

# **Investigation of Migratory Bird Mortality in Arkansas Oil Pits**

**Kevin A. Wood**, *U.S. Fish and Wildlife Service Special Agent, Post Office Building, Room 81, Little Rock, AR 72201*

**Fred W. Harrod, Jr.**, *Enforcement Supervisor Arkansas Game and Fish Commission, P.O. Box 110, Camden, AR 71711*

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*Abstract:* In south Arkansas, the use of open oil pits by the oil industry and the oil, which has escaped into the secondary containment areas, is having a detrimental impact on migratory waterfowl, game species, non-game species, and the surrounding environment. The use of aerial surveillance to visually locate these sites and recording of the sites with a GPS has proven the most effective method for location of problem areas. The formation of a partnership of 5 agencies provided the manpower for the land-based investigative teams and a letter gave the oil producers the knowledge of the investigation and problems thought to exist. The retrieval of migratory birds and game and non-game species during the on site investigative visits gave the U.S. Fish and Wildlife Service the evidence necessary to pursue criminal charges against offending oil producers. The investigation into oil pits and associated Environmental Protection Agency (EPA) clean water violations will be a long-term investigation which will make oil producers aware of the environmental problems associated with this practice. The recent increase in oil prices combined with this investigation should encourage oil producers to close open oil pits which are under their control.

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Oil was discovered in southern Arkansas in the 1920s. Early methods of extraction were primitive, often resulting in oil, sand, and brine water being discharged into the nearest stream with devastating results for the environment. As extraction methods improved, the industry made some advancements in techniques, and the worst environmental abuses were stopped. Even so, byproducts of the industry sometimes still found their way into the environment, chiefly as the result of poor oilfield management, but also because the legacy of past operations still affected the environment in south Arkansas.

In the past, some oil producers would use a pit to store crude oil or extraction byproducts until it could be pumped into a tanker for transport. In order to discourage this practice, new pits now require a permit from the Arkansas Oil and Gas Commission;

however, it has not stopped completely. Many open, oil-covered pits remain from past production located on sites that long since ceased to produce marketable oil.

Current production sites are mandated by state regulation to have secondary containment, which is a berm or levee constructed around the wellhead and tank battery to capture any oil and salt water that might escape due to a leak. Arkansas oil and gas regulations also require that any oil which has escaped into secondary containment be removed within 24 hours of discovery, but compliance is low.

Because oil fields in south Arkansas are nearly depleted, and the quality of the crude oil is so poor, extraction often requires that water or chemicals be injected into the well to ease the flow of oil. When the mixture of oil, water, or chemicals reaches the surface, it usually goes through a heat treater, which is a device used to separate the mixture. The crude oil is then pumped into a tank, and the water goes into a separate tank, or in the case at some sites, an open pit. Sometimes the process is not efficient and oil and water both are discharged from the heat treater. When the mixture goes into the pit, the result is exposed oil. If a leak or break occurs in a pipe, the oil and water mixture can be discharged into secondary containment. The result is a mixture of exposed oil and water, with the oil floating on top. In some instances secondary containment sites have pipes in the berm to allow rain water to escape along with other contaminants.

## **The Problem**

Investigations in other states as well as Arkansas have proven that exposed oil is an extreme hazard to wildlife, especially migratory birds. Birds, especially ducks, have difficulty distinguishing oil pits from ponds or natural wetlands, which can result in the birds becoming entrapped in the oil. Insects often become trapped in the oil and their struggles attract small songbirds and bats, which then become entrapped. Their struggles can attract larger prey such as hawks and owls. If the larger prey does not become trapped, they often collect oil on feathers which is ingested while preening. Ingested oil can be toxic. Other wildlife, such as deer, elk, and antelope have been found dead as a result of becoming trapped in oil pits in western states.

Even though bird carcasses may not be present in a pit, it does not mean that the pit does not kill them. There may be episodes of bird mortality, such as during migration, and other periods of the year when mortality is not as frequent. Carcasses of wildlife generally do not stay on the surface of oil pits very long, sometimes sinking from sight within a week.

Wildlife biologists have estimated that as many as 2 million migratory birds succumb to exposed oil in the more arid western states.

## **Identification of the Problem Techniques**

To identify the extent of the problem with open oil pits in Arkansas, Special Agent Gary Mowad with the U.S. Fish and Wildlife Service, Division of Law Enforcement, was recruited to visit Arkansas. Mowad has a wealth of experience dealing with oil pits in the western states. As part of his previous investigative effort,

Mowad formed a partnership with the Environmental Protection Agency (EPA), Region 6, in Denver, Colorado. As part of this agreement, EPA paid for the aircraft used in the Arkansas effort, as well as travel and lodging expenses for Mowad.

In May 1999, an aerial reconnaissance was conducted in 8 counties in south Arkansas where oil production is known to occur. The aircraft used was a Cessna 182, which was equipped with 2 portable Global Positioning System (GPS) receivers, 1 each for the pilot and co-pilot/observer. One of the GPS units was used exclusively to record coordinates of the oil pits observed. The other GPS unit had the capability of displaying a scrolling map screen, and this unit was used in conjunction with maps to locate known oil fields. Oil fields had been previously identified from county maps published by the Arkansas Highway Department. The approximate location and coordinates of each field were transferred to an Arkansas aeronautical chart to aid in navigation. Because of the amount and density of the vegetation in the survey area, the flight was conducted at approximately 1,000 feet above ground level to give the observers a better view of the terrain below.

When exposed oil was observed from the air, the pilot/observer would log the coordinates in the GPS, which expressed the way points in numerical order. To aid with future ground investigation, the co-pilot/observer wrote a brief description of the numbered site, including such information as whether the site was an oil pit or oil in secondary containment, the number and color of storage tanks, proximity to and compass bearing from the nearest town or other easily recognizable landmarks, and the approximate size of the pit. A tape recorder was available to record this information, but because of the number and frequency in which oil pits were encountered, the recorder was not used on the initial flight. Turbulence rendered some of the handwritten notes nearly unreadable, therefore another observer will be considered in future efforts so that both notes (in case the recorder fails) and a tape recording can be obtained. Because the GPS units used had selective availability (introduced error), coupled with the speed of the aircraft and the height above the target, it was later found that the coordinates which were recorded could be as much as 0.2 miles or more off target. However, for the most part, the coordinates recorded enabled investigators to locate the site with ease.

In approximately 10 flying hours, a total of 95 sites with either oil in secondary containment, or oil in pits was noted by the observers. Some of the pits were extremely small, but many were large, and some appeared to cover an acre in size. It was also noted during the flight that some oil fields were totally free of any obvious oil either in pits or secondary containment. It was apparent that producers in some oil fields were extremely good managers, and had closed pits sometime in the past.

When the aerial observation was complete, the way points were downloaded from the GPS unit into a computer and printed.

## **Partnerships**

In an effort to reduce the loss of wildlife to exposed oil in Arkansas, a partnership was formed between the U.S. Fish and Wildlife Service (USFWS)/Divisions of

Law Enforcement (AGFC/LE), the Environmental Protection Agency (EPA) Hazardous Waste and Oil Pollution Act Branches, the Arkansas Oil and Gas Commission (AOGC), and the Arkansas Department of Environmental Quality (ADEQ). This group met in El Dorado, Arkansas, in June 1999 and agreed to a cooperative strategy to reduce the hazard posed by the oil pits. This partnership of agencies recognized that oil pits were a problem of long standing, and that it was not practical to expect that problem pits were a problem of long standing, and that it was not practical to expect that problem pits could be eliminated in a short time. The group also recognized that prior efforts to mitigate or repair past environmental damage had been undertaken and had met with some success and support from the industry. It was also noted that ADEQ had ordered the closure of all pits in the 100-year flood plain by 1997.

The EPA utilized Global Information System (GIS) software to produce a map of the 8 counties which incorporated the way points of oil observed from the air, and their relationship to towns and other landmarks. This map later proved very valuable to investigators who were searching for oil pits identified in the flight.

The U.S. Attorney for the Western District of Arkansas was advised of the pending investigation, pledged full support, and assigned the investigation to the Environmental Crimes Task Force attorney. The Chief of Staff for the Congressman who represents the District in which this investigation was to take place was briefed twice. The first briefing was by telephone, with supporting materials faxed to his office. The second briefing took place in person and was supported by video taken of the actual effect of birds trapped in open oil pits in Arkansas.

In June 1999 a letter was prepared by the USFWS which explained the problem of exposed oil. This letter also advised that the partnership would be investigating oil pits in the near future to determine their effects on wildlife, and it encouraged oil producers to contact one of the partner agencies for information on how to eliminate the hazard of oil pits. AOGC mailed the letter to over 300 producers of record in the state of Arkansas. Although the letter was not sent certified mail, any such future mailings will be sent certified mail so that receipt of the letter can be documented for evidentiary purposes. The partnership agreed to wait at least 60 days after the letter was mailed before any investigation was conducted. This was done to give producers a chance to make inquiries, and to close or cover their pits. The letter also mitigated any subsequent defense by a defendant claiming ignorance that open oil pits killed wildlife.

### **Initial Investigation Techniques**

In early October 1999, an investigation into the mortality of wildlife in open oil pits was conducted by representatives of the agencies.

U.S. Fish and Wildlife Service agents, Arkansas Game and Fish Officers, and inspectors from the Oil and Gas Commission and Department of Environmental Quality divided into 4 teams. Each team was given a list of sites grouped in close proximity to each other, and the coordinates of those sites. Each team was equipped with a hand held GPS receiver, most of which were a Garmin model 12 XL. The teams were also given copies of the GIS generated maps mentioned earlier.

Each team was also equipped with a 35mm still camera and an 8mm video camera to photograph evidence. The video cameras proved especially important in graphically showing the hazard of oil pits to wildlife. Two of the teams also carried a digital camera.

In order to recover bird carcasses, each team was equipped with a 16-foot extendable paint pole. A paint roller was modified slightly to hold a spoon or ladle by using hose clamps to secure the spoon to the paint roller. Since the modified paint roller could be screwed onto the end of the pole, this allowed the spoon to be removed and stored in a plastic bag after evidence recovery when the roller was covered with oil. Each team was also provided with a number of plastic freezer bags of varying capacity and large trash bags. These were used to store evidence recovered from each site. Bird carcasses were double or triple bagged. The teams were also provided with a number of surgical gloves and heavier "dishwashing" gloves, goggles, face masks, hand cleaner, and alcohol-based disposable paper hand wipes.

Crude oil can contain heavy metals, as well as chemicals such as benzene, which are known carcinogens. In addition, the pits are likely sites for disposal of chemical wastes not normally associated with crude oil production, so every effort was taken to ensure that investigators did not come into direct contact with the oil. Hydrogen sulfide (H<sub>2</sub>S) gas is also occasionally a byproduct of oil production. This gas can be fatal if inhaled in any quantity. A few fields in south Arkansas are known to produce H<sub>2</sub>S gas, and these fields are clearly marked with warning placards. Sites with known H<sub>2</sub>S gas production were identified by AOGC inspectors and given a wide berth by the investigators. A safety briefing was conducted prior to actual field activities alerting all participants to the potential hazard. Each team carried a cell phone and was given the telephone numbers of the nearest hospitals.

Each team was assigned coordinates for roughly 25 sites to locate and investigate. It was found that teams could locate and investigate about 10 sites per day on this initial effort. Subsequent efforts to find the same sites should progress at a faster rate, due to the experience and familiarity of the investigators with the process and the geography.

## **Results**

*Of the 95 possible sites identified in the May flight, investigators actually found 63 sites which had oil in pits or secondary containment. The investigators were able to determine that 13 sites had been closed, either by filling in the pit or skimming exposed oil. It is hoped these sites were closed in response to the letter sent in June 1999.*

A total of 19 sites were not located, possibly due to the fact that the pits had been closed or oil in secondary containment has been removed. It is also possible that the coordinates obtained from the air were not reliable, and the site could not be found with the available information.

Of the 63 total sites found with exposed oil, 19 of the sites, or 30% of the total sites found, contained migratory birds. Two of the sites had wood ducks which were still alive and were found struggling in the oil. It should be noted that many sites had

bat carcasses on the surface. It is suspected that the bats were attracted by insects trapped in the oil. Although no endangered bats are known to inhabit south Arkansas, it should be noted that oil pits appear to be especially attractive to bats.

In order to document migratory bird mortality, investigators took both still and video pictures of the sites with birds and of birds in the site. When possible, the bird carcasses were retrieved with the extendable paint pole, and triple bagged in progressively larger freezer bags. An evidence seizure tag identifying the site number, and the number and species of birds, was placed inside the last bag and the tag was arranged so that the face of the evidence tag could be viewed through the bag. Multiple birds in 1 site required the use of item tags. These tags reflected the original evidence tag number for that site and specified which item number was inside the bag. All this evidence was then placed inside of a trash bag with the evidence tag tied on the outside.

Investigators also completed a form which included such information as the actual coordinates of the pit obtained on the site, the producer of record, if known, the number of birds present, evidence seizure tag assigned to the site, and whether the site was discharging oil into the environment through a leak or overflow.

Some oil pits were so large that bird carcasses could not be retrieved with the paint poles. Through prior agreement with the U.S. Attorney, photographs of such birds were taken, and birds that were not retrieved were included in subsequent criminal charges.

Exposed 35mm film was turned over to the case agent for development. It is recommended that only 12 exposure rolls be used to record still photographs. (In any event, it is strongly recommended that only one site be photographed per roll. Photographs of more than 1 site on a roll makes tracking evidence photographs very difficult.) Videos were duplicated, and the original was kept in possession of the investigator who took the video.

A chain of custody form was completed for all evidence turned over to the case agent. A second effort to document migratory bird mortality was undertaken in February 2000. During this detail, agents with the USFW team along with officers from the AGFC visited 55 sites. Of the 55 sites, 11 were new sites that were observed by the USFW using a fixed wing aircraft.

A total of 40 birds were actually collected from 15 sites. An additional 50 plus birds, that could not be recovered were observed dead in the oil pits. Numerous bats, 1 rabbit, 1 opossum, and 1 unknown animal, possibly a dog or a small deer, were also observed.

It was also noted during the February effort that some producers were making an effort to remove or hide bird carcasses. Evidence was found which indicated that some producers were removing birds from the pits. And in one instance, someone had cut nearby trees so that they fell on bird carcasses, and cut limbs and threw them over carcasses in an attempt to thwart recovery efforts. It is also noted that at least 3 sites had been closed by filling with dirt.

Observers in the USFW aircraft also located a significant oil spill in February, which was investigated by the team. As required by law, this spill was reported to the EPA National Response Center for action. Approximately 15 minutes after spill was

reported by investigators, the same spill was also reported by the oil company. It might be just a coincidence that oil field workers were questioned about the spill prior to the report being filed by both the investigators and the oil company.

The spill was reported by the company as about 10 barrels. It was actually estimated by EPA at about 100 barrels, and it was obvious from evidence at the scene that the spill had taken place some weeks before discovery. Since the spill was in a creek, it is suspected that the company planned to wait on a big rain to wash the evidence away from their site. EPA dispatched an "on scene coordinator" to monitor clean up efforts by the company, and the company faces substantial civil penalties for the violations.

## **The Law**

The Migratory Bird Treaty Act (16 USC 703–711) prohibits the unauthorized take of migratory birds. Although the MBTA was recently amended to require that the government prove a hunter had knowledge that bait was present, the amendment did not change the "strict liability" portion of the other parts of the act. The government is *not required to prove that an oil producer knew that exposed oil from production was taking migratory birds*. The Act makes it "unlawful at any time, by any means or manner, to pursue, hunt, take, capture, or kill" migratory birds protected by the Act. Although the take alleged in this investigation is not a "kill" as is normally associated with hunting violations, it is still a "take" as defined in the regulations. Case law (*U.S. v FMC Corp.* 572 F. 2d 902) supports charges in the event of such a take.

Such a take of migratory birds as alleged in this investigation is a Class B misdemeanor, punishable by a fine of \$15,000 and/or 6 months imprisonment as specified in the recently amended statute. Most Federal Judicial Districts have a forfeiture of collateral system (similar to a bond schedule) for misdemeanor violations. In the Western District of Arkansas, a violation of the Migratory Bird Treaty Act carries a forfeiture amount of \$250 per bird. Each bird killed in an exposed oil pit is charged as a separate and distinct violation, so a corporation with a pit that kills 4 birds could be charged a collateral amount of \$1,000. Defendants have the option of paying the collateral amount by mail without appearing in court.

Of the 19 sites which produced evidence of migratory bird mortality, only 9 were in production or could be tied to an identifiable oil producer. AOGC regulations require that active production sites must have a placard with the name and telephone number of the producer, and that storage tanks be marked with a number unique to the producer. AOGC was able to provide a mailing address for some producers where the placard was lacking or incomplete. A Notice of Violation charging the unauthorized take of migratory birds was mailed to each of the 9 oil producers with fine amounts dependant on the number of birds in each pit.

One oil producer indicated a desire for a trial. By prior agreement with the U.S. Attorney, no forensic examination of the evidence was required before charges were filed. When it became evident that a defendant desired a hearing, the bird carcasses were shipped to the National Fish and Wildlife Forensics lab in Ashland, Oregon, for identification and a determination as to cause of death, if possible.

## **The Objective**

Oil pits have been a problem of long standing in south Arkansas, and this investigation is not expected to solve the environmental problems associated with exposed oil in a short time. However, it is anticipated that this action will make oil producers more aware of the hazards associated with exposed oil. With the increase in crude oil prices, it should be financially possible for active producers to close pits under their control, even if the pits are no longer in active use.

It will likely be much more difficult to identify the responsible party for sites that have exposed oil but are no longer in production. The current owner of the site may never have owned the mineral rights, and should not be held responsible for the environmental damage that remains.

Mineral rights may have been purchased by a corporation that is no longer in business, and subsequently leased by a corporation that is no longer in business. An investigation in to the responsible party for such sites will require a thorough search of the title to the property, and a determination made as to the owner of mineral rights or leases. Such an investigation has not yet been initiated for sites that are no longer in production.

## **Associated Laws**

### **Clean Water Act (33 USC 1344)**

Investigators found 19 sites which appeared to be in violation of or had at some time in the past been in violation of the Clean Water Act. The Clean Water Act prohibits the discharge of certain materials into the waters of the United States. EPA often delegates responsibility for enforcement of the Act to the states, and in Arkansas this responsibility lies with the Arkansas Department of Environmental Quality. The offending sites were referred to both ADEQ and EPA.

### **Resource Conservation and Recovery Act (42 USEC 6973)**

The Resource Conservation and Recovery Act provides EPA with enforcement tools which can be used to alleviate conditions that may present an imminent and substantial endangerment to health or the environment. This Act allows EPA to address sites where solid or hazardous waste may present such an endangerment. The Federal Courts have held that EPA need not prove actual harm to the environment, but only that the potential exists for harm. EPA was alerted to several sites that might be in violation of the Resource Conservation and Recovery Act.

### **Oil Pollution Act (33 USC 2701)**

The Oil Pollution Act gives the U.S. Fish and Wildlife Service authority to make a natural resource damage assessment for natural resources which may have been affected as a result of oil production. This Act provides for restoration of the environment, to be paid by the party responsible for the damage to the environment. If a responsible party cannot be identified, the Oil Pollution Act provides some funds



for the actual restoration of natural resources. Some oil fields in south Arkansas, in particular what is known as the Smackover field, are candidates for a natural resource damage assessment.

## **Summary**

The hazards and effects that the practice of using open oil pits and secondary oil in containment areas which leak into the environment is having on migratory birds and other wildlife species have been documented during this investigation. The U.S. Fish and Wildlife Service Special Agents, assisted by the Arkansas Game and Fish Enforcement Division Wildlife Officers in conjunction with the other partnership agencies will continue to document oil pit related problems. These agencies will continue to educate the oil producers and to find solutions to avoid potential future conflicts. Criminal charges will be pursued against the oil producers whose practices are proven to be detrimental to wildlife and the environment in south Arkansas.