

NARRATIVE DESCRIPTION OF TTR UREA INCIDENT

The following narrative, arranged in the following sequence: A) The Incident; B) Background on Urea Use; C) Hopper Rinsing; D) Incident Discovery and Notification; and E) Amelioration; presents the known facts relevant to the Urea Hopper Truck Rinsing incident.

A. The Incident

Between November 3 and November 5, 1988, 61 horses died in an area north and east of the construction sump and fill stand located on the east side of the industrial area at TTR. Results from autopsies performed by a BLM veterinarian revealed that the horses died due to ammonia toxicity. The ammonia toxicity was caused by the horses drinking water pooled on the ground resulting from the washing of urea out of a truck which contained approximately 4,000 pounds of granular urea, which is used as a de-icer.

B. Background on Urea Use

Granular urea has been used as a de-icing agent at TTR for many years. The material has been purchased through the user organization's channels and delivered to REECO by common carrier. The urea is purchased as GSA Stock Number 6810-00-782-6521, and has been provided by several different manufacturers. Material Safety Data Sheets (MSDS) for urea have never been supplied by the manufacturer, nor requested by REECO or the user. The unused bags have most recently been stored in the REECO Nine Acre Yard, but were previously stored inside the user's restricted area.

Vehicle No. 80C-180 is a truck-mounted hopper with spreader box which is used to spread a layer of granular urea. As of November 2, 1988 this vehicle had been idle for over a year with a tarp spread over the hopper. According to Jim Long, REECO Superintendent, the hopper was filled to within about eight inches of the top, which by calculation would amount to approximately 4,000 pounds of urea in the hopper. Long had just been assigned to the position three days prior to the incident. The responsibility for cleaning the urea spreader truck was a part of his new job.

C. Hopper Rinsing

On the afternoon of November 2, 1988, a meeting was held in Building 235, Transportation Office, to determine how best to clean the truck and get it ready for use. The following people were at this meeting: Jim Long; William R. Hurlburt, Teamster Foreman; Larry Mason, Transportation Superintendent; John Loper, Fleet Maintenance Superintendent; John Hull, Transportation Maintenance Superintendent; Al Rosa, Heavy Duty Repair General Foreman; and S. R. Crouch, Project Manager, Operations & Maintenance (O&M). Hurlburt suggested taking the truck to the landfill and emptying out the urea there, but Mason and Hull both said the quickest method was to rinse out the hopper with water. Because urea was hydroscopic, there was also a fear that

the material would be hard and the conveyer and motor might be damaged by trying to spread the material. A decision was then agreed upon to wash out the hopper, thereby dissolving the urea.

At 1500 hours, Jim Long contacted Stewart Smith, REECo Environmental Health Sanitarian, and informed him of their intent to rinse out the hopper. Smith first suggested that the urea be spread out in the desert, but when informed by Long that they did not want to operate the spreader, he recommended that rinsing should be done at the dumpster washdown pad, Facility No. 8024. There the rinse water would flow through an oil-water separator and into the sewage lagoon. Long instructed Hurlburt to proceed with rinsing out the hopper, but to check with the sanitarians prior to washing the truck.

At 1530 hours, Hurlburt informed Smith that Crouch had told him to take the truck to the construction sump east of the industrial area to wash it out. Smith agreed to that, but recommended that large amounts of water be used to dilute the resulting solution. The rinse water was then to flow onto the desert floor and percolate into the soil. Crouch later confirmed that he had instructed Hurlburt to wash out the hopper, but doubted that he had specifically said to use the fill stand at the east construction sump.

Hurlburt and one of his drivers, Harry Whipperman, drove the hopper truck to the construction sump at about 1600 hours and rinsed the hopper out for 8-10 minutes. They then pulled the truck forward and let the water run for an additional 8-10 minutes to dilute the rinse water and wash the area under where the truck has been. Both men observed the water flowing away from the fill stand toward the desert in an easterly direction, but saw no horses drinking in the immediate area. Neither man was aware of any trenches or ponds in which the water might be collecting.

D. Incident Discovery and Notification

On November 3, 1988, at approximately 0650 hours, Long observed a dead horse on the west side of Moody Road, about 1/2 mile north of a storage area access road. A Nye County Deputy Sheriff had also stopped to investigate the dead horse. Long was requested by the Sheriff's Office to remove the dead horse.

At 0815 hours, the Sheriff's Office called ASI and requested that they investigate the dead horse. By 0900 hours, REECo personnel, ASI guards, and Sheriff's deputies had located several more dead horses in the area.

At 0904 hours, Major Zimmerman (ASI) notified the BLM offices in Caliente and Tonopah. These offices then contacted the BLM District Office in Las Vegas. A BLM Wild Horse and Burro Specialist, Bob Stager, along with a Veterinarian, Alan Ruegamer, and his assistant flew from Las Vegas to Tonopah Airport and arrived at TTR about 1400 hours. These three men proceeded to tour the area, autopsy two horses, and collect water samples.

A 0925 hours, Zelinda Wharff, Senior Staff Assistant TTR Department telephoned Mary Ely, Principal Staff Assistant for Vince Gong, Special Services Division Manager, and advised her to inform Gong and the Executive Office that there was a problem at TTR involving 9-19 head horses, the cause of which was unsure, and that Wendell Marrs was investigating.

At 1030 hours, Mary Ely called back to Wharff and instructed her that Gong wanted to be sure the DOE/TTR personnel had been notified. Wharff went to the office of Bob Tyrell, DOE/TTR Site Manager, and told him what she knew at that time. Someone else had already talked to Tyrell, and Wharff's impression was that he knew as much about the incident as she did.

E. Amelioration

Shortly after 0800 hours on November 3, Long went to the fill stand where the urea had been dissolved the previous day. Here he found horses drinking from an improvised watering area which he assumed had been dug with a front-end loader. This "watering hole" was about 25 feet wide by 30 feet long, and contained about 18 inches of water. The hole was located east of the fill stand, where water ran into the desert. Fearing that this might be the cause of the horses dying, he diverted a front-end loader which he had dispatched to collect the first dead horse. He instructed the front-end loader driver to fill the watering hole with dirt. They also made an unsuccessful attempt to chase the horses away from the water. Long also directed his foreman to turn on the pump at the fill stand in order to dilute the remaining standing water.

At 0930 hours, Marrs and Ray Peradotti, Project Manager, arrived at the scene and observed the fill stand pump operating. Not knowing if this extra water was complicating the problem, and not wanting the water to spread any farther, Marrs ordered the pump turned off. He also instructed that the front-end loader and a Huber blade be used to contain the water to prevent further spreading. By 1030 hours, the water was contained and the heavy equipment operators began to push soil into the water to eliminate standing pools.

Between 0945 hours and 1200 hours, Environmental Health Division personnel collected water samples (in 4 oz. bottles) from the sump and standing pools of water. Samples were also collected by user representatives, and later in the day REECO personnel gave a portion of the samples which they had collected to the BLM representatives.

At about 1240 hours, Marrs, Crouch, and Al Delgado of the DOE decided to pump water onto the ground from Well 3A, located about two miles to the north. It was hoped that this new water source would draw the horses away from the construction sump. Later that day, at about 1530 hours, Marrs requested Dave Ashe, Project Manager, to make water available to the horses at two other construction sumps at Wells EH1 and EH2.

At 1300 hours, Barry McNeill, Industrial Hygienist, who had been made the REECO point of contact by Marrs, began to collect information from Long regarding the spreader truck wash down. McNeill later met with ASI and BLM personnel and accompanied them on their inspection of the area. Sandia photographers were also taking pictures to document the scene and autopsies.

By 1630 hours, the BLM had completed their autopsies and directed REECO to bury the two animals at the nearby sanitary landfill.

From 1710 hours until 1730 hours, the equipment operators covered as much of the remaining standing water as possible that was around the construction sump.

The next morning (Friday) November 4, at 0720 hours, Joe DeHart, TTR Department Manager, and Vince Gong, were briefed as to previous activities and taken out to inspect the construction sump area.

At 0900 hours, a meeting was held in Delgado's office with REECO, ASI, and Sandia representatives. Information was presented that nine additional horses had died during the night. It was decided to bury the animals in place with at least two feet of overburden. Graves would be marked with a red flag and ASI would prepare a map locating the grave sites. Crouch was directed to have a "Goldak" survey performed to identify any buried utilities or hardware.

At 1030 hours, Environmental Health Division personnel collected additional water samples from and around the construction sump and began preparing samples collected for shipment to the Nevada Test Site and the State's Las Vegas Bacteriological Laboratories.

At 1215 hours, information was received by REECO that ASI had been directed by the BLM not to bury any animals that expired after Friday morning.

Friday afternoon at 1600 hours, DOE/NV representatives Curtis Watson and Don Boyce met with the user, REECO and ASI representatives at the construction sump. DOE requested that more samples, at distances of 10 and 100 feet away from the construction sump, be collected and held in a refrigerator by REECO Environmental Health. Watson also requested REECO procedures for filling water trucks, cleaning a urea spreading truck, and disposing of urea. User representative Messett requested that the earth east of the construction sump be blended using a windrowing method to further dilute any residual urea on the soil surface. This operation began the following morning, November 5 (Saturday).

On the morning of November 5, the windrowing operation began, the burial detail was continued, and two additional dead horses were found. Additional water and soil samples were collected from under the sump supply line tee on the west side of the fill stand. At 1030 hours, Bob Tyrell requested REECO to allow additional water to flow onto the desert floor at Well 3A for horse consumption. The well remained on until about 1600 hours. Horses were seen migrating south toward Cactus Spring.

At 1145 hours, Smith was instructed by Wendell Marrs to collect water samples on Monday, November 7, from Wells 3A, EH1, and EH2.

The BLM veterinarian arrived back at TTR at 1545 hours to examine the two horses found dead that morning. By 1800 hours, all horses had been buried, including the last two examined by the BLM veterinarian.

The BLM submitted a report to parties involved on November 8, which fixed the cause of death as ammonia toxicity, and stated that over population of the horses as well as a lessened fear of man had contributed to the problem.

No additional dead horses were found after Saturday morning, and on Tuesday, November 8, 3-6 inches of rock aggregate were spread over the ground where the major pools of water had been and the soil had been mixed. This completed the amelioration actions.