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NMED Hazardous
Waste Bureau

Mr. James P. Bearzi, Chief
Hazardous Waste Permits Program
Hazardous Waste Bureau
New Mexico Environmental Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303

Subject: August 26, 2004, letter to Mr. R. Paul Detwiler, and Dr. Steven Warren

Dear Mr. Bearzi:

This letter provides the information you requested regarding the collection of water from the bottom of the Waste Handling Shaft. Included is the applicable documentation.

If you have any questions regarding this transmittal, please contact Mr. Jody Plum at (505) 234-7462.

Sincerely,

R. Paul Detwiler, Acting Manager
Carlsbad Field Office

S. D. Warren, General Manager
Washington TRU Solutions LLC

Enclosure Also info in 3-ring binder

cc: w/enclosure
J. Kieling, NMED
C. Noble, NMED
CBFO M&RC

040942

CBFO:AMO:HLP:VW:04-1732:UFC:5487

bcc: w/o enclosure
G. Basabilvazo, CBFO
D. Galbraith, CBFO
H. Johnson, CBFO
L. Piper, CBFO
J. Plum, CBFO
C. Zvonar, CBFO
S. Anderson, WTS
G. Johnson, WTS
D. Reber, WTS
D. Bignell, WRES
R. Chavez, WRES
S. Jones, WRES
R. Kehrman, WRES
RCRA Chronology, WRES

CBFO:AMO:HLP:VW:04-1732:UFC:5487

Responses to the August 26, 2004 New Mexico Environment Department (NMED) Request for Information Related to the Collection of Liquids from Near the Bottom of the Waste Handling Shaft

1. *Describe the circumstances under which collection of liquids from near the bottom of the Waste Handling Shaft began. Provide all correspondence and other documents describing the initial decision to collect these liquids, including a chronology of events leading up to the establishment of a collection system.*

The use of water rings and piping water collection systems is a common practice in mine shafts. The original *Title II Design Basis for the Waste Shaft*, prepared by Bechtel, Inc., dated September 21, 1983, included water collection rings, (See Attachment A). Section 3.2.2 of that document states, "Water from the collection rings shall be piped to a tank at the shaft station and then transported to the surface." The collection of liquids from the water rings was implemented at construction in 1984 and has been operated throughout the life of the shaft. The as-built condition of the water rings is described in the System Design Description for system UH00, Section 2.2.2.5, p III-10, dated March 31, 2002, (See Attachment B). Attachment C contains relevant excerpts from the Waste Isolation Pilot Plant Design Validation Final Report that discusses the water ring collection system in detail. Attachment D contains the as-built drawings for the Waste Shaft.

In general, the waters collected from the underground were not segregated until the late 1980's or early 1990's. Based on interviews with employees, ring water has historically been collected in drums, portable containers, or the waste shaft sump. Waters collected in the underground were used for dust suppression in the drifts until sometime between 1988 and 1990. In 1988, larger volumes of water were being collected from the underground due to water used to flush the bit while drilling the Air Intake Shaft and water infiltrating the Air Intake Shaft from the Culebra Formation prior to lining and grouting the shaft. The waters collected in the underground were disposed of off-site until 1991 when an emergency permit was obtained from NMED to dispose of brine water from mine dewatering in the Salt Pile Evaporation Pond, (See Attachment E). On January 16, 1992, NMED approved a discharge plan to allow the disposal of up to 1,500 gallons per day of brine to the Salt Pile Evaporation Pond until the two evaporation ponds proposed in the sewage lagoon expansion project were constructed, (See Attachment F). The Air Intake Shaft was grouted in 1993 resulting in a decrease in water infiltration and collection.

Between 1995 and 1996, approximately 19 batches of Waste Shaft Sump water contained lead ranging in concentrations from 0.5 to 14.0 mg/l. Ten of these batches exceeded the Toxicity Characteristic Leaching Procedure (TCLP) threshold of 5.0 mg/l for lead and were disposed of off-site as hazardous waste in compliance with requirements. On September 1, 1995, a meeting was held with NMED to discuss comments on the WIPP Voluntary Release Assessment/Corrective Action Work Plan and the management of lead contaminated waters in the Waste Handling Shaft, (See Attachment G). NMED was briefed on the increased lead concentrations in the water from the Waste Shaft Sump and our management practices for Waste Shaft water.

Studies were conducted to determine the source of the lead in the Waste Shaft Sump water. These studies indicated that water seeping into the Exhaust Shaft through the concrete liner approximately 50 to 85 feet below the surface grade was a contributing source. The lead is believed to have leached into the water as a result of corrosion of the galvanized chain link

fence used for ground control in the construction of the shaft. In addition, some water may have seeped from the base of the Exhaust Shaft to the Waste Shaft Sump. The Exhaust Shaft Catch Basin was installed in March 1996 to intercept fluid in the Exhaust Shaft.

In this same time frame, the ring water collection drum was placed at the Waste Shaft Station to collect and separate ring water from other waters accumulated in the Waste Shaft Sump. A meeting was held with NMED on June 20, 1997, to discuss the status of the management of underground water at WIPP, (See Attachment H).

The following attachments are referenced in responding to Question number one:

Attachment A
U.S. Department of Energy Waste Isolation Pilot Plant, Design Basis, September 21, 1983

Attachment B
Underground Hoisting System Design Description, SDD-UH00

Attachment C
Waste Isolation Pilot Plant Design Validation Final Report, Chapter 3 pages 9-12 and Chapter 8

Attachment D
Drawing 31-R-001-01D, Rev. B Waste Shaft 311 Shaft Development Sections
Drawing 31-R-002-01D, Rev. A Waste Shaft 311 Lining and Key Section Details

Attachment E
September 18, 1991, Letter Re: Temporary Permission for Disposal of Brine Waters, Sisneros to Mewhinney
August 22, 1991, Letter Requesting temporary permission to dispose of Brine Waters in the Salt Pile Evaporation Pond, Mewhinney to Rebuck

Attachment F
November 14, 1991, Discharge Permit Application
January 16, 1992, Discharge Plan Approval, DP-831, Cary to Hunt

Attachment G
September 1, 1995, Trip Report, meeting with Steve Zappe

Attachment H
June 11, 1997, Exhaust Shaft Catch Basin Presentation to NMED
June 20, 1997, Trip Report

2. *Document the history of collecting liquids from near the bottom of the Waste Handling Shaft at the Satellite Accumulation Area (SAA). For each container ever used to collect liquids, provide documentation of the time period of collection, analytical results, hazardous waste determinations, and final disposition of liquids from the container.*

Part One: *Document the history of collecting liquids from near the bottom of the Waste Handling Shaft at the SAA.*

The collection of ring water in drums near the bottom of the Waste Handling Shaft began in 1996 as described above. Analytical data for samples taken from the collection drums showed the ring water collected from the Waste Handling Shaft was non-hazardous waste. However, a sample collected from a drum of ring water in November 2002 was determined to contain 6.18 mg/l of lead exceeding the TCLP threshold of 5.0 mg/l. The ring water collection area was designated an SAA in accordance with WIPP Procedure 02-RC.01, *Hazardous and Universal Waste Management Plan*, and the waste was managed as hazardous pending analysis. It was determined that future drums would be sampled until sufficient data were available to once again consider the waste stream to be non-hazardous. The designation of the area as an SAA assured that the area was managed properly and that no more than 55-gallons were accumulated prior to moving the drum to the surface for sampling. The ring water was sampled each time a drum was filled and removed from the underground.

Since November 2002, four drums have been removed from this area for sampling and analysis. Samples collected from three of the four drums were tested and determined to be non-hazardous. The fourth drum was recently removed from the area and analysis is pending. The non-hazardous ring water was either placed in a WIPP evaporation pond in accordance with Water Quality Bureau Discharge Permit (DP-831) or sent to an off-site Treatment, Storage, and Disposal Facility (TSDF). One drum of hazardous ring water was sent to a TSDF. The second of these four drums was the one that was in the SAA at the time of the NMED's inspection on January 22 and 23, 2004. Subsequent to the NMED inspection, the SAA was downgraded to a solid waste collection area in accordance with WIPP Procedure 02-RC.01, *Hazardous and Universal Waste Management Plan*, and the ring water has been managed as solid waste pending analysis.

Part Two: *For each container ever used to collect liquids, provide documentation of the time period of collection, analytical results, hazardous waste determinations, and final disposition of liquids from the container.*

Ring water collection in 55-gallon drums located near the bottom of the Waste Handling Shaft began in 1996.

- The first 55-gallon drum of ring water was removed from the underground in June 1996. The water was sampled and analyzed for TCLP metals (sample number WST-96-214). The waste was non-hazardous. This drum was sent to an off-site TSDF for disposal as non-hazardous waste. The collection time is unknown. (See Attachment 1 for documentation)

- The second drum of ring water was removed from the underground in August 1996. Process knowledge was used to characterize this waste as non-hazardous. This waste was placed in a WIPP evaporation pond. The collection time was two months. (See Attachment 2 for documentation)

- The third drum of ring water was removed from the underground in June 1997. This waste was sampled and analyzed for TCLP volatiles, TCLP Semi-volatiles, and TCLP metals (sample numbers WST-97-152 through WST-97-155). The waste was non-hazardous. The waste was sent to an off-site TSDF for disposal as non-hazardous waste. The collection time was ten months. (See Attachment 3 for documentation)

- The fourth drum of waste was removed from the underground in April 1998. Process knowledge was used to characterize this waste as non-hazardous waste. The drum was sent to an off-site TSDF for disposal as non-hazardous waste. The collection time was ten months. (See Attachment 4 for documentation)

- The fifth drum of ring water was removed from the underground in September 1998. This waste was sampled and analyzed for TCLP metals (sample number WST-98-270). The waste was non-hazardous. This drum was sent to an off-site TSDF for disposal as non-hazardous waste. The collection time was 5 months. (See Attachment 5 for documentation)

- The sixth drum of ring water was removed from the underground in June 1999. Process knowledge was used to characterize this waste as non-hazardous. This drum was sent to an off-site TSDF for disposal as non-hazardous waste. The collection time was nine months. (See Attachment 6 for documentation)

- The seventh drum of ring water was removed from the underground in August 1999. Process knowledge was used to characterize this waste as non-hazardous. This drum was sent to an off-site TSDF for disposal as non-hazardous waste. The collection time was two months. (See Attachment 7 for documentation)

- The eighth drum of ring water was removed from the underground in June 2000. Process knowledge was used to characterize this waste as non-hazardous. This drum was sent to an off-site TSDF for disposal as non-hazardous waste. The collection time was ten months. (See Attachment 8 for documentation)

- The ninth drum of ring water was removed from the underground in July 2000. Process knowledge was used to characterize this waste as non-hazardous. This drum was sent to an off-site TSDF for disposal as non-hazardous waste. The collection time was one and a half months. (See Attachment 9 for documentation)

- Due to escalating disposal costs, the decision was made in 2001 to place all non-hazardous wastewaters in a WIPP evaporation pond. The tenth drum of ring water was removed from the underground in March 2001. This waste was sampled and analyzed for TCLP metals (sample number WST-01-016). The waste was non-hazardous. The waste was placed in a WIPP evaporation pond. The collection time was eight months. (See Attachment 10 for documentation)

- The eleventh drum of ring water was removed from the underground in November 2002. The water appeared to be much more viscous than usual and contained more sediment than normal. The sampling team observed that the characteristics of the water were different from previous batches of water collected. Therefore, there was reason to suspect a change in water generation. Due to the obvious change in the physical characteristics of the waste stream, it was sampled and managed as hazardous waste pending analysis. The sample was analyzed for TCLP metals (sample number WST-02-265). The waste was determined to contain lead at a concentration of 6.18 mg/l. This drum was sent to an off-site TSDF for disposal as hazardous waste. The collection time for this drum was twenty months. (See Attachment 11 for documentation) Due to the observation that this waste could be hazardous, the area was managed as a SAA to ensure it was managed in accordance

20.4.1.300 New Mexico Administrative Code (NMAC) (incorporating 40 Code of Federal Regulations {CFR} 262.34) and the waste was designated for sampling until adequate data existed to designate the waste as hazardous or non-hazardous.

- The twelfth drum of ring water was removed from the underground in September 2003. The waste was managed as hazardous waste pending analysis. The waste was sampled and analyzed for TCLP metals (sample number WST-03-078). The waste was non-hazardous. The waste was placed in a WIPP evaporation pond. The collection time was ten months. (See Attachment 12 for documentation)

- The thirteenth drum of ring water was removed from the underground in January 2004. The waste was managed as hazardous waste pending analysis. The waste was sampled and analyzed for TCLP metals (sample numbers WST-04-003 and WST-04-004), TCLP volatiles and TCLP semi-volatiles (sample numbers WST-04-001 and WST-04-002) to confirm process knowledge that no other constituents of concern were present in the waste. The waste was non-hazardous for all constituents. The waste was placed in a WIPP evaporation pond. This is the drum that was in the underground SAA at the time of the NMED inspection. The collection time was four months. (See Attachment 13 for documentation) Since NMED raised questions about the water collection system, the process was modified to include a hard-piped fitting and the SAA was downgraded to a solid waste collection area.

- The fourteenth drum of ring water was removed from the underground in July 2004. The waste was managed as solid waste pending analysis. The waste was sampled and analyzed for TCLP metals (sample numbers WST-04-045 and WST-04-046). The waste was non-hazardous. The waste was placed in a WIPP evaporation pond. The collection time was six months. (See Attachment 14 for documentation)

- The fifteenth drum of ring water was removed from the underground in September 2004. The waste is being managed as solid waste pending analysis. The waste is pending sampling and analysis for TCLP metals. Waste disposal decisions will be made upon receipt of the analytical results. The collection time was one and a half months, (See Attachment 15 for documentation).

3. *Describe the circumstances under which it was determined that the open drum observed near the bottom of the Waste Handling Shaft during the NMED inspection should be labeled as hazardous waste.*

In accordance 20.4.1.300 New Mexico Administrative Code (NMAC) (incorporating 40 Code of Federal Regulations {CFR} 262.34), Title 40 Section 262.11(c) of the CFR states in part:

> *"...the generator must then determine whether the waste is identified in subpart C of Title 40 CFR part 261 by either: (1) Testing the waste ...; or (2) Applying knowledge of the hazard characteristic of the waste in light of the materials or the processes used."*

At WIPP, waste streams are determined to be hazardous or non-hazardous following the procedure outlined in 40 CFR 262.11, using process knowledge and/or sampling and analysis. Once sufficient data exists to characterize a waste as hazardous or non-hazardous, it is managed accordingly until there is reason to suspect that the waste generation process has changed. Reasons to suspect waste generation changes include, but are not limited to,

changes in the appearance or physical characteristics of the waste stream, changes in the waste generation process and new information obtained from analysis of routine or non-routine samples. Non-hazardous waste streams are checked on a routine basis to detect changes.

Ten drums of ring water generated in the Waste Shaft between June 1996 and November 2002 were managed as non-hazardous waste based on process knowledge and analytical results. The physical characteristics of the eleventh drum of ring water appeared to be different from those routinely observed as determined by the sampling team at the time of sample collection. This water was much more viscous than that normally encountered and the drum appeared to contain significantly more sediment than usual. Because of the unusual appearance of the water and the amount of sediment in the drum, a sample was collected from the drum in order to verify the characterization of the waste stream. The waste was determined to contain 6.18 mg/l of lead exceeding the TCLP threshold of 5.0 mg/l. Therefore, the sampling frequency was increased to determine if a change in the waste generation process had occurred.

The ring water accumulates continuously in the drum over a period of time that ranges from one and a half to 20 months. Therefore, it was decided that the ring water collection area should be established as an SAA and the waste was to be managed as "hazardous waste pending analysis." SAAs are allowed per the regulations at Title 40 CFR Section 262.34(c), provided that the generator "*Marks his containers either with the words 'Hazardous Waste' or with other words that identify the contents of the containers*" in accordance 20.4.1.300 NMAC (incorporating 40 CFR 262.34). WIPP personnel chose to conservatively label the drum in the SAA with both the words "Hazardous Waste" and words that identified the contents of the drum. Designation as an SAA assures that drums of waste are managed in the safest manner. Labeling assures that, when drums are full and closed; they are moved to the surface in a timely manner and managed appropriately pending analysis.