufacturer participation and triple the collection rate from year one. This increase demonstrates measurable success in providing residents the opportunity to participate in, and contribute to, improving Oklahoma and keeping it clean and safe from the toxic hazards in electronics.

To find out where to take e waste, go to: www.deq.state.ok.us/lpdnew/Ewaste.html

Figure 1:

A Comparison of Oklahoma Collection in Pounds for All Years



Above: A pallet of old monitors

Okmulgee Receives Prestigious Award for Redevelopment Efforts

Okmulgee is a good example of how community partnerships can spur reinvestment, job growth, and bolster economic prosperity. The historical Okmulgee Refinery site was transformed into a productive piece of property that includes a Tractor Supply, Holiday Inn, and Harlan Ford Dealership. Okmulgee was recently recognized with a national Phoenix Award for its work to bring this once contaminated property back to life.

The Phoenix Award recognizes redevelopment projects that show innovation and significantly improve the environmental, economic, and social conditions in the community. Prior to cleanup, the property had numerous environmental challenges that required attention. After 16 years of work, the site is now home to thriving businesses. The cleanup and redevelopment of the former Okmulgee Refinery was a

collaborative effort by DEQ, Okmulgee Area Development Corporation, the City of Okmulgee, Phillips 66, and Muscogee (Creek) Nation.

To learn more about Oklahoma's Brownfields program and what it could do for your community visit:

www.deq.state.ok.us/lpdnew/brownfindex.html

Before



After



Top: Before construction
Middle: Completion of Tractor Supply
Bottom: Completion of Holiday Inn



DEQ Launches School Chemical Disposal Program

Many Oklahoma schools now have a way to safely dispose of laboratory chemicals that are no longer used and can present a threat to students and teachers. DEQ is partnering with schools to provide a free, one-time disposal of chemicals that are outdated, unused, and might be harmful.

Previously, many schools did not have a way to safely dispose of these stored chemicals. In other

states, outdated laboratory chemicals have caused explosions and property damage, totaling hundreds of thousands of dollars in cleanup costs.

DEQ's School Chemical Program assists with safe disposal by picking up the chemicals at no cost to the school. The goal of this program is to create a safer laboratory environment for students, teachers, and other

staff members. Following cleanup of the laboratory chemicals, DEQ's Pollution Prevention Program helps the school develop a chemical hygiene plan and train a hygiene officer so that laboratory chemicals are properly disposed in the future. Thirty-five schools have signed up to participate in the School Chemical Disposal Program. DEQ hopes to work with more schools in the coming year..



Clockwise, from lower left: Moving chemicals from storage for transportation and disposal. Right: Certificate awarded to Pawhuska Public Schools. Lower right: Certificate awarded to Bethany Public Schools.



Collaboration for Club Clean-Up

The former Shawnee Gun Club in Pottawatomie County is slated for a future residential area for the community. Commissioners of the Land Office leased the property to the Shawnee Gun Club, which had two firing ranges. As a result, lead and arsenic were left behind at concentrations that were potentially harmful to the public.

To address the risk, DEQ created a plan to remove hazardous soil and tires that made up barriers at the former business. Bullets and casing fragments were also removed for proper disposal.

More than 600 tires, or eight tons, were removed from the property and taken to one of Oklahoma's

permitted tire recycling facilities. Twelve hundred tons of hazardous soil was removed and properly disposed. The property was leased by the Oklahoma Commission of Land Office. DEQ partnered with that agency and others to make this project a success.



Above: Former Shawnee Gun Club prior to cleanup

Below: Preparing land for fertilization and vegetative mixes.



Below: Former Shawnee Gun Club after removal of impacted soils.



DEQ partnered with several entities to clean up the former Shawnee Gun Club. The Pottawatomie County Commissioners designated routes for trucks hauling away waste. The Pottawatomie County Conservation District suggested vegetative mixes for the area, and the OSU Extension Office provided fertilizer. These partnerships play a vital role in achieving cleanup success across Oklahoma.



Progress Made at Former Refineries

Petroleum production and refining have always been a big part of Oklahoma's economy. Environmental regulations now govern waste management at refineries. Many refineries in operation long ago have since been abandoned, acquired, or sold. Historical operations at these sites left behind environmental hazards that can impact citizens. To address these hazards, DEQ cleans up old refinery sites through DEQ's cleanup programs.

In Cushing, DEQ has worked closely with OXY USA to plan and carry out a cleanup of the former Empire refinery site. Elevated concentrations of hydrocarbons, metals, and dangerous organic compounds found in soil were dug up, hauled off, and properly disposed. Clean soil was trucked in to backfill excavated areas. More than

107,000 tons of pollution was cleaned up at this site. Another site in Cushing that has gone through extensive work is the former Kerr-McGee refinery. DEQ provides oversight of the remaining environmental cleanup. Following ownership transfers and a bankruptcy, a trust was established to resolve any outstanding environmental issues. DEQ continues to work closely with the trustee.

In Bristow, DEQ has hosted community meetings to provide information and get feedback from citizens regarding the Wilcox Superfund site. More than 2,000 residents live within one mile of the property. Some live on the site's former footprint. The Wilcox site is currently in the initial investigation of the Superfund process. During this phase, DEQ is working with EPA to investigate the former

Additional sampling will take place this year at the Oklahoma Refining Company Superfund site or ORC in Cyril. After several completed phases of clean-up over many years of effort, in 2015, DEQ hired a consultant to prepare a design for the cleanup at this abandoned crude oil refinery. The plan includes verifying waste locations and volumes. The overall cleanup strategy will involve removal of contaminated soils, sediments, and other wastes and placement in an on-site repository. The repository will be designed to limit any exposure or migration of wastes and ensure that people are protected. Most refineries in Oklahoma operated long before any environmental regulations. The environmental hazards are related to historical practices that don't happen today.



Above: DEQ samples a pond on the Empire Refinery

KERR/McGEE Cushing Refinery

Left: During operation



Right: After initial cleanup

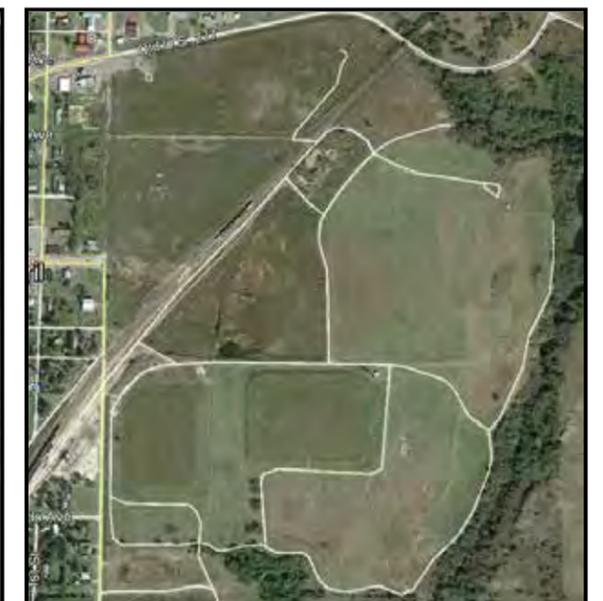


Oklahoma Refining Company in Cyril

Left: ORC in 1995



Right: ORC in 2013



Community Enhancement in The Village Leads to Growth & Prosperity

A 27-acre property in The Village that was once a dilapidated mecca for crime has been transformed into a residential area worth an estimated \$22 million and a community center and clinic estimated to be worth \$7 million. The redevelopment means that the property is once again bringing in tax revenue for The Village.

The area was previously the Vintage Lake Apartments. The property was foreclosed in 2007. After a year with no buyer, The Village began looking into redevelopment options. To move the project forward, asbestos had to be addressed at a cost of \$769,321. Multiple funding sources, including a loan through

DEQ's Brownfields Program, helped with asbestos abatement. Following asbestos abatement, the apartments were demolished. Today, in addition to the community center and clinic, around 100 homes sit on the property. Fifteen more homes are planned for construction soon.



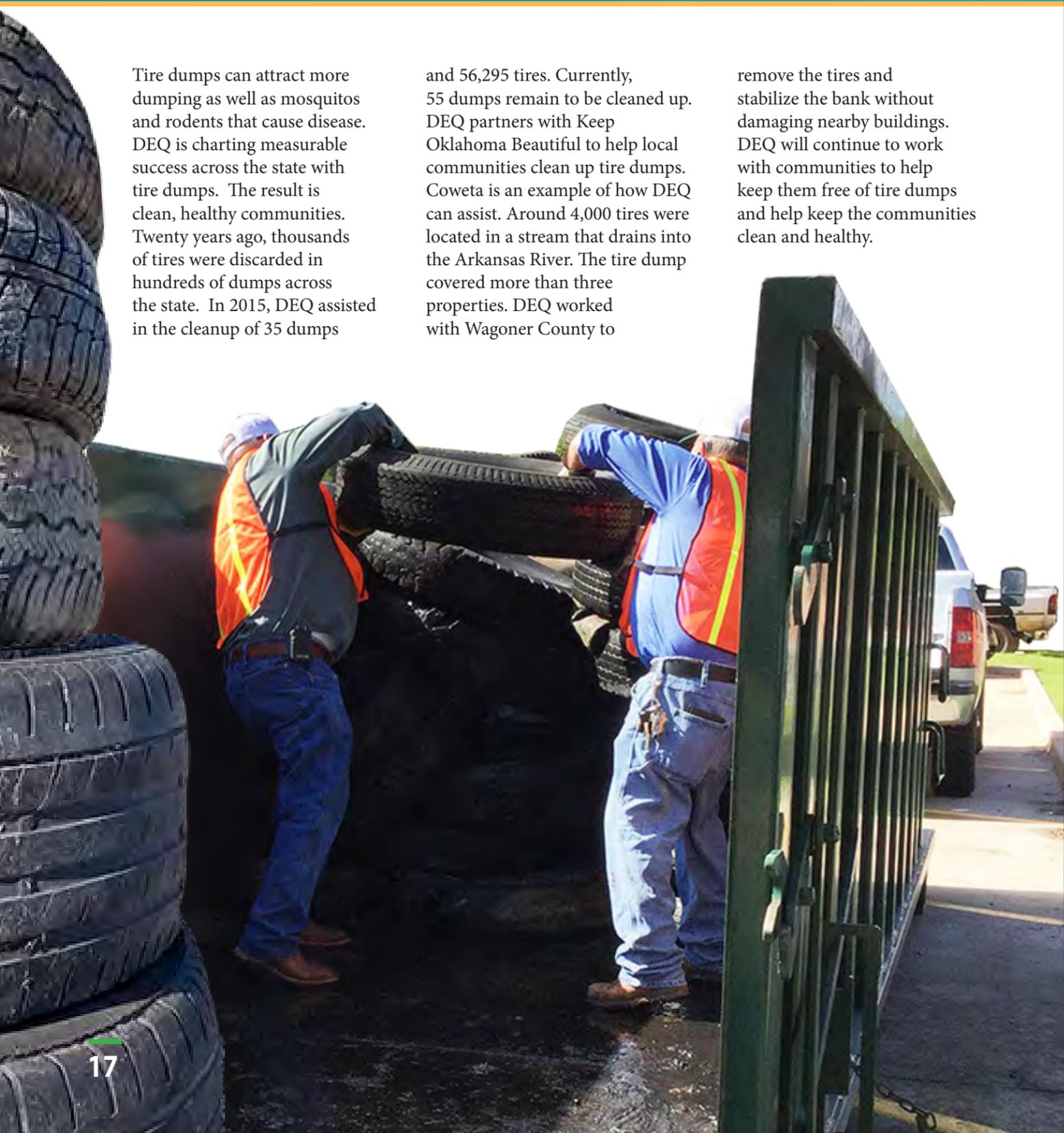
Above: Clinic in the Village
Below: New home in Village

Cleaning up Tire Dumps to Promote Healthier Communities

Tire dumps can attract more dumping as well as mosquitos and rodents that cause disease. DEQ is charting measurable success across the state with tire dumps. The result is clean, healthy communities. Twenty years ago, thousands of tires were discarded in hundreds of dumps across the state. In 2015, DEQ assisted in the cleanup of 35 dumps

and 56,295 tires. Currently, 55 dumps remain to be cleaned up. DEQ partners with Keep Oklahoma Beautiful to help local communities clean up tire dumps. Coweta is an example of how DEQ can assist. Around 4,000 tires were located in a stream that drains into the Arkansas River. The tire dump covered more than three properties. DEQ worked with Wagoner County to

remove the tires and stabilize the bank without damaging nearby buildings. DEQ will continue to work with communities to help keep them free of tire dumps and help keep the communities clean and healthy.



Before

After



Before

After

Above: Coweta tire dumps before and after cleanup

Energy Efforts Not Wasted in Solid Waste

When thinking of landfills and solid waste facilities, images of a trash receptacle may come to mind. While some waste reaches the end of its lifespan at a landfill, several solid waste facilities in the state have made noteworthy progress and advancements in the arena of not wasting waste.

American Environmental Landfill (AEL) in Sand Springs was the first landfill in Oklahoma to collect methane gas and convert it to electricity. The landfill provides this electricity to nearby residents. This same landfill also colonizes more than 100,000 bees with wildflowers that are part of the facility's vegetation plan. AEL takes the harvested honey and provides it to workers, visitors, and customers.

The Oklahoma Environmental Management Authority Landfill in El Reno and WCA Corporation's Sooner Landfill in Wewoka also collect landfill gas and send it to nearby commercial brick corporations. The gas helps maintain the temperatures of brick kilns that produce many of the bricks used in the construction of

homes in Oklahoma and in neighboring states. At Waste Management's East Oak Landfill in Oklahoma City, methane gas is converted into clean burning diesel and high-grade wax that can be used in cosmetics or distilled into other petroleum products. As a result of this effort, a new company was created to manage these products.

Additionally, Covanta partners with the Oklahoma Bureau of Narcotics and the City of Tulsa to safely dispose of outdated or unused prescription drugs. This effort keeps these prescriptions out of landfills and prevents medication from being flushed down the toilet and potentially winding up in waterways.



Above: Colonization of bees, AEL's vegetation plan



Covanta is also involved in a thermostat recycling initiative. The company partnered with Locke Supply, DEQ, and the Product Steward Institute to provide a convenient and responsible way to dispose of thermostats that contain mercury. This prevents potential exposure to a dangerous metal.

These innovations and partnerships in the solid waste industry help communities and citizens across the state.

At Covanta in Tulsa, several energy projects are underway. The company annually converts around 300,000 tons of waste that creates enough energy to power 20,000 homes.



Above: Oklahoma's waste to energy sites
Right: Brick corporation, which uses landfill gas sent by Sooner and Wewoka landfill's



“DEQ is committed to keeping Oklahoma communities clean and safe. The innovative and practical solutions highlighted in these stories demonstrates the diligent efforts and dedication of the Land Protection Division.”

*-Kelly Dixon
Land Protection Division Director*



