SECTION 15. FIGURES for the Report – Defective Groundwater Protection Practices at the Sandia National Laboratories' Mixed Waste Landfill – The Sandia MWL dump - Version December 30, 2010

Figure 1. Location of the Sandia National Laboratories (Sandia) Mixed Waste Landfill (Sandia MWL dump) in Sandia Technical Area 3 at Albuquerque, New Mexico.

Figure 2. Map of the 2.6 acre Sandia Mixed Waste Landfill (Sandia MWL dump) showing the locations of the unlined disposal pits in the 0.6-acre Classified Area and the unlined disposal trenches in the 2-acre Unclassified Area.

Figure 3. Enlarged view of the Sandia MWL dump showing the numbers that identify the disposal pits in the Classified Area of the dump.

Figure 4. Aerial view of the Sandia MWL dump looking to southwest in 1987. Trench F in the southwestern part of the Unclassified Area is open.

Figure 5. View of wastes dumped into unlined Trench F in the Unclassified Area of the Sandia MWL dump. Picture in 1987 with view looking south.

Figure 6. Map of the Sandia Mixed Waste Landfill (Sandia MWL dump) showing the monitoring well network in 2007 of the six monitoring wells MW1 to MW6 and the background water quality well BW1 500 feet south of the dump.

Figure 7. Schematic of the Monitoring Wells and the Hydrogeologic Setting at the Sandia MWL dump. The permeable sands and gravels in the Ancestral Rio Grande "A Deposits (ARG deposits) are the valuable groundwater resource for Albuquerque and the surrounding region.

Figure 8. Location of the new detection monitoring wells MWL-MW7, -MW8 and -MW9 along the western boundary of the Sandia MWL dump and the new background monitoring well MWL-BW2 200 feet east of the MWL dump.

Figure 9. Map showing the interpreted southwest direction of groundwater flow at the water table below the Sandia MWL dump for water level measurements on July 16, 1997. There are too few monitoring wells for accurate determination of the direction of groundwater flow.

Figure 10. Two examples of the design for groundwater monitoring well networks required by the Federal Resource Conservation and Recovery Act (RCRA) for hazardous and mixed waste disposal sites where buried wastes are not excavated.

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Figure 11A. Water table contour map that shows the southwest direction of the local groundwater flow at the water table below the Sandia MWL dump in April 2000 . The well network is inadequate to determine the actual direction of groundwater flow to the south or southwest.

Figure 12. Water level contour map in the *Sandia Mixed Waste Landfill Annual Groundwater Monitoring Report, Spring 2007 Sampling Event.*

Figure 12A. Enlarged view of Figure 12 to show the water table elevations posted on Figure 12 for the three monitoring wells MWL-MW1, -MW2 and -MW3 at the Sandia MWL Dump.

Figure 13. The incorrect water level contour map for the water table below and away from the Sandia MWL dump for water levels measured in the three new defective monitoring wells installed at the Sandia MWL dump in 2008. The new defective wells are MWL-MW7, MWL-MW8 and MWL-MW9. The water levels were measured in October 2008.

Figure 13A. Enlarged view of water level contour map in Figure 13.

Figure 14. Water table contour map for the southwest direction of the local groundwater flow at the water table below the Sandia MWL dump.

Figure 15. Hydrograph of water levels measured in monitoring well MWL-MW3 over the period from 1991 through 2001.

Figure 16. Description of the Air-Rotary Casing Hammer (ARCH) Drilling Method.

Figure 17. Description of the Stratex[R] Underreamer Rotary Drilling Method.

Figure 18. Total nickel concentrations measured in groundwater samples collected from monitoring wells MWL-MW1, -MW2, MW3, MW4 and -BW1 at the Sandia Mixed Waste Landfill.

Figure 19. Comparison of 1995 and 2008 Tritium sediment sample analytical results for the 10-, 30- and 50-foot depth samples at the Sandia MWL dump.

Figure 20. 1995 and 2008 borehole locations and tritium sampling results at 10-, 30- and 50-foot depths at the Sandia MWL dump.

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Figure 25. Unreliable isopleth map of the Tritium contamination at the 50-foot depth below the Sandia MWL Dump for only 3 sample locations.

Figure 26. 1994 and 2008 soil-vapor Total Volatile Organic Compound (VOC) concentrations in parts per billion volume (ppbv) at 10-, 30- and 50-foot depths at the Sandia MWL dump.

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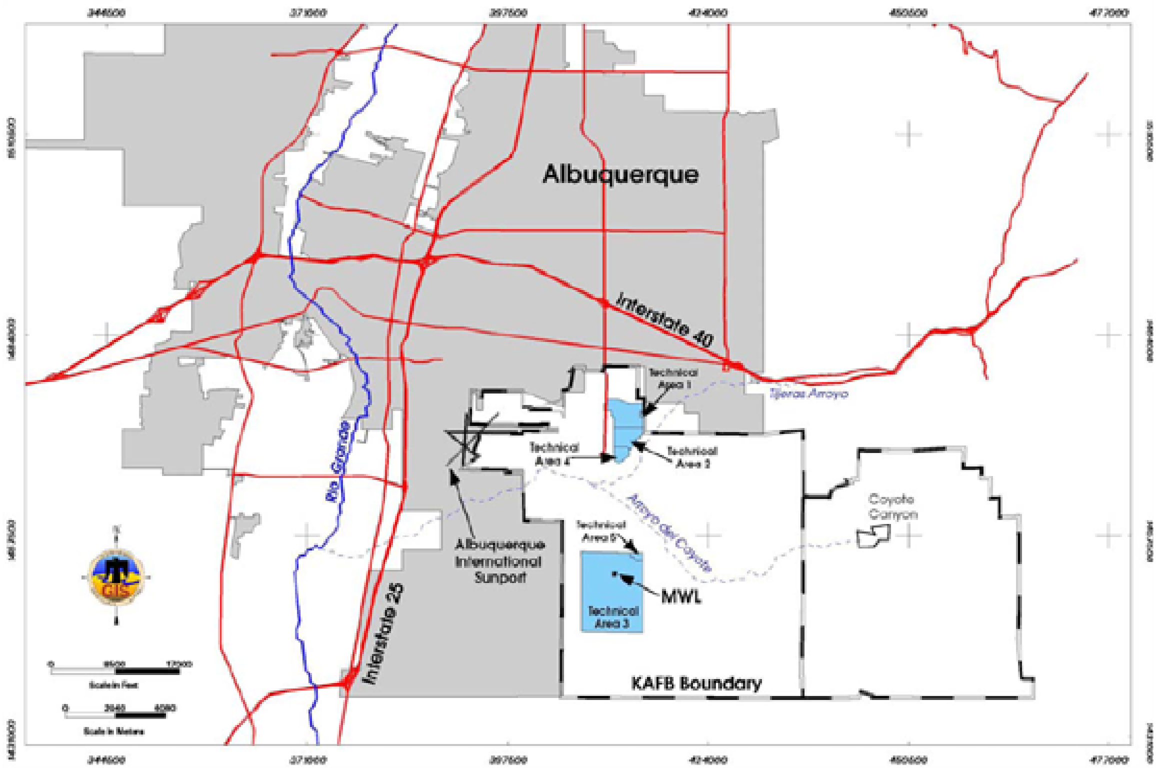
Figure 28. 1994 and 2008 soil-vapor TCE concentrations in parts per billion volume (ppbv) at 10-, 30- and 50-foot depths at the Sandia MWL dump.

Figure 29. The predicted concentrations of PCE contamination in the groundwater below the Sandia MWL dump derived from 100 simulations with the DOE/Sandia computer fate and transport model.

Figure 30. Vertical profile view of the VOC soil-gas plume in 1997 below the Chemical Waste Landfill (CWL dump) at the Sandia National Laboratories Albuquerque, New Mexico Facility.

Figure 31. The proposed locations for three vadose zone monitoring wells and the three existing soil-moisture monitoring tubes at the Sandia MWL dump.

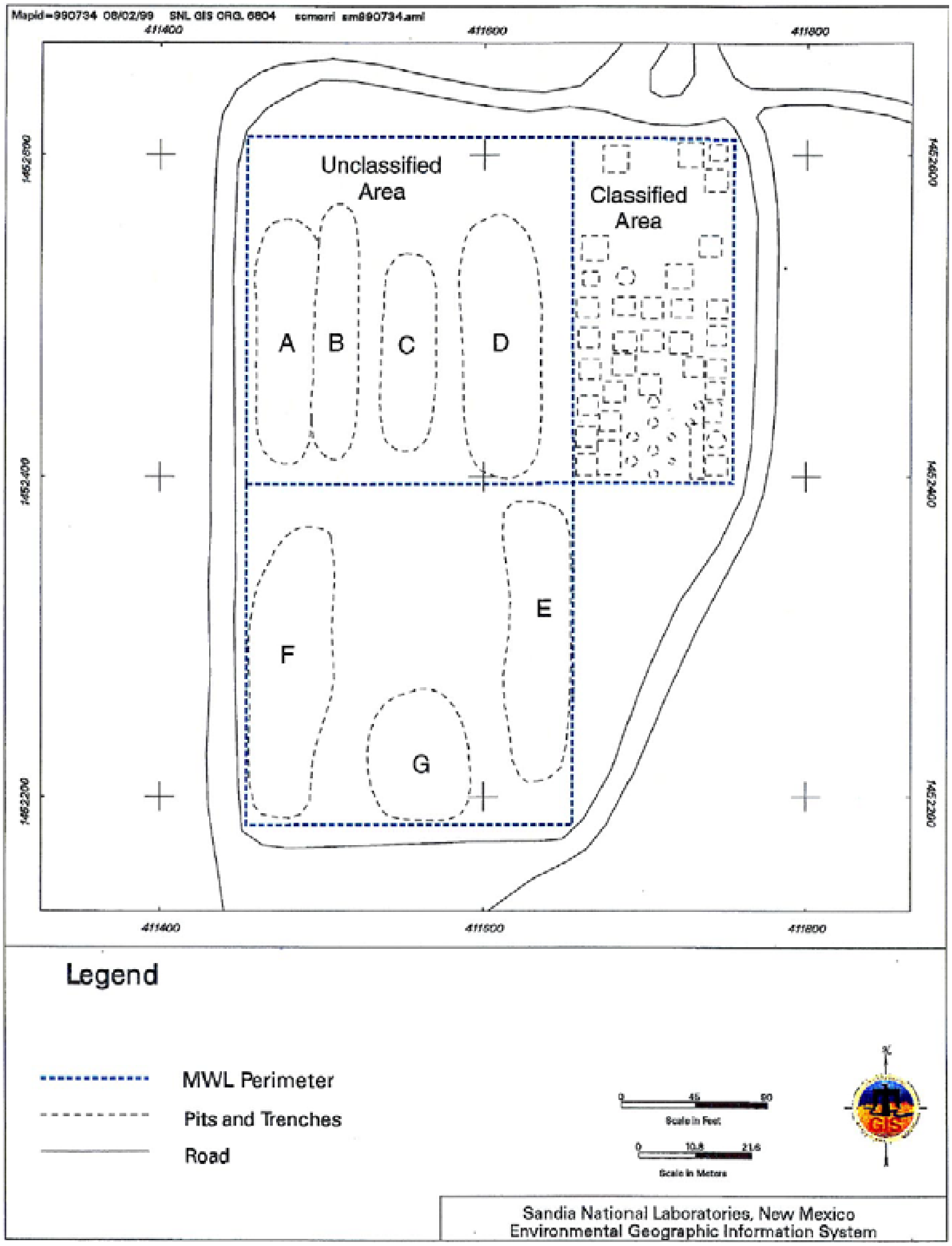
Figure 1. Location of the Sandia National Laboratories (Sandia) Mixed Waste Landfill (Sandia MWL dump) in Sandia Technical Area 3 at Albuquerque, New Mexico.



Note: The Sandia Mixed Waste Landfill (MWL dump) is located approximately 5 miles southeast of the Albuquerque International Airport and approximately 1 mile east of the new Mesa del Sol Subdivision and Business Park.

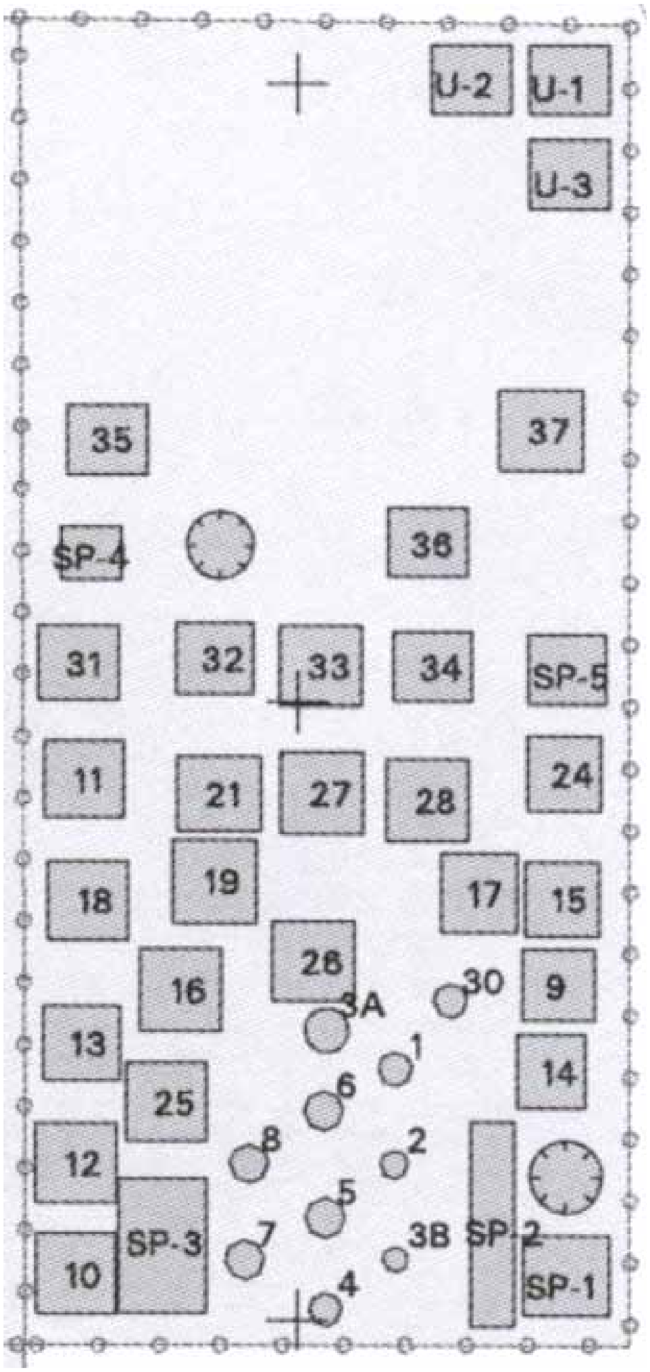
Source: Figure 1-1 in *Mixed Waste Landfill Corrective Measures Implementation Report. January 2010* Sandia National Laboratories/New Mexico Environmental Restoration Project

Figure 2. Map of the 2.6 acre Sandia Mixed Waste Landfill (Sandia MWL dump) showing the locations of the unlined disposal pits in the 0.6-acre Classified Area and the unlined disposal trenches in the 2-acre Unclassified Area.



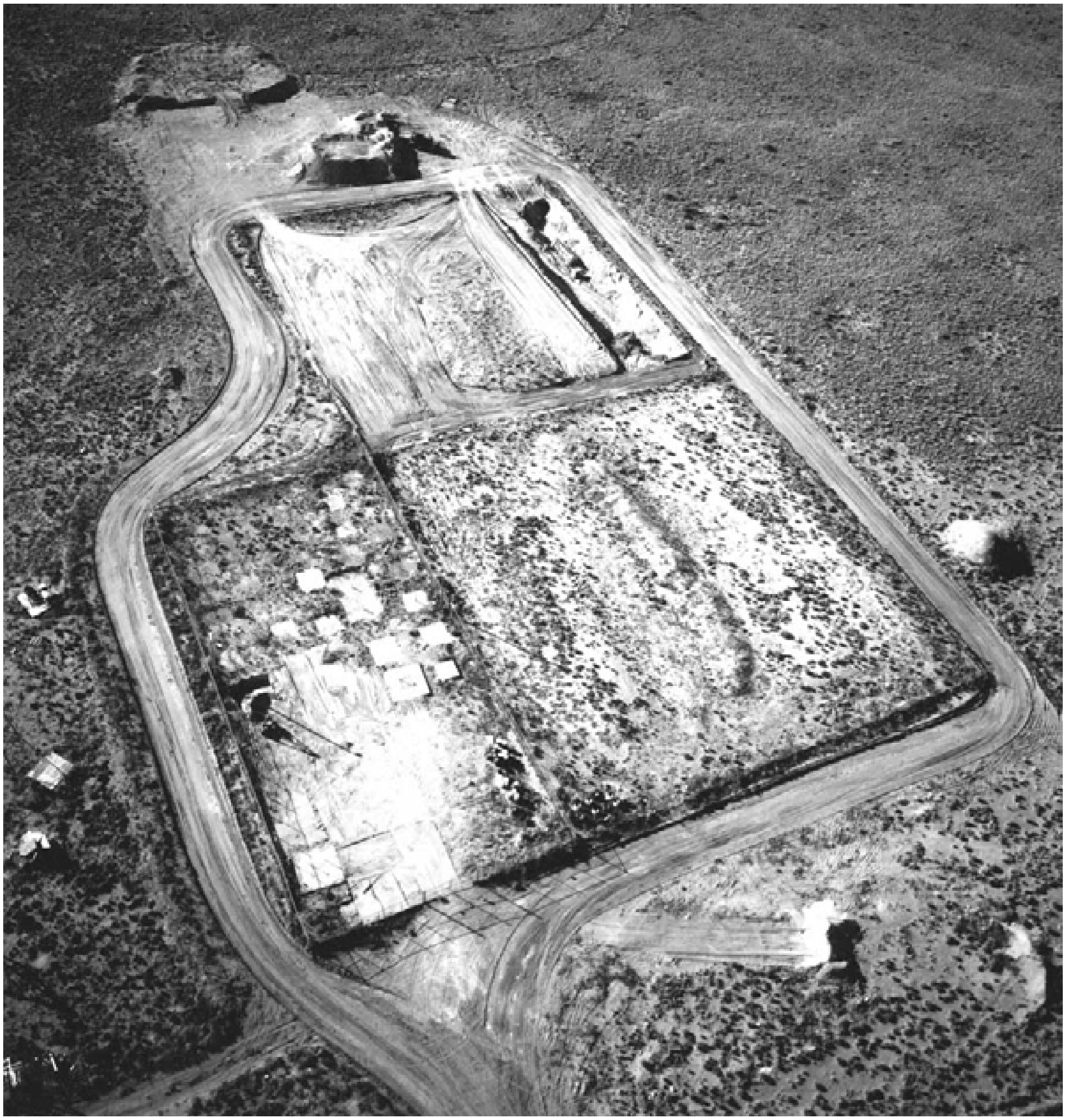
Source: Figure 1-3 in Sandia Report SAND 2002-4098 (Goering et al., 2002).

Figure 3. Enlarged view of the Sandia MWL dump showing the numbers that identify the disposal pits in the Classified Area of the dump.



Source: Figure 2 in *Final Report - Independent Peer Review of the U.S. Department of Energy Sandia National Laboratories' Mixed Waste Landfill August 31, 2001* Performed by WERC: A Consortium for Environmental Education and Technology Development

Figure 4. Aerial view of Sandia MWL dump looking to southwest in 1987. Trench F in the southwestern part of the Unclassified Area is open.

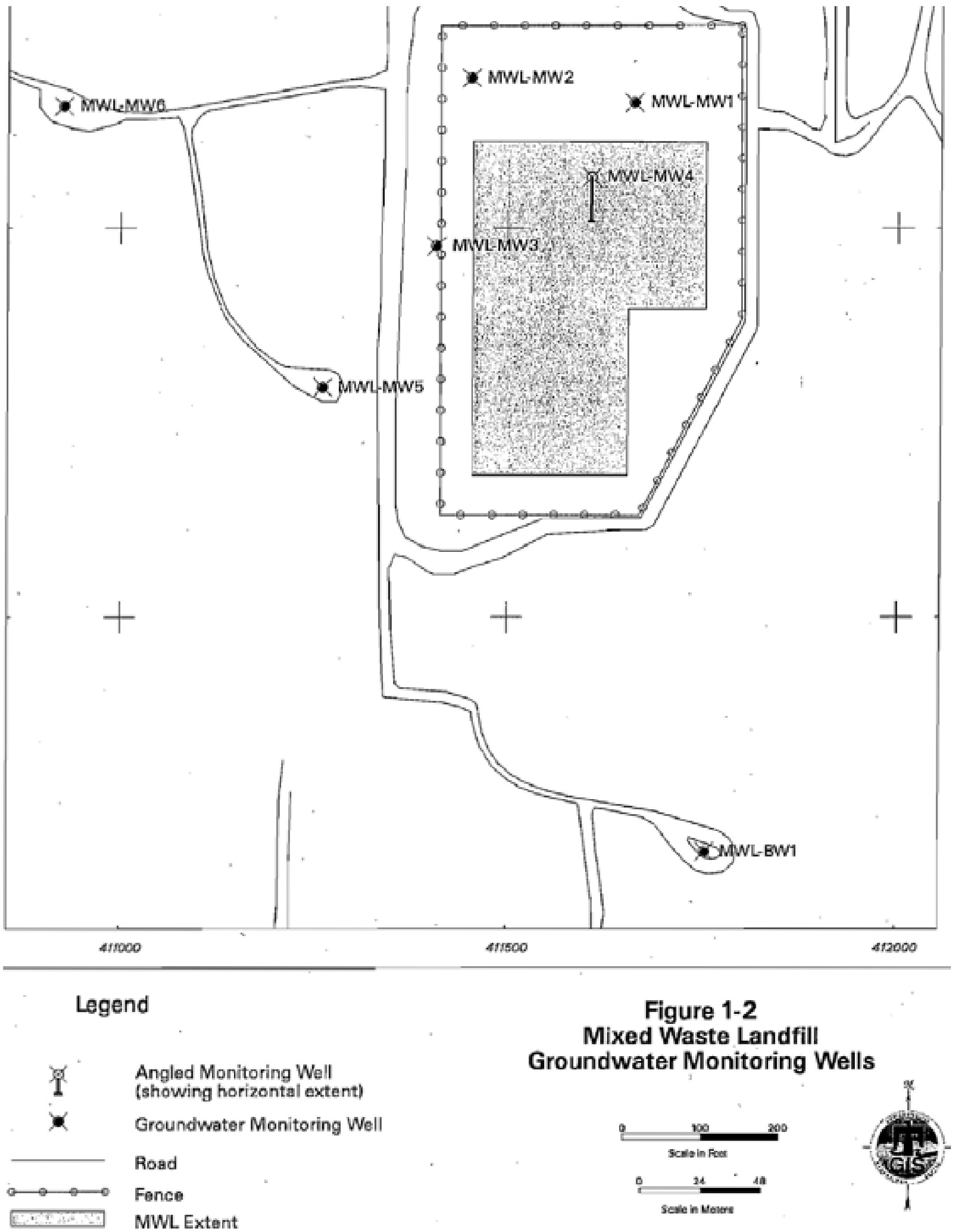


Source: Figure 3 in *Final Report - Independent Peer Review of the U.S. Department of Energy Sandia National Laboratories' Mixed Waste Landfill August 31, 2001* Performed by WERC: A Consortium for Environmental Education and Technology Development

Figure 5. View of wastes dumped into unlined Trench F in the Unclassified Area of the Sandia MWL dump. Picture in 1987 with view looking south.

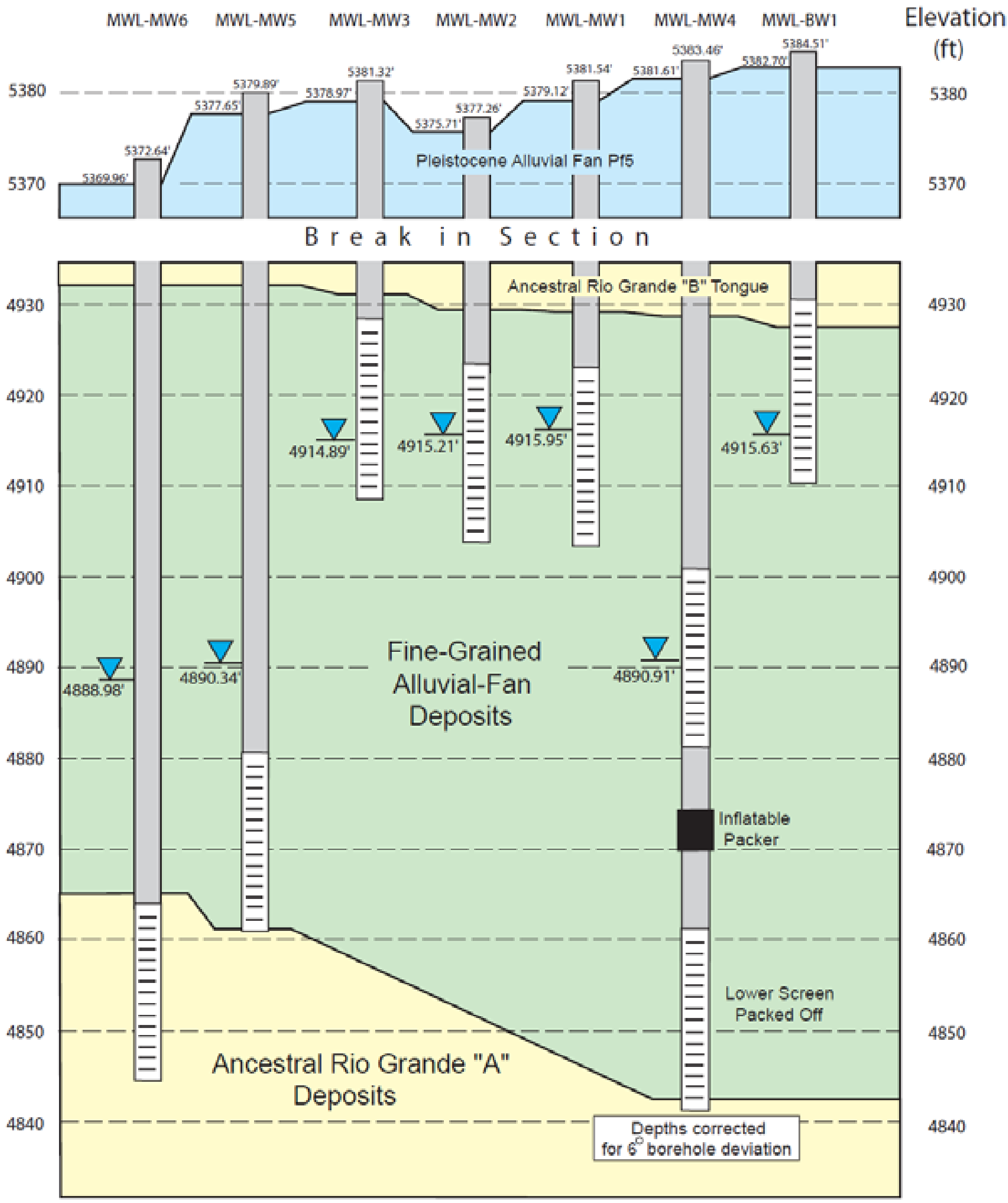
Source: Figure 7 in *Final Report - Independent Peer Review of the U.S. Department of Energy Sandia National Laboratories' Mixed Waste Landfill August 31, 2001* Performed by WERC: A Consortium for Environmental Education and Technology Development

Figure 6. Map of the Sandia Mixed Waste Landfill (Sandia MWL dump) showing the monitoring well network in 2007 of the six monitoring wells MW1 to MW6 and the background water quality well BW1 500 feet south of the dump.



Source: Figure 1-2 in *Mixed Waste Landfill Annual Groundwater Monitoring Report April and June 2007 Sampling Event,* Sandia National Laboratories/New Mexico, Report issued in February 2008.

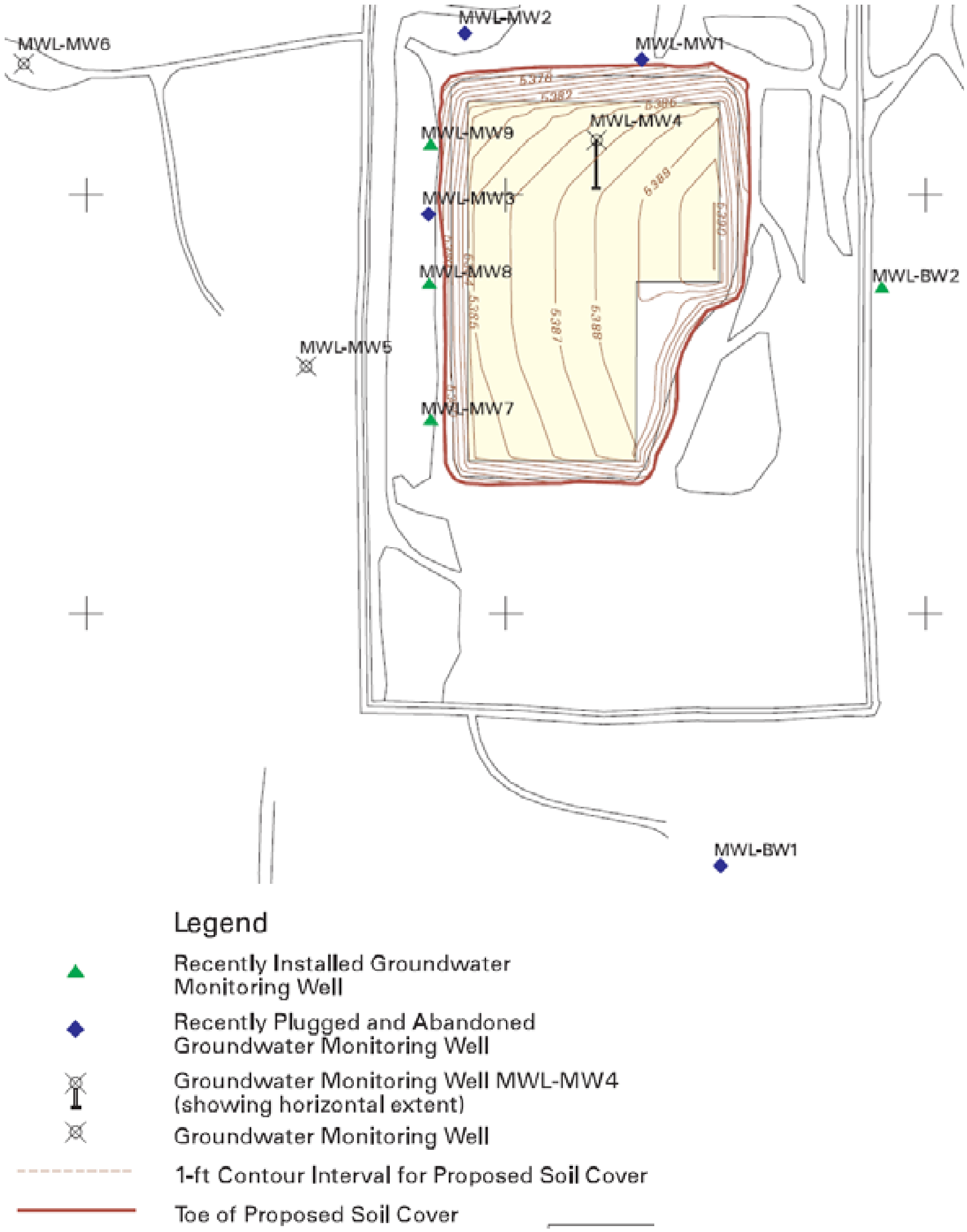
Figure 7. Schematic of the Monitoring Wells and the Hydrogeologic Setting at the Sandia MWL dump. The permeable sands and gravels in the Ancestral Rio Grande "A Deposits (ARG deposits) are the valuable groundwater resource for Albuquerque and the surrounding region.



(Note: Water Levels as of 12/4/01)

Source: Figure 3-13 in *Mixed Waste Landfill Groundwater Report, 1990 through 2001, Sandia National Laboratories, Albuquerque, New Mexico* SAND 2002-4098 (Goering et al., 2002).

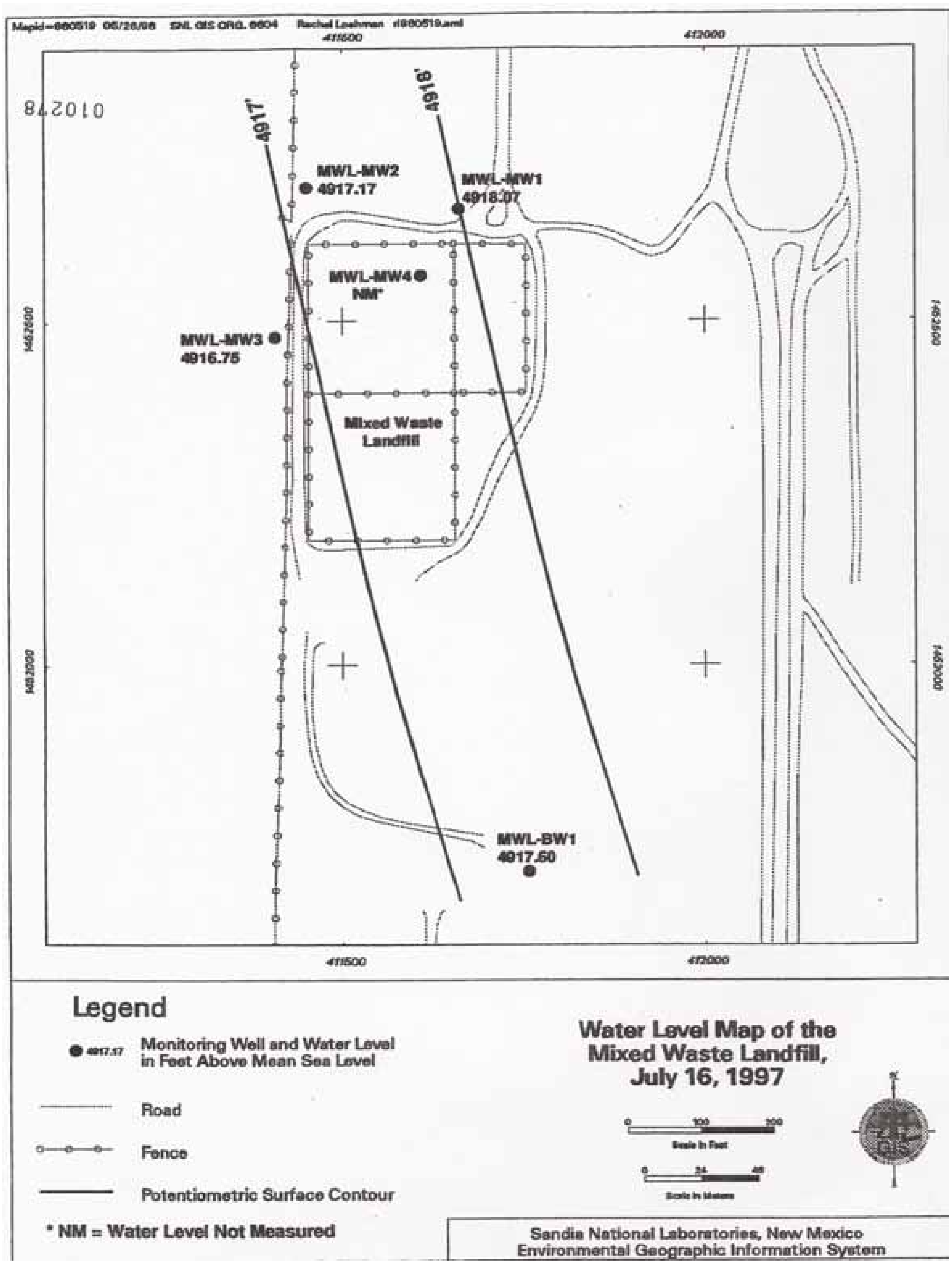
Figure 8. Location of the new detection monitoring wells MWL-MW7, -MW8 and -MW9 along the western boundary of the Sandia MWL Dump and new background monitoring well MWL-BW2 200 feet east of the MWL Dump.



Scale 0………………..200 feet

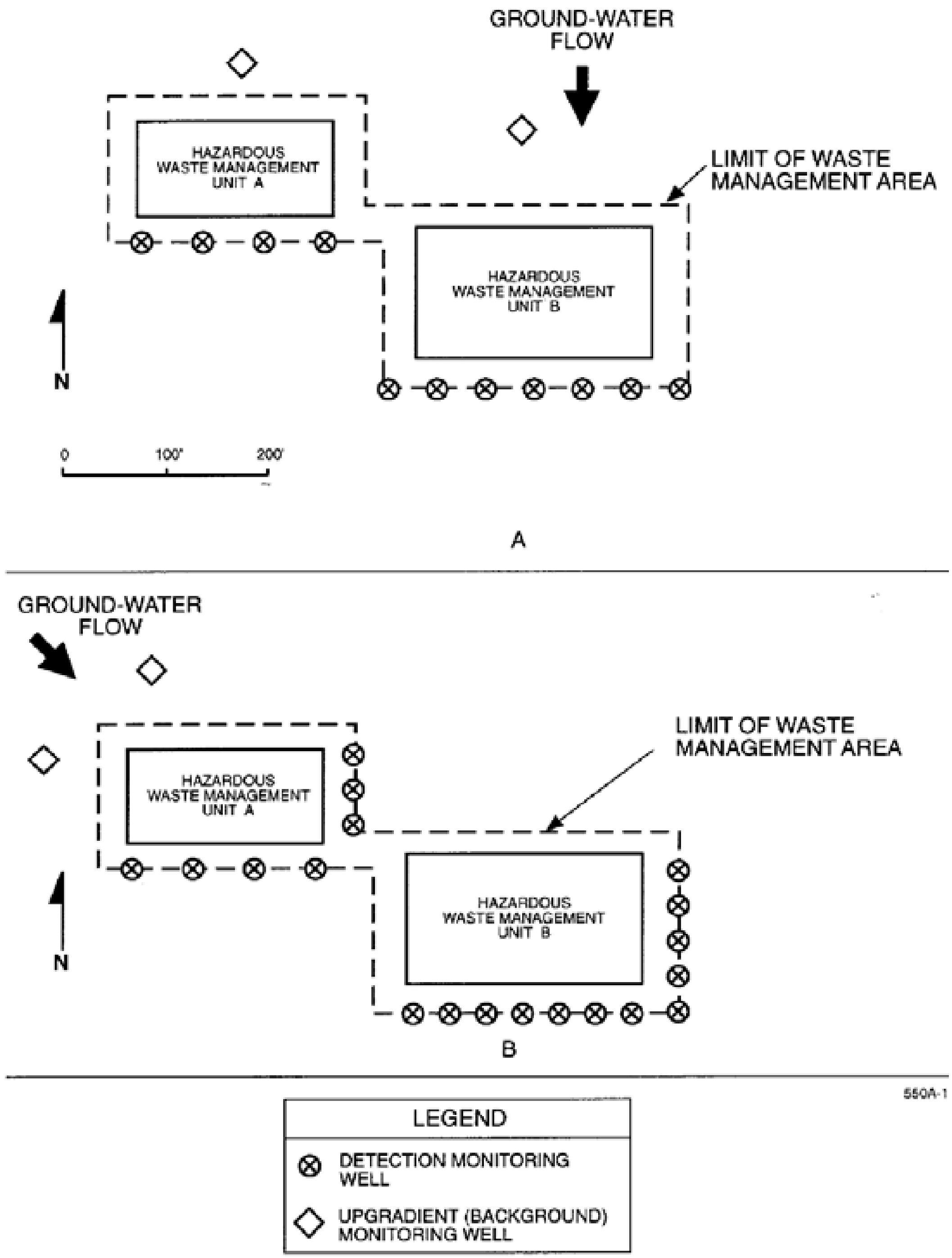
Source: Figure 1-2 in Mixed Waste Landfill Groundwater Monitoring Report Calendar Year 2008, Sandia National Laboratories, May 27, 2009

Figure 9. Map showing the interpreted southwest direction of groundwater flow at the water table below the Sandia MWL dump for water level measurements on July 16, 1997. There are too few monitoring wells for accurate determination of the direction of groundwater flow.



Source: NMED Administrative Record AR 010278.

Figure 10. Two examples of the design for groundwater monitoring well networks required by the Federal Resource Conservation and Recovery Act (RCRA) for hazardous and mixed waste disposal sites where buried wastes are not excavated.



Source: Figure 9 *in* U.S. EPA, *RCRA Groundwater Monitoring: Draft Technical Guidance*, EPA/530-R-93-001, Nov. 1992.

Figure 11. Water level contour map in the *Mixed Waste Landfill Ground-water Report, 1990 through 2001, Sandia National Laboratories, Albuquerque, New Mexico* (Goering et al, 2002). Water levels were measured in April 2000. The MWL dump is at the center of the figure.

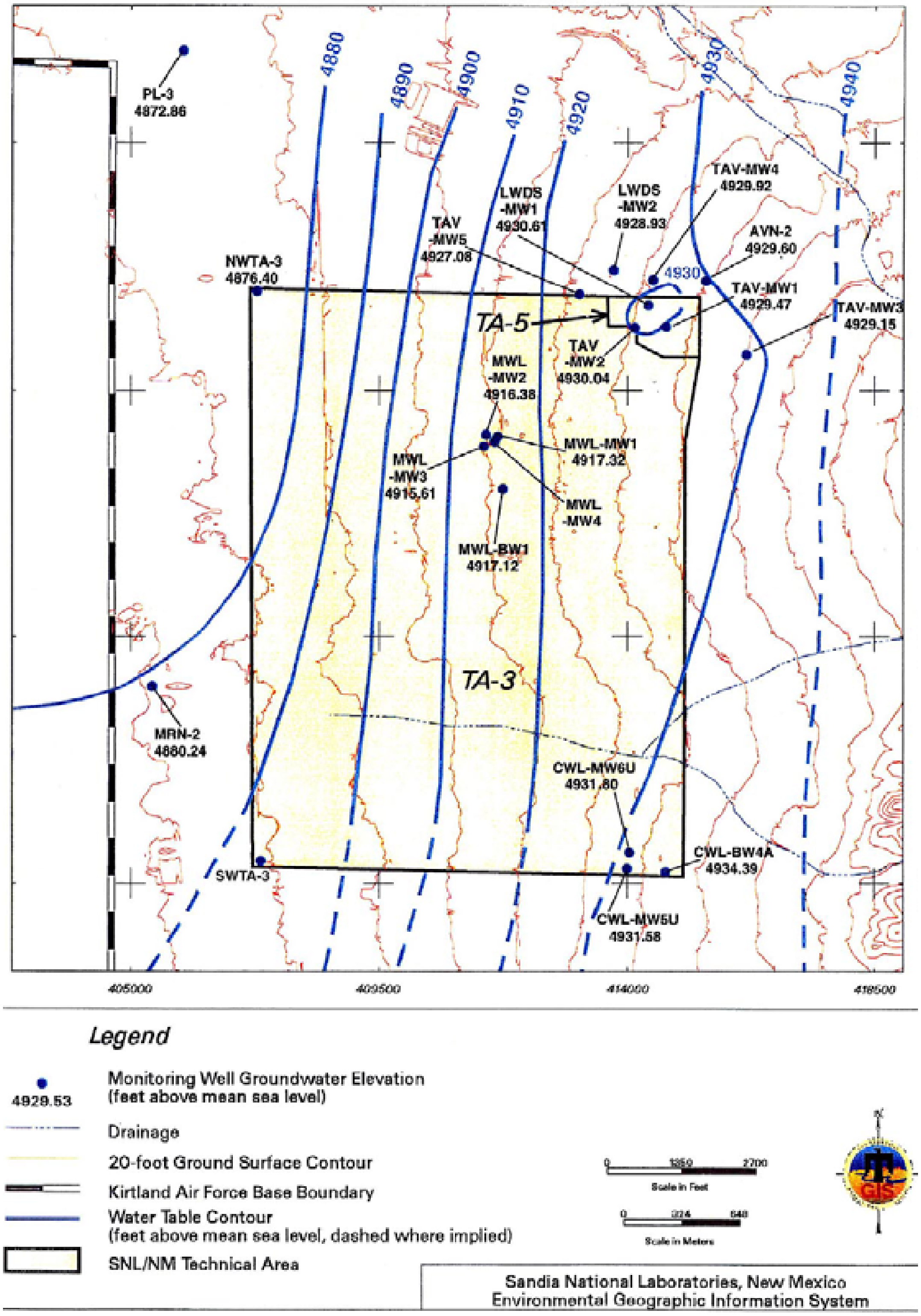
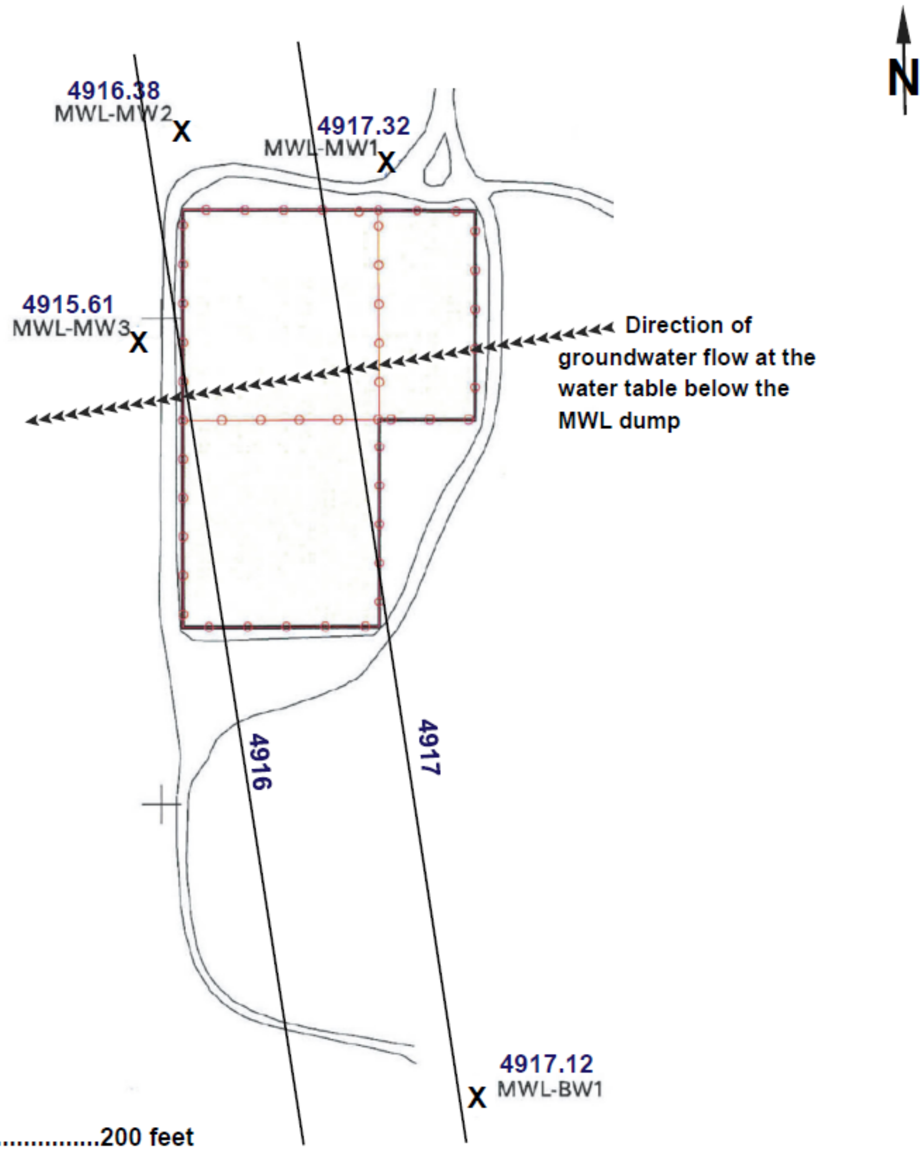


Figure 11A. Water table contour map that shows the southwest direction of the local groundwater flow at the water table below the Sandia MWL dump in April 2000 . The well network is inadequate to determine the actual direction of groundwater flow to the south or southwest.



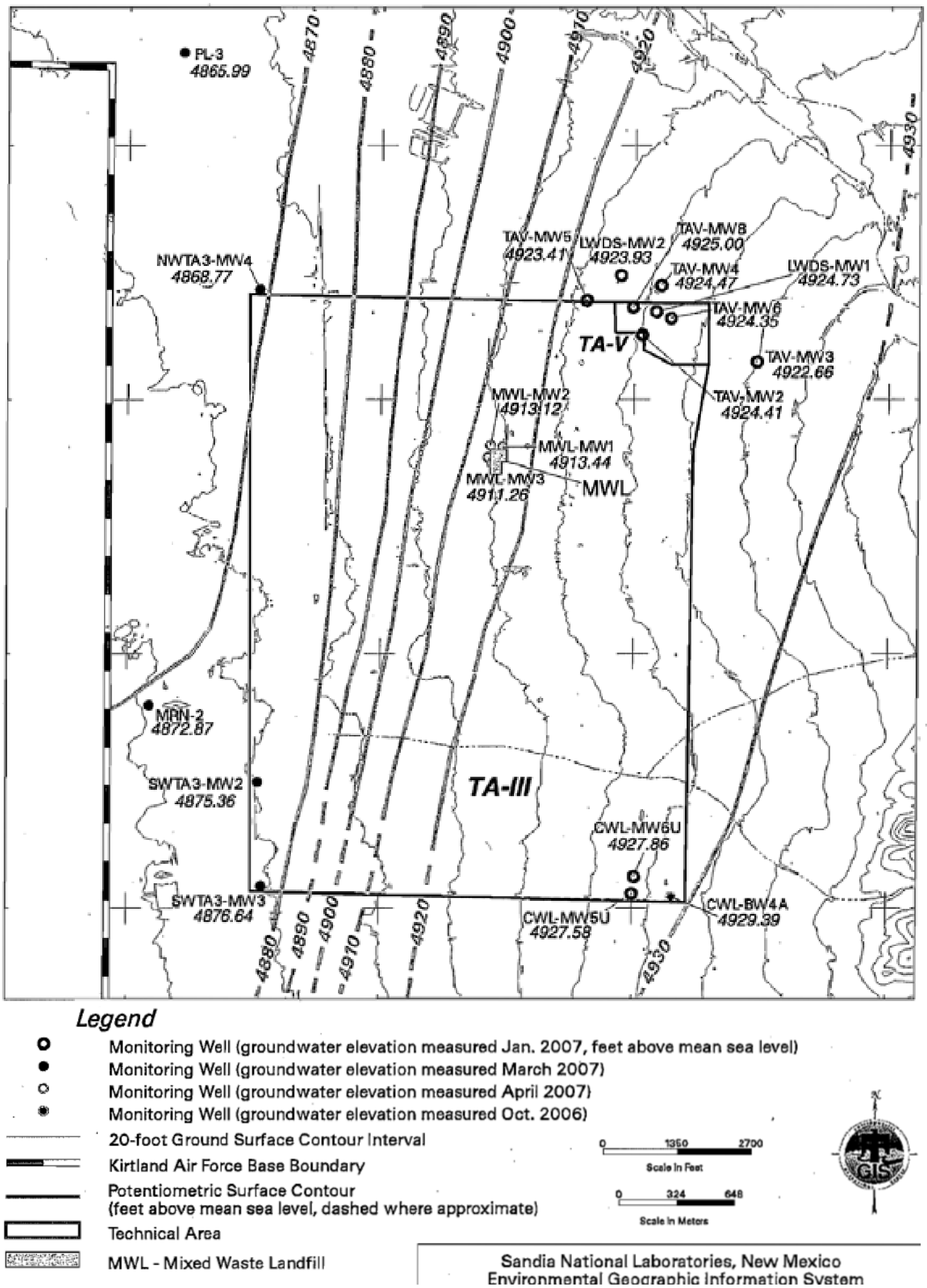
Scale 0......................200 feet

4917.12 [water table elevations (feet above mean sea level)]
MWL-BW1 – X

____________ Groundwater elevation contour (1-foot interval)

NOTE: The local contour map on this figure shows the southwest direction of groundwater flow at the water table below the Sandia MWL dump. The contour map is constructed using the water table elevations posted on Figure 11. Figure 11 shows that the regional direction of groundwater flow is to the northwest. But the local flow direction below the MWL dump is to the southwest and the local flow direction is important for the selection of the locations of monitoring wells.

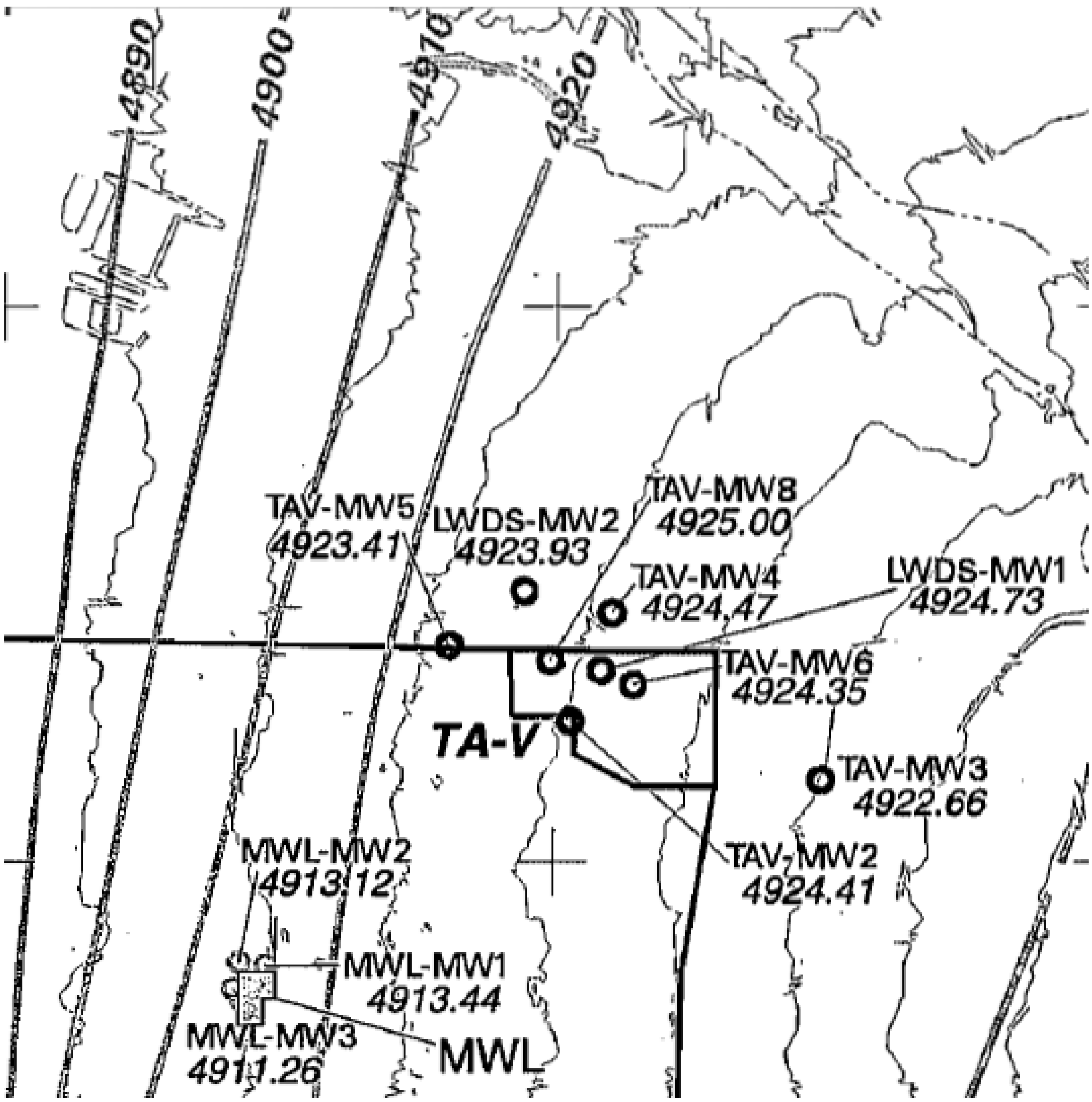
Figure 12. Water level contour map in the *Sandia Mixed Waste Landfill Annual Groundwater Monitoring Report, Spring 2007 Sampling Event.* **The MWL dump is at the center of the figure.**



SOURCE: Figure 4.1-2 in *Mixed Waste Landfill Annual Groundwater Monitoring Report, Spring 2007 Sampling Event* **Report Issued in February 2008.**

Figure 12A. Enlarged view of Figure 12 to show the water table elevations posted on Figure 12 for the three monitoring wells MWL-MW1, -MW2 and -MW3 at the Sandia MWL dump.

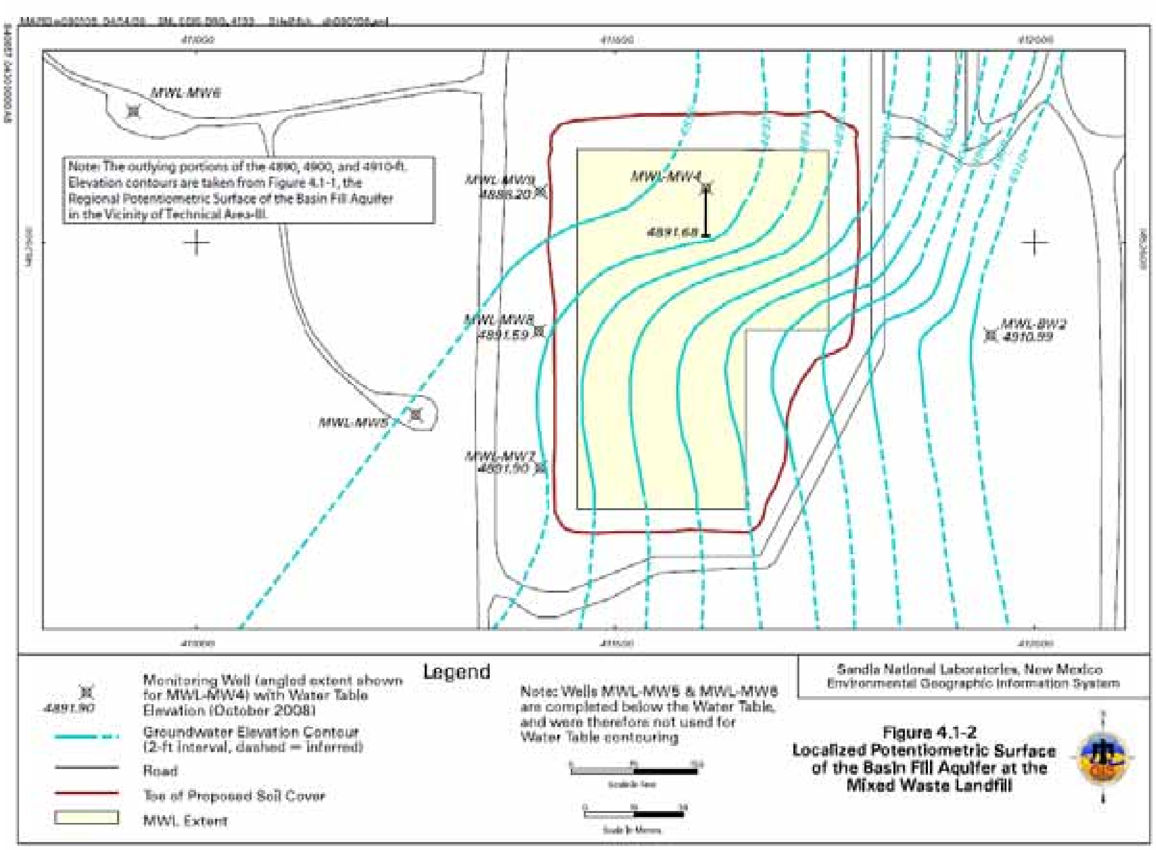
NOTE: The water table elevations measured in the three wells MWL-MW1, -MW2 and -MW3 indicate the direction of local groundwater flow at the water table in the fine-grained alluvial fan sediments below the MWL dump is to the south or southwest and not to the northwest as displayed by the contour lines on the regional flow map in Figure 12



NOTE: The water level measurements were on April 2, 2007.

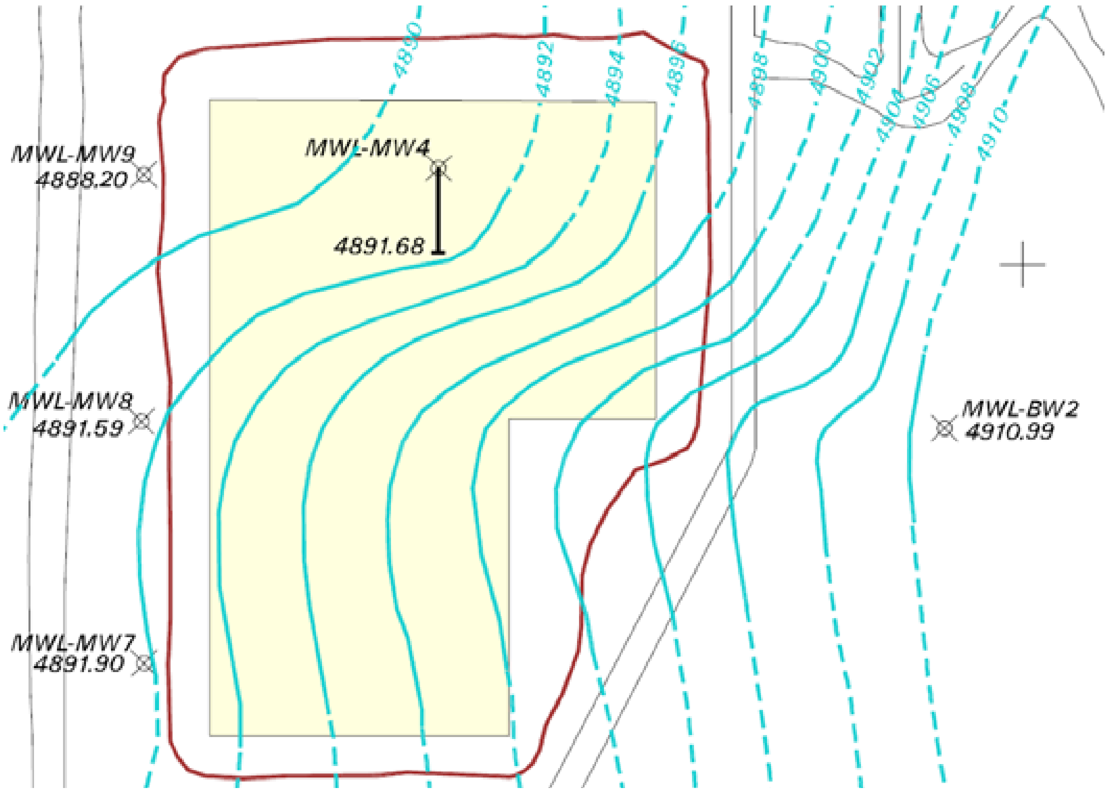
Figure 13. The incorrect water level contour map for the water table below and away from the Sandia MWL dump for water levels measured in the three new defective monitoring wells installed at the Sandia MWL dump in 2008. The new defective wells are MWL-MW7, MWL-MW8 and MWL-MW9. The water levels were measured in October 2008.

NOTE: The water level contours on this map are not accurate for the direction or lateral gradient of groundwater travel at the water table in the fine-grained alluvial sediments below the Sandia MWL dump. The best water table contour map for the MWL dump is Figure 14 below.

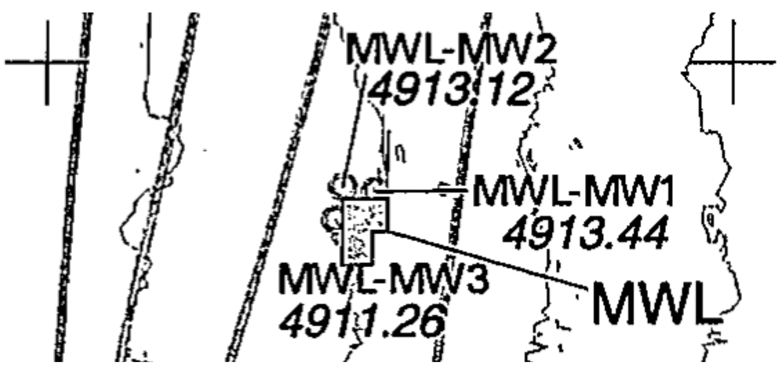


Source: Figure 4.1-2 in *Mixed Waste Landfill Groundwater Monitoring Report Calendar Year 2008,* Sandia National Laboratories, May 27, 2009

Figure 13A. Enlarged view of water level contour map in Figure 13 for water levels measured in October 2008.

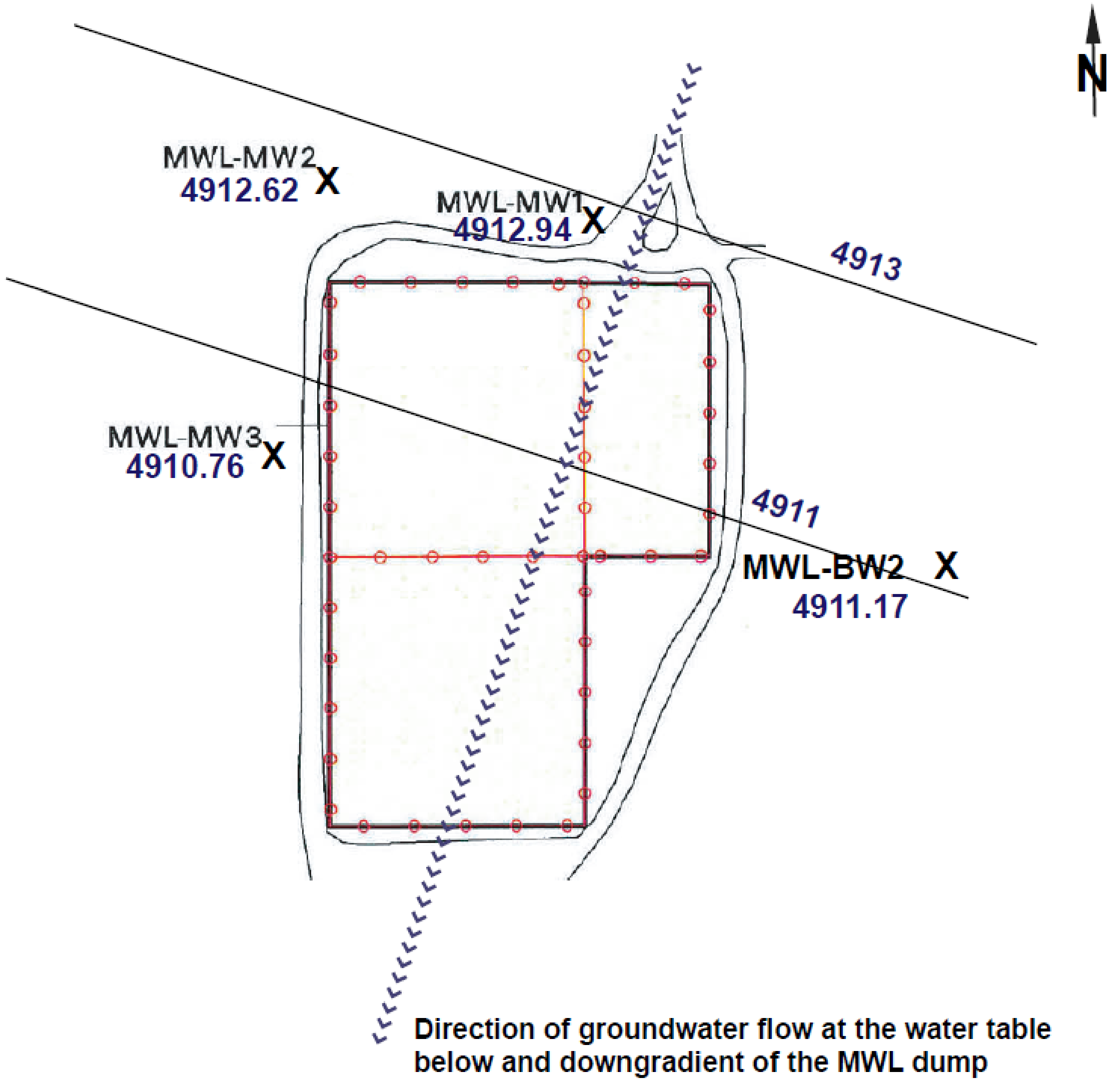


For comparison, the map below is an enlarged view of the water table contour map in Figure 12 for water table elevations in April 2007.



Note: Figure 8 shows that well MWL-MW3 was located along the western side of the MWL dump midway between the new monitoring wells MWL-MW8 and -MW9. The ~20 ft lower measured elevation of the water table along the western side of the Sandia MWL dump in the new monitoring wells MWL-MW7, -MW8 and -MW9 is unreasonable compared to the water table elevation measured in well MWL-MW3. The error in the water levels in the new wells is because of the mistakes that were made in the drilling method, drilling operations and well design (i.e., 30-ft screen length).

Figure 14. Water table contour map for the southwest direction of the local groundwater flow at the water table below the Sandia MWL dump.



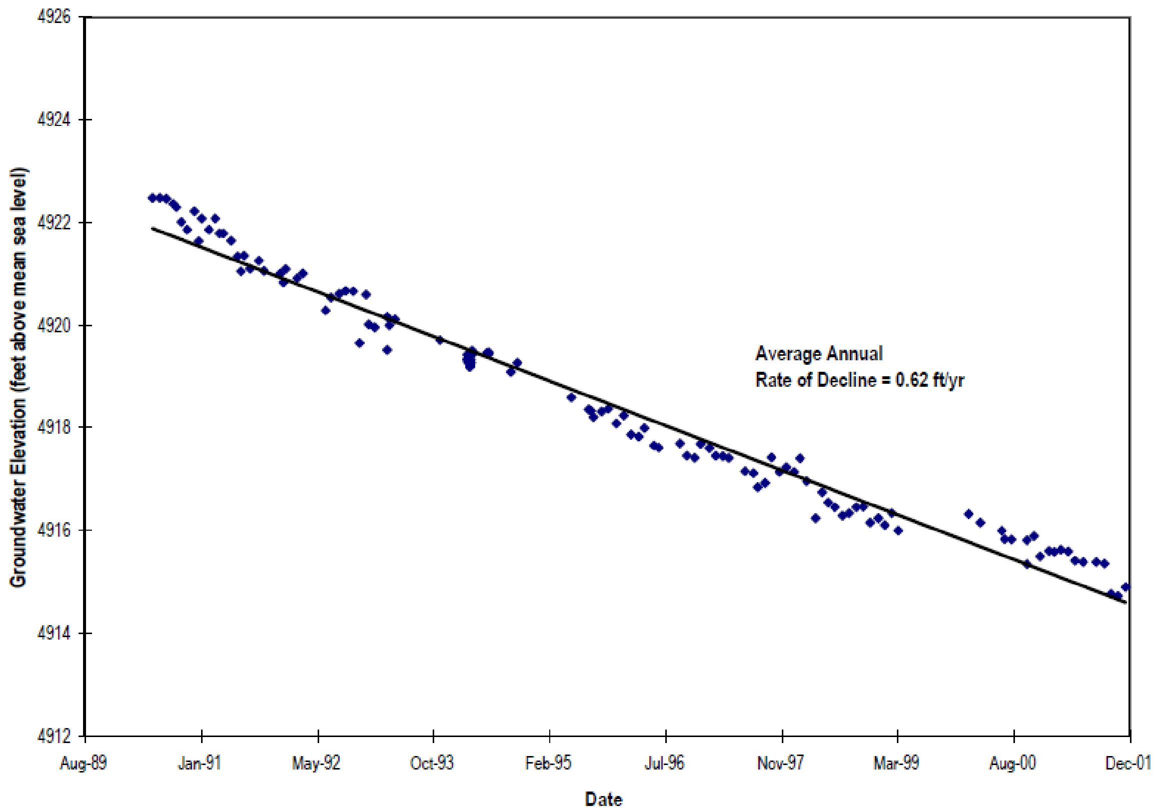
Scale 0……………..................200 feet

4911.17 [water table elevations (feet above mean sea level)]
MWL-BW2 – X

____________ Groundwater elevation contour (2-foot interval)

NOTE: The water table contour map is based on a 0.5 foot decline for water table elevations measured in monitoring wells MWL-MW1, -MW2, and -MW3 on April 02,2007 and the water table elevation measured in monitoring well MWL-BW2 on April 07, 2008.

Figure 15. Hydrograph of the elevation of the water table below the Sandia MWL dump measured in monitoring well MWL-MW3 over the period from 1991 through 2001. The water table declined at an average annual rate of 0.62 feet per year.



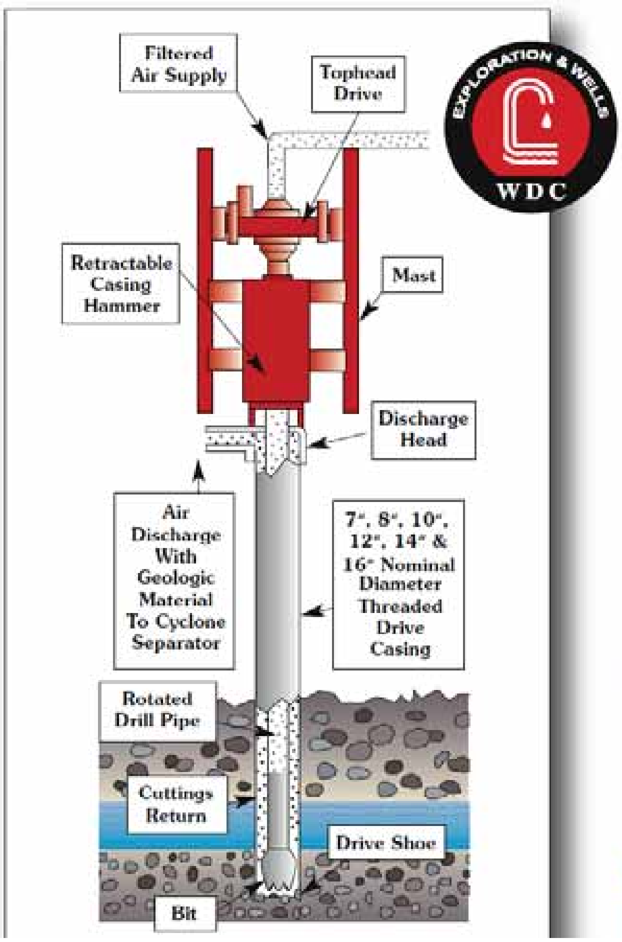
Source: Figure 3.7 in the December 2002 DOE/Sandia Report – *Mixed Waste Landfill Groundwater Report, 1990 through 2001, Sandia National Laboratories, Albuquerque, New Mexico* By Timothy J. Goering, Grace M. Haggerty, Dirk Van Hart, and Jerry L. Peace (Goering et al., 2002).

Figure 16. Description of the Air-Rotary Casing Hammer (ARCH) Drilling Method.

NOTE: Excerpt from the WDC advertisement. "The flush-threaded drive casing seals off formations in the borehole as drilling progresses, eliminating the potential for cross-contamination of the aquifers."

The Air Rotary Casing Hammer System (ARCH) consists of a non-rotating flush-threaded casing driven in conjunction with a conventional air rotary drill string. Cuttings are cleared from the hole by the bit rotation and air circulation. The material is discharged through a hose into a cyclone, which separates the air from the formation cuttings to facilitate sampling and drill cuttings containment. The advanced drive casing is a heavy wall flush-threaded pipe. Six diameters are available to accommodate different well diameters and depth requirements. The casing is driven with a pneumatic or hydraulic drill-through casing hammer, which is rated up to 9700 foot-pounds of energy.

Upon completion of drilling, the drill rod and bit are extracted from the center of the drive casing to allow the installation of permanent well construction materials. A hydraulic casing puller rated up to 250 tons extracts the drive casing. After the well casing is placed, the sand, bentonite pellets, and cement are installed in the annulus as the drive casing is pulled.



PRIMARY BENEFITS

Eliminates the need to set cemented-in conductor casing in upper aquifers in order to drill into lower aquifers.

The flush-threaded drive casing seals off formations in the borehole as drilling progresses, eliminating the potential for cross contamination of the aquifers.

Eliminates the need for drilling fluids.

The casing can be driven to a specified depth allowing continued borehole advancement with direct air/mud rotary methods.

Depth discreet water, vapor, and soil samples can be taken at selected intervals.

Drill cuttings discharged from the cyclone provide representative stratigraphy while drilling progresses.

Drills through most geologic formations and is superior over other methods in conglomerate.

Provides a clean borehole for well construction. This eliminates problems during well installation.

The completed well does not have any drilling mud to develop; thus the well develops quicker and is more efficient.

The method has been approved and utilized for over fifteen years on projects for the Environmental Protection Agency, California Department of Health Services, Arizona Department of Environmental Quality, Regional Water Quality Boards, Department of Energy, Department of Defense and private clients throughout the Western States.

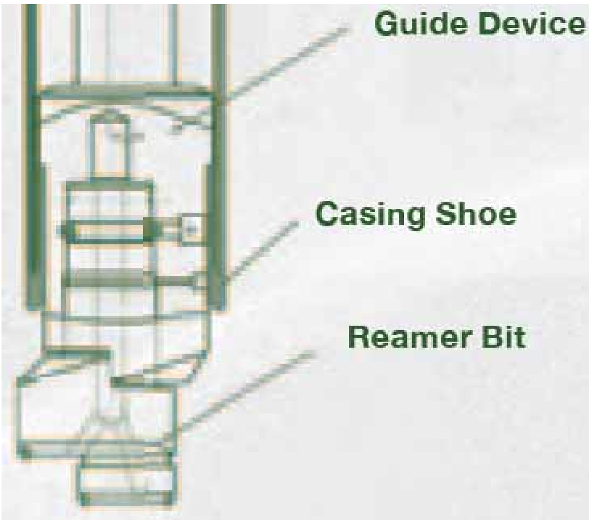
Sample specifications and references are available upon request.

GENERAL INFORMATION

Nominal		Nominal	Telescoped	Telescoped

Source: Advertisement by the Water Development Corporation (WDC) drilling company.

Figure 17. Description of the Stratex[R] Underreamer Rotary Drilling Method.



During drilling operations, the rotation of the Stratex [R] Underreamer Bit cuts a larger diameter hole than the diameter of the drill casing. For retraction from the drill casing, the Stratex [R] Underreamer Bit closes to a smaller diameter than the inside diameter of the drill casing. Drilling with the underreamer method will minimize the damage to fine-grained alluvial fan sediments at the water table below the Sandia MWL dump.

Drilling Operations With the Stratex[R] Underreamer Bit	The Stratex [R] Underreamer Bit in Closed Position

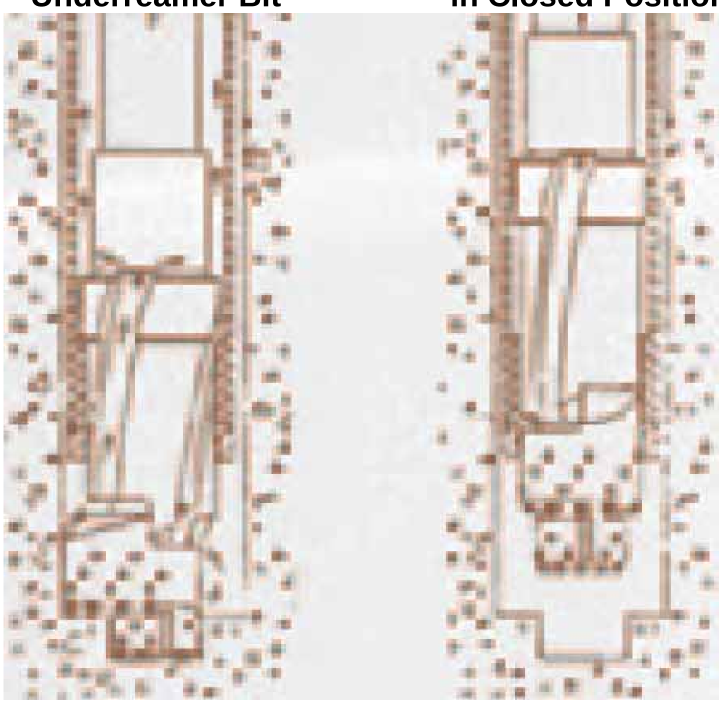
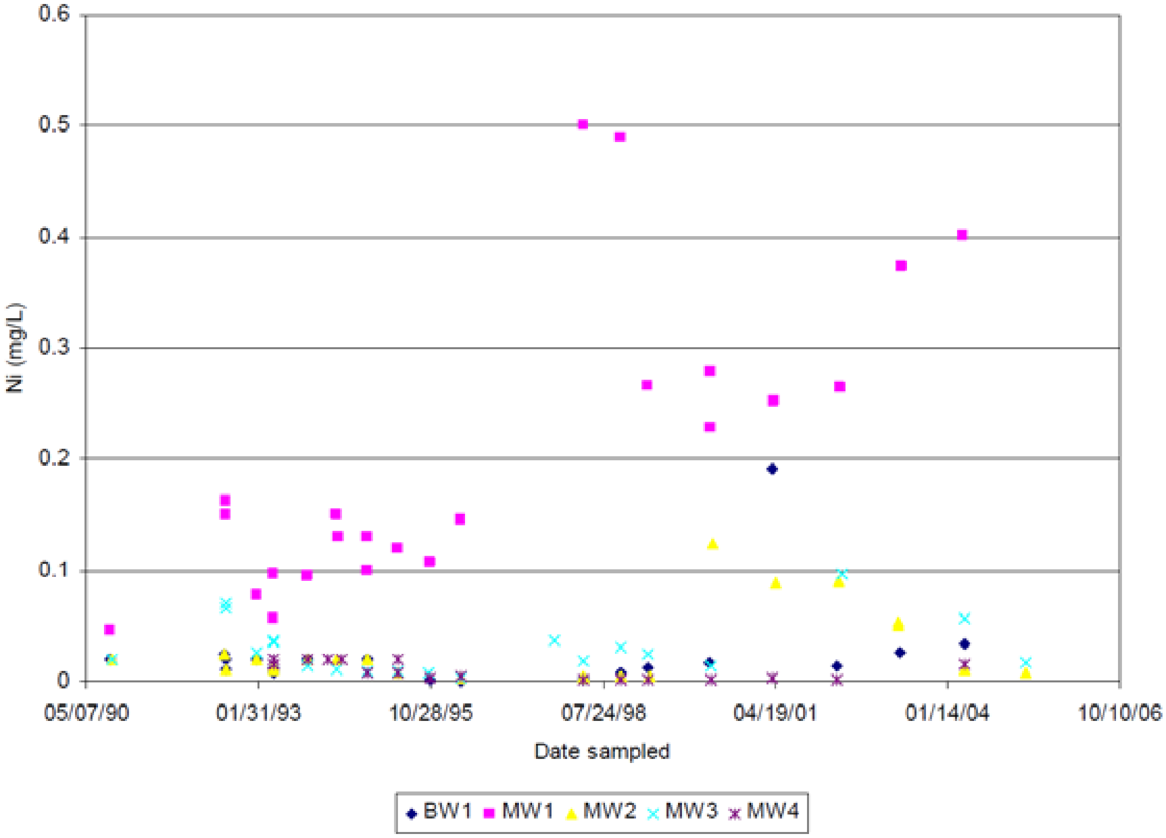


Figure 18. Total nickel concentrations measured in groundwater samples collected from monitoring wells MWL-MW1, -MW2, MW3, MW4 and -BW1 at the Sandia Mixed Waste Landfill.



Note: The figure presents nickel concentrations measured in unfiltered water samples. On the figure, the total nickel concentrations are in milligrams per liter or parts per million. 0.1 milligrams per liter = 100 micrograms per liter.

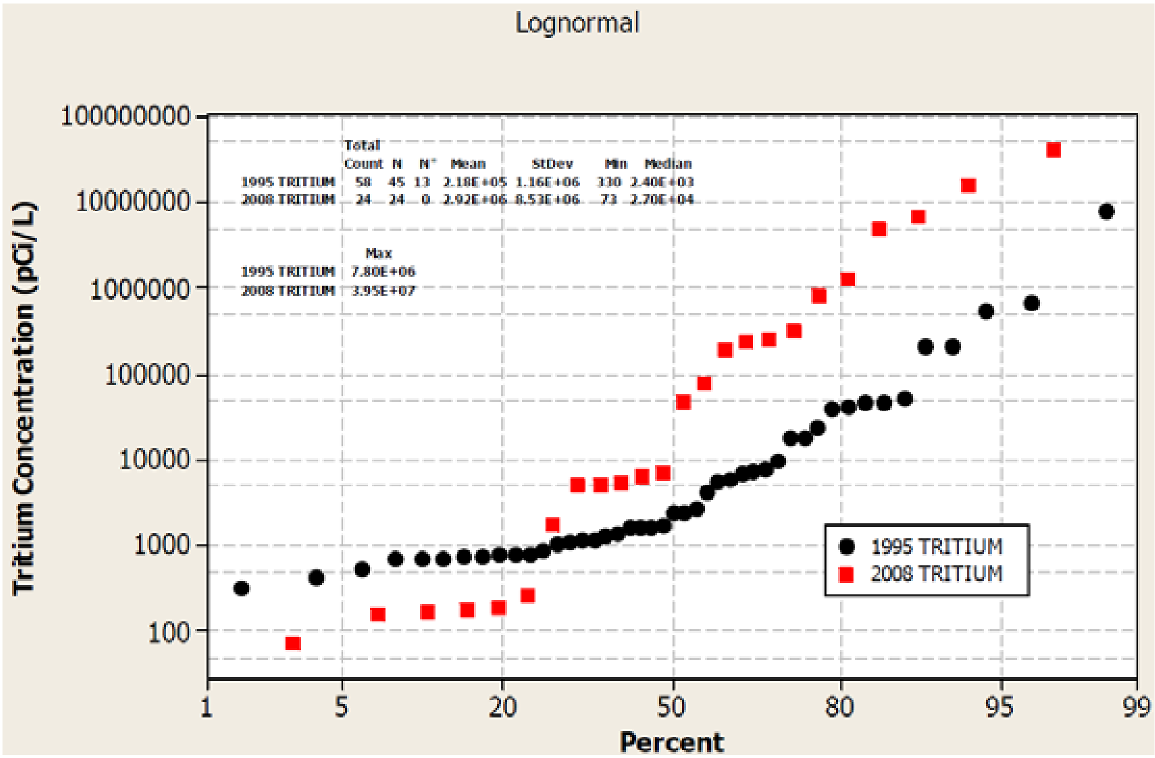
Note: Monitoring wells MWL-MW1, MW2 MW4 and BW1 have corroded stainless steel screens. The screen in monitoring well MWL-MW4 is the plastic PVC.

Note: The US Environmental Protection Agency recommends the nickel concentration in drinking water to not exceed 0.1 milligrams per liter (100 parts per billion). All of the nickel concentrations measured in water samples collected from well MWL-MW1 after 1993 are greater than 0.1 mg/L with many concentrations ranging above 0.2 mg/L to near 0.5 mg/L (500 parts per billion).

Note: The high nickel concentrations measured in the water samples collected from well MWL-MW1 are evidence of nickel contamination from the Sandia MWL dump.

Source: Figure 6 in the NMED report *Evaluation of the Representativeness and Reliability of Groundwater Monitoring Well Data, Mixed Waste Landfill, Sandia National Laboratories* By: William P. Moats, David L. Mayerson, and Brian L. Salem of the New Mexico Environment Department (November 2006).

Figure 19. Comparison of 1995 and 2008 Tritium sediment sample analytical results for the 10-, 30- and 50-foot depth samples at the Sandia MWL dump.



- An enlarged view of the Tritium Maximum Concentration Data posted on the above figure is below:

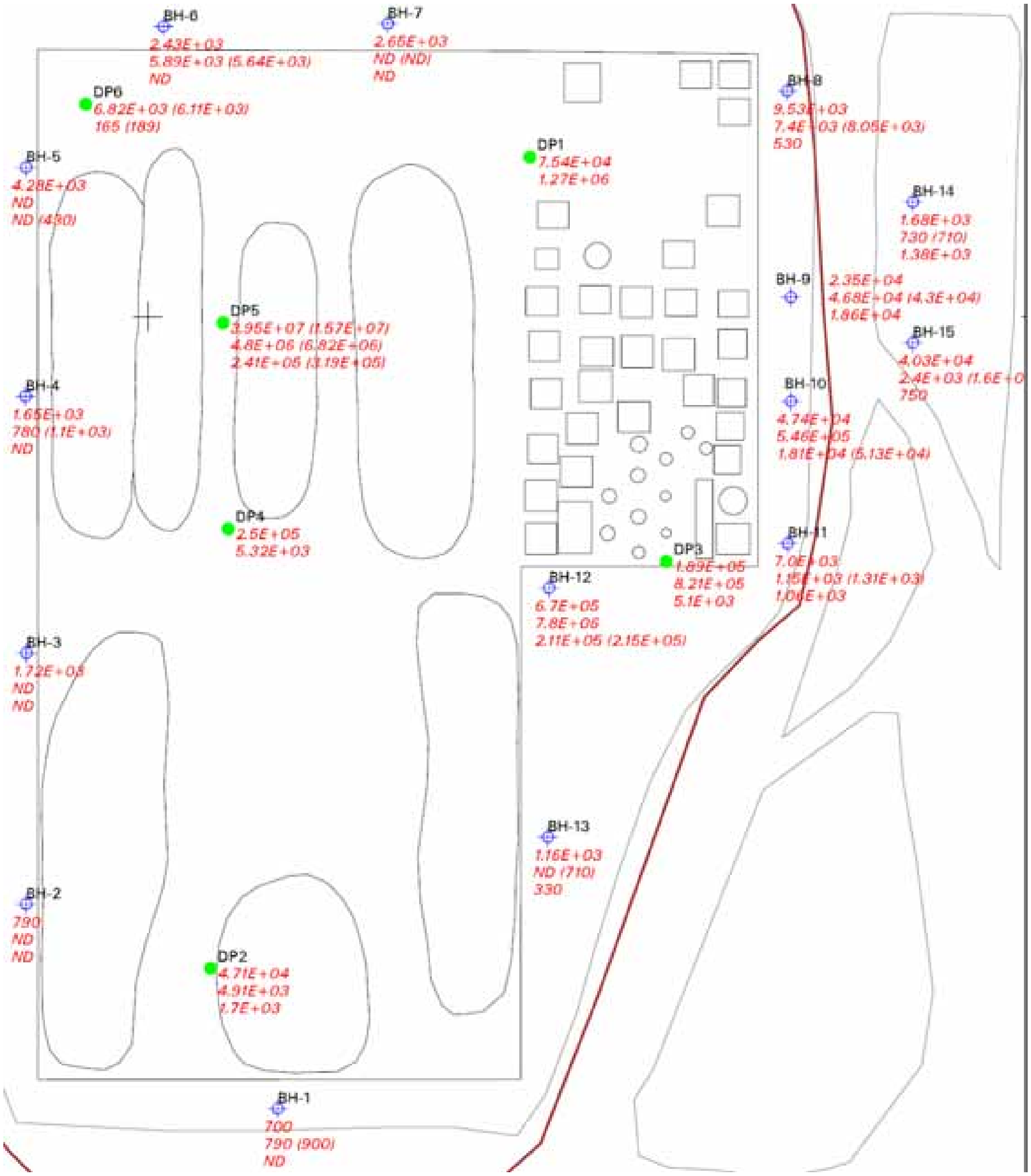
- **7,800,000 pCi/L = Maximum Tritium Concentration in 1995 Sediment Samples**
- **39,500,000 pCi/L = Maximum Tritium Concentration in 2008 Sediment Samples**
- **3,900,000 pCi/L = Expected Maximum Tritium Concentration in 2008 Sediment Samples**

Note: The half-life of tritium is 12.3 years. Therefore, the maximum tritium concentration measured in the 2008 soil samples was expected to be 50% less than the maximum value measured 13 years earlier in 1995. The maximum value expected to be measured in the 2008 study was approximately 3,900,000 pCi/L.

However, the maximum tritium concentration measured in 2008 was 39,500,000 pCi/L and ten times greater than the expected maximum concentration. The high tritium concentrations measured in the 2008 samples is evidence of a new release of contamination from the wastes buried in the MWL dump.

Source: Figure 6-6 in *Investigation Report on the Soil-Vapor Volatile Organic Compounds, Tritium, and Radon Sampling at the Mixed Waste Landfill, August 2008* SNL/NM Environmental Restoration Project

Figure 20. 1995 and 2008 borehole locations and tritium sampling results at 10-, 30- and 50-foot depths at the Sandia MWL dump.



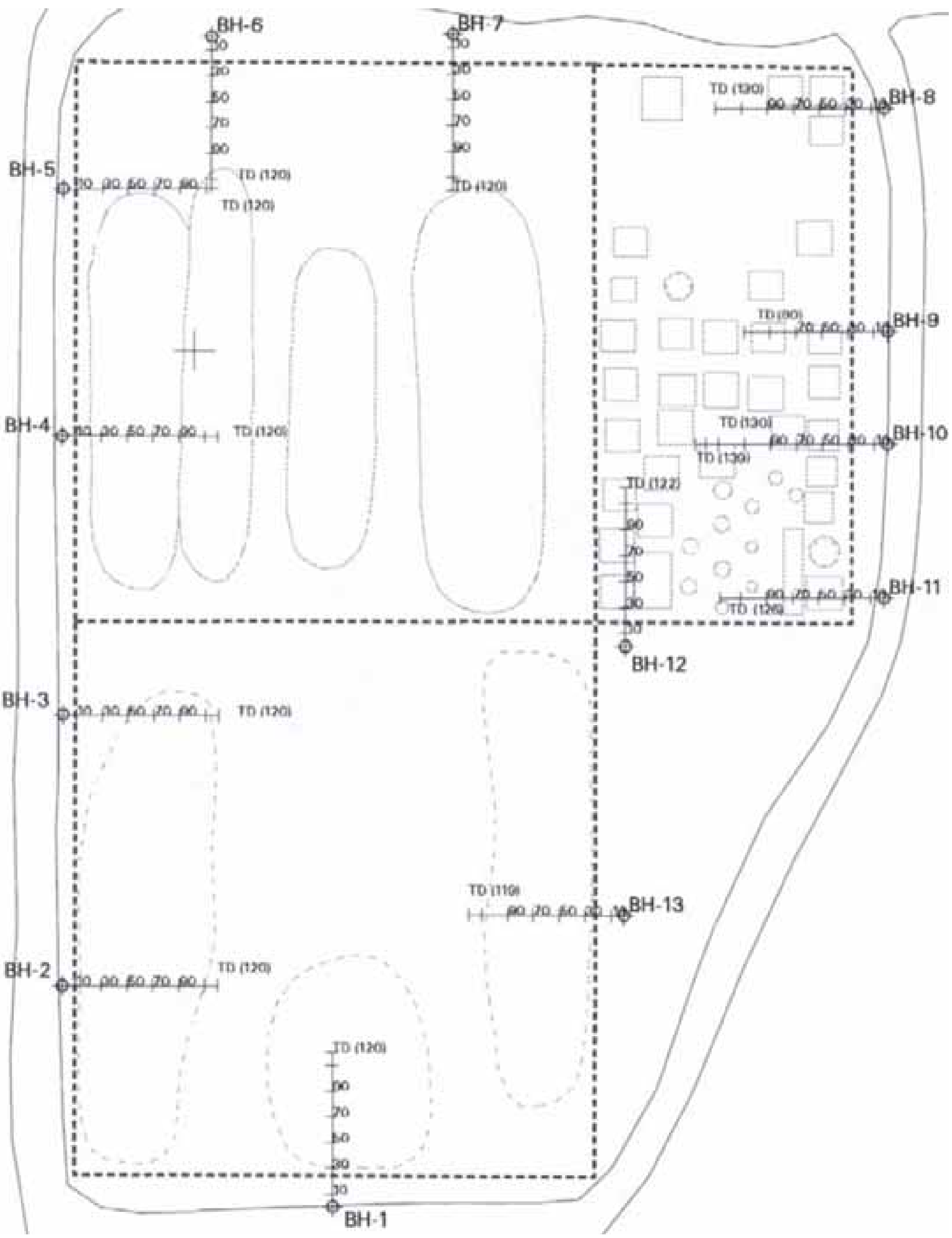
0--200 feet lateral scale

DP2 4.7E+04 — 2008 Tritium sampling location and result (pCi/L) at 10 and 30 ft. (two values), and 10, 30, and 50 ft. (three values) (duplicate)

BH-1 700 — 1995 Soil-Vapor and Tritium sampling location and result (pCi/L) at 10, 30, and 50 ft. (duplicate)

Source: Figure 5-2 in *Investigation Report on the Soil-Vapor Volatile Organic Compounds, Tritium, and Radon Sampling at the Mixed Waste Landfill, August 2008* SNL/NM Environmental Restoration Project

Figure 21. **Map of the 1995 RFI Angle Boreholes Below the Sandia MWL Dump.**



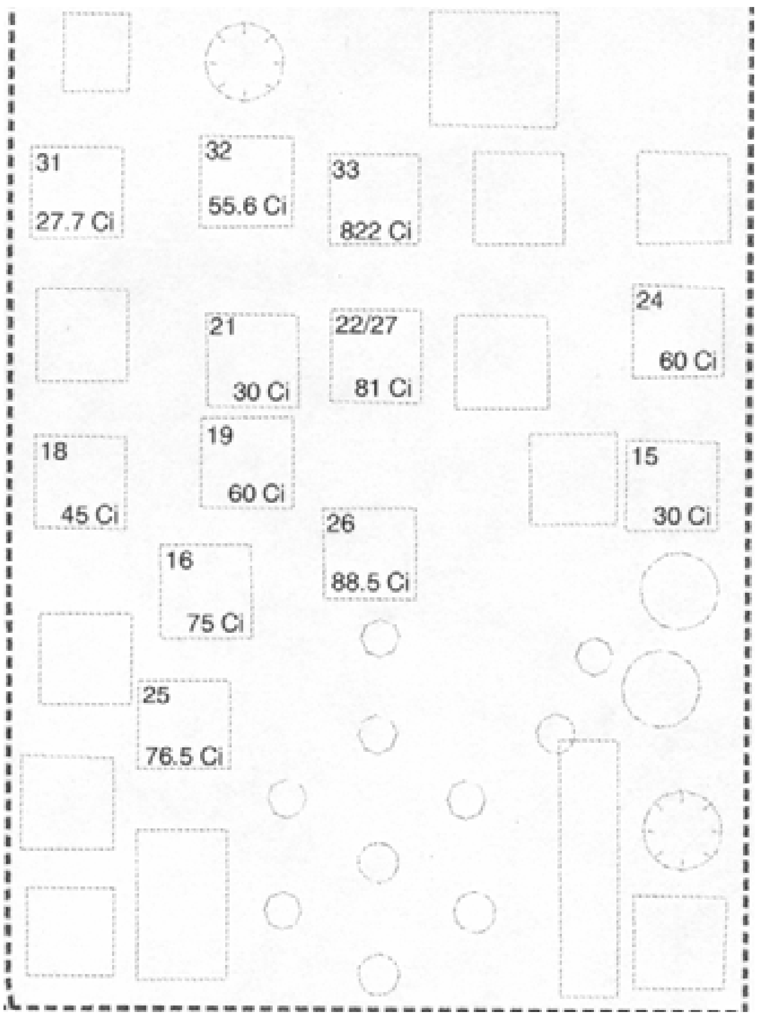
0___________________________________200 feet lateral scale

NOTE: The boreholes BH-1 to BH-13 were located around the perimeter of the Sandia MWL Dump and drilled at an angle to collect soil samples below the trenches and pits.

Source: Figure 10 in *Final Report - Independent Peer Review of the U.S. Department of Energy Sandia National Laboratories' Mixed Waste Landfill August 31, 2001* Performed by WERC: A Consortium for Environmental Education and Technology Development.

Figure 22. Enlarged view of the Classified Area of the Sandia MWL dump to show the total inventory of Tritium wastes buried in Unlined Pits in the Classified Area of the dump.

For Example - 822 Curies of Tritium wastes were buried in Pit 33 and the total inventory of Tritium wastes buried in the disposal pits on this figure is 1451.3 curies or 60% of the total inventory of 2400 curies of Tritium wastes buried in the Sandia MWL dump.



0---100 feet – lateral scale.

Note: See Figures 2, 3 and 21 for a complete view of all the trenches and pits at the Sandia MWL dump.

Source: Figure 9 in *Final Report - Independent Peer Review of the U.S. Department of Energy Sandia National Laboratories' Mixed Waste Landfill August 31, 2001* Performed by WERC: A Consortium for Environmental Education and Technology Development

Figure 23. Isopleth map of Tritium Contamination measured in the 1993 surface soil sampling at the Sandia MWL dump.

Source: Figure 6-2 in the Sandia Report - *INVESTIGATION REPORT ON THE SOIL-VAPOR VOLATILE ORGANIC COMPOUNDS, TRITIUM, AND RADON SAMPLING AT THE MIXED WASTE LANDFILL,* August 2008

Figure 24. Unreliable isopleth map of the Tritium contamination at the 30-foot depth below the Sandia MWL Dump for only 6 sample locations.

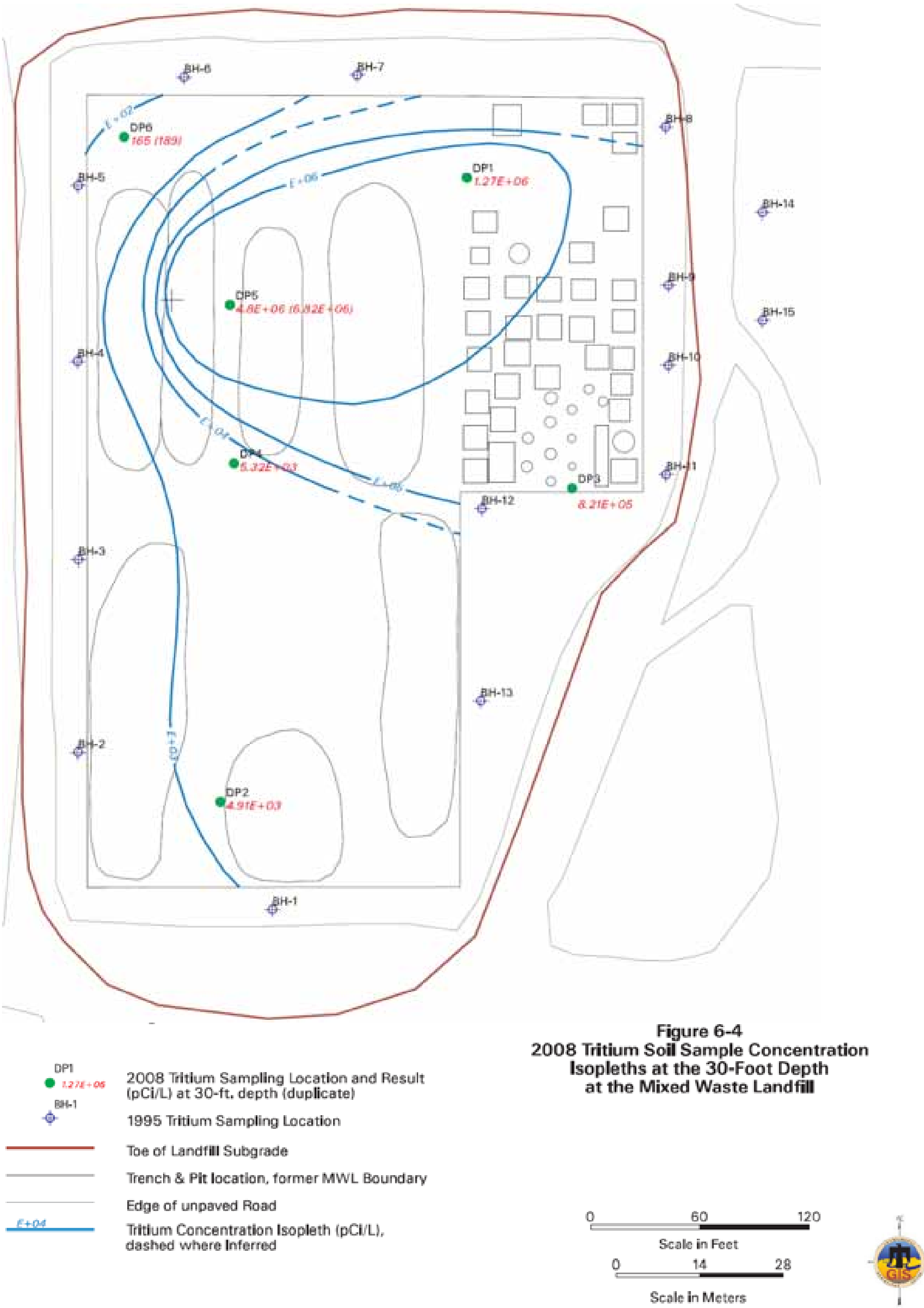
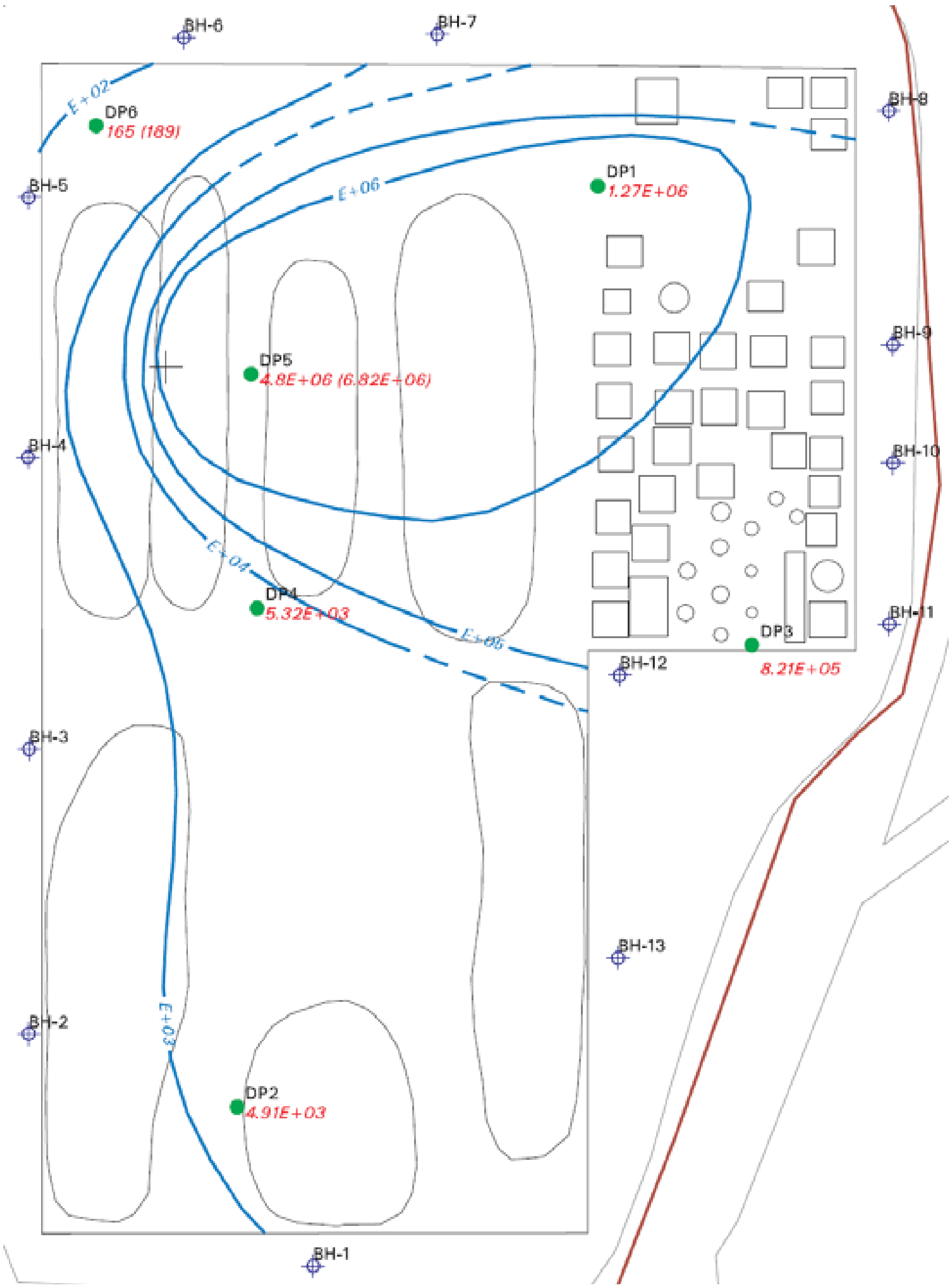
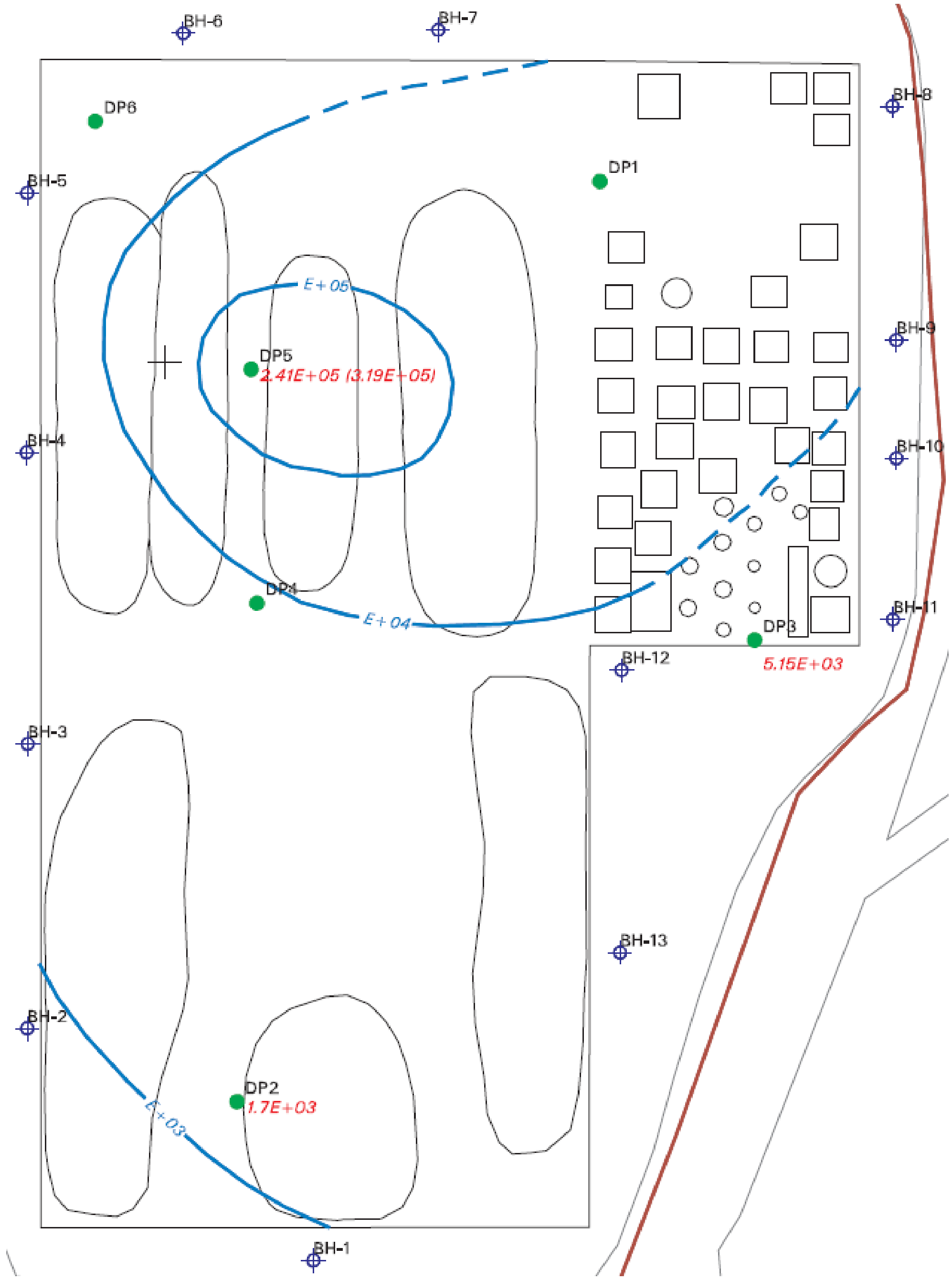


Figure 24A. Enlarged view of Figure 24 to show the locations of the 6 30-foot depth sample locations reading down the page for sample locations DP6, DP1, DP5, DP4, DP3 and DP2. None of the 6 sample locations were located near the pits or trenches where the large inventory of tritium wastes were known to be buried.



Source for Figure 24 and 24A: Figure 6-4 in *Investigation Report on the Soil-Vapor Volatile Organic Compounds, Tritium, and Radon Sampling at the Mixed Waste Landfill, August 2008* SNL/NM Environmental Restoration Project.

Figure 25. Unreliable isopleth map of the Tritium contamination at the 50-foot depth below the Sandia MWL Dump for only 3 sample locations.

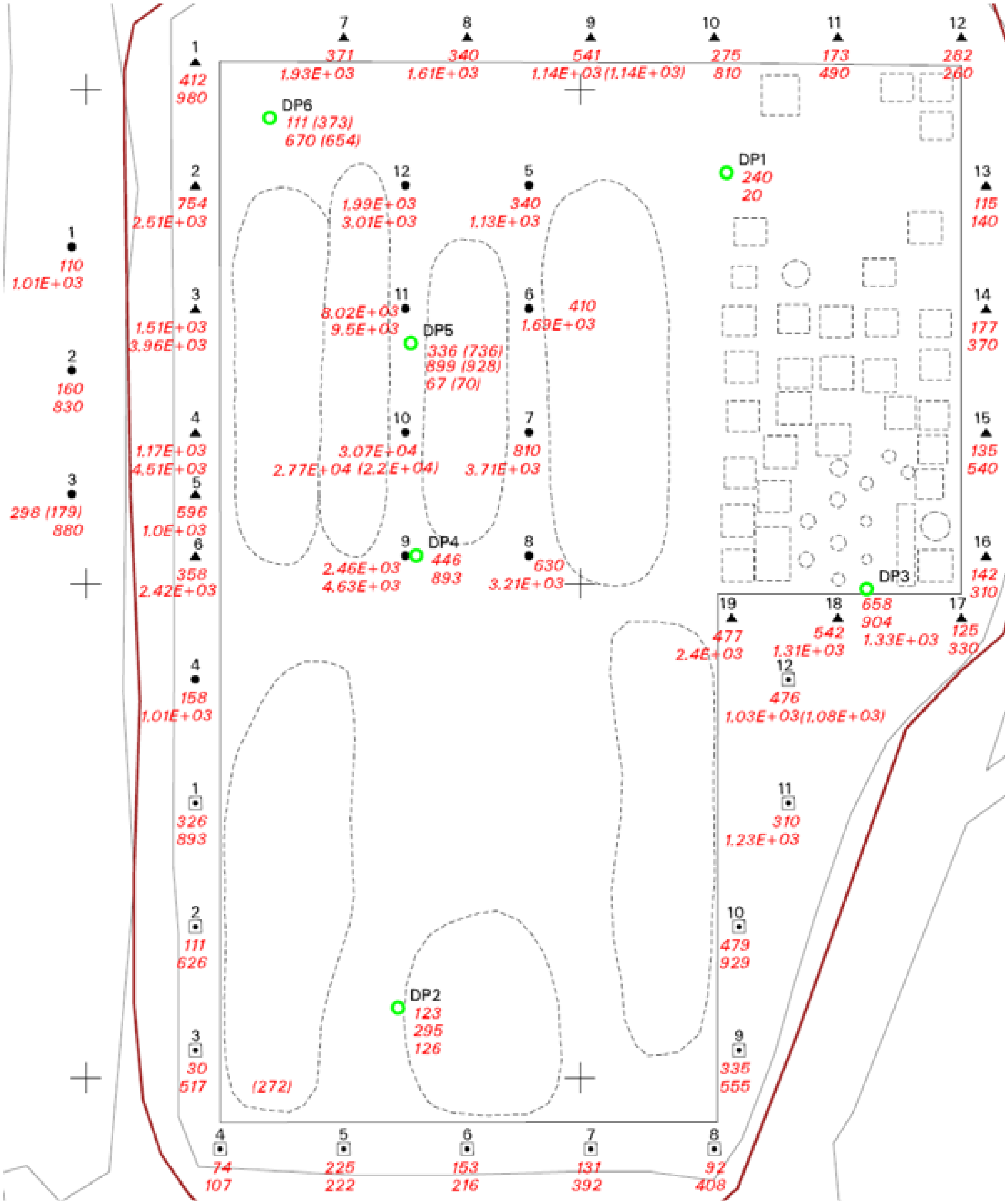


NOTE: The three sample locations from bottom to top of map are DP2, DP3 and DP5. <u>None</u> of the three sample locations are near the trenches and pits where the large inventory of tritium wastes were known to be buried.

Source: Figure 6-5 in *Investigation Report on the Soil-Vapor Volatile Organic Compounds, Tritium, and Radon Sampling at the Mixed Waste Landfill, August 2008* SNL/NM Environmental Restoration Project.

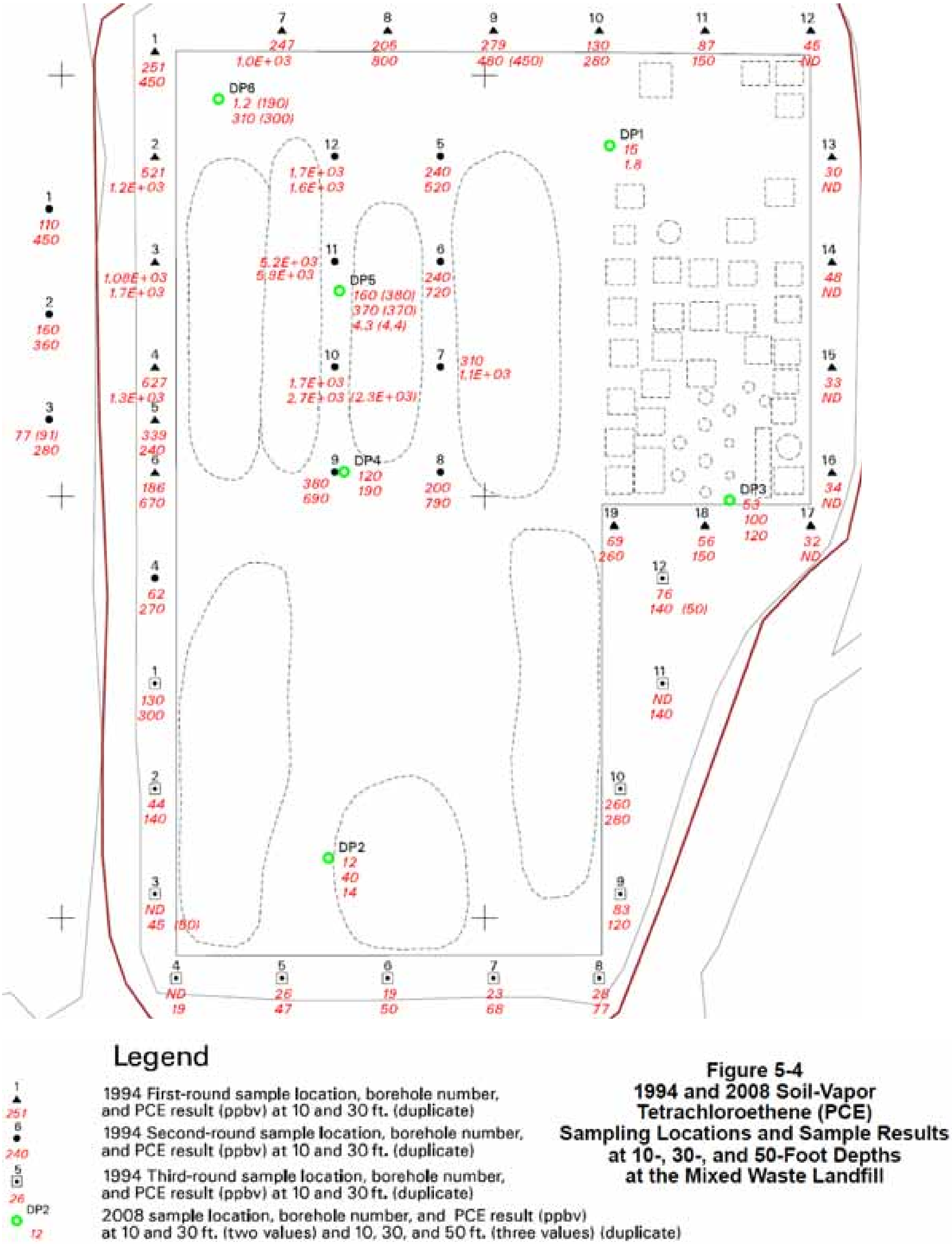
Figure 26. 1994 and 2008 soil-vapor Total Volatile Organic Compound (VOC) concentrations in parts per billion volume (ppbv) at 10-, 30- and 50-foot depths at the Sandia MWL dump.

Note: The six green circles are the 2008 sampling locations. See Legend on Fig. 27



Source: Figure 5-6 in *Investigation Report on the Soil-Vapor Volatile Organic Compounds, Tritium, and Radon Sampling at the Mixed Waste Landfill, August 2008* SNL/NM Environmental Restoration Project.

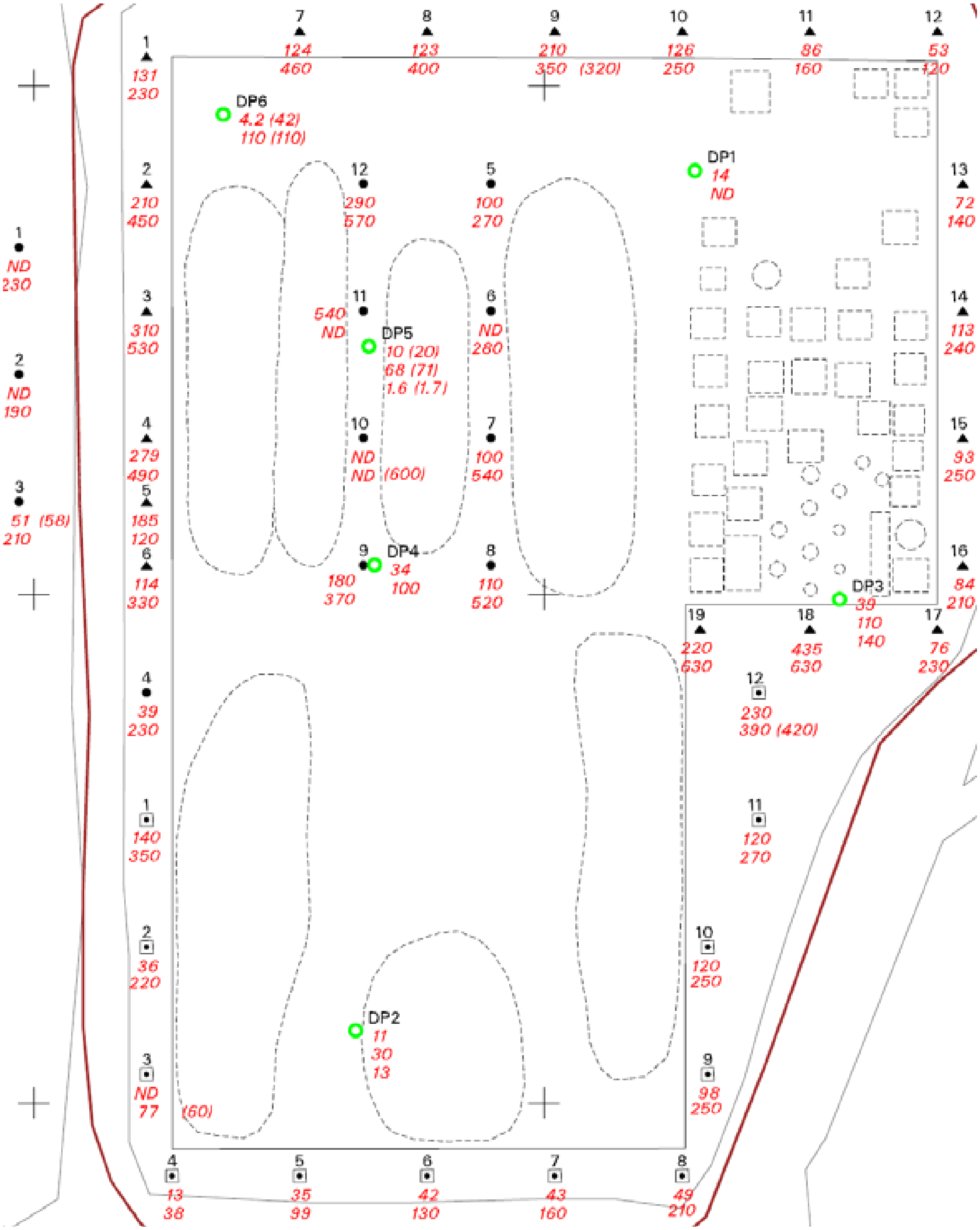
Figure 27. 1994 and 2008 soil-vapor PCE concentrations in parts per billion volume (ppbv) at 10-, 30- and 50-foot depths at the Sandia MWL dump.



Source: Figure 5-4 in *Investigation Report on the Soil-Vapor Volatile Organic Compounds, Tritium, and Radon Sampling at the Mixed Waste Landfill, August 2008* SNL/NM Environmental Restoration Project.

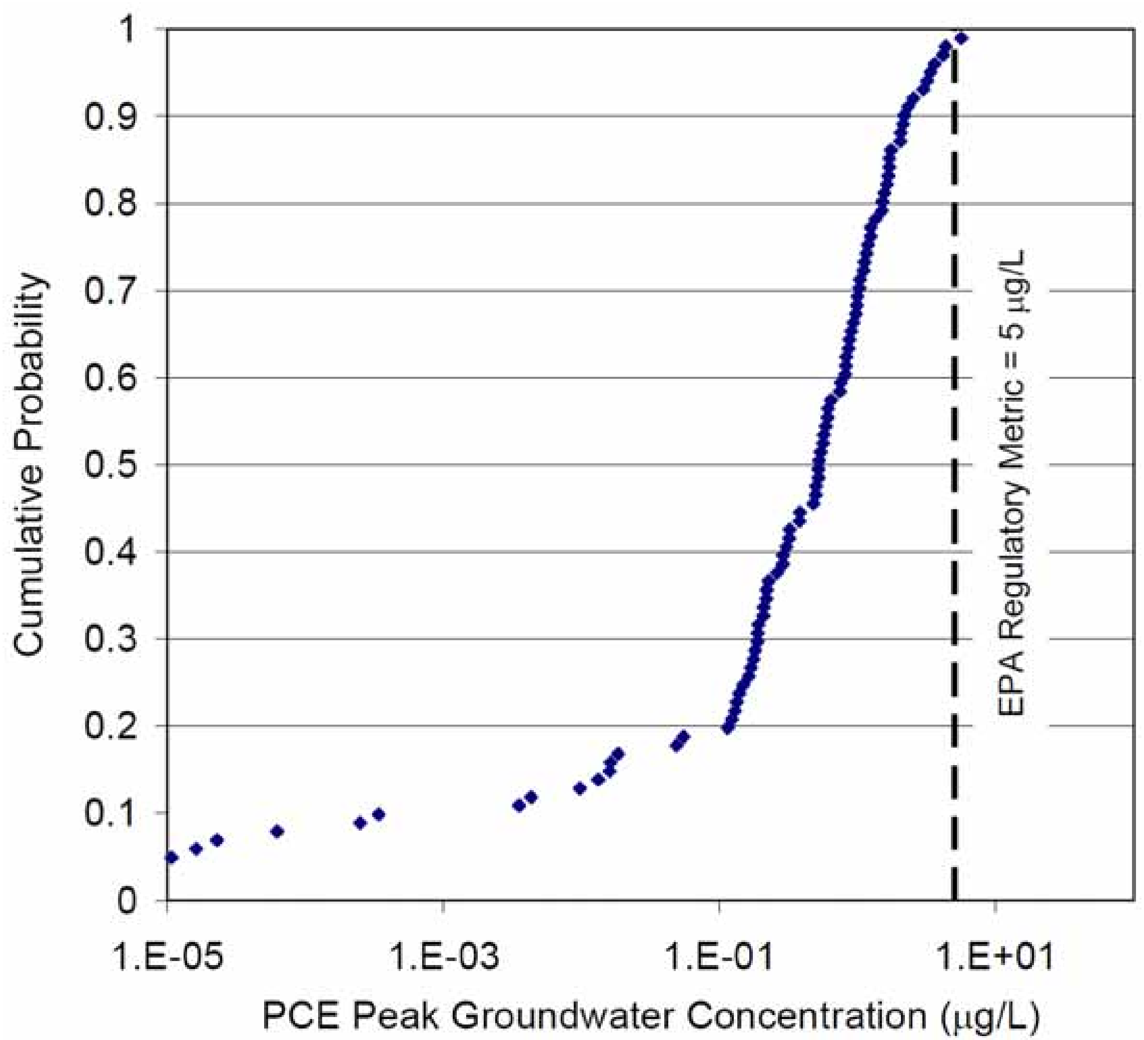
Figure 28. 1994 and 2008 soil-vapor TCE concentrations in parts per billion volume (ppbv) at 10-, 30- and 50-foot depths at the Sandia MWL dump.

Note: The six green circles are the 2008 sampling locations. See Legend on Fig. 27



Source: Figure 5-5 in *Investigation Report on the Soil-Vapor Volatile Organic Compounds, Tritium, and Radon Sampling at the Mixed Waste Landfill, August 2008* SNL/NM Environmental Restoration Project.

Figure 29. The predicted concentrations of PCE contamination in the groundwater below the Sandia MWL dump derived from 100 simulations with the DOE/Sandia computer fate and transport model.



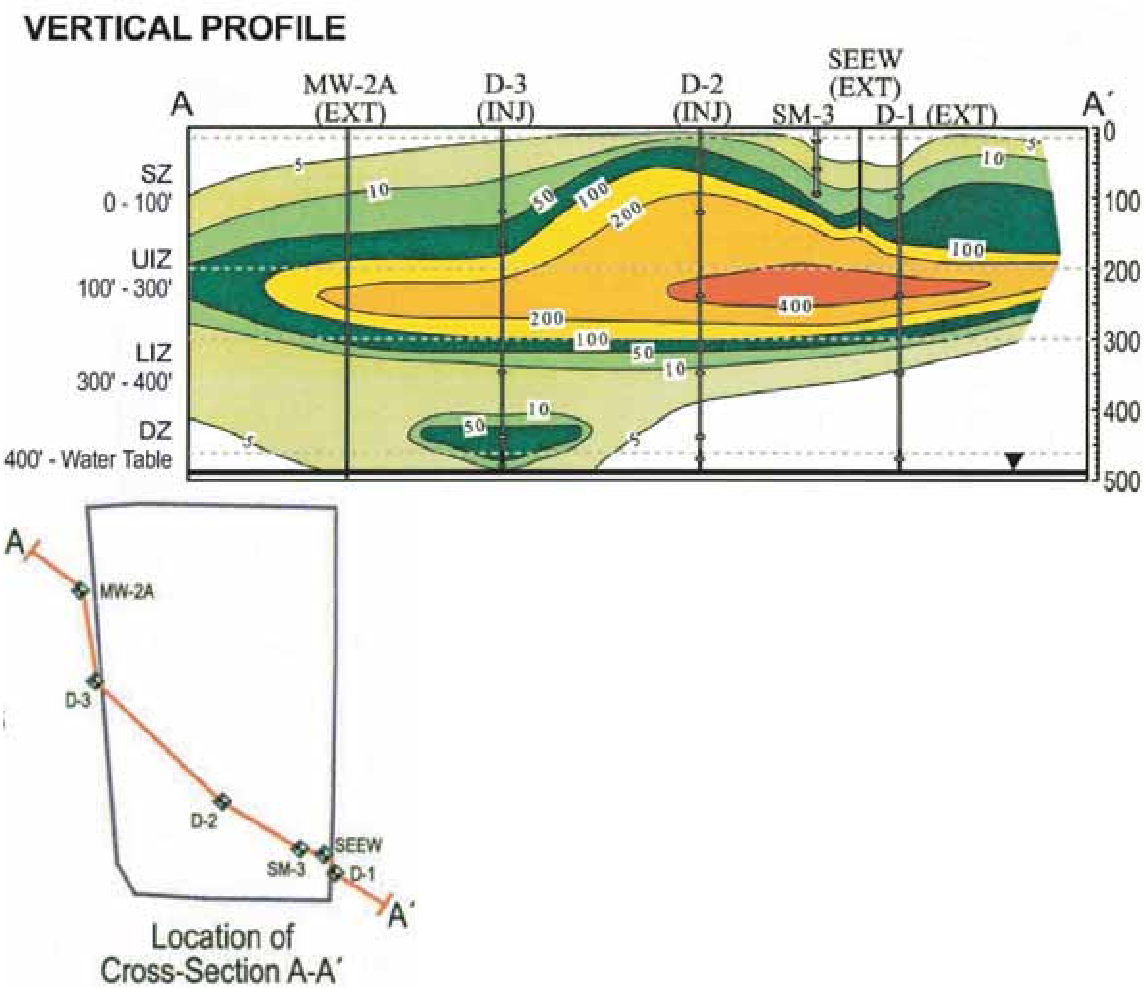
NOTE:
The EPA will promulgate a new drinking water standard (DWS) maximum contaminant level (MCL) for PCE in 2011. The EPA has indicated the new DWS MCL will be set at 0.05 ug/L, a 100-fold tightening from the current MCL of 5 ug/L.

- **The above figure shows that 87 of the 100 DOE/Sandia computer simulations predict that the groundwater below the MWL dump is contaminated with PCE at a concentration above 0.05 ug/L.**

- **The above figure shows that 59 of the 100 DOE/Sandia computer simulations predict that the groundwater below the MWL dump is contaminated with PCE at a concentration above 0.5 ug/L.**

Source: The above figure is Figure 23 in the DOE/Sandia Fate and Transport Computer Modeling Report for the Sandia MWL Dump, DOE/Sandia Report SAND2007—170 (January 2007). See Reference No. 2 in Section 13.

Figure 30. Vertical profile view of the VOC soil-gas plume in 1997 below the Chemical Waste Landfill (CWL dump) at the Sandia National Laboratories Albuquerque, New Mexico Facility.



Note:

- **The VOC soil-gas plume on the above Figure is before any operations to extract the soil-gas plume below the Sandia CWL dump**

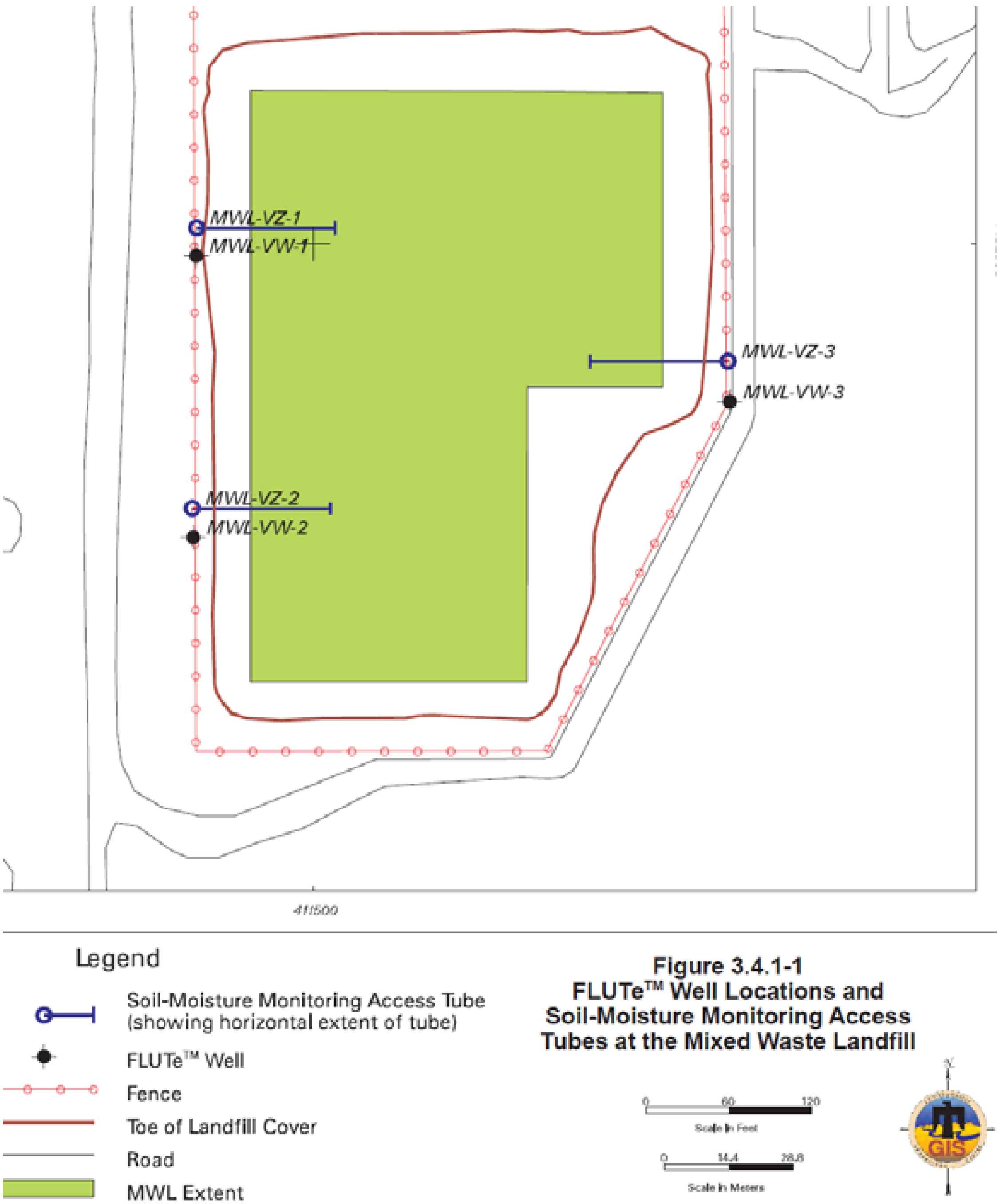
- **The above Figure shows the maximum VOC concentrations in the soil-gas plume below the Sandia CWL dump are at depths greater than 200 feet below ground surface.**

- **The Total VOC soil-gas concentrations on the above figure are in parts per million volume.**

Source: Figure 1-8 in Chemical Waste Landfill Corrective Measures Study Report – December 2004. Environmental Restoration Project, Sandia National Laboratories/New Mexico

Figure 31. The proposed locations for three vadose zone monitoring wells and the three existing soil-moisture monitoring tubes at the Sandia MWL dump.

Note: The three proposed vertical vadose zone monitoring wells are MWL-VW1, MWL-VW2 and MWL-VW3. The three existing soil-moisture monitoring tubes installed at an angle below the MWL dump are MWL-VZ1, -VZ2 and -VZ3.



Source: Figure 3.4.1-1 in DOE/Sandia proposed *Long-Term Monitoring and Maintenance Plan, September 2007*