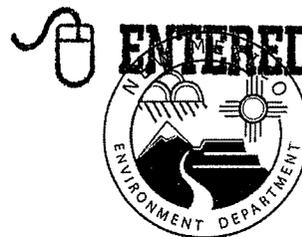




NEW MEXICO  
ENVIRONMENT DEPARTMENT



*Hazardous Waste Bureau*

BILL RICHARDSON  
Governor

2905 Rodeo Park Drive East, Building 1  
Santa Fe, New Mexico 87505-6303

RON CURRY  
Secretary

DIANE DENISH  
Lieutenant Governor

Phone (505) 476-6000 Fax (505) 476-6030

JON GOLDSTEIN  
Deputy Secretary

[www.nmenv.state.nm.us](http://www.nmenv.state.nm.us)

MEMORANDUM

TO: SNL Files 2009

FROM: Sid Brandwein  
Hazardous Waste Bureau

RE: **GROUNDWATER SPLIT SAMPLING,  
SNL MONITORING WELLS MWL-BW2, MWL-MW7, MWL-MW8,  
MWL-MW9 and CTF-MW2**

Date: June 18, 2009

NMED conducted a groundwater monitoring well split sampling event along with SNL personnel for the following wells on the shown dates:

<u>Well Name</u>	<u>Date</u>
CTF-MW2	3/23/09
MWL-BW2	4/01/09
MWL-MW7	4/08/09
MWL-MW8	4/07/09
MWL-MW9	4/09/09

The samples were collected from the wells by Sandia/contractor personnel and immediately given to Sid Brandwein of NMED. A second NMED representative (different for each day) was also present for each sampling event (William McDonald at CTF-MW2 and MWL-MW8, Brian Salem at MWL-BW2 and MWL-MW9, and Dezbah Tso at MWL-MW7). Groundwater purge field measurements are attached.

Sampling bottles with pre-filled preservatives were supplied by Paragon Laboratory. The samples were collected unfiltered. The bottles and preservatives were as follows:

Analyte	Bottle Size	Bottle Type	Preservative
VOCs	3x40 ml VOA	glass	HCl
SVOCs	1 liter	Amber glass	None
Metals	½ Liter	poly	HNO <sub>3</sub>
Gross Alpha/Beta	½ liter	poly	HNO <sub>3</sub>
Gamma Spectroscopy	1 liter	poly	HNO <sub>3</sub>
High Explosives	1 liter	Amber glass	None

Except for MWL-MW8 samples, each set of samples were FedExed to Paragon Laboratory (the NMED contract laboratory) in Ft. Collins, CO, on the day of collection, with custody seals on the ice chests. The samples from MWL-MW8 were held overnight in the NMED District 1 sample refrigerator with custody seals on each sample and then FedExed with the MWL-MW7 samples. A brief summary of the laboratory results follows.

#### CTF-MW2

CTF-MW2 had exhibited sporadic detections of high explosives (HE) components in the past and was chosen for a split sample to confirm a potential detection. About 37 gallons were pumped from the well using a Bennett pump at an approximate average of 0.33 gallons/minute prior to sampling. The well had about 84 feet of water above the pump. CTF-MW-2 was tested for barium (Method SW6010), VOCs (Method SW8260\_25B) and HPLC Explosives (Method SW8330). Duplicate samples were collected for the VOC, explosives and barium tests. A trip blank for VOC testing was also sent to the laboratory. The groundwater from this well has historically exhibited a high buffering capacity, and this information was forwarded to the laboratory.

The barium result of .068 mg/L (and .067 mg/L in the duplicate) was qualified with "B" code (reported value was obtained from a reading that was less than the Practical Quantitation Limit but greater than or equal to the Instrument Detection Limit). All VOC analytes were reported with a "U" code (not detected), except for vinyl chloride, (both in the sample and the duplicate) which was reported with a "J" code (typically used when the result is less than the reporting limit (RL) but greater than the method detection limit (MDL)). The VOC trip blank had a "J" qualifier for 1,1-dichloroethene. All the analytes for the explosives test were reported with a "U" code.

#### MWL Wells

The 4 Mixed Waste Landfill wells sampled are newly emplaced wells and were therefore chosen for confirmatory split sampling. A Bennett pump was used to evacuate and sample well water.

Well Name	Gallons pumped	Average rate (g/m)	Initial height of water above pump (ft.)	Comments
MWL-BW2	39	.33	22	
MWL-MW7	9	.23	6	
MWL-MW8	14	.15	6	Comment 1
MWL-MW9	6	.2-.3	6	Comment 1

Comment 1 – Well pumped dry, sample collected after 80% recovery and pumping ½ gallon.

The 4 MWL wells were tested for VOCs, SVOCs, metals, gross alpha/beta and gamma spectroscopy.

VOCs –

GC/MS volatiles were tested using method SW8260\_25B. A duplicate sample was collected at MWL-BW2. All coolers sent to the laboratory had trip blanks. A deionized water spike was also sent as part of the MWL-MW8 sampling. All VOC analytes were reported with a “U” code, except for the following.

Well Name	Detected Analyte – “J” Code
MWL-BW2	Toluene(in duplicate)
MWL-MW7	Toluene, Carbon disulfide
MWL-MW8	Toluene, Trichloroethene
MWL-MW9	Toluene

SVOCs –

GC/MS semi-volatiles were tested using method SW8270D. All SVOC analytes were reported with a “U” code in all 4 wells.

Metals –

Metals tested for included aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron lead, magnesium, manganese, nickel, potassium, selenium, silver, sodium, thallium, tin, vanadium, zinc (total recoverable ICP metals – SW6010B) and mercury (total Mercury – SW7470). A duplicate sample was taken at well MWL-BW2.

Well Name	Detected Analyte – No Code	Detected Analyte – “B”Code
MWL-BW2	Calcium, magnesium, potassium, sodium	Manganese, vanadium, zinc, mercury, arsenic, iron, barium (arsenic was non-detect in duplicate)
MWL-MW7	Calcium, magnesium, potassium, sodium	Manganese, vanadium, zinc, aluminum, iron
MWL-MW8	Calcium, magnesium, potassium, sodium, barium	Manganese, vanadium, zinc, aluminum, arsenic, barium, iron
MWL-MW9	Calcium, magnesium, potassium, sodium	Manganese, vanadium, zinc, aluminum, arsenic, barium, iron

Gross Alpha/Beta –

Gross Alpha/Beta was tested using method PAI 724 Rev 10.

Well Name	Gross Alpha (result +/- 2 s TPU) pCi/L	Gross Beta (result +/- 2 s TPU) pCi/l
MWL-BW2	9.3+/-2.7	4.4+/-2.0
MWL-MW7	4.8+/-1.7	5.0+/-2.1
MWL-MW8	8.4+/-2.1	5.8+/-1.8
MWL-MW9	5.9+/-1.7	7.2+/-2.1

Note: TPU = Total Propagated Uncertainty  
s = standard deviation

Values of less than 15pCi/L for gross alpha and less than 50 pCi/L for gross beta are typically not considered of concern.

Gamma Spectroscopy

Gamma Spectroscopy was tested using method PAI 713 Rev 10. Target nuclides were reported with a "U" code, except for the following.

Well Name	Nuclide
MWL-BW2	Bi-214 "J", Pb-214 "J"
MWL-MW7	Bi-214 "J", Pb-214 "J"
MWL-MW8	Bi-214 "U,J", Pb-214 "U,J", Tl-208 "Tl" (nuclide ID is tentative)
MWL-MW9	Bi-214 "U,J", Pb-214 "J"

Both Bi-214 and Pb-214 are naturally occurring radioisotopes, and are daughter products of naturally occurring U-238. Tl-208 is a daughter product of thorium, another naturally occurring radioisotope.

General Results

All Samples were received cool (on ice) at the laboratory. All holding times were met. Laboratory QA/QC criteria (Surrogate recovery, internal standards, etc.) were acceptable. All trip blanks and spikes had "U" codes for all analytes except for the one "J" code for 1,1-dichloroethene for the trip blank associated with CTF-MW2. Duplicate samples showed similar values. No obvious groundwater contamination was evident.



## ATTACHMENT A FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Project Name: <b>MWL</b>	Project No.:
Well ID: <b>BW2</b>	Date: <b>April 1, 2009</b>
Weather: <b>Cold &amp; cloudy</b>	
Method: <input checked="" type="checkbox"/> Portable pump <input type="checkbox"/> Dedicated pump      Pump depth: <b>499'</b>	

### PURGE MEASUREMENTS

Depth to Water (FD)	Time 24 hr	Vol. L (ft <sup>3</sup> )	Temp °C	EC (µmho)	ORP MV	pH	Flow L/gal	Turb NTU	DO %	Color and appearance
477.44	0803									
483.34	0840	10	18.09	748	139.8	7.31		0.80	10.4	0.98
484.19	0858	15	18.13	746	127.6	7.32		1.45	11.0	1.06
484.63	0905	20	17.92	750	120.3	7.34		1.30	11.0	1.04
484.43	0922	25	17.31	753	115.2	7.34		1.28	9.2	0.88
484.61	0938	30	17.56	758	110.8	7.34		0.50	7.8	0.74
484.65	0944	32	17.43	761	109.5	7.34		0.47	7.4	0.71
484.70	0950	34	17.43	762	108.9	7.34		0.40	7.1	0.67
484.74	0959	36	17.51	762	108.7	7.34		0.39	7.0	0.66
484.74	1006	38	17.52	763	108.8	7.34		0.33	6.8	0.65
484.74	1011	39	17.51	762	108.8	7.34		0.25	6.7	0.64
	1018									
<i>SAMPLING</i>										
COC number(s):										
Sample number(s):										

DOW/

#### Purge Volume Calculations

Well Diameter

- 2" well: 0.16 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons
- 4" well: 0.58 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons
- 6" well: 1.47 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons

~ 4.00 gal. purged prior to measurements  
0817

Tubing Diameter

- 1/4" OD: 2.4 ml/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters
- 3/8" OD: 9.7 ml/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters
- 1/2" OD: 21.6 ml/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters

## ATTACHMENT A FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

Project Name: <u>MWL-GWM</u>		Project No.:	
Well ID: <u>MWL-MW7</u>		Date: <u>4-8-09</u>	
Weather:			
Method: <input checked="" type="checkbox"/> Variable pump	<input type="checkbox"/> Dedicated pump	Purge depth: <u>49.5'</u>	

### PURGE MEASUREMENTS

Depth to Water (FT)	Time 24 hr	V <sub>0</sub> (L/s)	Temp (°C)	Ec (µmho)	ORP (mV)	pH	Flow (L/s)	Turb NTU	DO (%)	Salinity (ppt)
<u>488.73</u>	<u>0826</u>	<u>2</u>	<u>START</u>							
<u>490.93</u>	<u>0852</u>	<u>2</u>	<u>18.63</u>	<u>627</u>	<u>178.1</u>	<u>7.41</u>		<u>0.29</u>	<u>45.3</u>	<u>4.51</u>
<u>491.34</u>	<u>0859</u>	<u>4</u>	<u>19.19</u>	<u>628</u>	<u>178.0</u>	<u>7.47</u>		<u>1.32</u>	<u>45.8</u>	<u>4.22</u>
<u>491.45</u>	<u>0903</u>	<u>5</u>	<u>19.37</u>	<u>628</u>	<u>177.5</u>	<u>7.48</u>		<u>1.30</u>	<u>44.3</u>	<u>4.07</u>
<u>491.54</u>	<u>0907</u>	<u>6</u>	<u>19.58</u>	<u>629</u>	<u>174.8</u>	<u>7.49</u>		<u>1.11</u>	<u>42.8</u>	<u>4.00</u>
<u>491.58</u>	<u>0911</u>	<u>7</u>	<u>19.74</u>	<u>629</u>	<u>170.7</u>	<u>7.50</u>		<u>1.17</u>	<u>42.3</u>	<u>3.86</u>
<u>491.64</u>	<u>0917</u>	<u>8</u>	<u>19.93</u>	<u>630</u>	<u>164.9</u>	<u>7.50</u>		<u>1.06</u>	<u>42.4</u>	<u>3.80</u>
<u>491.60</u>	<u>0922</u>	<u>9</u>	<u>19.99</u>	<u>630</u>	<u>165.2</u>	<u>7.50</u>		<u>1.03</u>	<u>43.0</u>	<u>3.90</u>
	<u>0922</u>		<u>SAMPLING</u>							
COC number(s): <u>612157</u>										
Sample number(s): <u>087165</u>										

Down

#### Purge Volume Calculations

Well Diameter

2" well: 0.15 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons  
 4" well: 0.65 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons  
 6" well: 1.47 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons

~400 gals purged  
from tubing  
0845

Tubing Diameter

1/2" OD: 2.4 mL/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters  
 3/8" OD: 2.7 mL/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters  
 1/2" OD: 2.6 mL/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters

**ATTACHMENT A**  
**YIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE**  
**COLLECTION**

491.65 = 80% recovery

Project Name: <u>MWL - GVM</u>	Project No.:
Well ID: <u>MWL - MW 8</u>	Date: <u>4-7-09</u>
Weather:	
Method: <input checked="" type="checkbox"/> Portable pump <input type="checkbox"/> Dedicated pump	Pump depth: <u>496.5'</u>

**PURGE MEASUREMENTS**

Depth to Water (FD)	Time 24 hr	Vol L/gal	Temp °C	Ec µmho	ORP MV	pH	Flow L/gal	Turb NTU	DC %	Color appearance
<u>490.67</u>	<u>0758</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>---</u>
<u>493.90</u>	<u>0814</u>	<u>1</u>	<u>19.16</u>	<u>592</u>	<u>186.4</u>	<u>7.03</u>	<u>---</u>	<u>0.31</u>	<u>70.6</u>	<u>6.48</u>
<u>494.51</u>	<u>0817</u>	<u>2</u>	<u>19.12</u>	<u>610</u>	<u>167.0</u>	<u>7.411</u>	<u>---</u>	<u>0.41</u>	<u>59.6</u>	<u>5.50</u>
<u>495.03</u>	<u>0820</u>	<u>3</u>	<u>19.35</u>	<u>611</u>	<u>156.2</u>	<u>7.49</u>	<u>---</u>	<u>1.36</u>	<u>58.6</u>	<u>6.39</u>
<u>495.60</u>	<u>0824</u>	<u>4</u>	<u>19.46</u>	<u>613</u>	<u>147.6</u>	<u>7.52</u>	<u>---</u>	<u>2.18</u>	<u>57.8</u>	<u>5.31</u>
<u>496.28</u>	<u>0827</u>	<u>5</u>	<u>19.54</u>	<u>616</u>	<u>142.1</u>	<u>7.52</u>	<u>---</u>	<u>2.41</u>	<u>55.8</u>	<u>5.11</u>
<u>496.45</u>	<u>0828</u>	<u>5.5</u>	<u>19.48</u>	<u>620</u>	<u>140.0</u>	<u>7.52</u>	<u>---</u>	<u>2.53</u>	<u>52.7</u>	<u>4.10</u>
<u>496.45</u>	<u>0828</u>	<u>---</u>	<u>well dry</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>---</u>
<u>491.65</u>	<u>1055</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>---</u>
<u>494.38</u>	<u>1120</u>	<u>0.5</u>	<u>19.48</u>	<u>620</u>	<u>119.9</u>	<u>7.53</u>	<u>---</u>	<u>0.97</u>	<u>60.5</u>	<u>5.55</u>
	<u>1121</u>	<u>---</u>	<u>SAMPLING</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>---</u>	<u>---</u>
COC number(s): <u>612155</u>										
Sample number(s): <u>081161</u>										

**Well Diameter:**

2" well: 0.16 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons

4" well: 0.63 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons

6" well: 1.47 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons

**Tubing Diameter:**

1/2" OD: 2.4 mL/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters

3/8" OD: 9.7 mL/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters

1/2" OD: 21.5 mL/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters

24.00 gals purged from tubing  
0812  
200 1119

## ATTACHMENT A FIELD MEASUREMENT LOG FOR GROUNDWATER SAMPLE COLLECTION

492.09 = 80% recovery

Project Name:		Project No.:	
Well ID:	MWL-MW9	Date:	4-9-09
Weather: Clear & Cold			
Method:	<input checked="" type="checkbox"/> Portable pump	<input type="checkbox"/> Dedicated pump	Pump depth: 497'

### PURGE MEASUREMENTS

Depth to Water (ft)	Time 24 hr	Vol L	Temp °C	Ec (µmho)	ORP MV	pH	Flow L/gk	Turb NTU	DO %	Notes
490.71	0819		Start purge							
494.50	0845	2	17.53	619	175.7	7.31		0.29	26.1	2.48
495.49	0854	4	17.40	609	153.4	7.49		0.42	33.3	3.18
496.22	0903	6	17.45	609	144.3	7.52		1.24	35.4	3.38
496.82	0913	8	17.72	616	135.5	7.51		1.44	26.3	2.50
493.70	1001	9	16.74	620	140.9	7.60		1.88	28.7	2.71
494.50	1004	10	17.64	622	138.1	7.55		2.25	28.5	2.71
495.12	1007	11	17.72	626	132.0	7.52		1.73	24.6	2.40
495.82	1010	12	17.76	627	132.2	7.64		2.15	113.3	11.30
496.52	1014	13	17.95	625	136.0	7.52		3.46	120.5	11.37
497.18	1017	14	18.11	626	134.6	7.51		4.45	46.4	4.81
497.26	1020	182L	well DRY							
496.40	1255		START							
494.77	1309	0.5	19.92	629	116.9	7.50		6.82	44.0	9.00
CSC number(s):		612158								
Sample number(s):		087167								

DO sat

pump stopped  
10:20

(1310) sample

#### Purge Volume Calculations

##### Well Diameter:

- 2" well: 0.16 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons
- 4" well: 0.65 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons
- 6" well: 1.47 gal/ft X \_\_\_\_\_ (height of water column) = \_\_\_\_\_ gallons

~ 4.00 gal. purged  
prior to measurement.  
0834

2nd 1306

##### Tubing Diameter:

- 1.9" OD: 2.4 ml/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters
- 3.8" OD: 9.7 ml/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters
- 7.0" OD: 21.5 ml/ft X \_\_\_\_\_ (length of tubing) = \_\_\_\_\_ milliliters

ADDITIONAL INFORMATION