Mr. John E. Kieling, Chief  
Hazardous Waste Bureau  
New Mexico Environment Department  
2905 E. Rodeo Park Dr. Bldg. 1  
Santa Fe, New Mexico 87505-6303  

Subject: Report to Demonstrate Outside Contamination as the Source of Toluene Detected in WIPP Detection Monitoring Well WQSP-5, Permit Number NM4890139088-TSDF  


Dear Mr. Kieling:  

With this letter, the Permittees are providing the New Mexico Environment Department (NMED) with a report that demonstrates outside contamination as the source of the toluene recently detected in monitoring well WQSP-5, and reported in the referenced letter. Because the Permittees believed the source of toluene was not the regulated unit, Permit Part 5, Section 5.10.4.2 was implemented, requiring the submittal of a report to demonstrate outside contamination within 90 calendar days of determining statistically-significant evidence of contamination.  

We certify under penalty of law that this document and all attachments were prepared under our direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on our inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of our knowledge and belief, true, accurate and complete. We are aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.  

If you have any questions, please contact Mr. Michael R. Brown at (575) 234-7476.  

Sincerely,  

Todd Shrader, Manager  
Carlsbad Field Office  

Bruce C. Covert  
Nuclear Waste Partnership LLC  

Enclosure  

cc: w/enclosure  
R. Maestas, NMED * ED  
D. Biswell, NMED ED  
M. McLean, NMED ED  
H. Tellez, NMED ED  
CBFO M&RC  
*ED denotes electronic distribution
1.0 Introduction

The purpose of this report is to demonstrate that the toluene detected in WIPP Detection Monitoring Well (DMW) WQSP-5 is caused by a source other than the regulated unit and therefore can be classified as "outside contamination" per 40 CFR §264.98(g)(6)(ii). This report is being submitted as required by the Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit (Permit), Part 5, Section 5.10.4.2. On August 6, 2018, the Permittees notified the NMED of their intent to demonstrate outside contamination as the source of toluene. This notification was pursuant to Permit Part 5, Section 5.10.4.1.

WQSP-5 was sampled on May 31, 2018, (Sampling Round 40), as part of the annual Detection Monitoring Program (DMP). Results of DMP groundwater sampling were verified and validated on July 30, 2018. The concentration of toluene detected in WQSP-5 was 2.07 micrograms per liter (µg/L) in the primary sample and 2.0 µg/L in the duplicate sample. These concentrations are statistically higher than previous sampling rounds and exceed the background value of 1.0 µg/L presented in, Permit Part 5, Table 5.6. All other parameters and constituents were at normal levels. Because toluene concentrations are typically below the method reporting limits for this well, the reported value is considered statistically significant.

The Permit requires the Permittees to submit a demonstration of outside contamination if it is suspected that a source other than the regulated unit caused the increase, or that the detection is an artifact caused by an error in sampling, analysis, or statistical evaluation, or natural variation in the groundwater.

Activities described herein are intended to demonstrate that the source of contamination is not the regulated unit, and can be classified as outside contamination in accordance with the Permit. This report also presents evidence that the contamination did not result from any error in sampling, analysis, or statistical evaluation.

An assessment indicates the source of toluene in WQSP-5 is not the regulated unit, but contamination due to the replacement of the well pump on May 21, 2018, prior to sampling. The contractor indicated that gloves and tools used during pump installation could have been contaminated by various substances, including gasoline or other volatile liquids, prior to use for installation of the new pump. Thus, it is plausible that the offsite contractor is the source of toluene contamination.

2.0 Demonstration

2.1 WQSP-5 Well Resampling and Results

On May 15, 2018, during Round 40 sampling of WQSP-5, the pump failed. On May 21, 2018, the pump assembly (including tubing, power cable, and discharge hose) was removed and disassembled. The reason for failure of the pump could not be determined. The pump was replaced and the assembly re-installed in the well. During installation, the power cable and sampling line were attached at every discharge tubing joint using nylon zip ties.
Table 1 shows the recent toluene concentrations for WQSP-5. Prior to and including sampling Round 40, toluene concentrations were consistently below the method reporting limit (MRL) of 1.0 µg/L, which is also the background value presented in Permit Part 5, Table 5.6. Following installation of a new pump, toluene was detected in both the primary and duplicate samples.

### Table 1. Comparison of Toluene Concentrations in WQSP-5 Groundwater Before and After 2018 Pump Replacement.

<table>
<thead>
<tr>
<th>Sampling Round</th>
<th>Sample Date</th>
<th>Primary Sample</th>
<th>Duplicate Sample</th>
</tr>
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<tbody>
<tr>
<td>36</td>
<td>4/29/2014</td>
<td>0.2&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.21&lt;sup&gt;c&lt;/sup&gt;</td>
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<tr>
<td>37</td>
<td>5/27/2015</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>38</td>
<td>5/10/2016</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>39</td>
<td>5/09/2017</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>40</td>
<td>5/31/2018</td>
<td>2.07</td>
<td>2.0</td>
</tr>
</tbody>
</table>

<sup>a</sup>Toluene quantified by EPA Method 8260B  
<sup>b</sup>ND = non detect; concentration below method detection limit.  
<sup>c</sup>Analyte detected below MRL and attributed to an outside source

2.1.1 Well Purging

The pump was started again on August 14, 2018, and allowed to run continuously through August 15, 2018 (29 hours run time). This step was performed to equilibrate the water in the well with fresh formation water. Based on flow meter readings and field calculations, 725 gallons were removed, or an equivalent of approximately 3.24 wellbore volumes (WBV).

2.1.2 Groundwater Resampling

Re-sampling for toluene began on August 16, 2018, when pumping restarted and field parameters were measured per procedure WP 02-EM1010, *Field Parameter Measurements and Final Sample Collection*. Once field parameters stabilized, final samples were obtained on August 16, 2018, after purging a estimated total of 780 gallons (3.4 WBV) of groundwater. Samples were packaged and shipped to Hall Environmental Analysis Laboratory (HEAL), Albuquerque, NM on August 16, 2018, per procedure. Samples were received at HEAL on August 17, 2018.
2.1.3 Results of Groundwater Resampling

Table 2 shows the comparison of toluene concentrations between the original Sampling Round 40 sample and resampling for WQSP-5. A reduction in toluene was observed following well purging (appendix A). Appendix A uses the practical quantitative limit (PQL) qualifier which is equivalent to MRL.

The concentration of toluene detected in the resampled groundwater was 0.89 µg/L in the primary sample and 0.81 µg/L in the duplicate resample. Both results were J coded, meaning the analyte was detected below quantitation limits. A decrease in the concentration of toluene, in response to purging, demonstrates that the source of the contamination has been reduced and therefore it can be concluded that the source is not the regulated unit. In addition, purging appeared to be an effective method to restore the groundwater to its background value.

Table 2. Comparison of Toluene Concentrations in WQSP-5 Groundwater, Rounds 40 and 40R.

<table>
<thead>
<tr>
<th>Round</th>
<th>Sample Date</th>
<th>Primary Sample</th>
<th>Duplicate Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>40, original sample&lt;sup&gt;b&lt;/sup&gt;</td>
<td>5/31/2018</td>
<td>2.07</td>
<td>2.0</td>
</tr>
<tr>
<td>40R, resample&lt;sup&gt;c&lt;/sup&gt;</td>
<td>8/16/2018</td>
<td>0.89&lt;sup&gt;d&lt;/sup&gt;</td>
<td>0.81&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

*a Toluene quantified by EPA Method 8260B  
<sup>b</sup>Collected after new pump installation following initial failure.  
<sup>c</sup>Collected after purging approximately 3.4 WBV.  
<sup>d</sup>Analyte detected below MRL.

3.0 Conclusions and Recommendations

This report demonstrates the toluene detected in WQSP-5 was due to use of contaminated equipment during pump replacement. Through purging, the well water equilibrated with fresh formation water and toluene concentrations declined to the background values in Permit Part 5, Table 5.6, and below. At this time it is recommended that continued monitoring and reporting, per the Permit, should be sufficient for follow-up activities with respect to toluene detection in this well.
Appendix A

WQSP-5 Round 40R, Resample Analytical Report
August 22, 2018

Hnin Khaing
WIPP
P.O. Box 2078
Carlsbad, NM 88221-2078
TEL: (575) 234-8615
FAX

RE: WIPP DMP

Dear Hnin Khaing:

Hall Environmental Analysis Laboratory received 4 sample(s) on 8/17/2018 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109
All analytes reported are associated with passing CCVs.

METHOD: 8260B

HOLDING TIMES: All holding times for Preparation and Analysis were met.

METHOD: Preparations: 5030
            Analysis: 8260B

PREPARATION: Sample preparation proceeded normally.

ANALYSIS:
1. Calibration: All acceptance criteria were met.
2. Blanks: All acceptance criteria were met.
3. Internal Standards: All acceptance criteria were met.
4. Surrogates: All acceptance criteria were met.
5. Spikes: All acceptance criteria were met.
6. Samples: All acceptance criteria were met.
**Analytical Report**

**Lab Order 1808B08**

**Date Reported:** 8/22/2018

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**Hall Environmental Analysis Laboratory, Inc.**

- **CLIENT:** WIPP
- **Project:** WIPP DMP
- **Lab ID:** 1808B08-001
- **Matrix:** AQUEOUS

**Client Sample ID:** GW-WQ5-C-R40R

**Collection Date:** 8/16/2018 12:14:00 PM

**Received Date:** 8/17/2018 9:20:00 AM

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### Analyses

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<th>Qual</th>
<th>Units</th>
<th>DF</th>
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<td>J</td>
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Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:**

- **A** Value exceeds Maximum Contaminant Level
- **B** Analyte detected in the associated Method Blank
- **D** Sample Diluted Due to Matrix
- **E** Value above quantitation range
- **H** Holding times for preparation or analysis exceeded
- **J** Analyte detected below quantitation limits
- **ND** Not Detected at the Reporting Limit
- **P** Sample pH Not In Range
- **PQL** Practical Quantitative Limit
- **RL** Reporting Detection Limit
- **S** % Recovery outside of range due to dilution or matrix
- **W** Sample container temperature is out of limit as specified

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*Page 2 of 7*
## Analytical Report

### Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** WIPP  
**Project:** WIPP DMP  
**Lab ID:** 1808B08-002  
**Matrix:**

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<td></td>
</tr>
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</table>

**Analysis: Toluene**

- **Result:** 0.81 µg/L
- **MDL:** 0.064 µg/L
- **PQL:** 1.0
- **Qual:** J
- **Units:** µg/L
- **Date Analyzed:** 8/20/2018 6:39:56 PM
- **Batch ID:** WW53!

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

### Qualifiers:

- **A** Value exceeds Maximum Contaminant Level
- **B** Analyte detected in the associated Method Blank
- **C** Value above quantitation range
- **D** Analyte detected below quantitation limits
- **E** Sample Diluted Due to Matrix
- **F** Sample pH Not In Range
- **H** Holding times for preparation or analysis exceeded
- **J** Analyte detected below quantitation limits
- **K** Analyte detected above quantitation limits
- **L** Reporting Detection Limit
- **M** Sample container temperature is out of limit as specified
- **N** Not Detected at the Reporting Limit
- **P** Sample container temperature is out of limit as specified
- **Q** Practical Quantitative Limit
- **R** Reporting Detection Limit
- **S** % Recovery outside of range due to dilution or matrix
- **T** Analyte detected above quantitation limits
- **U** Reporting Detection Limit
- **V** Sample container temperature is out of limit as specified
- **W** Sample container temperature is out of limit as specified
- **X** Reporting Detection Limit
- **Y** Sample container temperature is out of limit as specified
- **Z** Reporting Detection Limit
**Analytical Report**

**Lab Order:** 1808B08

**Date Reported:** 8/22/2018

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**CLIENT:** WIPP  
**Project:** WIPP DMP  
**Lab ID:** 1808B08-003

**Analyses**

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**Client Sample ID:** GW-WQ5-C-R40R FIELD BLA  
**Collection Date:** 8/16/2018 12:27:00 PM  
**Received Date:** 8/17/2018 9:20:00 AM

**Date Reported:** 8/22/2018

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Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:**
- Value exceeds Maximum Contaminant Level (MCL)
- Sample Diluted Due to Matrix (D)
- Holding times for preparation or analysis exceeded (H)
- Not Detected at the Reporting Limit (ND)
- Practical Quantitative Limit (PQL)
- % Recovery outside of range due to dilution or matrix (S)
- Analyte detected in the associated Method Blank (B)
- Value above quantitation range (E)
- Analyte detected below quantitation limits (J)
- Sample pH Not In Range (P)
- Reporting Detection Limit (RL)
- Sample container temperature is out of limit as specified (W)
### Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** WIPP  
**Project:** WIPP DMP  
**Lab ID:** 1808B08-004  

**Analyses**

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**Client Sample ID:** TRIP BLANK  
**Collection Date:** Received Date: 8/17/2018 9:20:00 AM

**Qualifiers:**

- * Value exceeds Maximum Contaminant Level
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RIL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.
Hall Environmental Analysis Laboratory, Inc.

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Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:
- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quantitative Limit
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified
## QC SUMMARY REPORT

**Hall Environmental Analysis Laboratory, Inc.**

**Client:** WIPP  
**Project:** WIPP DMP

### Sample ID: rb
- **SampType:** MBLK
- **TestCode:** EPA Method: 8260B

#### Client ID: PBW  
**Batch ID:** WW53574  
**RunNo:** 53574  
**Prep Date:** Analysis Date: 8/20/2018  
**SeqNo:** 1766104  
**Units:** µg/L

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- **TestCode:** EPA Method: 8260B

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**RunNo:** 53574  
**Prep Date:** Analysis Date: 8/20/2018  
**SeqNo:** 1766105  
**Units:** µg/L

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### Sample ID: 100ng lcsd
- **SampType:** LCSd4
- **TestCode:** EPA Method: 8260B

#### Client ID: BatchQC  
**Batch ID:** WW53574  
**RunNo:** 53574  
**Prep Date:** Analysis Date: 8/20/2018  
**SeqNo:** 1766106  
**Units:** µg/L

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### Sample ID: 1808b08-001a ms
- **SampType:** MS4
- **TestCode:** EPA Method: 8260B

#### Client ID: GW-WQS5-C-R40R  
**Batch ID:** WW53574  
**RunNo:** 53574  
**Prep Date:** Analysis Date: 8/20/2018  
**SeqNo:** 1766108  
**Units:** µg/L

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### Qualifiers:
- **A** Value exceeds Maximum Contaminant Level
- **B** Analyte detected in the associated Method Blank
- **C** Sample Diluted Due to Matrix
- **D** Value above quantitation range
- **E** Analyte detected below quantitation limits
- **F** Sample pH Not In Range
- **G** Holding times for preparation or analysis exceeded
- **H** Sample container temperature is out of limit as specified
### QC SUMMARY REPORT

**Hall Environmental Analysis Laboratory, Inc.**

**Client:** WIPP  
**Project:** WIPP DMP

**Sample ID:** 1808b08-001a msd  
**SampType:** MSD4  
**TestCode:** EPA Method: 8260B

**Client ID:** GW-WQ5-C-R40R  
**Batch ID:** WW53574  
**RunNo:** 53574

**Prep Date:** Analysis Date: 8/20/2018  
**SeqNo:** 1766109  
**Units:** µg/L

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</table>

**Qualifiers:**

- *: Value exceeds Maximum Contaminant Level  
- D: Sample Diluted Due to Matrix  
- H: Holding times for preparation or analysis exceeded  
- ND: Not Detected at the Reporting Limit  
- PQL: Practical Quantitative Limit  
- S: % Recovery outside of range due to dilution or matrix  
- B: Analyte detected in the associated Method Blank  
- E: Value above quantitation range  
- J: Analyte detected below quantitation limits  
- P: Sample pH Not In Range  
- RL: Reporting Detection Limit  
- W: Sample container temperature is out of limit as specified
Sample Log-In Check List

Client Name: WIPP  Work Order Number: 1808B06  RptNo: 1

Received By: Ashley Gallagors  8/17/2018 9:20:00 AM
Completed By: Anne Thorne  8/17/2018 1:24:37 PM
Reviewed By:  8/17/18

Chain of Custody
1. Is Chain of Custody complete? Yes ☑ No ☐ Not Present ☐
2. How was the sample delivered? FedEx

Log In
3. Was an attempt made to cool the samples? Yes ☑ No ☐ NA ☐
4. Were all samples received at a temperature of >0°C to 6.0°C? Yes ☑ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☑ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☑ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☑ No ☐
8. Was preservative added to bottles? Yes ☑ No ☐
9. VOA vials have zero headspace? Yes ☑ No ☐
10. Were any sample containers received broken? Yes ☑ No ☐
11. Does paperwork match bottle labels? Yes ☑ No ☐
   (Note discrepancies on chain of custody)
12. Are matrices correctly identified on Chain of Custody? Yes ☑ No ☐
13. Is it clear what analyses were requested? Yes ☑ No ☐
14. Were all holding times able to be met? Yes ☑ No ☐
   (If no, notify customer for authorization.)

Special Handling (if applicable)
15. Was client notified of all discrepancies with this order? Yes ☑ No ☐ NA ☐

Person Notified: RJ  Date: 8/17/2018
By Whom: Anne Thorne  Via: ☑ eMail ☐ Phone ☐ Fax ☐ in Person
Regarding: SAMPLE TEMPERATURE
Client Instruction: PROCEED WITH ANALYSIS

16. Additional remarks: CUSTODY SEALS INTACT ON BUBBLE BAGS CONTAINING SAMPLES/6/17/18

17. Cooler Information

<table>
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<tr>
<th>Cooler No</th>
<th>Temp °C</th>
<th>Condition</th>
<th>Seal Intact</th>
<th>Seal No</th>
<th>Seal Date</th>
<th>Signed By</th>
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Page 1 of 1
# Chain of Custody Record

**Project Number:** TO502072-1  
**Project Name:** WIPP/OMP

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<th>Sampler(s)</th>
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<tr>
<td>R. Jimenez</td>
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</table>

<table>
<thead>
<tr>
<th>Sample Date</th>
<th>Sample Time</th>
<th>Matrix</th>
<th>Sample Number</th>
<th>Total Number of Containers</th>
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<tbody>
<tr>
<td>8/16/13</td>
<td>12:14</td>
<td>GW</td>
<td>GW-WQS-C-R40R-N1</td>
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</table>

**Requested Analyses:**

- **Tox:**

**Analytical Laboratory:**

- **HEAL:**
  - **ALBUQUERQUE, NM**
  - **Comments:**
    - 1808 BS-201
    - 202
    - FIELD BLANKS
    - TOX
    - TRIP BLANKS
    - HEALTH

**Sample Disposal:**

- **Return to Client**
  - **Disposal by Lab**

**Sample Receipt Remarks:**

- **Results:**
  - **7.4-1.0(CF)=LO.4**
  - **Received By:**
    - **Signature, Date/Time:**
      - **08/11/13 - 09:20**

**Sample Disposal:**

- **Return to Client**
  - **Disposal by Lab**

**Carrier/Airbill No.:**

- **FED EX**
  - **8675-2092-4806**

**Requested Turnaround Time:**

- **Routine**
  - **Rush**

**Required Instructions:**

- **7.4-1.0(CF)=LO.4**

**Results To:**

- **HNN NG**
  - **KAI**

**Responded:**

- **PO Box 2978, MS 452-09**
  - **Carlsbad, NM 88221-2076**
  - **Phone:** 575-234-8972
  - **FAX:** 575-334-6003

**EDD:**

- **HNN.KHANG@WIPP.US**

**Trip Blanks Have:**

- **Table Blanks**

**WHITE - Analytical Laboratory**

- **DI - Dissolved Water**
  - **GW - Groundwater**

**YELLOW - Field Copy**

- **AF - Air Filter(s)**
  - **AN - Animal(s)**

**pink - Redacted Copy**

- **SE - Sediment**
  - **SO - Soil**

**SW - Surface Water**

- **VG - Vegetation**

---

**Form CofC/RFA, Rev. 0 - NICHOLS PRINTING, INC.**