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*Date:* August 15, 2008  
*Refer To:* EP2008-0447

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

**Subject: Material Disposal Area G Soil Vapor Extraction Test Status**

Dear Mr. Bearzi:

The purpose of this letter is to provide a status of the ongoing soil vapor extraction (SVE) pilot study at Material Disposal Area (MDA) G within Technical Area 54 (TA-54). The pilot test is being conducted to evaluate the effectiveness of using SVE to remove volatile organic compounds (VOCs) from the subsurface at MDA G.

This status report satisfies the first of three reporting requirements on the SVE pilot test identified in the New Mexico Environment Department's (NMED's) June 11, 2008, approval with modifications to the revised work plan for implementation of an in situ soil vapor extraction pilot study at MDA G. Los Alamos National Laboratory (the Laboratory) will submit a second status update of the SVE pilot test to NMED by September 15, 2008. The final report and conclusions will be submitted by October 31, 2008.

SVE pilot tests are being conducted in two separate zones beneath MDA G. The shallow extraction test was conducted in the Tshirege Member of the Bandelier Tuff to evaluate source removal and control immediately beneath the shaft field source zone. The shallow extraction borehole was drilled in the vicinity of the large shaft field in the north-central portion of the site near the center of the VOC plume (Attachment 1, Figure 1).

This borehole was cored and logged from ground surface to refusal to find actual geologic contacts. The following geological contacts were encountered:

- Soil/fill, 0–2 ft
- Unit 2 Tshirege Member of the Bandelier Tuff (Qbt 2), 2–60 ft
- Unit 1v (upper slope-forming tuff) Tshirege Member of the Bandelier Tuff (extraction interval) (Qbt 1v-u), 60–80 ft



- Unit 1v (Colonade Tuff) Tshirege Member of the Bandelier Tuff (extraction interval) (Qbt 1v-c), 80–87 ft
- Unit 1g Tshirege Member of the Bandelier Tuff (extraction interval) (Qbt 1g), 87–147.5 ft
- Tsankawi Pumice Bed (Qbtt), 147.5–149.5
- Cerro Toledo interval formation (Qct), 149.5–159 ft
- Otowi Member of the Bandelier Tuff (Qbo), 159–180 ft
- Guaje Pumice Bed (Qbog), 180–182.5
- Refusal at basalt, (Tcb) 182.5

The bottom of the shallow extraction borehole was grouted to avoid short-circuiting of air-flow through the higher permeability of the Tsankawi Pumice Bed. The borehole was cased with 10-in. steel from ground surface to 63 ft, approximately 3 ft into the top of the Tshirege Member, resulting in an 83.5-ft extraction interval within the Tshirege Member of the Bandelier Tuff from 63 ft to 146.5 ft (Attachment 1, Figure 2).

Monitoring boreholes were constructed in existing boreholes located approximately 25 ft (54-24378), 50 ft (54-01116), 115 ft (54-24388), and 135 ft (54-01117) away from the shallow extraction borehole (Attachment 1, Figure 1). Each borehole was extended using hollow-stem auger (HAS) to refusal and then air-rotary drilled 15 ft into the basalt. Once drilled, each monitoring borehole was completed with nine stainless-steel vapor-monitoring ports to sample each major geologic unit. Ports were installed at each of the following depths: 22.5 ft (Qbt 2), 42.5 ft (Qbt 2), 66.5 ft (Qbt 1v-u), 82.5 ft (Qbt 1v-c), 97.5 ft (Qbt 1g), 132.5 ft (Qbt 1g), 151.5 ft (Qct), 167.5 ft (Qbo), and 190 ft (Tcb). Each port was installed in a 5-ft interval of sand (2.5 ft of sand above and below the port) and capped on the top and bottom with 2.5 ft of hydrated bentonite chips to seal off the interval.

Baseline data were collected, and the pilot test began on July 8, 2008. Active extraction continued for 30 days; however, two short interruptions to operations occurred as a result of thunderstorm-related power outages. The active portion of the shallow SVE test concluded on August 7, 2008, and the Laboratory continues to collect data to monitor rebound effects.

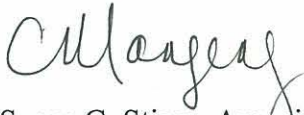
Data were collected during the test to measure system performance and effectiveness. Concentrations of VOCs were monitored at the extraction borehole and at the four monitoring borehole locations. Trichloroethane (TCA) is the primary constituent in the plume, and its concentration peaked at approximately 315 parts per million by volume (ppmv) shortly after the start of the test and decreased to approximately 140 ppmv at the end of the 30-day test (Attachment 1, Figure 3). Preliminary VOC mass removal estimates indicate that more than 250 lb of VOCs was removed during the shallow extraction pilot test (Attachment 1, Figure 4).

To determine the near-source effects on the extraction system, all ports in the four monitoring boreholes were screened using both the Brüel and Kræjer and the digital manometer. Data were collected from ports within, above, and below the extraction interval to determine the effect of the SVE on these zones. Preliminary data indicate that VOC concentrations and differential pressure readings were impacted by the vacuum at distances greater than 100 ft from the extraction borehole. Early rebound data indicate that differential pressure readings returned to ambient levels within several days after the test was completed. Final data from the first test are still pending and will be summarized in the pilot test final report, due October 31, 2008.

Drilling operations began on August 8, 2008, to construct the deep extraction borehole needed to support the second test, to be conducted in the deeper Otowi Member of the Bandelier Tuff, to evaluate the ability of SVE to remove contaminated pore gas from the subsurface strata overlying the basalt.

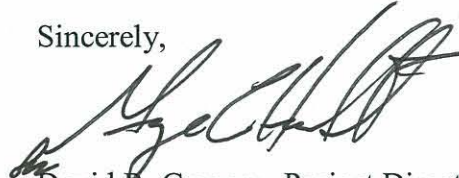
If you have any questions, please contact Steve Paris at (505) 606-0915 (smparis@lanl.gov) or Edwin Worth at (505) 606-0398 (eworth@doeal.gov).

Sincerely,



Susan G. Stiger, Associate Director  
Environmental Programs  
Los Alamos National Laboratory

Sincerely,



David R. Gregory, Project Director  
Environmental Operations  
Los Alamos Site Office

SS/DG/DM/SP:sm

Neil Weber, San Ildefonso Pueblo  
Steve Paris, EP-CAP, MS M992  
RPF, MS M707 (with two CDs)  
Public Reading Room, MS M992  
Laurie King, EPA Region 6, Dallas, TX  
Steve Yanicak, NMED-OB, White Rock, NM  
Ed Worth, DOE-LASO, MS A316  
Tom Anderson, Apogen, Los Alamos, NM  
Kristine Smeltz, WES-DO, MS M992  
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Tom Skibitski, NMED-OB, Santa Fe, NM  
Alison Bennett, DOE-LASO (date-stamped letter emailed)  
Susan G. Stiger, ADEP, MS M991  
Dave McInroy, EP-CAP, MS M992  
Alison M. Dorries, WES-DO, MS M992  
IRM-RMMSO, MS A150 (date-stamped letter emailed)



Attachment 1

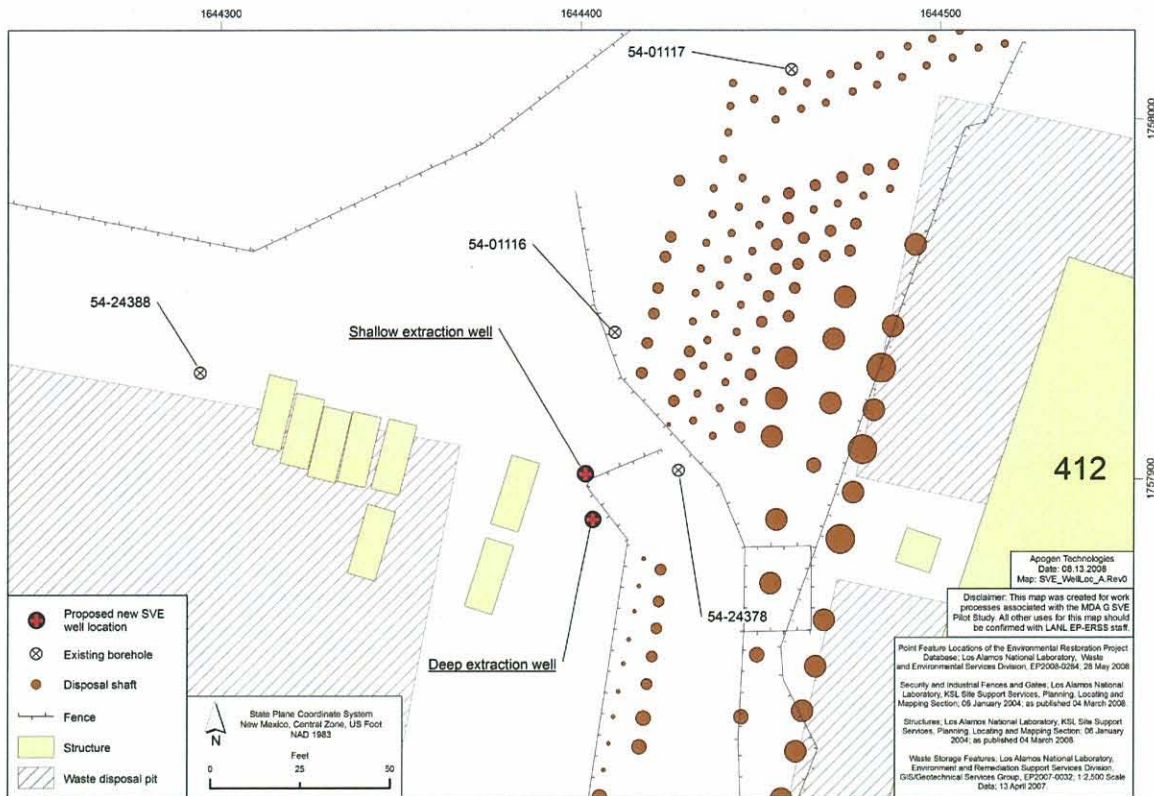


Figure 1. Locations of MDA G extraction and monitoring boreholes

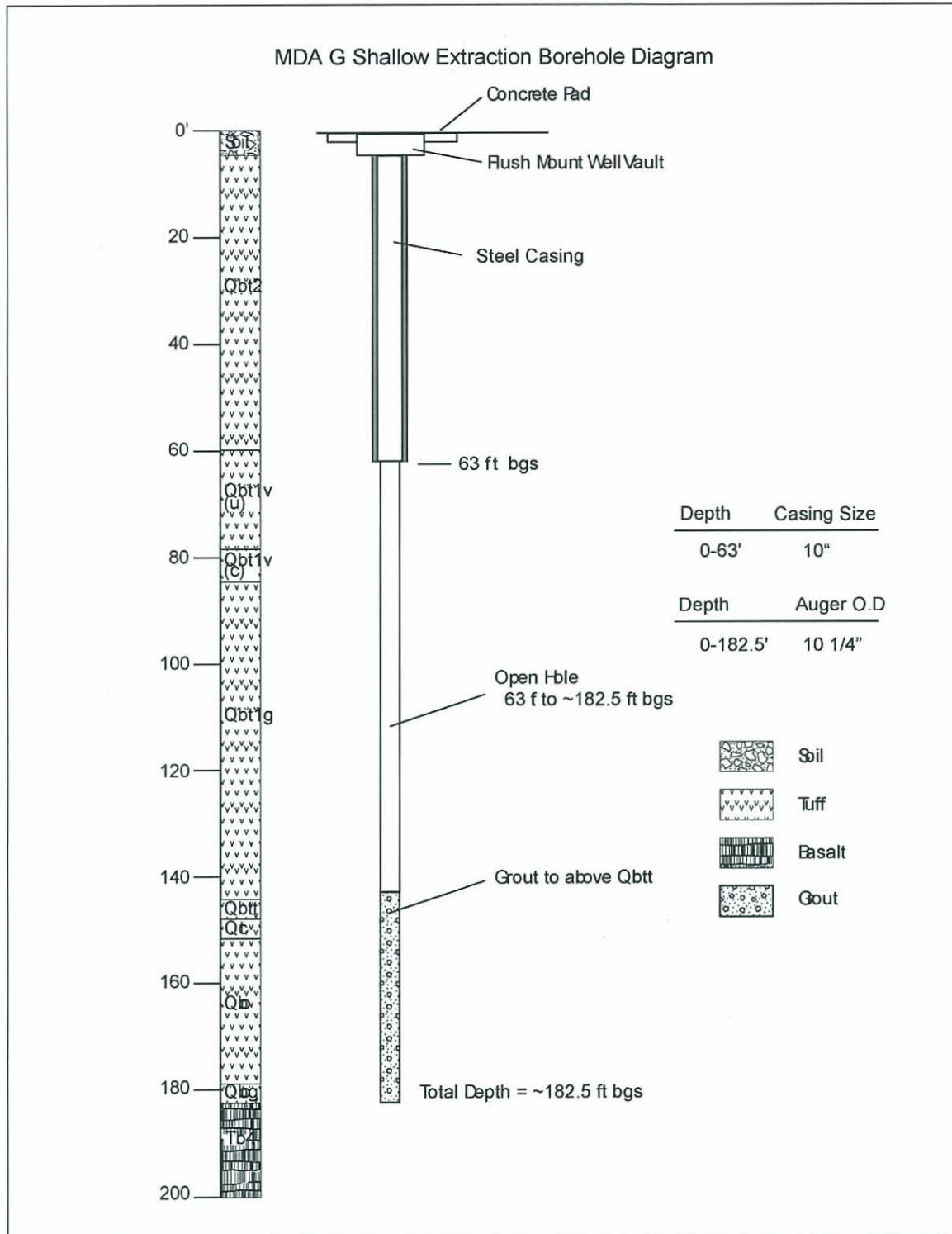


Figure 2. MDA G shallow extraction completion log

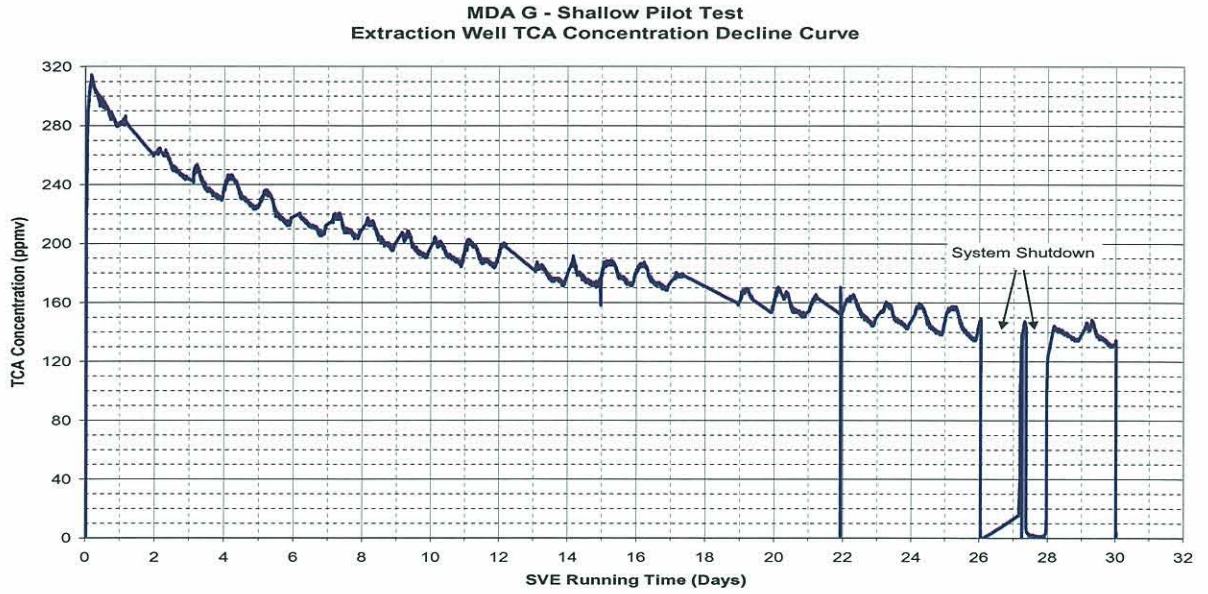


Figure 3. TCA concentration trends during the MDA G shallow SVE pilot test

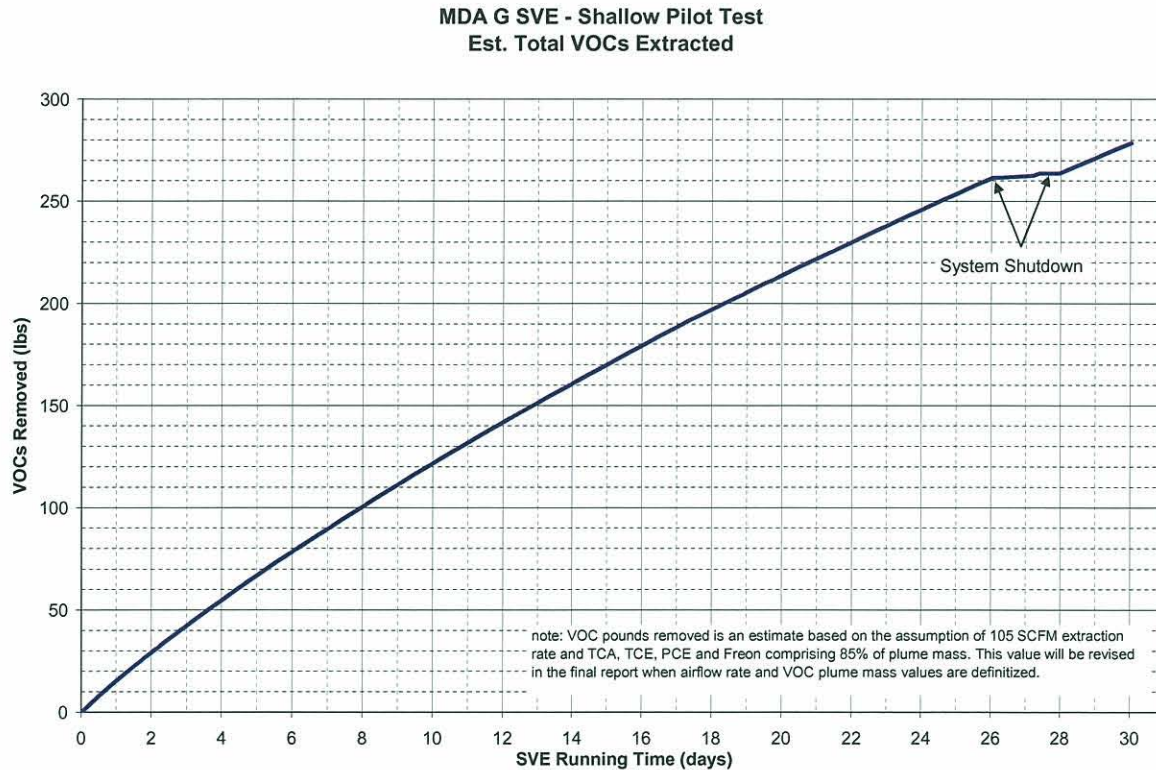


Figure 4. MDA G shallow SVE pilot test VOC mass trend