

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.

At 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.

November 15, 1988

REECO
P.O. Box 98521
Las Vegas, Nevada 89193

Attn: Fred Shelly

REFERENCE DATA:

Analysis Requested: GC/MS Scan
DataChem Reference Number: S88-0719
Sample Type: Water
Date Received: November 7, 1988
Date Analyzed: November 11, 1988
Sample(s): 4 Analyses: 4

Sample Numbers:	Field Number	DataChem Number
	4	EH 3217
	5	EH 3218
	6	EH 3219
	15	EH 3220

ANALYTICAL PROCEDURE:

Ten ml of each sample were extracted with 1ml of Carbon disulfide containing D10-ethyl benzene for internal standard. Shook for a minute and let the extracts stand for 5 minutes. Extracts were dried with anhydrous sodium sulfite. The extracts were injected into an HP 5985B GC/MS in order to identify any volatile or semi-volatile organics. The following conditions were used in the analysis.

GAS CHROMATOGRAPH

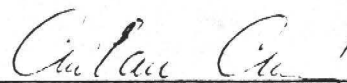
Injection mode: 4.ul splitless
GC column: 25m x 0.32mm i.d. DB-5 capillary column, with a 1.0um thick phase.
Carrier gas: Helium at a head pressure of 10 p.s.i.
GC oven temperature: 50°C for one minute, heating to 320°C at 10°C/minute.
GC/MS interface: Direct coupled to MS source.

MASS SPECTROMETER:

Scanning: 17-417 AMU at 400 AMU/second
Ionization mode: Electron impact at 70 eV

RESULTS AND DISCUSSION:

Figures 1, 2, 3, and 4. show the reconstructed ion chromatograms for samples EH 3217 through EH 3220. Limit of detection (LOD) for this method was 1ug/ml. Nothing was detected greater than LOD.



Milan Mraz
Analytical Chemist
Special Measurements

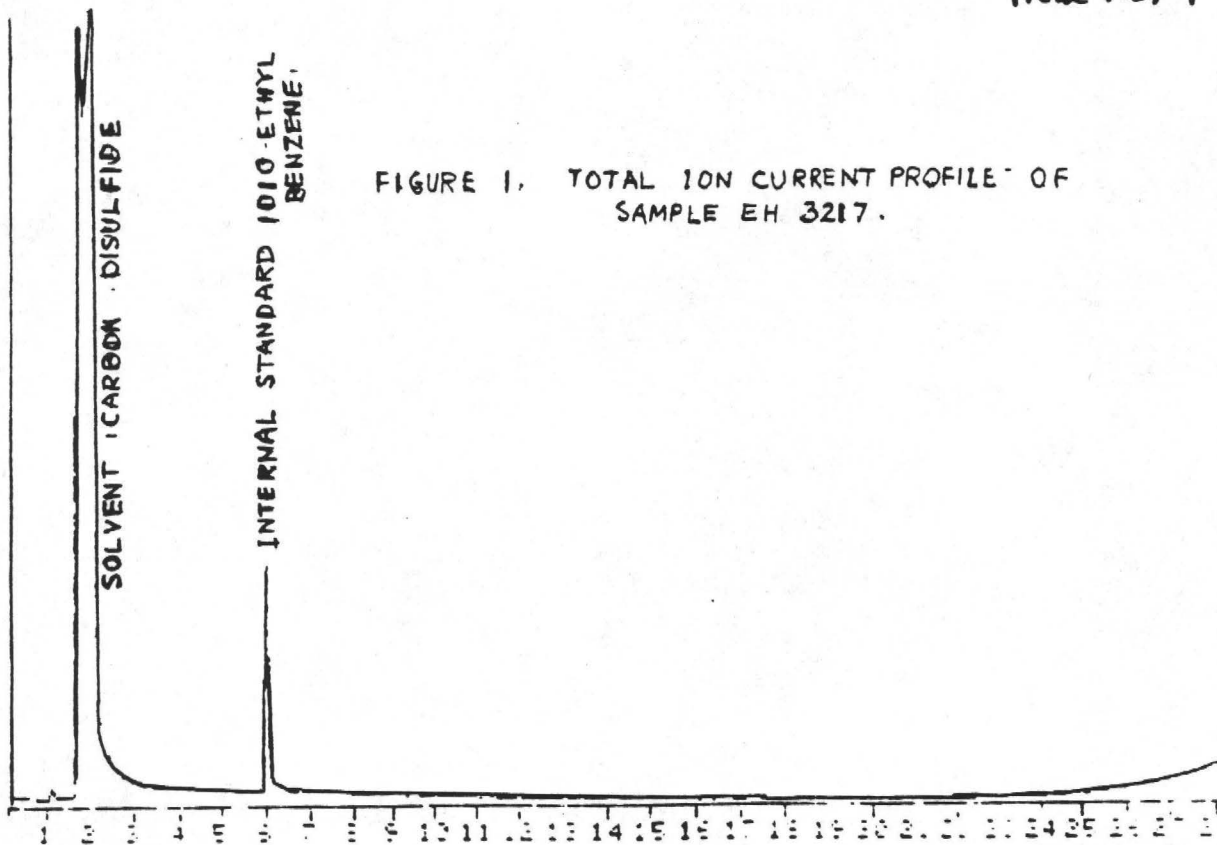


FIGURE 1. TOTAL ION CURRENT PROFILE OF SAMPLE EH 3217.

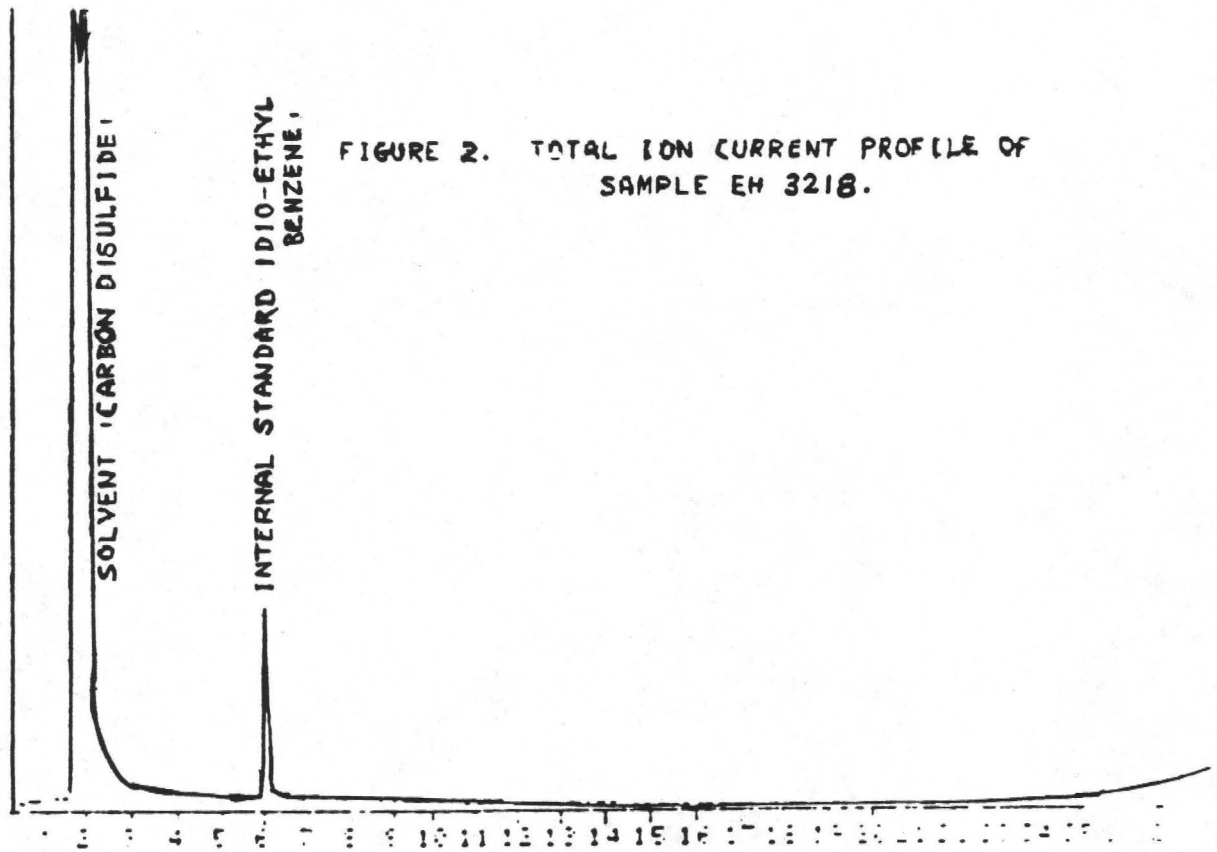


FIGURE 2. TOTAL ION CURRENT PROFILE OF SAMPLE EH 3218.

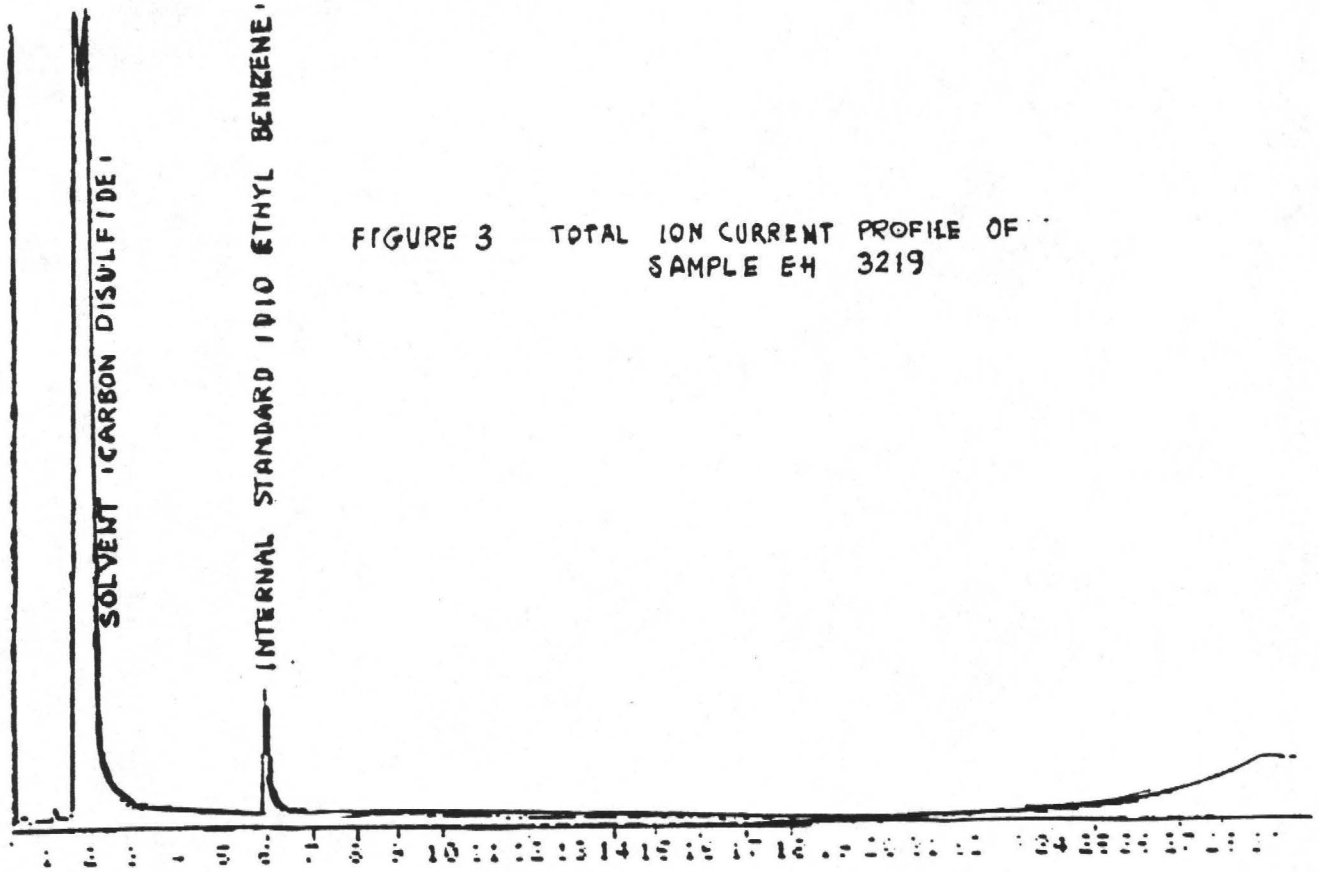


FIGURE 3 TOTAL ION CURRENT PROFILE OF SAMPLE EH 3219

11-11-80

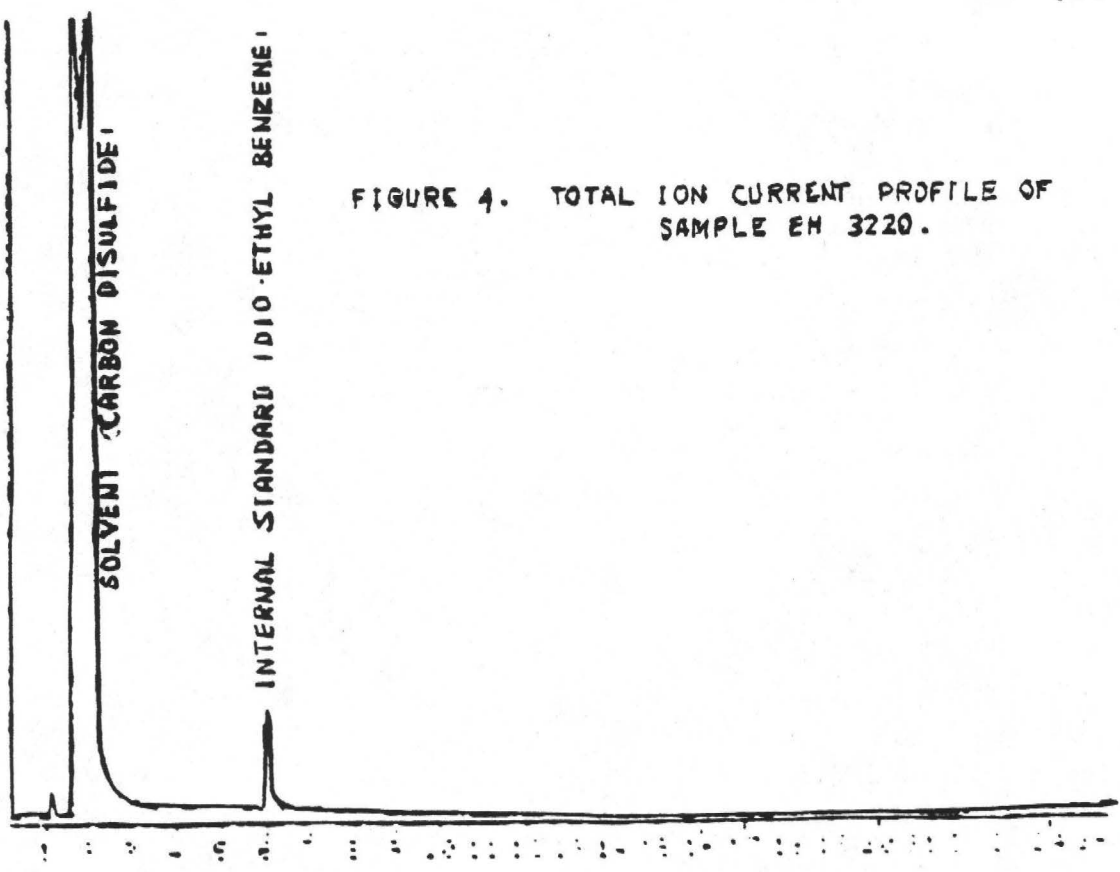


FIGURE 4. TOTAL ION CURRENT PROFILE OF SAMPLE EH 3220.



DataChem

ANALYTICAL REPORT

Form ARP-AL

Page 1 of 1

Part 1 of 1

Date 11/28/88
Agency Identification Number S88-0719-BE
Account No. 03018

REECO
P.O. Box 98521 M/S 706
Las Vegas, NV 89193-8521
Attention: Fred Shelly

Telephone (702) 295-7191

Sampling Collection and Shipment

Sampling Site _____ Date of Collection November 05, 1988

Date Samples Received at DataChem November 07, 1988

Analysis

Method of Analysis _____

Date(s) of Analysis _____

Analytical Results

Field Sample Number	Detachen Lab Number	Sample Type	Urea %						
1	EN 3214	WATER	0.05						
3	EN 3215	WATER	7.28						
Limit of Detection									

! See comment on last page.
ND Parameter not detected.
NR Parameter not requested.

** Parameter not analyzed (See comment on last page).
() Parameter between LOD and LOQ.



DataChem was formerly known as USTL

Jeanine K. Howell
Analyst: Lancaster Labs

Reviewer: _____

Laboratory Supervisor: _____

TARGET ANALYTE SUMMARY REPORT

EPA METHOD 624

Sponsor REECO

COMPOUND	Field No. DataChem EH No. MDL ug/L	Results ug/L				Method Blank
		1 3214	3 3215			
chloromethane	4 *	U	U			U
bromomethane	4 *	U	U			U
vinyl chloride	4 *	U	U			U
chloroethane	3 *	U	U			U
dichloromethane	2.8	U	U			U
trichlorofluoromethane	3 *	U	U			U
1,1-dichloroethane	4.7	U	U			U
1,1-dichloroethene	2.8	U	U			U
trans-1,2-dichloroethene	1.6	U	U			U
chloroform	1.6	U	U			U
1,2-dichloroethane	2.8	U	U			U
1,1,1-trichloroethane	3.8	U	U			U
carbon tetrachloride	2.8	U	U			U
bromodichloromethane	2.2	U	U			U
1,2-dichloropropane	6.0	U	U			U
trans-1,3-dichloropropene	4 *	U	U			U
trichloroethene	1.9	U	U			U
benzene	4.4	U	U			U
chlorodibromomethane	3.1	U	U			U
1,1,2-trichloroethane	5.0	U	U			U
cis-1,3-dichloropropene	5.0	U	U			U
2-chloroethylvinyl ether	10 *	U	U			U
bromoform	4.7	U	U			U
1,1,2,2-tetrachloroethane	6.9	U	U			U
tetrachloroethene	4.1	U	U			U
toluene	6.0	U	U			U
chlorobenzene	6.0	U	U			U
ethylbenzene	7.2	U	U			U
1,3-dichlorobenzene	5 *	U	U			U
1,2 & 1,4-dichlorobenzenes	5 *	U	U			U

See footnotes on Page 2 of the analytical report

Thomas J. Masoran
Analyst

Richard W. Hilde
Data Release Authorized By

Lee Ann S. Hall
Reviewer

NON-TARGET ANALYTE RESULTS
Additional VolatilesField Sample ID 1

<u>Cas. No</u>	<u>COMPOUND</u>	<u>Scan Number</u>	<u>Results ug/L</u>	<u>Footnotes</u>
-----	<u>NO UNKNOWNNS REPORTED</u>	----	-----	----

FOOTNOTES

- B The analyte was found in the method blank. The reported results have been adjusted for the quantity found in the blank.
- E The reported concentration is an estimate only. The response factor was assumed to be 1.000 relative to an internal standard.
- J Indicates an estimated concentration below the Method Detection Limit.
- K The isomer is unknown.
- N Analytical standards were not analyzed for this compound.
- U Not detected.
- W The identification is tentative or closely related to the compound.

ANALYTICAL REPORT FOR SAMPLE NO. EH3215

Page 1 of 2

EPA METHOD 624
TARGET ANALYTE RESULTSField Sample ID 3 Sponsor REECO
File ID E188EH3215 Date of Analysis 11/08/88 Date Received 11/07/88DataChem Set ID S88-0719DE

<u>Cas. No</u>	<u>COMPOUND</u>	<u>RESULTS</u> <u>(ug/L)</u>	<u>EPA PUBLISHED</u> <u>METHOD DETECTION</u> <u>LIMITS</u> <u>(ug/L)</u>
29479-9	chloromethane	U	4 *
29584-5	bromomethane	U	4 *
9003-22-9	vinyl chloride	U	4 *
29480-2	chloroethane	U	3 *
75-09-2	dichloromethane	U	2.8
75-69-4	trichlorofluoromethane	U	3 *
75-34-3	1,1-dichloroethane	U	4.7
75-35-4	1,1-dichloroethene	U	2.8
107-06-2	trans-1,2-dichloroethene	U	1.6
76-66-3	chloroform	U	1.6
107-06-2	1,2-dichloroethane	U	2.8
71-55-6	1,1,1-trichloroethane	U	3.8
56-23-5	carbon tetrachloride	U	2.8
75-27-4	bromodichloromethane	U	2.2
78-87-5	1,2-dichloropropane	U	6.0
542-75-6	trans-1,3-dichloropropene	U	4 *
79-01-6	trichloroethene	U	1.9
71-43-2	benzene	U	4.4
124-48-1	chlorodibromomethane	U	3.1
79-00-5	1,1,2-trichloroethane	U	5.0
542-75-6	cis-1,3-dichloropropene	U	5.0
110-75-8	2-chloroethylvinyl ether	U	10 *
75-25-2	bromoform	U	4.7
79-34-5	1,1,2,2-tetrachloroethane	U	6.9
127-18-4	tetrachloroethene	U	4.1
108-88-3	toluene	U	6.0
108-90-7	chlorobenzene	U	6.0
100-41-4	ethylbenzene	U	7.2
541-73-1	1,3-dichlorobenzene	U	5 *
	1,2 & 1,4-dichlorobenzenes	U	5 *

* current DataChem detection limit

NON-TARGET ANALYTE RESULTS
Additional VolatilesField Sample ID 3

<u>Cas. No</u>	<u>COMPOUND</u>	<u>Scan Number</u>	<u>Results ug/L</u>	<u>Footnotes</u>
-----	<u>NO UNKNOWNNS REPORTED</u>	----	-----	----

FOOTNOTES

- B The analyte was found in the method blank. The reported results have been adjusted for the quantity found in the blank.
- E The reported concentration is an estimate only. The response factor was assumed to be 1.000 relative to an internal standard.
- J Indicates an estimated concentration below the Method Detection Limit.
- F The isomer is unknown.
- N Analytical standards were not analyzed for this compound.
- U Not detected.
- W The identification is tentative or closely related to the compound.



ENVIRONMENTAL WATER REPORT

Form EPRV-A
Page 1 of 4
Part 1 of 1

Date 11/14/88
Agency Identification Number S88-0719-AE
Account No. 03018

REECO
P.O. Box 98521 M/S 706
Las Vegas, NV 89193-8521
Attention: Fred Shelly

Telephone (702) 295-7191

Sampling Collection and Shipment

Sampling Site _____ Date of Collection November 05, 1988
Date Samples Received at DataChem November 07, 1988

Analytical Results

Parameter Name Analysis Date Method	Units Prep Method	Field Number Lab Number	1 EH 3214	3 EH 3215	2 EH 3216				Limit of Detection
Aluminum (Al) 11/10/1988 6010 [1]	 3010 [1]	 μg/L	610	150000	ND*				200
Antimony (Sb) 11/10/1988 6010 [1]	 3010 [1]	 μg/L	ND*	ND*	ND*				100
Arsenic (As) 11/10/1988 6010 [1]	 3010 [1]	 μg/L	ND*	ND*	ND*				100
Barium (Ba) 11/10/1988 6010 [1]	 3010 [1]	 μg/L	37.	1200	23.				5.
Beryllium (Be) 11/10/1988 6010 [1]	 3010 [1]	 μg/L	ND*	7.	ND*				5.
Boron (B) 11/10/1988 6010 [1]	 3010 [1]	 μg/L	ND*	410	ND*				200
Cadmium (Cd) 11/10/1988 6010 [1]	 3010 [1]	 μg/L	ND*	ND*	ND*				5.
Calcium (Ca) 11/10/1988 6010 [1]	 3010 [1]	 μg/L	12000	220000	15000				1000

1 See comment on last page.
ND Parameter not detected.
NR Parameter not requested.
1 Analyses completed on or before this date.

** Parameter not analyzed (See comment page).
() Parameter between LOD and LOQ.
[] Method Reference (See comments page.)



DataChem was
formerly known
as UBTL

John T. Korshisnik
Analyst: John T. Korshisnik

Henny F. Lin
Reviewer: Henny F. Lin

Norman K. Christensen
-9- Laboratory Supervisor: Norman K. Christensen



ENVIRONMENTAL WATER REPORT

Date 11/14/88
Agency Identification Number S88-0719-AE
Account No. 03018

Analytical Results

Parameter Name Analysis Date Method	Units Prep Method	Field Number Lab Number	1 ZH 3214	3 ZH 3215	2 ZH 3216	Limit of Detection
Chromium (Cr) 11/10/1988 6010 [1]	µg/L 3010 [1]		ND*	76.	ND*	10
Cobalt (Co) 11/10/1988 6010 [1]	µg/L 3010 [1]		ND*	ND*	ND*	30
Copper (Cu) 11/10/1988 6010 [1]	µg/L 3010 [1]		ND*	230	ND*	30
Iron (Fe) 11/10/1988 6010 [1]	µg/L 3010 [1]		370	81000	110	100
Lead (Pb) 11/10/1988 6010 [1]	µg/L 3010 [1]		ND*	170	ND*	150
Magnesium (Mg) 11/10/1988 6010 [1]	µg/L 3010 [1]		1400	45000	1600	1000
Manganese (Mn) 11/10/1988 6010 [1]	µg/L 3010 [1]		20.	2900	ND*	20
Molybdenum (Mo) 11/10/1988 6010 [1]	µg/L 3010 [1]		ND*	ND*	ND*	50
Nickel (Ni) 11/10/1988 6010 [1]	µg/L 3010 [1]		ND*	93.	ND*	50
Potassium 11/10/1988 6010 [1]	µg/L 3010 [1]		8700	65000	8100	5000
Selenium (Se) 11/10/1988 6010 [1]	µg/L 3010 [1]		ND*	ND*	ND*	200
Silver (Ag) 11/10/1988 6010 [1]	µg/L 3010 [1]		ND*	ND*	ND*	20
Sodium (Na) 11/10/1988 6010 [1]	µg/L 3010 [1]		54000	170000	96000	5000
Thallium (Tl) 11/10/1988 6010 [1]	µg/L 3010 [1]		ND*	400	ND*	200
Vanadium (V) 11/10/1988 6010 [1]	µg/L 3010 [1]		ND*	250	ND*	50

* See comment on last page.
ND Parameter not detected.
NR Parameter not requested.
† Analyses completed on or before this date.

** Parameter not analyzed (See comments page).
() Parameter between LOD and LOQ.
[] Method Reference (See comments page).

Page 1
Received: 12/01/88

'REECO IH LAB ' REPORT
12/23/88 15:46:25

Work Order # 88-12-009

REPORT REECO
TO P.O. BOX 98521 M/S 706
LAS VEGAS, NV 89193-8521

PREPARED BY *Ron M. May*

ATTEN A.R. FRAZIER

ATTEN
PHONE

CERTIFIED BY

CONTACT ROGER

CLIENT FRAZIER AR SAMPLES 3
COMPANY REECO
FACILITY MERCURY

UREA ANALYZED AS AMMONIA FOLLOWING TREATMENT WITH UREASE.
ADJUSTING DATA TO REFLECT ALL AMMONIA PRESENT WAS ORIGINALLY
FROM UREA YIELDS THE FOLLOWING RESULTS (PPM UREA):
SAMP 01: 100.5 SAMP 02: 97.1 SAMP 03: 98.4

Previously Reported on 12/15/88.

WORK ID TONOPAH UREA SAMPLES
TAKEN
TRANS
TYPE CONT. SUMP WATER SAMPLES
P.O. #
INVOICE under separate cover

SAMPLE IDENTIFICATION
01 IH881571 (FIELD # 1)
02 IH881572 (FIELD # 2)
03 IH881573 (FIELD #3)

TEST CODES and NAMES used on this report
UREA UREA

Page 2
Received: 12/01/88

'REECO IH LAB ' REPORT
Results By Test

Work Order # 88-12-009

TEST CODE default units	Sample 01 (entered units)	Sample 02 (entered units)	Sample 03 (entered units)
UREA PPM	64	62	61

Page 3
Received: 12/01/88

'REECO IH LAB ' REPORT
Test Methodology

Work Order # 88-12-009

TEST CODE UREA NAME UREA

UREA PERFORMED BY SIGMA CHEMICAL COMPANY METHOD NUMBER 640
METHOD C.V.= 5.4%
LIMIT OF DETECTION: 7 PPM
LIMIT OF QUANTITATION: 22 PPM

Page 1
Received: 12/15/88

'REECO IH LAB ' REPORT
12/23/88 15:48:46

Work Order # 88-12-018

REPORT REECO
TO P.O. BOX 98521 M/S 706
LAS VEGAS, NV 89193-8521

PREPARED BY R. M. [Signature]

ATTEN A.R. FRAZIER

ATTEN _____
PHONE _____

CERTIFIED BY _____

CONTACT ROGER

CLIENT FRAZIER AR SAMPLES 2
COMPANY REECO
FACILITY MERCURY

Previously Reported on 12/21/88.

WORK ID TONOPAH UREA WATER SAMPLES
TAKEN 12/14/88
TRANS 12/14/88
TYPE WATER
P.O. #
INVOICE under separate cover

SAMPLE IDENTIFICATION

01 IH881594 (NOV 14 A)
02 IH881595 (NOV 14 B)

TEST CODES and NAMES used on this report

UREA UREA

Page 2
Received: 12/15/88

'REECO IH LAB' REPORT
Results By Test

Work Order # 88-12-018

TEST CODE default units	Sample 01 (entered units)	Sample 02 (entered units)
UREA PPM	93	95

SAMPLE DESCRIPTION

<u>Field Number</u>	<u>Sample Description</u>	<u>Analyzed For</u>	<u>Page Number of Results</u>
4	Rinseate from urea	Organics by GC/MS	1, 2, 3
5	Rinseate from urea	Organics by GC/MS	1, 2, 3
6	Rinseate from urea	Organics by GC/MS	1, 2, 3
15	Six million gallon reservoir	Organics by GC/MS	1, 2, 3
1	Bartholomew sump sample	Urea	4
3	Peripheral soil sample	Urea	4
1	Bartholomew sump sample	Volatile organics EPA Method 624	5, 6
3	Peripheral soil sample	Volatile organics EPA Method 624	4, 7, 8
1	Bartholomew sump sample	Metals by ICP-OES	9, 10, 11
3	Peripheral soil sample	Metals by ICP-OES	9, 10, 11
2	EH-2, well water distribution system	Metals by ICP-OES	9, 10, 11
1	Bartholomew sump sample	Cyanide	11
3	Peripheral soil sample	Cyanide	11
2	EH-2 well water distribution system	Cyanide	11
1	Bartholomew sump sample	Pesticides	12, 13, 14, 15

<u>Field Number</u>	<u>Sample Description</u>	<u>Analyzed For</u>	<u>Page Number of Results</u>
3	Peripheral soil sample	Pesticides	12, 13, 14, 15
1	Barholomew sump	Urea	16, 17, 18
2	Barholomew sump	Urea	16, 17, 18
3	Barholomew sump	Urea	16, 17, 18
14A	Barholomew sump	Urea	19, 20, 21
14B	Barholomew sump	Urea	19, 20, 21

Page 3
Received: 12/15/88

'REECO IH LAB ' REPORT
Test Methodology

Work Order # 88-12-018

TEST CODE UREA NAME UREA

UREA PERFORMED BY SIGMA CHEMICAL COMPANY METHOD NUMBER 640
METHOD C.V. = 5.4%
LIMIT OF DETECTION: 7 PPM
LIMIT OF QUANTITATION: 22 PPM

REFERENCES

- Battelle, Project Management Division, Office of Hazardous Waste Management, 1986. Guidance Criteria for Identifying Areas of Vulnerable Hydrology, Appendix C, Technical Guidance Manual for Calculating Time of Travel (TOT) in the Unsaturated Zone. Prepared for the Office of Solid Waste, Waste Management Division, U.S. Environmental Protection Agency.
- Buckman, Harry O., and Nye C. Brady, 1969. The nature and properties of soils. pp 527-565. The Macmillian Company, New York, New York.
- Farrimond, Kenneth, 1988. Personal communication, Mgr., Area Operations, Holmes & Narver, Tonapah Test Range, Tonapah, NV.
- French, Richard H., 1986. Daily, Seasonal, and Annual Precipitation at the Nevada Test Site, Nevada. Desert Research Institute, Univ. of Nevada, Pub. 45042, DOE/NV/10384-01.
- Hargrove, W.L. and D.E. Kissel, 1979. Ammonia Volatilization from Surface Applications of Urea in the Field and Laboratory. Soil Sci. Soc. Am. J., 43:359-363.
- Jones, H.W., 1932. Soil Science, 34, 281.
- Klein Products, Inc., Hurricane pump model 12D specification sheet. Ontario, California.
- Luthin, James N., 1973. Drainage Engineering, Robert E. Krieger Pub. Co., New York., p. 51.
- Madsen, David D., 1988. Personal communications, Holmes & Narver, Tonapah Test Range, Materials Testing Laboratory, Tonapah, NV.
- Kearl, Peter M., 1982. Water Transport in Desert Alluvial Soil. Desert Research Institute, Pub. 45024. DOE/NV/10162-2.
- Rush, F.E., 1970. Regional ground-water systems in the Nevada Test Site Area, Nye, Lincoln, and Clark Counties, Nevada. Water Resources-Reconnaissance Series, Report 54, State of Nevada, Department of Conservation and Natural Resources, Division of Water Resources, Carson City, Nevada.
- Sullivan, Timothy P., 1988. Personal communication, Sr. Eng., Operations and Maintenance, C.E./Prod. Control., Reynolds Electrical and Engineering, Las Vegas, NV.
- Verschauer, K., 1983. Handbook of Environmental Data on Organic Chemicals. Van Nostrand Rienhold Company, New York. p 1178.
- Wahhab, A., M. Knan, and M. Ishaq, 1960. Nitrification of urea and its loss through volatilization of ammonia under different soil conditions. J. Agr. Sci. 55:47-51.

HYDROGEOLOGIC EVIDENCE

Time of Travel to the Water Table

From Runoff

The incident site is located on an alluvial fan which drains toward a normally dry lake bed. The area receives an average annual precipitation of less than 17 centimeters (French, 1986). Potential evapotranspiration greatly exceeds this precipitation. The depth to the water table under the site, as indicated by the static water level in wells in the area, is in excess of 30 meters. Drill logs of these wells and test borings show that the profile above the water table is composed of silty sands and gravels, some of which are cemented (Farrimond, 1988).

An estimate of the travel time from surface to the water table can be obtained by following an EPA example (Batelle, 1986) for calculating travel time through the vadose zone. This technique utilizes the equations:

$$t = \frac{L h}{q}$$

where: t is travel time in years,

L is distance through the vadose zone in centimeters,

q is the flow into the surface in centimeters per year, and

h is the average vadose zone moisture content calculated with:

$$h = \left(\frac{q}{K_s} \right)^m h_0$$

where: K_s is the saturated conductivity in centimeters per year,

h_0 is the saturated moisture content usually taken as being equal to the porosity, and

m is calculated with:

$$m = \frac{1}{2b+3}$$

where: b is the absolute value of the logarithmic slope of the soil moisture-capillary pressure curve. The closest location for which this curve has been determined is Frenchman Flat (Kearl, 1982), for which the value of b is 4. K_s can be estimated at 10^5 centimeters per year for the site from percolation tests made in the design of a leach field at the nearby Sandia Compound (Madsen, 1988). Since standard percolation tests include some radial as well as vertical percolation, this estimate is in excess of the actual vertical hydraulic conductivity. The similar soil at Frenchman Flat has a measured hydraulic conductivity of 10^4 centimeters per year (Kearl, 1982). The porosity of a sandy soil can be taken as greater than 0.3 (Luthin, 1973). The flow into the surface, q , can be no more than the average precipitation, 17 centimeters (French, 1986), plus the water used in flushing the spreader. The pump at the fill stand was designed to lift water 6 meters at about 200 liters per second (Klein Products). Estimates of the time required to fill a 40 cubic meter tank confirm this flow rate. The pump was run for an estimated 1 1/2 hours, which resulted in a total volume of water of less than 1100 cubic meters. The water spread out about 30 degrees across and approximately 1000 meters down the alluvial fan over a total area of greater than 20 hectares. This results in an application depth of less than a centimeter, which is insignificant compared to the annual precipitation and its deviation of 5 centimeters (French, 1986). These parameter values result in a m of 0.09, a h of 0.14, and a very conservative estimate of the travel time through the vadose zone of greater than 20 years. A more realistic estimate of q as less than 3 per cent of the precipitation (Rush, 1970) results in a time of travel of over 500 years.

From Sump

The travel time to the water table beneath the construction sump could be different from that for the surrounding soil. The sump was originally constructed to the dimensions of about 30 by 40 by 3 meters deep in late 1985, but was soon doubled in area to 60 by 40 meters. Some of the original berm is

still between the original sump and its addition. A layer about 1/2 meter thick of clay from the nearby dry lake bed was used for a liner. The side slopes of the sump are about 2:1. The capacity of the sump calculated from these dimensions is less than 5000 cubic meters. The sump has not been filled or used since the incident. The 1100 cubic meters used to flush and dilute the urea would have lowered the sump level by about 1 meter. The water level was about 1 1/2 meters below the overflow 45 days after the incident. If the sump was full after the incident and lateral flow and evaporation losses not considered, the worst case average leakage rate would be about 1 centimeters per day or less than 400 centimeters per year. Through calculations similar to those above this leads to a travel time to the water table of over 8 months. A test of the clay liner material at the nearby Fire Training Burn Pit, about 1000 meters to the northwest of the sump, (Madsen, 1988) showed no measurable infiltration over 7 days. This indicates that the above depression in sump level was due mainly to pumping and evaporation and not leakage. The actual time of travel could be greater than that for the surrounding area because of this impeding layer.

Urea Degradation

In Soil

The amount of urea that was flushed out of the spreader was estimated to be 500 to 2000 kilograms. If this was mixed with the 1100 cubic meters of water pumped from the sump the original concentration was between 500 and 2000 parts per million. This was equivalent to a fertilizer application of 25 to 100 kilograms per hectare. Agricultural applications of urea-water solutions can be well over 1000 kilograms per hectare (Hargrove and Kissel, 1979), being usually limited only by the economic value of the crop response. Urea readily undergoes hydrolysis in the soil producing ammonium carbonate by the reaction (Buckman and Brady, 1969):



The ammonium carbonate which results is unstable and promptly produces ammonia by the reaction:



greater than 8, indicating the above soils are alkaline. Therefore, urea is quickly lost to the atmosphere as ammonia and carbon dioxide gases with the resulting water mixing with existing soil moisture.

In Sump

Urea degrades in waste water treatment at 2°C by psychrophilic bacteria at the average rate of 3.2 milligrams per liter per hour (Verschueren, 1983). At this rate, even if the urea in the sump was equal to that calculated by dilution of the estimated hopper contents of 2000 parts per million, the urea would be degraded in less than 30 days. Ground water samples in the area (Sullivan, 1988) have temperatures greater than 20°C indicating that the degradation rate for part of the vadose zone would be greater than 10.9 milligrams per liter per hour (Verschueren, 1977) and degradation might occur in less than 50 hours.

Conclusions

The conservative estimates of the travel times from the ground surface to the groundwater table of 20 years and from the sump bottom of 8 months greatly exceed the time required for the urea to degrade. The soil degradation of urea is essentially immediate and the sump degradation of urea is less than a month. Therefore, no contamination of the usable groundwater can result from this incident.

RESULTS OF INVESTIGATION OF ANY HUMAN HEALTH CONSEQUENCES
OF THE UREA SPILL

There were no human health consequences of the urea spill. There was one allegation of human health consequence which upon investigation was shown to be without merit. John Deck, a REECO teamster who claimed that he was ill on November 1, and 2, 1988, claimed to have drank the water that made the horses sick. Deck claimed that he rinsed his mouth with water from his water-pull truck on November 1 and 2, 1988 (the water-pull trucks are normally filled at the construction sumps).

However, it was impossible that John Deck could have drank the urea contaminated water on November 1 or 2, 1988. According to Deck's signed statement and reports from supervision, John Deck left work and the TTR at 12:30 on November 2, 1988 because he wasn't feeling well. AT 4:00 p.m. on November 2, 1988 the truck and the urea that was to become involved in the urea spill accident was still parked in its normal parking place at Building 186.

FILED
FIFTH JUDICIAL DISTRICT
MAY 22 1989
Karen D. Quilter, Nye County Clerk
By ARTE ROBB Deputy

Case No. 11178
Department No.

IN THE FIFTH JUDICIAL DISTRICT COURT OF THE STATE OF NEVADA
IN AND FOR THE COUNTY OF NYE

THE STATE OF NEVADA, EX REL.)
ROLAND D. WESTERGARD, DIRECTOR OF)
THE DEPARTMENT OF CONSERVATION AND)
NATURAL RESOURCES,)
Plaintiff,)
vs.)
REYNOLDS ELECTRICAL AND ENGINEERING)
COMPANY, A Texas Corporation,)
Defendant.)

ORDER

Pursuant to the Consent for the Issuance of a Decree which has been entered into by and between the Plaintiff and Defendant,

IT IS HEREBY ORDERED:

1. Defendant is subject to a civil penalty and damages, and shall:

(a) Pay the amount of fifteen thousand dollars (\$15,000.00) by check made payable to the Nevada Commission for the Preservation of Wild Horses.

(b) Coordinate, cooperate, and consult with the Bureau of Land Management (BLM), the federal agency with management authority on the Nevada Wild Horse Range, to develop and/or reconstruct three (3) water sources for use by wild horses. The specific locations for development and/or reconstruction

1 are to be determined by the BLM in coordination and concurrence with the Nellis
2 Range Complex Five Party Group and will be identified by name and incorporated
3 into this document as Exhibit "A". Exhibit "A" shall be provided to Plaintiff
4 and approved by Plaintiff within ninety (90) days from execution of this
5 Agreement.

6 (c) Complete development and/or reconstruction within one (1) year
7 according to all BLM guidelines and directions and provide project maintenance
8 for a period of three (3) years subsequent to completion.

9 (d) Subsequent to completion of the development and/or reconstruction,
10 Defendant shall provide Plaintiff with a written statement from the BLM cer-
11 tifying completion of the work according to BLM guidelines for Plaintiff's
12 approval.

13 (e) Subsequent to completion of maintenance, Defendant shall provide
14 Plaintiff with a written statement from the BLM certifying completion of the
15 maintenance according to BLM guidelines for Plaintiff's approval.

16 (f) Submit a request to the Department of Energy or Department of
17 Defense to allow an independent representative designated by Plaintiff to
18 inspect the designated springs prior to construction, after construction and
19 annually to verify proper development and maintenance of the springs.

20 4. Upon payment of such sums and the completion of the tasks outlined
21 above, Defendant REECO, shall be released by Plaintiff from any further action
22 or proceeding of any nature, administrative or judicial by Plaintiff as to
23 violations alleged herein.

24 Consent Decree entered in accordance with the foregoing this 22 day
25 of May, 1989.

26 **WILLIAM P. BEKO**

27 _____
District Judge

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28

Case No. 11178

Department No.

FILED
FIFTH JUDICIAL DISTRICT

MAY 22 1989

Maren D. Quitter, Nye County Clerk

By ARTE ROBB Deputy

IN THE FIFTH JUDICIAL DISTRICT COURT OF THE STATE OF NEVADA
IN AND FOR THE COUNTY OF NYE

THE STATE OF NEVADA, EX REL.
ROLAND D. WESTERGARD, DIRECTOR OF
THE DEPARTMENT OF CONSERVATION AND
NATURAL RESOURCES,

Plaintiff,

vs.

REYNOLDS ELECTRICAL AND ENGINEERING
COMPANY, A Texas Corporation,

Defendant.

CONSENT FOR THE
ISSUANCE OF A DECREE

Plaintiff, State of Nevada, Ex Rel. Roland D. Westeryard, Director of the Department of Conservation and Natural Resources ("DCNR") through the Division of Environmental Protection ("DEP") having filed the Complaint herein alleging that Defendant Reynolds Electrical and Engineering Company ("REECO") unlawfully discharged urea into waters of the State without a permit in violation of the provisions of the Nevada Water Pollution Control Law ("NWPCL"), NRS 445.131 to 445.354.

Plaintiff and Defendant, with no admission of liability, have agreed that all matters arising from or related to the above incident, including those set forth in the said Complaint should be settled without trial.

1 aids and abets in the unlawful discharge of pollutants into waters of the State
2 shall pay a civil penalty of up to \$25,000 for each day of violation and for the
3 payment of damages including compensation for any loss or destruction of
4 wildlife, fish or aquatic life.

5 8. On or about November 2, 1988, REECO employees rinsed and flushed
6 waste urea from a spreader hopper onto the ground over a period of approximately
7 1.5 hours.

8 9. The urea and water formed several small ponds or catchments
9 including one which measured 30' by 25'. Low soil permeability prevented the
10 water from soaking into the ground.

11 10. On or about November 3, 1988, a Nye County Sheriff's Deputy
12 discovered a dead horse in the vicinity of the reservoir referenced in paragraph
13 10 and observed several horses drinking from the 30' by 25' pool.

14 11. On or about November 5, 1988, a total of sixty-one (61) wild
15 horses were found dead in an area radiating out from the reservoir.

16 12. During November, 1988, autopsies of dead horses were per-
17 formed by Dr. Alan Ruegamer under the direction of the U.S. Bureau of Land
18 Management wild horse and burro specialist, Robert Stager and samples of tissue,
19 body fluids and water from the small ponds were taken to the APL Veterinary Lab
20 in Las Vegas for analysis.

21 13. On or about November 11, 1988, the lab test results confirmed that
22 the horses died of acute ammonia toxicity and calculations based on the urea
23 concentrations in the pond water samples showed that ingestion of 3.5 to 4.0
24 gallons of the contaminated water would provide a lethal dose of ammonia to a
25 horse.

1 14. The Administrator of the DEP found REECO in violation of
2 NRS 445.221 for the unlawful discharge of urea into waters of the state
3 resulting in the death of sixty-one horses. However, Defendant disputes the
4 contention that REECO violated the subject provision and further denies that it
5 is subject to any fine or penalty under said statute.

6 15. Without any admission of liability, the parties agree that this
7 Consent Decree is intended to compromise a disputed claim and that Defendant in
8 full and final settlement of all matters arising out of the alleged unlawful
9 discharge of urea into waters of the state shall be subject to a civil penalty
10 and damages, and shall:

11 (a) Pay the amount of fifteen thousand dollars (\$15,000.00) by check
12 made payable to the Nevada Commission for the Preservation of Wild Horses.

13 (b) Coordinate, cooperate, and consult with the Bureau of Land
14 Management (BLM), the federal agency with management authority on the Nevada
15 Wild Horse Range, to develop and/or reconstruct three (3) water sources for use
16 by wild horses. The specific locations for development and/or reconstruction
17 are to be determined by the BLM in coordination and concurrence with the Nellis
18 Range Complex Five Party Group and will be identified by name and incorporated
19 into this document as Exhibit "A". Exhibit "A" shall be provided to Plaintiff
20 and approved by Plaintiff within ninety (90) days from execution of this
21 Agreement.

22 (c) Complete development and/or reconstruction within one (1) year
23 according to all BLM guidelines and directions and provide project maintenance
24 for a period of three (3) years subsequent to completion.

1 (d) Subsequent to completion of the development and/or reconstruction,
2 Defendant shall provide Plaintiff with a written statement from the BLM cer-
3 tifying completion of the work according to BLM guidelines for Plaintiff's
4 approval.

5 (e) Subsequent to completion of maintenance, Defendant shall provide
6 Plaintiff with a written statement from the BLM certifying completion of the
7 maintenance according to BLM guidelines for Plaintiff's approval.

8 (f) Submit a request to the Department of Energy or the Department of
9 Defense to allow an independent representative designated by Plaintiff to
10 inspect the designated springs prior to construction, after construction and
11 annually to verify proper development and maintenance of the spring.

12 16. Each party will pay its own attorneys' fees and costs of settlement.

13 17. Plaintiff may submit this Consent for the Issuance of a Decree to
14 the Fifth Judicial District Court in Nye County for the issuance of an
15 appropriate Order.

16 18. In the event the Court does not approve the above terms and con-
17 ditions, this Consent for the Issuance of a Decree and stipulations contained
18 herein will cease to be binding, shall be null and void, and shall not be
19
20
21
22
23
24
25
26
27
28

1 offered into evidence by either party in any proceeding. The State shall
2 thereafter be permitted to amend its Complaint to amend its relief requested and
3 the Defendant shall be permitted to file its answer or other response.

4 DATED: 5/15/89.

5 Respectfully submitted,

6 BRIAN MCKAY
7 Attorney General

8 By Marta Adams
9 Marta Adams
10 Deputy Attorney General

11 Division of Environmental Protection
12 201 South Fall Street, Room 221
13 Carson City, Nevada 89710
14 (702) 885-4670

15 Attorneys for Plaintiff

16 DATED: 5/8/89.

17 Reynolds Electrical and Engineering
18 Company

19 By Arthur L. Williams, Jr.
20 Arthur L. Williams, Jr.
21 General Counsel

22 Reynolds Electrical and Engineering
23 Company
24 P.O. Box 14400
25 Las Vegas, Nevada 89114

BOB MILLER
Acting Governor

STATE OF NEVADA

TERRI JAY
Executive Director



**COMMISSION FOR THE
PRESERVATION OF WILD HORSES**

Stewart Facility
Capitol Complex
Carson City, Nevada 89710
(702) 885-5589

COMMISSIONERS

Deloyd Satterthwaite, *Chairman*
Spanish Ranch
Tuscarora, Nevada 89834

Dawn Lappin
15640 Sylvester Road
Reno, Nevada 89511

Michael Kirk, D.V.M.
P.O. Box 5896
Reno, Nevada 89513

MEMORANDUM

TO: Wild Horse Commissioners
FROM: Terri Jay, Executive Director *Jay*
SUBJECT: REECo Check
DATE: June 6, 1989

We received the check from REECo today. The pertinent correspondence is enclosed.

The check and the original letter was forwarded to Tracy Raxter, at the Department of Administration. He has informed me that the check will be deposited in the grant account.



Reynolds Electrical & Engineering Co., Inc.

OPERATIONS AND MAINTENANCE
ENVIRONMENTAL HEALTH SECTION

INTERNAL PROCEDURE

TITLE:

STORAGE, USE AND DISPOSAL
OF UREA BY O&M AT TTR

NO.

EH 6.10

PAGE 1

of 1

APPROVED:

A. R. Church 1-13-89
DATED

PURPOSE

To define the methods of storage, use and disposal of urea at Tonopah Test Range by O&M Operations.

POLICY

To ensure compliance with REECO, Environmental Protection Agency (EPA) and Air Force directives in the handling of urea to accomplish work requirements as outlined in the Statement of Work (SOW).

METHODS

Storage

Urea is stored under the control of O&M warehousing operations and is located in the warehouse nine-acre storage yard. It is received and stored in 100-pound bags on pallets and covered with tarps. During the snow and ice season, a urea spreader with hopper is placed in the back of a five-ton dump truck and the spreader is filled with urea to approximately 4,000 pounds. This truck is parked in Building 186 with the rest of the snow removal equipment.

Use

Urea is only used as a de-icer in the airfield area (ie, runways, taxiways and aircraft parking areas) which is controlled and completely fenced.

Only the Snow Control Manager, his/her assistant, or the designated Snow Control Superintendent are authorized to direct the use of urea for ice control and removal.

Disposal

At the end of the snow and ice season, all urea left in the spreader with hopper on the five-ton dump truck is disposed of in the sanitary landfill.



Reynolds Electrical & Engineering Co., Inc.

COMPANY PROCEDURE
PROPERTY AND SUPPLY SECTION

TITLE

RESPONSE TO SPILLS AND LEAKS
OF HAZARDOUS MATERIALS

NO

3,2,53

PAGE 1

of 6

APPROVED:

[Signature]

General Manager

1-12-87

DATED

This supersedes Procedure 3.2.53, dated November 14, 1983.

PURPOSE

To describe the responsibilities and procedures to enable quick coordinated response to accidental spills of hazardous materials in a manner which minimizes actual or threatened human endangerment, property loss, environmental impact, or adverse public opinion.

POLICY

To minimize the impact of accidental spills of hazardous materials on NTS activities by contingency planning which considers effective and efficient use of resources, logical order of response activity, and applicable rules and regulations.

METHOD

Coordinate through formal procedures a response to onsite or offsite spills of hazardous materials which: 1) can be adjusted to satisfy the demands of the situation; 2) considers priorities for life saving, threat reduction, property protection, control, containment, abatement and cleanup; and 3) directs response activities in a manner which minimizes the risk of aggravating a given situation.

In addition to response as directed from within the responsible department, further assistance may be required. The following personnel control, operate or have access to technical resources which may be required to deal with an emergency. This technical advisory group may be called upon collectively or singly to report to the accident scene or to be available for consultation. An extensive listing of emergency response resources (material and services) are identified and located in Annex H of the NTS Emergency Preparedness Plan. The Technical Advisory Group shall consist of:

Chief, Industrial Hygiene Section or designee

Fire Protection Engineer

Manager, Environmental Sciences Department or designee

Chief, Traffic Section or designee

METHOD (Continued)

Public Information Officer or designee

Chief, Fire Protection Services

RESPONSIBILITIES

A. DEPARTMENT HAVING CUSTODY OR SPONSORSHIP OF THE MATERIAL

1. Responds or designates a representative to coordinate at the scene after notification through these procedures.
2. Assembles those elements of the Technical Advisory Group and other resources as necessary to manage the situation.
3. Directs activities and be in charge of the response effort, unless other assignment is made by the General Manager or his NTS representative.
4. Identifies the material involved by shipping papers, bills of lading, marking and labeling, or use of other resources.
5. Takes actions required to reduce immediate danger to life, property, and the environment.
6. Makes notification required in Appendix B through appropriate channels.
7. Terminates the response when appropriate.

B. INDUSTRIAL HYGIENE SECTION

1. Develops and maintains a hazardous materials spill/leak response advisory capability consistent with these procedures.
2. Coordinates annual training activities necessary to successfully implement these procedures for serious spills/leaks.
3. Establishes and maintains an information file on hazardous materials used, stored, handled, transported, and disposed of on the NTS.
4. Identifies and records names, phone numbers, addresses, etc., of groups and agencies who may be able to provide pertinent information on hazardous chemicals.
5. Identifies and prescribes protective equipment required for abatement, cleanup, and disposal of spills.
6. Refines the determination of the nature of the hazard, if required.
7. Estimates probable behavior of the material.
8. Assists the on-scene coordinator in directing abatement, cleanup, and disposal activities.

RESPONSIBILITIES (Continued)

9. Reviews and approves department spill contingency plans before adoption.
10. Reviews department spill contingency plans and audits key functional elements biennially.

C. TECHNICAL ADVISORY GROUP

1. Assists the on-scene coordinator as directed, including furnishing other personnel and services under their control.
2. Assists the on-scene coordinator in making control, containment, abatement, and cleanup decisions.

D. EMERGENCY COORDINATOR (1-2-3/MAYDAY)

1. Notifies the cognizant/responsible department manager.
2. Activates emergency services such as medical, fire protection, etc.

E. ENVIRONMENTAL SCIENCES DEPARTMENT TRAINING SECTION

1. Develops scenarios and exercises and manages such exercises to test the procedures for serious spills/leaks.
2. Makes formal recommendations based on test exercise results to the Industrial Hygiene Section for modifying this plan.

F. PUBLIC INFORMATION OFFICE

Assumes responsibility for making all public statements concerning the response.

G. BASIC REQUIREMENTS

1. ACCIDENTAL SPILLS OF HAZARDOUS MATERIALS: (considerations in the management of spills of hazardous materials, see appendix A).

Departments using, storing, handling, and disposing of hazardous materials are responsible for developing their own spill contingency plans. All departmental plans will be reviewed and approved by the Industrial Hygiene Section for adequacy before adoption. Thereafter, each plan shall be reviewed and key functional elements audited biennially by the department and the Industrial Hygiene Section. One copy of each plan will be kept in the immediate area for which it was written. Additional copies of the plan shall be kept on file by the department office and the Industrial Hygiene Section. Such plans should include fundamental activities such as storing breakable containers in areas where spills can be contained; eliminating potential ignition sources in the area of a spill; controlling employee exposure; proper abatement techniques; proper use of personal protective equipment during abatement and clean-up; notification of others as required; where to get assistance when needed; etc. When it is the judgment of the competent supervisor that the requirements for

RESPONSIBILITIES (Continued)

proper handling of a spill of hazardous material exceed the capability of the department, section or branch plan, etc., the following procedures shall be initiated.

2. SERIOUS SPILLS/LEAKS

a. Reporting

Consistent with the NTS Emergency Preparedness Plan and REECO Safety Codes A-9 and A-10, serious spills of hazardous materials governed by these procedures shall be reported by the existing emergency reporting system (1-2-3/Mayday). The Emergency Coordinator (1-2-3/Mayday) will notify the department manager having custody or sponsorship of the spilled material. The responsibility for control and amelioration shall lie with the specified department manager. The Manager, Occupational Safety & Fire Protection Services, will serve as the NTS representative of the General Manager for emergency situations at the NTS and for situations requiring commitment of REECO resources from the NTS for emergency responses offsite. The minimum information conveyed should be:

The nature of the spill or leak

The location

The cognizant/responsible department manager

The hazardous material involved

The material's physical state (gas, liquid, solid, etc.)

Initial impact (injury, damage)

An estimate of the magnitude of the leak or spill

How and where the person doing the reporting can be reached

APPENDIX A

Considerations in the management of serious spills of hazardous materials:

A. Initial Actions

1. Rapid coordinated response.
2. Treat the injured; prevent further injury, property damage, or environmental impact.
 - a. Warn road users.
 - b. Restrict access as appropriate for hazard.
 - c. Evacuate personnel or movable property as indicated.
 - d. Prevent initial, primary or secondary fires/explosions.
 - e. Eliminate ignition sources.
3. Identify hazardous material as soon as possible and assess the hazard.
4. Reduce the immediate danger to life, property or the environment.
5. Control the hazard.
6. Contain the material.
7. Assess the residual hazard.
8. Make reports to appropriate REECo and DOE offices as required.

B. Secondary Actions

1. Get additional information if necessary.
2. Refine assessment of the hazard and risk.
3. Begin amelioration based on refined data:
 - a. Think through approach.
 - b. Organize required resources.
 - c. Consider economics.
 - d. Improve containment if necessary.
 - e. Select effective, efficient clean-up methods.
 - f. Select proper disposal method.

APPENDIX B

Notifications required under 49, CFR, Transportation, in conjunction with spills/leaks of hazardous materials in transport. See DOE Order NV5484.1-4 and REECO Safety Code A-10 for reporting protocol.

A. Report materials other than etiologic agents to DOT telephone number (800) 424-8802; report etiologic agents to the Center for Disease Control (CDC) telephone number (404) 633-5313. The necessity for reports shall be verified by the Chief, Traffic Section.

B. Reports, 49 CFR, Chapter 1, Paragraph 177:

1. Carrier must report as early as possible:

- a. When someone is killed.
- b. When someone is hospitalized for injuries.
- c. Damage exceeds \$50,000.
- d. When fire, spillage, breakage, or suspected contamination involves radioactive material or etiologic agents.
- e. When a continuing danger exists even though Items a, b, and c above are not yet involved.

2. Verbal reports should provide:

- a. Name of reporter.
- b. Name and address of carrier.
- c. A phone number where the caller can be reached.
- d. The date, time, and location of accident.
- e. The extent of injuries involved.
- f. The class or name of the hazardous material.
- g. Information regarding the type accident.

3. Written reports should:

- a. Be made within 15 days on DOT Form F5800.1.
- b. Provide information on the disposition of the accident.

4. Report to Coast Guard:

When navigable waters or shoreline are involved, report to the Coast Guard National Response Center telephone number (800) 424-8802.



DIRECTIVE

APPROVED:

Harold Cunningham
General Manager

1/24/86
DATED

This supersedes Directive 83-50, dated December 12, 1983.

REECo's environmental, safety and health protection responsibilities at the Tonopah Test Range are assigned as follows:

OCCUPATIONAL SAFETY

1. Provide adequately documented staff support and monitoring by Occupational Safety Professional to include jobsites of REECo personnel and jobsites of subcontractors for which REECo has subcontract administration responsibilities.
2. Review technical packages for capital equipment acquisitions by REECo to ensure adequate inclusion of safety considerations when such equipment will be operated by REECo personnel. Advise of safety requirements when acquisitions are effected by a user.
3. Participate in review of subcontract packages to ensure adequate inclusion of safety considerations when such subcontracts will be administered by REECo.
4. Review requisitions for excess property to ensure inclusion of safety considerations if requisitioned by REECo and is to be operated by REECo personnel.

FIRE PROTECTION (The Users have responsibility for fire fighting and fire protection engineering of fire alarm/detection/suppression systems.)

1. Participate in conducting and properly documenting routine fire prevention inspections through shops, offices, and other facilities occupied by REECo personnel.
2. Provide all maintenance and repair of fire alarm/detection/suppression systems up to the point where such systems tie into communication lines. Conduct and properly document periodic tests of these systems.

OPERATIONS AND MAINTENANCE SECTION (TTR)

1. Conduct and properly document sanitation inspections as follows:
 - a. Feeding facilities - bimonthly
 - b. Housing, recreation facilities, and REECo-occupied facilities - annually
 - c. Sanitary landfill operations - monthly

OPERATIONS AND MAINTENANCE SECTION (Continued)

2. Conduct and properly document potable water sampling and analyses as follows:
 - a. Distribution systems, bacteriological analyses - monthly
 - b. Well heads, radiological analyses - every two years
 - c. Well heads, chemical analyses - every three years
3. Conduct and properly document monthly sampling of sewage systems.
4. Update the five-year plan for the Sanitary Landfill for yearly submittal to the Air Force representative.
5. Provide technical assistance on storage, packaging, and transportation of hazardous wastes.
6. Provide pest control services by or under the direction of a certified pest control applicator.
7. Check well log maintained at each chlorinator or iodinator, monthly.
8. Check and document monthly tests of residual chlorine or iodine in potable water distribution systems.

INDUSTRIAL HYGIENE

1. Conduct and properly document quarterly industrial hygiene inspections of REECo-occupied shops.
2. Evaluate and document REECo employees exposures to chemical and physical agents.
3. Prescribe and evaluate the performance of exposure control measures.
4. Provide support as requested for special operations.
5. Provide respirator training and fitting to REECo employees who wear respirators and to employees of other TTR agencies as requested.
6. Identify to DOE/NV those affected facilities controlled or operated by REECo and REECo subcontractors that require permits, review or approval under applicable environmental regulations.

RADIOLOGICAL SAFETY

1. Conduct and document semi-annually, surveys at the fence lines of Clean Slate Areas 1, 2, and 3, and the Double Track Area.

RADIOLOGICAL SAFETY (Continued)

2. Surveillance and maintenance of the fences surrounding Clean Slate and Double Track Areas to ensure the fences are intact and posted with appropriate radiation warning signs.
3. Perform and document radiological swipe and instrument surveys of selected REECo-occupied shops.
4. Provide support for special operations as requested.

HDC:WRW:bm

B, M



Reynolds Electrical & Engineering Co., Inc.

COMPANY PROCEDURE
PROPERTY AND SUPPLY SECTION

TITLE

HAZARDOUS MATERIAL
CONTROL

NO

3.2.51

PAGE 1

of 6

APPROVED

[Signature] 1-7-87
General Manager DATED

This supersedes Procedure 3.2.51, dated December 3, 1984.

PURPOSE

To describe the responsibilities for controlling substances designated as hazardous materials.

POLICY

To use and store hazardous materials in accordance with prescribed codes, standards, and regulations governing transportation, storage, use, and disposal of hazardous materials (see DOT Regulation 49 CFR entitled Classification of Hazardous Material, and Appendix A attached).

RESPONSIBILITIES

A. Requester

Identifies those special order line items on the Purchasing Requisition, RE-1253; Request for Stock Item, Issue and Delivery, RE-1254; or the Pre-expensed Stock Item Request, RE-1700, which are hazardous materials as described in DOT Regulation 49 CFR and Appendix A, where possible.

B. Supply and Property Management Department

1. Supply Support

- a. Screens all special order Purchasing Requisitions for hazardous materials and stamps those requisitions containing orders for such material with the hazardous material (H M) stamp.
- b. Forwards to the Industrial Hygiene Section a copy of each Purchasing Requisition with an item(s) that is identified as or that is suspected to be hazardous. A copy of a Purchasing Requisition with an item(s) of doubt for hazardous identification is also forwarded to the Industrial Hygiene Section.
- c. Processes all Purchasing Requisitions, including those with hazardous materials, in a normal manner.

2. Receiving and Shipping Branch

- a. Reviews Receiving Form, RE-0858, for incoming special order material shipments identified as hazardous materials.

RESPONSIBILITIES (Continued)

- b. Compares incoming paperwork, i.e., freight bills, packing lists, etc., to the physical packaging and labeling of incoming hazardous materials or shipments suspected of being hazardous for compliance with requirements set forth in 49 CFR - Transportation Subtitle B Chapter I, Part 172. Contacts Industrial Hygiene and/or Traffic Section for the proper classification and disposition of unmarked or questionable material shipments.
- c. Prepares and processes a Discrepancy Report, RE-1630, for improperly packaged and/or labeled shipments of hazardous materials.
- d. Repackages and/or relabels hazardous material items when required to insure compliance with current DOT regulations and the Hazard Communication Program prior to releasing items for delivery to onsite or offsite location.
- e. Provides temporary, segregated storage for incoming material items that are classified or suspected of being hazardous materials, i.e., flammable, explosive, toxic, corrosive, etc.
- f. Develops and implements leak and spill contingency plans when required. (Reference: Material Safety Data Sheets and Company Procedure 3.2.53, Response to Spills and Leaks of Hazardous Materials.)
- g. Prepares a Warehouse Bill of Lading - Hazardous Material, RE-0173, for special order hazardous materials prior to releasing the material for delivery to an on/offsite location via the NTS shuttle service.
- h. Forwards one copy of Receiving Form and one copy of Warehouse Bill of Lading - Hazardous Material, RE-0173, to the Industrial Hygiene Section for each special order hazardous material item(s) received.
- i. Dispatches a qualified driver who has been trained and certified by REECO for the transportation of hazardous materials. The driver is responsible for the proper loading, segregation of hazardous items, securing and protection of materials during loading/off-loading operations and while in transit from the warehouse to the delivery site.
- j. The driver is responsible for assuring that the shipping papers have been properly prepared in accordance with CFR 49 regulations. The driver is responsible for making sure the shipping papers contain complete information regarding the description of shipment, proper shipping name, proper hazard class, quantity/weight and exception information. The driver is responsible for making certain each package of hazardous materials is marked appropriately and in the proper shipping containers. If there are any questions regarding the way the shipment is packaged or labeled, THE DRIVER WILL NOT ACCEPT THE SHIPMENT until all questions have been answered.

RESPONSIBILITIES (Continued)

- k. Notifies DOE or the REECo/DOE designate of all non-REECo hazardous material that is received for supply processing.
 - l. Forwards any Material Safety Data Sheets (MSDS) received with incoming material to the Industrial Hygiene Section.
3. General Stores/Equipment Parts Warehouse (Receiving and Issuing)
- a. Ensures that the packaging and labeling of hazardous material stock items is consistent with the classification of the material and 49 CFR requirements.
 - b. Provides segregated storage space, as required, for stock items that are classified as hazardous materials, i.e., flammable, explosive, toxic, corrosive, etc.
 - c. Forwards to the Industrial Hygiene Section one copy of Receiving Form, Request for Stock Issue, Material Recap Sheet for Over-the-Counter Issues, RE-1475, the Pre-Expensed Stock Item Request and the Warehouse Bill of Lading - Hazardous Materials for each hazardous material stock item(s) received and subsequently issued from Stores Inventory.
 - d. Prepares a Warehouse Bill of Lading - Hazardous Materials for hazardous material stock items issued from Stores Inventory in preparation for delivery to an on/offsite NTS location.
 - e. Develops and implements leak and spill contingency plans as required. (Reference: Material Safety Data Sheets and Company Procedure 3.2.53, Response to Spills/Leaks of Hazardous Materials.)
- C. Fleet Operations Department
- Provides departments and users with qualified drivers who have been trained and certified for the transportation of hazardous materials at the NTS.
- D. Using Organization
1. Segregates and stores hazardous materials properly when such material is at the job site.
 2. Maintains records of receipt, usage, and disposal of hazardous materials.
 3. Uses hazardous materials in accordance with guidelines contained in the Material Safety Data Sheet (MSDS) and/or instruction furnished by the Industrial Hygiene Section.
 4. Notifies the Industrial Hygiene Section when a hazardous material is received for use before the user has received a MSDS and equivalent information.

RESPONSIBILITIES (Continued)

5. Disposes of hazardous materials and hazardous material waste in accordance with guidelines established by the Industrial Hygiene Section.
6. Retains identification of containers holding or having held hazardous materials.
- *7. Furnishes use, disposal, and transfer records to the Industrial Hygiene Section upon request.
- *8. Ensures that hazardous materials in their custody are transferred, transported, documented, packaged and labelled as required for use and transportation, are transported only by REECO certified drivers and that the Industrial Hygiene Section is notified of the change in custody and location.
9. Develops and implements leak and spill contingency plans as required. (Reference: MSDS and Company Procedure 3.2.53, Response to Spills/Leaks of Hazardous Material.)

E. Industrial Hygiene Section

1. Reviews copies of Purchasing Requisitions and/or Purchase Orders screened by Supply Support Section and/or the Procurement Department, and classifies or verifies proper classification of line items as hazardous material.
2. Requests, files, and forwards to concerned groups and users, the MSDS, or its equivalent, for hazardous material.
3. Maintains a computerized file of hazardous material MSDS.
4. Creates a life cycle file containing such pertinent information as the quantity of hazardous material, its location, precautions, and users. This file shall be updated as information required is received in accordance with this procedure.
5. Reviews spill and leak procedures for adequacy.
6. Provides technical advice, etc., relating to the application of CFR 49 Regulations as requested.

F. Environmental Health Branch

Disposes of or approves disposal methods for hazardous chemicals and wastes.

*Denotes those items to be implemented at a later date.

RESPONSIBILITIES (Continued)**G. Procurement Department****1. Purchasing Section**

- a. Informs the seller that items that are hazardous materials are to be packaged, labeled, and shipped in accordance with applicable regulations.
- b. Forwards to the Industrial Hygiene Section a copy of the Purchase Order for hazardous material when purchased.

2. Traffic Section

Provides technical advice, etc., relating to the application of 49 CFR Regulations as requested.

H. Information Systems Department

Codes the Receiving Form with "yes or no" under the H M Column.

RESPONSIBILITIES (Continued)

APPENDIX A

TYPES OF HAZARDOUS MATERIAL COMMODITIES

Commodities that may be classified as Hazardous Materials for transportation (DOT regulations).

1. Solvents, thinners (flammable and nonflammable)
2. Paints, coating, adhesives
3. Resins (epoxy, urethane, gas plug, cable gas-blocking, etc.)
4. Blasting agents and explosives
5. Corrosives (acids, caustics, cleaners, descalers)
6. Pesticides, herbicides, fungicides
7. Compressed gases (flammable and nonflammable)
8. Chemicals ordered by generic name (acetone, methylethyl ketone, toluene, ether, nitrogen tetroxide, hydrazine, etc.)
9. Radioactive materials

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28

BEFORE THE
NEVADA ENVIRONMENTAL COMMISSION

In the Matter of:)
)
REYNOLDS ELECTRICAL &)
ENGINEERING CO., INC.)

PETITION FOR HEARING

To: L.H. Dodgion
Executive Secretary
Nevada Environmental Commission

COMES NOW Reynolds Electrical & Engineering Co., Inc. ("REECO"), a corporation, and respectfully requests a hearing on the Finding of Alleged Violation and Order issued by the State Department of Conservation and Natural Resources, Division of Environmental Protection. In support whereof, the following is asserted:

1. On December 14, 1988 REECO was served by the State Division of Environmental Protection with a document entitled "Finding of Alleged Violation and Order" dated December 2, 1988. (The Finding and Order are appended to this Petition, and are made a part hereof.)

2. REECO wishes a hearing on the matter to challenge the Division's charge that the facts identified in the Findings of Fact of December 2, 1988 entail a violation of NRS 445.221. It is REECO's position the facts of the matter do not constitute an actionable pollution of the waters of the State of Nevada, specifically NRS 445.131-354.

. . .

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28

CERTIFICATE OF MAILING

I hereby certify that on January 9, 1989, I served the foregoing Petition for Hearing by depositing a copy in the United States mail, postage prepaid, addressed to:

L. H. DODGION
Executive Secretary
State of Nevada
Environmental Commission
201 South Fall Street
Capitol Complex
Carson City, Nevada 89710

his last known business address.

Michelle Hale
An Employee of REECO

RICHARD H. BRYAN, Governor

Administration 702/885-4670
Air Quality 885-5065
Construction Grants 885-5870

REECO STATE OF NEVADA
CENTRAL FILE

Groundwater 702/885-4670
Waste Management 885-5872
Water Pollution 885-4670

DEC 14 10 12 AM '88



DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION

201 South Fall Street
Carson City, Nevada 89710

December 2, 1988

RECEIVED

DEC 14 10 12 AM '88

REECO
CENTRAL FILE

Reynolds Electrical and Engineering Company
ATTN: Dale L. Fraser, President
2501 Wyandotte Street
Las Vegas, NV 89101

Certified Mail# P 568 575 302
Return Receipt Requested

Dear Mr. Fraser:

The enclosed Finding of Alleged Violation and Order issued by the Administrator of the Division of Environmental Protection, pursuant to Nevada Revised Statutes (NRS) 445.317 and 445.324, requires compliance by Reynolds Electrical and Engineering Company (REECO) with the terms and conditions of the Order by the dates specified.

The Finding and Order were developed as a result of information obtained from the U.S. Bureau of Land Management regarding the death of 61 wild horses at the Tonopah Test Range. It is the Division's position that the entrainment of urea into water pumped from a small reservoir and the subsequent discharge of that polluted water into an area where it formed several small ponds of standing water, constitutes an illegal discharge of pollutants to waters of the state.

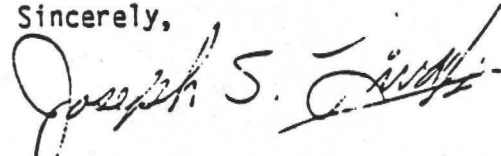
Any violation of the terms of this order could subject Reynolds Electrical and Engineering Company (REECO) to an action for appropriate relief pursuant to NRS 445.327, NRS 445.331 or NRS 445.334.

This order is final and not subject to review unless, within thirty (30) days after the date such order is served, a request by written petition for a hearing is received by the State Environmental Commission, 201 South Fall Street, Capitol Complex, Carson City, Nevada 89710.

Reynolds Electrical and
Engineering Company
Certified Mail # P 568 575 302
December 2, 1988
Page 2 of 2

If you have any questions concerning this matter, please contact me at
(702) 885-4670.

Sincerely,



Joseph S. Livak
Water Enforcement Officer

- srb

Enclosures

cc: Roland Westergard
L.H. Dodgion
Marta Adams
Environmental Commission
Terri Jay, Wild Horse Commission
EPA, Region IX
Len Sims, BLM
A.W. Marrs, REECO
Robert B. Tyrrell, DOE Site Manager
Frank Bingham, DOE Environmental Division

FINDING OF ALLEGED VIOLATION

I. This Finding is made on the basis of the following facts, to wit:

A. The State of Nevada Department of Conservation and Natural Resources, Division of Environmental Protection, under the authority of Nevada Revised Statutes (NRS) 445.214 subsection 1 has the power and duty to administer and enforce the provisions of NRS 445.131 to 445.354 inclusive and all rules, regulations and standards promulgated by the Commission and all orders and permits promulgated by the Department.

B. NRS 445.221 Unlawful discharge of a pollutant without a permit.

Except as authorized by a permit issued by the Department under the provisions of NRS 445.131 to 445.354 inclusive and regulations promulgated under such sections by the Commission, it is unlawful for any person to discharge from any point source any pollutant into any waters of the State.

C. NRS.445.178 "Pollutant" defined.

"Pollutant" means dredged soil, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal and agricultural waste discharged into water.

D. NRS 445.191 "Waters of the state" defined.

"Waters of the state" means all waters situated wholly or partly within or bordering upon this state, including but not limited to:

1. All streams, lakes, ponds, impounding reservoirs, marshes, water courses, waterways, wells, springs, irrigation systems and drainage systems; and
2. All bodies or accumulations of water, surface and underground, natural or artificial.

E. Reynolds Electrical and Engineering Company (REECO) is a contractor working for the U.S. Department of Energy (DOE). REECO provides support services to the DOE at the Sandia National Laboratory facility located in Cactus Flat within the Tonopah Test Range. In an area near the Range Operations Center, REECO maintains a small fenced reservoir and pump to supply water for construction projects and dust control. The pump provides water at a rate of approximately 3000 gpm.

REECO uses chemical urea as a runway deicer. The urea is supplied in a granular prill form and is applied to the runway by means of a spreader box mounted on a truck. Urea is a compound synthesized from ammonia and carbon dioxide. Due to its hygroscopic nature, the prill tends to consolidate into a crusted mass if left exposed for an extended period of time.

The Hazardous Materials Information System Basic Publication specifies the appropriate procedure for disposal of urea as follows:

"Waste may be spread on farmland as fertilizer, or buried in approved landfill. Follow federal, state, local regs."

- F. On November 2, 1988 REECO decided to clean out a spreader box containing an estimated 1,000 to 1,600 pounds of urea. The material had hardened as a result of being left in the spreader hopper since January of 1988. Although REECO personnel discussed disposing of the material by taking it to a landfill for burial, it was decided that flushing it out with water would be easier. This procedure was then approved by appropriate supervisory personnel and by the REECO sanitarian whose primary responsibility is waste management.

Two REECO employees then proceeded with the spreader truck to the pump site at the small reservoir and washed the urea out of the hopper. The urea was removed from the hopper within a period of 10 minutes but the water was pumped for approximately 1.5 hours in an attempt to dilute the solution. Some of this water formed several small ponds or catchments, one of which measured 30' x 25' x 18". Some of the water appears to have flowed under the fence and back into the reservoir. Low soil permeability prevented the water from soaking into the ground.

On the morning of November 3, 1988 a Nye County Sheriff's Deputy discovered a dead horse in the vicinity of the reservoir and several horses were observed drinking from the 30' x 25' pool. During the day REECO created a fresh water supply to lure the horses away from the contaminated ponds and covered most of the standing water in the vicinity of the reservoir.

By November 5, 1988 a total of 61 wild horses had been found dead in an area radiating out from the reservoir. Several horned larks had also been found dead in the immediate vicinity of the contaminated water.

On November 3, 1988 autopsies of several dead horses were conducted by Dr. Alan Ruegamer under the direction of the BLM wild horse and burro specialist, Robert Stager. Samples of tissue, body fluids and water from the small ponds were taken to the APL Veterinary Lab in Las Vegas for analysis.

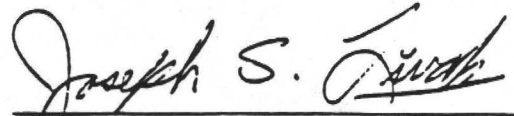
Finding of Alleged Violation
Reynolds Electrical and
Engineering Company
December 2, 1988
Page 3 of 3

On November 11, 1988 the lab test results confirmed that the horses died of acute ammonia toxicity. Ammonia concentrations in the ocular fluid of two horses eyes were found to be 1000 times normal and calculations based on the urea concentrations in the pond water samples showed that ingestion of 3.5 to 4.0 gallons of the contaminated water would have provided a lethal dose of ammonia to a horse.

- II. On the basis of the facts listed above, the Administrator of the Division of Environmental Protection finds that Reynolds Electrical and Engineering Company violated NRS 445.221 by discharging a pollutant into waters of the state without authorization.

Dated _____

12/2/88



Joseph S. Livak
Water Quality Enforcement Officer

IN THE MATTER OF)
REYNOLDS ELECTRICAL AND)
ENGINEERING COMPANY)

ORDER

The following order is issued this date pursuant to the powers and duties vested in the Director of the Department of Conservation and Natural Resources by Nevada Revised Statutes (NRS) Chapter 445.214, subsection 1 and 445.216, subsection 8, delegated to the Division of Environmental Protection pursuant to NRS Chapter 445.216 subsection 9, and in accordance with NRS Chapter 445.307, NRS 445.317 subsection 1 (a) and NRS 445.324.

On the basis of the Finding of Alleged Violation attached hereto and made a part of this Order, the Administrator of the Division of Environmental Protection, pursuant to authority delegated to him by the Director, Department of Conservation and Natural Resources, has determined that Reynolds Electrical and Engineering Company (REECO) is in violation of NRS 445.221 as outlined in the Finding of Alleged Violation.

IT IS HEREBY ORDERED:

That REECO complete the following acts by the dates specified:

1. By December 31, 1988 submit to the Division of Environmental Protection a report which includes the following:
 - a. A narrative description of the events leading up to the poisoning of the wild horses.
 - b. Results of any water sampling that was conducted by REECO or the Department of Energy.
 - c. Hydrogeologic evidence that the urea did not and will not contaminate groundwater underlying the wastewater disposal area.
 - d. Results of the investigation of any human health consequences of the urea spill .
2. By December 31, 1988 submit to the Division a plan for the proper handling, storage, control and disposal of chemicals used for deicing runways and for washing equipment, vehicles or aircraft.
3. By January 15, 1989 show cause why the Division of Environmental Protection should not commence a civil action to recover civil penalties and damages as provided for under NRS 445.331. A meeting for this purpose may be arranged by contacting Joe Livak or Wendell McCurry at 885-4670.

DATED

12/7/88

L.H. Dodgion
L.H. Dodgion, Administrator
Division of Environmental Protection



5

STATE OF NEVADA
OFFICE OF THE ATTORNEY GENERAL

ENVIRONMENTAL DIVISION

Capitol Complex

Carson City, Nevada 89710

BRIAN McKAY
Attorney General

MARTA ADAMS
Deputy Attorney General
(702) 885-4670

February 2, 1989

Arthur L. Williams, Jr., Esq.
General Counsel
Reynolds Electrical and Engineering
Company, Inc.
P. O. Box 14400
Las Vegas, Nevada 89114

Re: State v. REECO (Enforcement Action)

Dear Mr. Williams:

Please find enclosed copies of a Complaint and Order and an Original Consent Decree in the above-entitled matter. In order for the State to collect a civil penalty and damages in a civil enforcement context, the Nevada Water Pollution Control Law (NRS 445.131 to 445.354) requires the Department to file a civil Complaint in the appropriate district court. Where, as here, the parties have settled the matter, the Complaint, the Consent Decree and Order can be filed contemporaneously with the Court.

If the enclosed Consent Decree conforms to your understanding of our agreement, please sign it and return it to me. I will file the Complaint in the Fifth Judicial District Court in Tonopah. Under a separate letter, I will request that Judge Beko sign the Order and forward both the Order and the signed Consent Decree to the court clerk for filing. Please remit payment of the check of \$15,000.00 to the State of Nevada. I will then forward file-stamped copies of each of the documents to you for your files. Thank you for your cooperation in helping to resolve this matter.

Sincerely,

A handwritten signature in cursive script that reads "Marta Adams".

Marta Adams
Deputy Attorney General

MA:mlw
Enclosures
cc: Lew Dodgion
Joe Livak

A handwritten signature in cursive script, likely belonging to Lew Dodgion or Joe Livak.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28

Case No.

Department No.

IN THE FIFTH JUDICIAL DISTRICT COURT OF THE STATE OF NEVADA
IN AND FOR THE COUNTY OF NYE

THE STATE OF NEVADA, EX REL.
ROLAND D. WESTERGARD, DIRECTOR OF
THE DEPARTMENT OF CONSERVATION AND
NATURAL RESOURCES,

Plaintiff,

vs.

REYNOLDS ELECTRICAL AND ENGINEERING
COMPANY, A Texas Corporation,

Defendant.

COMPLAINT

The State of Nevada, on behalf of the Director of the ("DCNR"), brings this action for the unlawful discharge of urea into waters of the state without a permit in violation of the provisions of the Nevada Water Pollution Control Law ("NWPCL"), NRS 445.131 to 445.354.

1. This civil action is instituted by DCNR pursuant to NRS 445.317(1)(b), 445.327 and 445.331 to impose a civil penalty and for mandatory injunctive relief for violations of NRS 445.221.
2. Authority to bring this action is vested with the Attorney General of the State of Nevada by NRS 445.314.
3. This Court has subject matter jurisdiction over this action and

1 venue properly lies in this district court in that the violations occurred at
2 the Tonopah Test Range, Nye County, Nevada.

3 4. The State of Nevada DCNR through the Division of Environmental
4 Protection ("DEP") under the authority of NRS 445.214(1) has the power and duty
5 to administer and enforce the provisions of the NWPCL.

6 5. Defendant Reynolds Electrical and Engineering Company ("REECO") is
7 a Texas corporation authorized to do business in Nevada as a contractor working
8 for the U.S. Department of Energy at the Sandia National Laboratory located in
9 Cactus Flat within the Tonopah Test Range.

10 CLAIM FOR RELIEF

11 6. NRS 445.221 provides, in pertinent part, that
12 Except as authorized by a permit issued by the
13 Department under the provisions of NRS 445.131
14 to 445.354 inclusive and regulations promulgated
15 under such sections by the commission, it is
16 unlawful for any person to discharge from any
17 point source any pollutant into any waters of
18 the State.

19 7. "Pollutant" within the meaning of the NWPCL, NRS 445.178, includes
20 the chemical waste urea.

21 8. NRS 445.331 provides that any person who unlawfully discharges or
22 aids and abets in the unlawful discharge of pollutants into waters of the State
23 shall pay a civil penalty of up to \$25,000 for each day of violation and for the
24 payment of damages including compensation for any loss or destruction of
25 wildlife, fish or aquatic life.

26 9. On or about November 2, 1988, REECO employees rinsed and flushed
27 waste urea from a spreader hopper onto the ground over a period of approximately
28

1 1.5 hours.

2 10. The urea and water formed several small ponds or catchments
3 including one which measured 30' by 25' and some of it flowed into a reservoir
4 used to supply water for construction projects and dust control. Low soil per-
5 meability prevented the water from soaking into the ground.

6 11. On or about November 3, 1988, a Nye County Sheriff's Deputy disco-
7 vered a dead horse in the vicinity of the reservoir referenced in paragraph 10
8 and observed several horses drinking from the 30' by 25' pool.

9 12. On or about November 5, 1988, a total of sixty-one (61) wild hor-
10 ses and numerous horned larks were found dead in an area radiating out from the
11 reservoir.

12 13. On or about November 3, 1988, autopsies of dead horses were per-
13 formed by Dr. Alan Ruegamer under the direction of the U.S. Bureau of Land
14 Management wild horse and burro specialist, Robert Stager, and samples of tissue,
15 body fluids and water from the small ponds were taken to the APL Veterinary Lab
16 in Las Vegas for analysis.

17 14. On or about November 11, 1988, the lab test results confirmed that
18 the horses died of acute ammonia toxicity and calculations based on the urea
19 concentrations in the pond water samples showed that ingestion of 3.5 to 4.0
20 gallons of the contaminated water would provide a lethal dose of ammonia to a
21 horse.

22 15. The Administrator of the DEP found REECO in violation of
23 NRS 445.221 for the unlawful discharge of urea into waters of the state
24 resulting in the death of sixty-one horses.

25 RELIEF REQUESTED

26 Plaintiff Roland D. Westergard, Director of the Nevada Department of
27 Conservation and Natural Resources prays for judgment as follows:

1 (a) For payment to the State of Nevada a civil penalty in an amount
2 not to exceed \$25,000 for the discharge of urea into waters of the state in
3 violation of NRS 445.221.

4 (a) For payment to the State of Nevada actual damages, expenses, and
5 compensation for the violations alleged in this Complaint.

6 (c) For an order requiring Defendant to develop three springs for use
7 by wild horses, namely, Cedar Pass Spring, Cactus Spring and Northern Spring and
8 to maintain these springs for a period of three years.

9 (d) For whatever other relief the Court deems just and proper.

10 DATED: _____

11 Respectfully submitted,

12 BRIAN MCKAY
13 Attorney General

14
15 By _____

16 Marta Adams
17 Deputy Attorney General
18 Division of Environmental Protection
19 201 South Fall Street, Room 221
20 Carson City, Nevada 89710
21 (702) 885-4670

22 Attorneys for Plaintiff
23
24
25
26
27
28

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28

Case No.

Department No.

IN THE FIFTH JUDICIAL DISTRICT COURT OF THE STATE OF NEVADA
IN AND FOR THE COUNTY OF NYE

THE STATE OF NEVADA, EX REL.)
ROLAND D. WESTERGARD, DIRECTOR OF)
THE DEPARTMENT OF CONSERVATION AND)
NATURAL RESOURCES,)
)
Plaintiff,)
)
vs.)
)
REYNOLDS ELECTRICAL AND ENGINEERING)
COMPANY, A Texas Corporation,)
)
Defendant.)

CONSENT FOR THE
ISSUANCE OF A DECREE

Plaintiff, State of Nevada, Ex Rel. Roland D. Westergard, Director of the Department of Conservation and Natural Resources ("DCNR") through the Division of Environmental Protection ("DEP") having filed the Complaint herein alleging that Defendant Reynolds Electrical and Engineering Company ("REECO") unlawfully discharged urea into waters of the State without a permit in violation of the provisions of the Nevada Water Pollution Control Law ("NWPCCL"), NRS 445.131 to 445.354.

And Plaintiff and Defendant, with no admission of liability, having agreed that all matters set forth in the said Complaint should be settled without trial.

1 And Plaintiff and Defendant, having carefully considered the allega-
2 tions of the Complaint herein, hereby agree and stipulate as follows:

3 STIPULATIONS

4 1. This Court has jurisdiction of the ~~subject~~ matter herein and of the
5 parties consenting for the purpose of entering this Consent Decree.

6 2. The provisions of the Consent Decree shall apply to and be binding
7 upon all the parties to this action, their officers, directors, agents, ser-
8 vants, employees, successors and assigns, and all persons, firms, and cor-
9 porations having notice of the Consent Decree and who are or will be acting in
10 concert and privity with the Defendants to this action or their officers,
11 agents, servants, employees, successors and assigns.

12 3. The State of Nevada DCNR, DEP under the authority of
13 NRS 445.214(1) has the power and duty to administer and enforce the provisions
14 of the NWPCCL.

15 4. Defendant REECO is a Texas corporation authorized to do business in
16 Nevada as a contractor working for the U.S. Department of Energy at the Sandia
17 National Laboratory facility located in Cactus Flat in the Tonopah Test Range.

18 5. NRS 445.221 provides in pertinent part that
19 except as authorized by a permit issued by the Department
20 under the provisions of NRS 445.131 to 445.354 inclusive
21 and regulations promulgated under such sections by the
22 commission it is unlawful for any person to discharge
23 from any point source any pollutant into any waters of
24 the State.

25 6. "Pollutant" within the meaning of the NWPCCL, NRS 445.178 includes
26 the chemical waste urea.

27 7. NRS 445.331 provides that any person who unlawfully discharges or
28

1 aids and abets in the unlawful discharge of pollutants into waters of the State
2 shall pay a civil penalty of up to \$25,000 for each day of violation and for the
3 payment of damages including compensation for any loss or destruction of
4 wildlife, fish or aquatic life.

5 8. On or about November 2, 1988, REECO employees rinsed and flushed
6 waste urea from a spreader hopper onto the ground over a period of approximately
7 1.5 hours.

8 9. The urea and water formed several small ponds or catchments
9 including one which measured 30' by 25' and some of it flowed into a reservoir
10 used to supply water for construction projects and dust control. Low soil per-
11 meability prevented the water from soaking into the ground.

12 10. On or about November 3, 1988, a Nye County Sheriff's Deputy
13 discovered a dead horse in the vicinity of the reservoir referenced in paragraph
14 10 and observed several horses drinking from the 30' by 25' pool.

15 11. On or about November 5, 1988, a total of sixty-one (61) wild hor-
16 ses and numerous horned larks were found dead in an area radiating out from the
17 reservoir.

18 12. On or about November 3, 1988, autopsies of dead horses were per-
19 formed by Dr. Alan Ruegamer under the direction of the U.S. Bureau of Land
20 Management wild horse and burro specialist, Robert Stager and samples of tissue,
21 body fluids and water from the small ponds were taken to the APL Veterinary Lab
22 in Las Vegas for analysis.

23 13. On or about November 11, 1988, the lab test results confirmed that
24 the horses died of acute ammonia toxicity and calculations based on the urea
25 concentrations in the pond water samples showed that ingestion of 3.5 to 4.0
26 gallons of the contaminated water would provide a lethal dose of ammonia to a
27 horse.

1 14. The Administrator of the DEP found REECO in violation of
2 NRS 445.221 for the unlawful discharge of urea into waters of the state
3 resulting in the death of sixty-one horses.

4 15. Without any admission of liability, the parties agree that this
5 Consent Decree is intended to compromise a disputed claim and that Defendant in
6 full and final settlement of all matters arising out of the alleged unlawful
7 discharge of urea into waters of the state shall:

8 (a) Pay a civil penalty and damages in the amount of fifteen thousand
9 dollars (\$15,000.00) by check made payable to the State of Nevada.

10 (b) Develop according to applicable Bureau of Land Management guideli-
11 nes Cedar Pass Spring, Cactus Pass Spring and Northern Unit Spring for the bene-
12 fit of wild horses and other wildlife.

13 (c) Maintain these springs for a period of three years from the date
14 of completion of the development of the springs and to obtain whatever security
15 clearance is necessary to allow an independent representative designated by
16 Plaintiff to annually verify proper development and maintenance of the spring.

17 16. Each party will pay its own attorneys' fees and costs of settle-
18 ment.

19 17. Plaintiff may submit this Consent for the Issuance of a Decree to
20 the Fifth Judicial District Court in Nye County for the issuance of an
21 appropriate Order.

22 18. In the event the court does not approve the above terms and con-
23 ditions, this Consent for the Issuance of a Decree and stipulations contained
24 herein will cease to be binding and shall be null and void and the State shall
25 be permitted to amend its Complaint to amend its relief requested and the
26 Defendant shall thereafter file its answer or other responsive pleading.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28

DATED: _____.

Respectfully submitted,

BRIAN McKAY
Attorney General

By

Marta Adams
Deputy Attorney General
Division of Environmental Protection

201 South Fall Street, Room 221
Carson City, Nevada 89710
(702) 885-4670

Attorneys for Plaintiff

DATED: _____.

Reynolds Electrical and Engineering
Company

By

Arthur L. Williams, Jr.
General Counsel

Reynolds Electrical and Engineering
Company
P.O. Box 14400
Las Vegas, Nevada 89114

1 Case No.

2 Department No.

3
4
5
6 IN THE FIFTH JUDICIAL DISTRICT COURT OF THE STATE OF NEVADA
7 IN AND FOR THE COUNTY OF NYE
8

9
10 THE STATE OF NEVADA, EX REL.
11 ROLAND D. WESTERGARD, DIRECTOR OF
12 THE DEPARTMENT OF CONSERVATION AND
13 NATURAL RESOURCES,

14 Plaintiff,

15 vs.

16 REYNOLDS ELECTRICAL AND ENGINEERING
17 COMPANY, A Texas Corporation,

18 Defendant.

ORDER

19 Pursuant to the Consent for the Issuance of a Decree which has been
20 entered into by and between the Plaintiff and Defendant,

21 IT IS HEREBY ORDERED:

22 1. Defendant agrees to pay a civil penalty and damages in the amount
23 of fifteen thousand dollars (\$15,000.00) by check made payable to the State of
24 Nevada.

25 *Fallini owns* 2. Defendant agrees to develop according to applicable BLM guidelines
26 Cedar Pass Spring, Cactus Pass Spring, and Northern Unit Spring for the benefit
27 of wild horses and other wildlife.

28 3. Defendant agrees to maintain these springs for a period of three

Cliff Spring

1 years from the date of completion of the development of the springs and to
2 obtain whatever security clearance is necessary to allow an independent repre-
3 sentative designated by Plaintiff to annually verify proper development and
4 maintenance of these springs.

5 4. Upon payment of such sums and the completion of the tasks outlined
6 above, Defendant shall be released by Plaintiff from any further action or pro-
7 ceeding of any nature, administrative or judicial by Plaintiff as to violations
8 alleged herein.

9 Consent Decree entered in accordance with the foregoing this ____ day
10 of _____, 1989.

11
12
13 _____
District Judge
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28