

**Radiological Survey Report
Former Middlesex Municipal Landfill
Middlesex, New Jersey**



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Table of Contents

EXECUTIVE SUMMARY	iv
1.0 INTRODUCTION	1
2.0 OBJECTIVE	1
3.0 SITE DESCRIPTION	2
4.0 RADIOLOGICAL CONTAMINANTS	2
5.0 SURVEY ACTIVITIES.....	2
5.1 General.....	2
5.2 Survey Reference System	5
5.3 Instrumentation	5
5.4 Integrated Survey Strategy.....	5
6.0 SURVEY RESULTS	6
6.1 Gamma Scans.....	6
6.2 Sampling	7
7.0 DISCUSSION	12
8.0 SUMMARY	13
9.0 REFERENCES	15

Table of Figures

Figure 1. Location of the Middlesex Municipal Landfill Site	3
Figure 2. Plot Plan of Former Middlesex Landfill Property, Indicating Planar Coordinates and Grid System Established for Survey	4
Figure 3. Graphic Display of Gamma Scan Data for Two 100 ft x 100 ft Grid Sections, Indicating Scan Coverage. Coordinates at Display Corners are for Survey Reference Grid, State Planar Coordinates are Indicated at Left and Bottom.....	8
Figure 4. Locations of Sampling from Areas of Elevated Surface Contact Radiation	9
Figure 5. Locations of Elevated Surface Radiation Identified by Gamma Walkover	10

Table of Tables

Table 1. Locations of Elevated Surface Radiation Identified by Gamma Scans	11
Table 2. Radionuclide Concentrations in Soil Samples from Locations of Elevated Contact Radiation.....	12

Appendices

Appendix A. DCSI Procedures, Applicable to Middlesex Landfill Survey

Acronyms and Abbreviations

cpm	counts per minute
DCSI	DeNuke Contracting Services, Inc.
DOE	Department of Energy
ft	feet
ft ²	square feet
FUSRAP	Formerly Utilized Sites Remedial Action Program
g	grams
GPS	Global Positioning System
ha	hectares
k cpm	thousand counts per minute
LM	Legacy Management
m	meter
m ²	square meter
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MDC	minimum detectable concentration
NaI	sodium iodide
pCi/g	Picocuries per gram
Ra-226	radium 226
Th-232	thorium 232
U-238	uranium 238
y	year

Metric/English Conversions

Metric Unit	Arithmetic Conversion	English Unit
Centimeter	Divide by 2.54	Inch
Meter	Multiply by 3.28	Feet
Square meter	Multiply by 10.76	Square feet
Kilometer	Divide by 1.61	Mile
hectare	Multiply by 2.47	Acre

EXECUTIVE SUMMARY

Between 1943 and 1955, the Middlesex Sampling Plant in the Borough of Middlesex, NJ assayed uranium and thorium ores for the Manhattan Engineer District and the U.S. Atomic Energy Commission – predecessors of the U.S. Department of Energy (DOE). It is believed that construction activities at the Sampling Plant during the late 1940's resulted in placement of soil, containing small quantities of uranium ore, into a small (3 to 5 acre) portion of the nearby Middlesex Municipal Landfill. From 1984 through 1986, Bechtel National, Inc. conducted characterization, remedial action, and a final survey of that impacted portion of the Landfill under DOE's Formerly Utilized Sites Remedial Action Program (FUSRAP). The site was then released to the Borough of Middlesex for future unrestricted use. Surveys and remedial actions performed by the DOE were limited to that potentially impacted 3 to 5 acre portion at the north end of the former Landfill. In 2001 and 2002, the State of New Jersey contracted for a radiological survey of the entire former Landfill site. That survey identified elevated radiation levels along the south boundary, near Pershing Avenue; the source of these elevated radiation levels was not determined and further characterization of the deposits was not performed.

The Borough plans to construct a recreation center on the former Landfill site. DOE's Office of Legacy Management (LM), which is responsible for long-term surveillance of remediated former FUSRAP properties, wishes to assure that the near-surface soil of the former Landfill site does not contain residual deposits of contaminated soil that might be exposed as a result of these construction activities.

During the period of September 22-27, 2008, DeNuke Contracting Services, Inc. (DCSI) of Oak Ridge, TN performed a radiological survey of at the former Middlesex Municipal Landfill site. The objective of this survey was to identify elevated surface radiation levels that may be indicative of residual deposits of radioactive material in the near-surface soil. The survey consisted of walkover gamma scans and limited sampling of locations identified by the scans.

This survey demonstrated that there are small areas of elevated, low-level surface radiation on the Landfill site. The contaminants at locations of elevated radiation include Ra-226, U-238, and Th-232; relative concentrations of these contaminants vary and the radionuclide mix in the southern portion of the Landfill does not appear to be uranium or thorium ore, as was the contaminant identified by previous surveys of the northern portion.

Elevated radiation levels were identified on only a small portion of the site; the remainder of the property does not exhibit direct radiation levels differing from the typical background levels for the area. Several locations of residual low-level contamination are on the previously remediated northern portion of the site; however, the radiological conditions on this area are within the DOE FUSRAP guidelines applicable at the time of the remedial action. Contamination is more extensive along the southernmost boundary

and several of the generally elevated areas would not satisfy the DOE FUSRAP guidelines.

Although there are small areas of residual radioactive contamination on the site, the levels are such that, under conditions of current and proposed property use, the contamination does not pose a health risk to members of the public on or in the vicinity of the site.

Radiological Survey Report Former Middlesex Municipal Landfill Middlesex, New Jersey

1.0 INTRODUCTION

Between 1943 and 1955, the Middlesex Sampling Plant in the Borough of Middlesex, NJ assayed uranium and thorium ores for the Manhattan Engineer District and the U.S. Atomic Energy Commission – predecessors of the U.S. Department of Energy (DOE). It is believed that construction activities at the Sampling Plant during the late 1940's resulted in placement of soil, containing small quantities of uranium ore, into a small (3 to 5 acre) portion of the nearby Middlesex Municipal Landfill. From 1984 through 1986, Bechtel National, Inc. conducted characterization, remedial action, and final survey of that impacted portion of the Landfill under DOE's Formerly Utilized Sites Remedial Action Program (FUSRAP). Following the remediation, an independent DOE verification of the effectiveness of the remedial actions confirmed that the radiological conditions satisfied the DOE guidelines, applicable to FUSRAP. These surveys identified small, isolated pieces of uranium ore remaining in the near-surface soil of the Landfill site, and, although the guidelines were satisfied, these residual pieces of ore were removed to satisfy the As-Low-As-Reasonably-Achievable (ALARA) philosophy. The former Landfill site was then released to the Borough of Middlesex for future use without restrictions. (References 1, 2, 3, and 4)

Surveys and remedial actions performed by the DOE were limited to that potentially impacted 3 to 5 acre portion at the north end of the former Landfill. In 2001 and 2002, the State of New Jersey contracted for a radiological survey of the entire former Landfill site. That survey identified elevated radiation levels along the south boundary, near Pershing Avenue; the source of these elevated radiation levels was not determined and further characterization of the deposits was not performed. (Reference 5)

The Borough plans to construct a recreation center on the former Landfill site. DOE's Office of Legacy Management (LM), which is responsible for long-term surveillance of remediated former FUSRAP properties, wishes to assure that the near-surface soil of the former Landfill site does not contain residual deposits of contaminated soil that might be exposed as a result of these construction activities. Under contract with the S.M. Stoller Corp., during the period of September 22-27, 2008, DeNuke Contracting Services, Inc. (DCSI) of Oak Ridge, TN performed a radiological survey of the surface of the former Middlesex Municipal Landfill site. This report describes the survey approach and activities.

2.0 OBJECTIVE

The objective of this survey was to identify elevated surface radiation levels that may be indicative of residual deposits of radioactive material in the near-surface soil of the former Middlesex Municipal Landfill site. Soil samples would be obtained at selected discrete locations of elevated radiation levels (if any) to determine the radionuclide(s) present and their concentrations. Where practical, the source of elevated direct radiation

would be identified and removed by the sampling effort. If more extensive deposits were identified, the extent of these deposits would be determined and described in the report of findings.

3.0 SITE DESCRIPTION

The former Middlesex Municipal Landfill is located in the Borough of Middlesex, NJ, approximately 16 miles (26 kilometers) southwest of Newark (Figure 1). The site consists of parcels belonging to the Borough of Middlesex and the Middlesex Presbyterian Church and occupies approximately 25 acres. It is bounded on the west by Mountain Avenue, on the South by Pershing Avenue, and on the north by the Municipal Building and facilities. Bound Brook provides the eastern boundary of the former Landfill. Chain-link fencing delineates portions of the west and south perimeters. Figure 2 is a plot plan of the site.

The site surface is generally level, except along the eastern boundary, where the elevation decreases towards Bound Brook. In preparation for the survey, small trees, brush, and high weeds were cleared from the central portion of the site. Mature trees and other ground cover remain along the south and west perimeter fence, and there is heavy tree and ground vegetation along Bound Brook on the eastern part of the site. Individual trees and large bushes are also disbursed throughout the central and southern portions of the property. The presence of miscellaneous debris, scattered across the site, indicates that local residents continue to use the site for disposal of household trash.

The site is readily accessible to foot traffic and small motorized vehicles (e.g., ATV's). Current site use is recreational.

4.0 RADIOLOGICAL CONTAMINANTS

Based on historic operations and previous radiological surveys, the potential radiological contaminant is expected to be small pieces of ore, containing uranium and/or thorium in natural isotopic abundances and in secular equilibrium with members of the naturally occurring uranium and/or thorium decay series. (References 1, 2, and 4).

5.0 SURVEY ACTIVITIES

5.1 General

A survey plan (Reference 6) was prepared in accordance with the guidelines and recommendations presented in the "*Multi-Agency Radiation Survey and Site Investigation Manual*" (MARSSIM), NUREG-1575 (Reference 7). Radiological surveys were performed by trained radiological technicians following standard, written DCSI radiological monitoring and quality assurance procedures (see Appendix A).

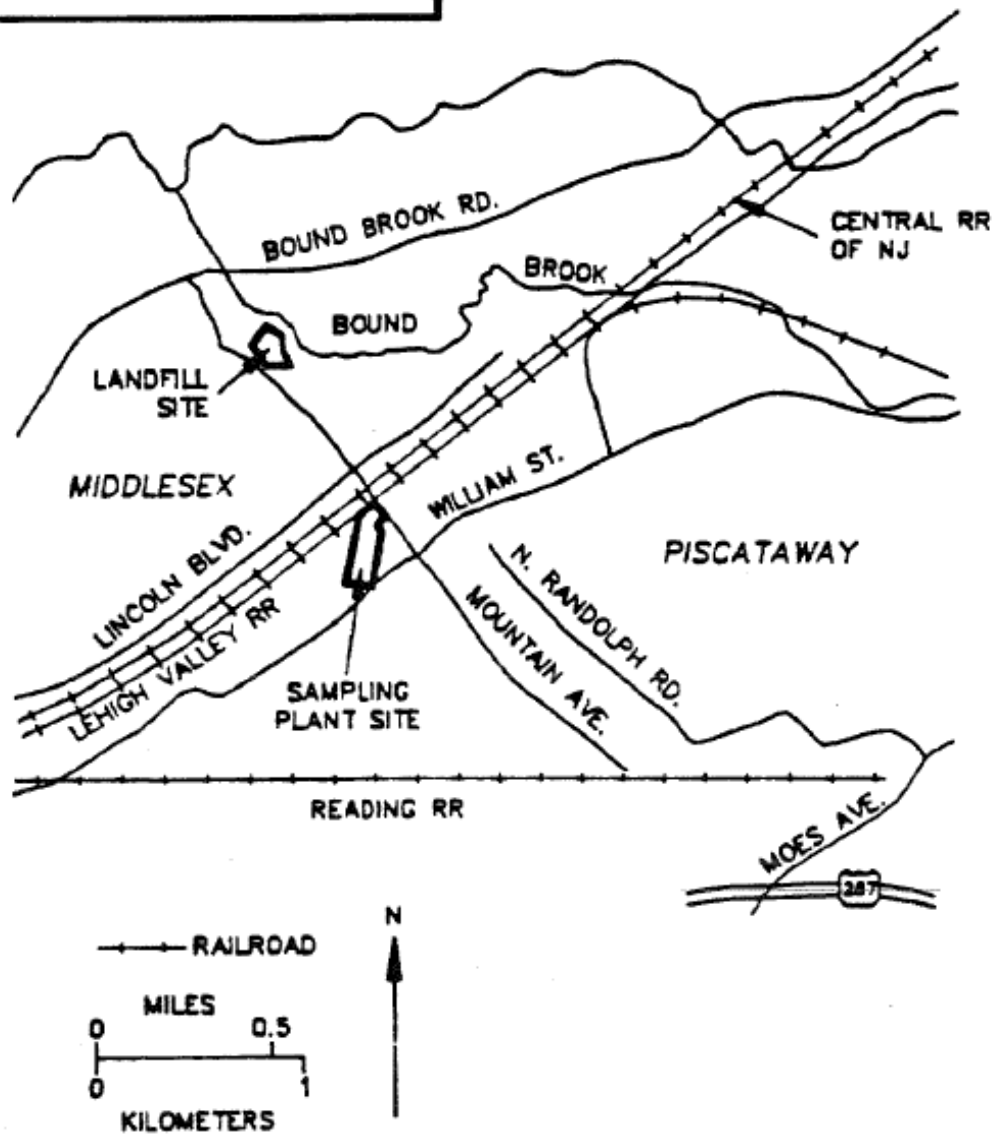
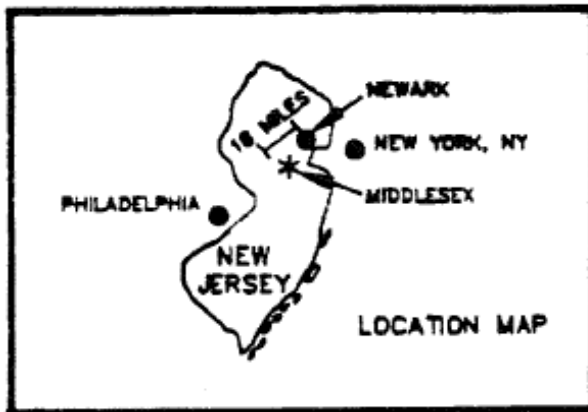


Figure 1. Location of the Middlesex Municipal Landfill Site

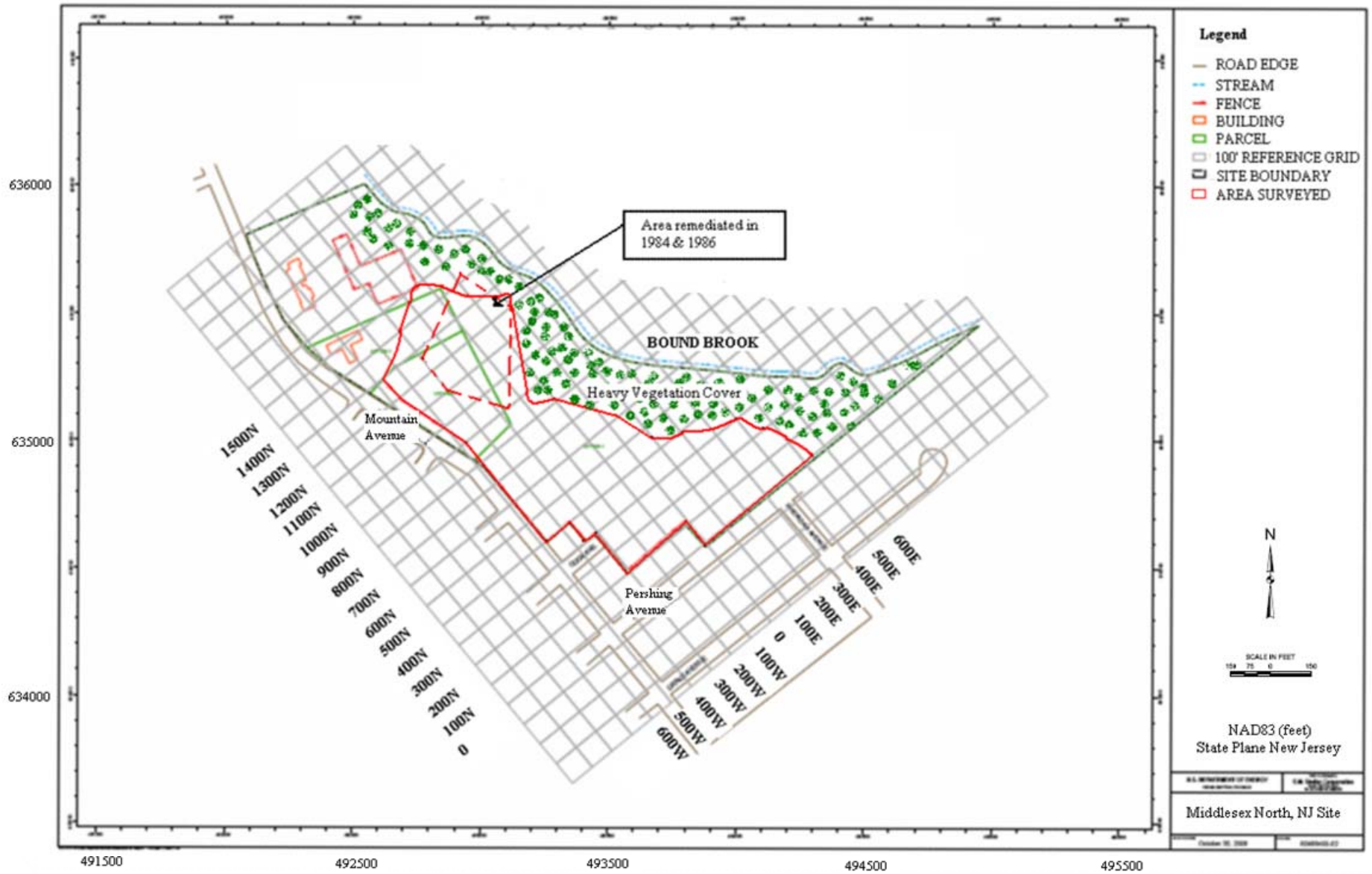


Figure 2. Plot Plan of Former Middlesex Landfill Property, Indicating Planar Coordinates and Grid System Established for Survey

5.2 Survey Reference System

A 100-ft grid pattern was established over the site to provide a means for referencing measurement and sampling locations; this reference grid is shown in Figure 2. In addition, where conditions permitted, scans and sample locations were referenced to the New Jersey Planar Coordinate system, using instruments equipped with GPS-based logging capabilities.

5.3 Instrumentation

The primary instrument type used was a 2" x 2" Ludlum Model 44-10 sodium iodide (NaI) gamma scintillation detector, coupled with a Ludlum Model 2221 ratemeter/scaler readout/display instrument. This instrument combination was used for walkover gamma surface scans and for monitoring direct radiation levels at soil sampling locations. Based on an average general background count rate of 10,000 cpm, the walkover scan minimum detectable concentration (MDC) of approximately 2.5 pCi/g for Ra-226 (present in uranium ore, in secular equilibrium with uranium 238) and 2.5 pCi/g of Th-232 (in secular equilibrium with its decay series) was estimated using the guidance in MARSSIM and NUREG-1507 (Reference 8). This sensitivity enabled identification of small deposits of elevated activity, having an activity concentration of Ra-226 or Th-232, approximately twice the upper level in naturally occurring soil from this area of New Jersey.

Instruments had current calibrations in accordance with ANSI N323B (Reference 9). Operational and background checks were performed at the beginning of each day of survey activity and whenever there was reason to question instrument performance.

5.4 Integrated Survey Strategy

5.4.1 Gamma Surface Scans

Gamma surface scans were performed to identify locations of residual surface activity. NaI gamma scintillation detectors were used for these scans. Scanning was performed by moving the detector in a serpentine pattern, while advancing at a rate of approximately 1.0 m per second. The distance between the detector and the surface was maintained within approximately 5 cm. Scan coverage for the property of interest was 100% of accessible areas. Audible signals were monitored and locations of elevated direct levels above 12,000 counts per minute (12 k cpm) were confirmed and marked for further investigation. Systems were equipped with global positioning system (GPS) sensors and data loggers to record scan position and data for statistical evaluation and graphical presentation.

Because the 2001/2002 survey identified only background radiation levels along the heavily vegetated eastern site boundary and the vegetation cover restricted access, that portion of the site was not included in this survey. Also, because of overhead vegetation and equipment malfunctions, logged scans with GPS assist could only be obtained from approximately half of the remaining site area. A

graphic display, typical for portions of the site where GPS/logged scans were obtained, is included in Figure 3 to illustrate the thoroughness of coverage. Blank areas on this figure represent surfaces that either were not accessible, due to surface conditions, or locations where overhead cover prevented GPS signal reception. The remaining portion of the site was scanned in a similar manner to achieve complete surface coverage.

5.4.2 Sampling

Localized shallow sampling, guided by monitoring of direct gamma level, was performed at five locations of elevated direct surface radiation. Sample locations are shown on Figure 4. To avoid disturbing the grassy area between the fence and Pershing Avenue, sampling was not performed at the two locations of highest discrete surface radiation (i.e., 100 k cpm and 120 k cpm). Attempts were made during sampling to identify and remove the source of elevated radiation. Following sampling, radiation levels at the surface and the bottom of the excavation were monitored to determine the effectiveness of source removal. Samples were packaged and submitted to Paragon Analytics, Inc. for gamma spectroscopy analysis in accordance with their contract with SM Stoller Corporation.

6.0 SURVEY RESULTS

This section summarizes findings of the survey. Detailed information supporting these results is contained in the field survey data records and analytical packages, retained by DOE/LM.

6.1 Gamma Scans

Gamma scans identified 8 small discrete locations of elevated direct radiation and 7 larger areas, ranging from about 250 ft² to 2100 ft², with generally higher near-surface radiation levels and containing multiple discrete elevated locations. These elevated locations are indicated on Figure 5, and associated radiation levels and areas are listed in Table 1.

Several of the larger areas and individual locations with the highest direct radiation levels were located near the extreme southern boundary of the property. The highest discrete direct contact radiations levels of 120 k cpm and 100 k cpm were identified in the narrow grassy strip between the fence and Pershing Avenue. Other discrete locations in this general area ranged up to 90 k cpm. The dose equivalent level at the point of highest count rate identified by the scans was 70 microrem/h at contact and 25 microrem/h at 1 meter above the surface. For comparison, the background dose equivalent level in this area is approximately 5 microrem/h at a height of 1 meter.

There were also four elevated locations identified in the northwest portion of the site, in the vicinity of the area which was previously remediated. The highest discrete location

was 72 k cpm. An area of generally elevated levels contained multiple discrete locations of ≤ 2 ft² with a maximum level of 50 kcpm.

6.2 Sampling

Surface (0-6 inches) soil samples were obtained at 5 locations of elevated surface radiation. At two of these locations, additional samples were obtained at a depth of approximately 6 – 10 inches. Deeper sampling could not be performed with the hand tools available, due to coarse gravel and tree roots below the 10 inch depth. Direct radiation levels at the sampling locations, during and after sample removal, did not identify specific sources of the elevated radiation levels. At most locations, slight increases in radiation levels with depth indicated contamination was deeper than could be reached with the available sampling tools.

Table 2 summarizes sample analytical results. A sample from the generally elevated area (location 5) in the northwest portion of the site contained 39.4 pCi/g of Ra-226, 22.3 pCi/g of U-238, and 35.0 pCi/g of Th-232. This combination of radionuclides is similar to that identified in previous sampling from this portion of the site (References 1, 2, and 4). The sample from the 72 k cpm discrete location 4 near the fence in the northwest portion of the site contained concentrations of Ra-226, U-238, and Th-232 at approximately background levels. This indicates that the elevated radiation is likely due to a discrete, rather than diffuse source.

In samples from the southern portion of the site, the radionuclide is primarily Ra-226. The maximum concentration of Ra-226 in these samples is 135 pCi/g from the 6-10 inch depth at sample location 1; the sample from the 0-6 inch depth at this location contained 108 pCi/g of Ra-226. Concentrations of uranium in these samples are significantly lower than those of Ra-226. This combination of radionuclides differs from that in samples from the remediated northern portion of the Landfill and raises doubt as to whether the contaminants in the southern and northern portions of the site are from the same process or source.

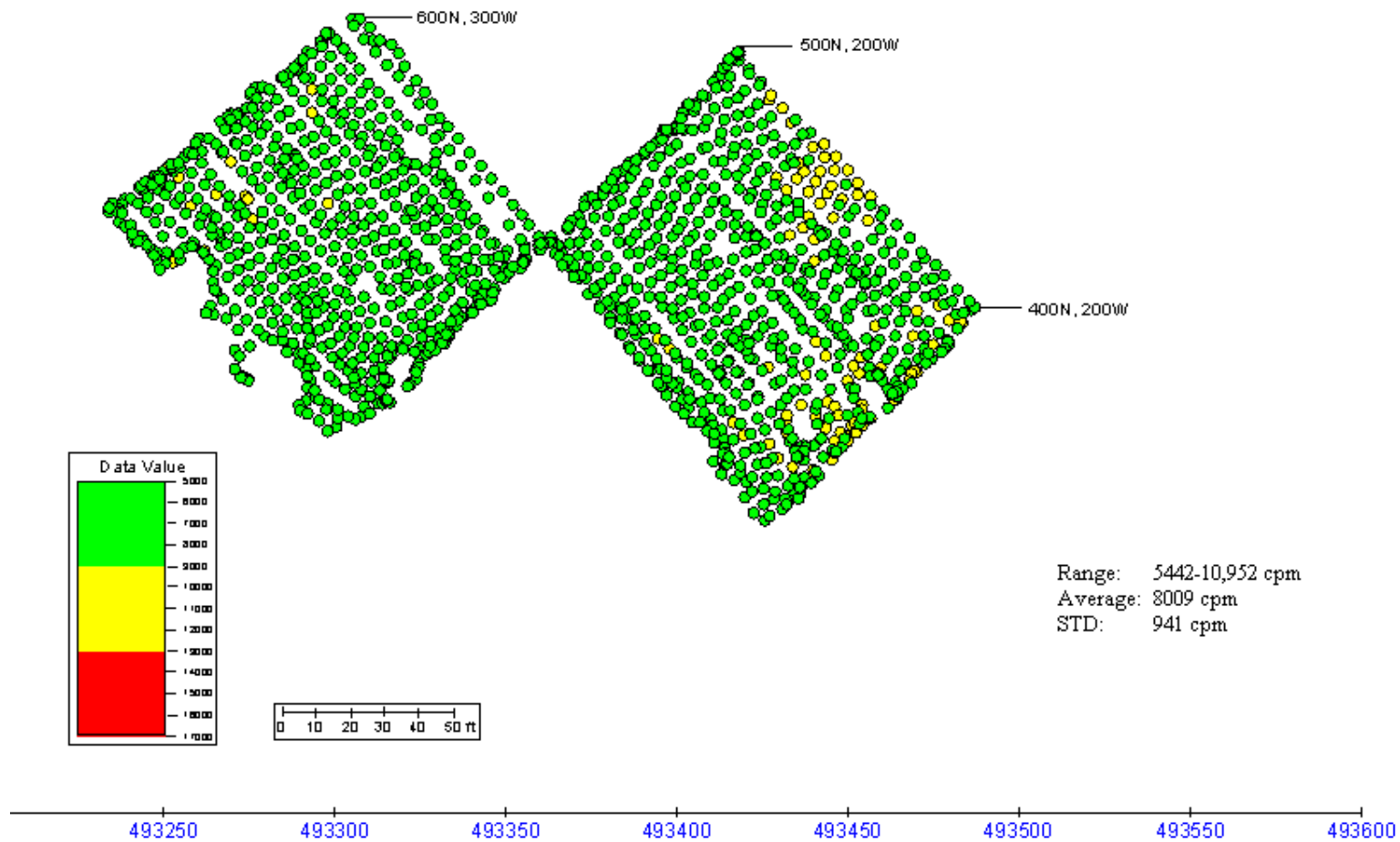


Figure 3. Graphic Display of Gamma Scan Data for Two 100 ft x 100 ft Grid Sections, Indicating Scan Coverage. Coordinates at Display Corners are for Survey Reference Grid, State Planar Coordinates are Indicated at Left and Bottom.

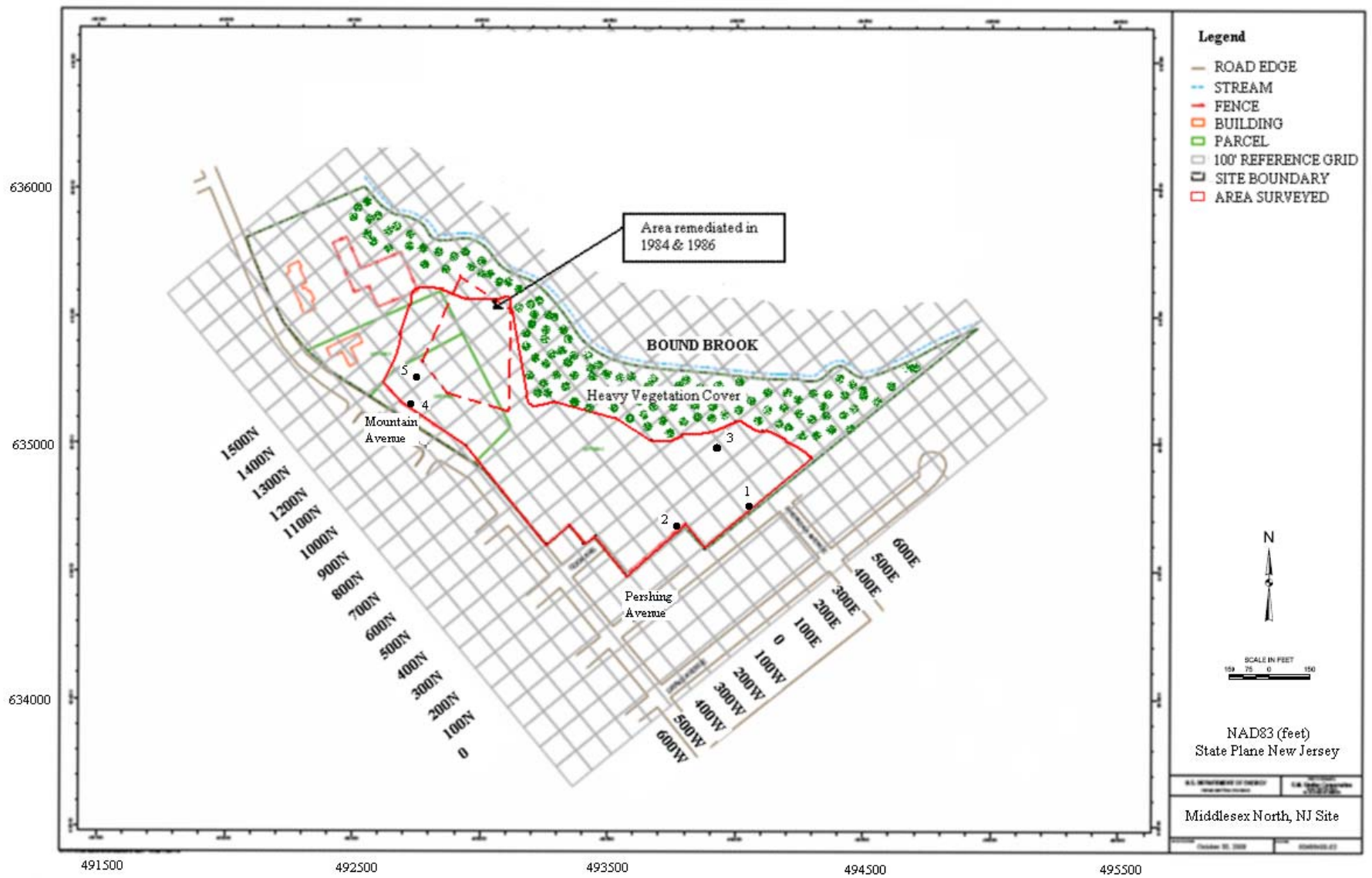


Figure 4. Locations of Sampling from Areas of Elevated Surface Contact Radiation

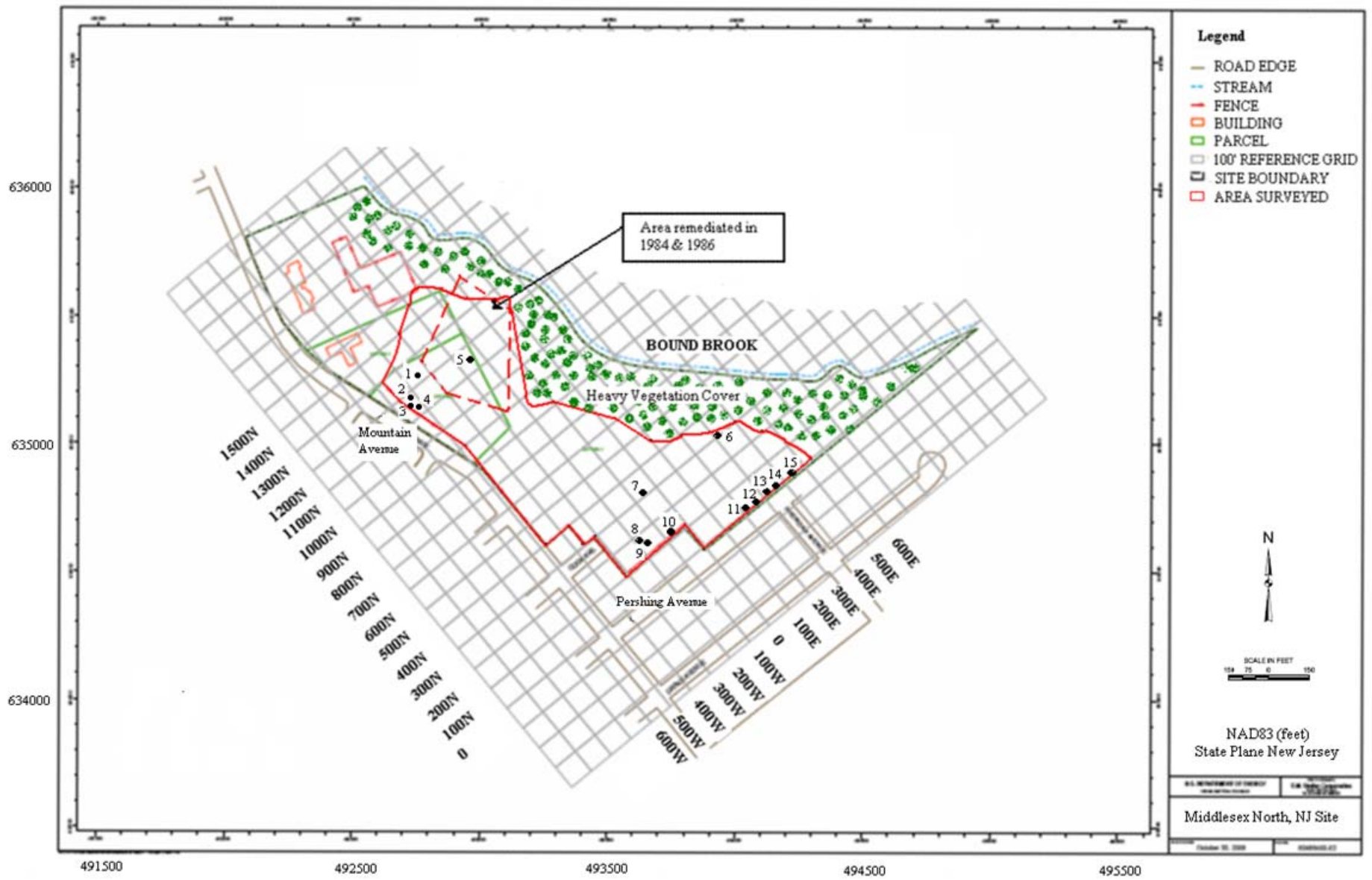


Figure 5. Locations of Elevated Surface Radiation Identified by Gamma Walkover

Table 1. Locations of Elevated Surface Radiation Identified by Gamma Scans

Number (a)	New Jersey State Coordinates (b)		Maximum Contact Radiation Level (x 1000 cpm)	Comments
	North	East		
1	635255-635285	492750-492770	50	600 ft ² area, multiple discrete elevated locations
2	635190	492730	26	Small discrete point
3	635150	492730	72	Small discrete point
4	635150	492765	19	Small discrete point
5	635325	492960	12	Small discrete point
6	635025-635045	492903-492918	16	300 ft ² area, multiple discrete elevated locations
7	634805	493635	14	Small discrete point
8	634620	493625	20	Small discrete point
9	634610	493635	15	Small discrete point
10	634643-634658	493755-493775	20	300 ft ² area, multiple discrete elevated locations
11	634685-634715	493975-494045	120	2100 ft ² area, multiple discrete elevated locations
12	634715-634735	494045-494075	60	300 ft ² area, multiple discrete elevated locations
13	634755-634765	494087-494112	32	250 ft ² area, multiple discrete elevated locations
14	634840	494145	25	Small discrete point
15	634860-634870	494238-494263	59	250 ft ² area, multiple discrete elevated locations

(a) Refer to Figure 5

(b) Approximate boundaries of elevated area

Table 2. Radionuclide Concentrations in Soil Samples from Locations of Elevated Contact Radiation

Location (a)	NJ Coordinate		Depth (Inches)	Concentration (pCi/g)		
	North	East		Ra-226	U-238	Th-232
1	634700	494030	0-6	108 ± 13	12.6 ± 1.9	0.97 ± 0.30
1	634700	494030	6-10	132 ± 16	13.6 ± 1.9	0.83 ± 0.28
2	634630	493775	0-6	8.55 ± 1.03	5.94 ± 0.91	0.65 ± 0.18
2	634630	493775	6-10	13.7 ± 1.6	6.63 ± 1.17	0.88 ± 0.17
3	634975	493925	0-6	0.93 ± 0.17	1.09 ± 0.56	1.00 ± 0.24
4	635150	492730	0-6	1.21 ± 0.23	1.84 ± 1.23	0.89 ± 0.32
5	635260	492750	0-6	39.4 ± 4.6	22.3 ± 2.8	35.0 ± 4.1

(a) Refer to Figure 4

7.0 DISCUSSION

The DOE's guidelines for FUSRAP at the time of the remedial action at the Middlesex Landfill were (Reference 9):

- Ra-226 and Th-232; 5 pCi/g in the surface soil (first 15 cm), and 15 pCi/g in any 15-cm thickness below the surface layer. These concentrations are above-background levels and are applied as averages across the 15-cm layer and over a contiguous 100-m² surface area.
- U-238; A site-specific concentration was not developed for uranium at the Landfill, because the contaminant at the site would be expected to have a uranium content comparable to or lower than the corresponding Ra-226 concentration. Ra-226 would therefore be the controlling radionuclide.
- Direct radiation; External gamma radiation levels such that, under reasonable conditions of site use and occupancy, an individual would not receive a dose equivalent greater than 100 millirem/y above background.

The above guidelines were established for unrestricted future property use. Current use of this property is recreational and industrial; because of the landfill, underlying the site, future residential use is not an option.

At the time of the Landfill remediation, there was no limit for a small area of soil containing higher levels of contamination, i.e., a "hot spot", provided the average for 100 m² was satisfied. Several years later, DOE implemented an approach for establishing acceptable concentrations in small areas. This approach permitted small areas of elevated contamination, provided the area-weighted average for 100 m² was satisfied and the hot spot concentration was less than a factor of $(100/A)^{0.5}$, where A is the area of elevated contamination in m² (References 13 and 14). For ease of application, the following values were provided:

Impacted Area	Multiplier times average value
10 – 25 m ²	2
3-<10 m ²	3
1-<3 m ²	6
<1 m ²	10

In addition, the DOE guidelines state that:

- For areas over 25 m² the 100 m² average is applicable.
- Areas less than 1 m² are averaged over 1 m².
- Reasonable efforts shall be made to remove any source of radioactivity that exceeds 30 times the 100 m² average concentration limit.

Based on the extent of contamination indicated by the scans and the limited soil sampling results, it is probable that four general surface areas along the south perimeter contain Ra-226 concentrations that exceed the average FUSRAP Ra-226 guidelines in effect at the time of remediation. In addition, small areas of surface soil along the south boundary contain Ra-226 concentrations in excess of the more recent hot-spot guideline for localized contamination of 50 pCi/g.

Other locations satisfy the FUSRAP concentration guidelines, which were in effect during the mid 1980's at the time of the Landfill remedial actions. Guideline concentrations for radionuclides in soil have not been developed for the Landfill, based on DOE criteria and current site use. Therefore, no comparison of radiological conditions with current guidelines is possible.

Radiation exposure to site occupants under recreational and industrial use scenarios would be from direct radiation. For an industrial scenario, the maximum time on site would be 2,000 hours/y. Based on a maximum direct radiation level at 1 meter above the surface of 20 microrem/h above background, the direct radiation for an annual 2,000 hour exposure period would be 40 millirem. This is within the DOE basic dose limit of 100 millirem/y for the general public. Moreover, this represents an individual small location, and it is unlikely that a person would be at this location for a full 2,000 hr during the year. Recreational use involves less time on site and proportionally lower direct radiation exposure.

8.0 SUMMARY

During the period of September 22-27, 2008, DeNuke Contracting Services, Inc. (DCSI) of Oak Ridge, TN performed a radiological survey of at the former Middlesex Municipal Landfill site. The objective of this survey was to identify elevated surface radiation levels that may be indicative of residual deposits of radioactive material in the near-surface soil. The survey consisted of walkover gamma scans and limited sampling of locations identified by the scans.

This survey demonstrated that there are small areas of elevated, low-level surface radiation on the Landfill site. The contaminants at locations of elevated radiation include Ra-226, U-238, and Th-232; relative concentrations of these contaminants vary and the radionuclide mix in the southern portion of the Landfill does not appear to be uranium or thorium ore, as was the contaminant identified by previous surveys of the northern portion.

Elevated radiation levels were identified on only a small portion of the site; the remainder of the property does not exhibit direct radiation levels differing from the typical background levels for the area. Several locations of residual low-level contamination are on the previously remediated northern portion of the site; however, the radiological conditions on this area are within the DOE FUSRAP guidelines, applicable at the time of the remedial action. Contamination is more extensive along the southernmost boundary and several of the generally elevated areas would not satisfy the DOE FUSRAP guidelines. Guideline concentrations for radionuclides in soil have not been developed for the Landfill, based on DOE criteria and current site use. Therefore, no comparison of radiological conditions with current DOE derived volumetric guidelines is possible.

Although there are small areas of residual radioactive contamination on the site, the levels are such that, under conditions of current property use, the contamination does not pose a health risk to members of the public on or in the vicinity of the site.

9.0 REFERENCES

1. Post-Remedial Action Report for the Middlesex Municipal Landfill Site (DOE/OR/20722), Bechtel National, Inc., February 1987.
2. Verification of Remedial Action, Middlesex Municipal Landfill., Middlesex, New Jersey, Oak Ridge Associated Universities, September 1987.
3. Middlesex North Site Program Fact Sheet, DOE Office of Legacy Management, August 2008.
4. Radiological Survey of the Middlesex Municipal Landfill., Middlesex, New Jersey (DOE/EV-0005/20), Oak Ridge National Laboratory, April 1980.
5. Surface Radiological Assessment of Middlesex Municipal Landfill, Integrated Environmental Management, Inc., 2002.
6. Radiological Survey Plan, Former Middlesex Municipal Landfill, Middlesex, New Jersey, DeNuke Contracting Services, Inc., August 2008.
7. NUREG-1575, "Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)," Revision 1, October 18, 2000.
8. NUREG-1507, "Minimum Detectable Concentrations with Typical Radiation Survey Instruments for Various Contaminants and Field Conditions," December 1997.
9. ANSI N323B-2003, "American National Standard for Radiation Protection Instrumentation Test and Calibration, Portable Survey Instrumentation for Near Background Operation," 2004.
10. "U.S. Department of Energy Guidelines for residual Radioactivity at Formerly Utilized Sites Remedial Action Program and Remote Surplus Facilities Management Program Sites", Revision 2, March 1987.
11. Radiation Protection of the Public and the Environment, DOE Order 5400.5, February 1990.
12. Implementation Guide, Control and Release of Property with Residual Radioactive Material, Doe G 441.1-xx, April 2002.

Appendix A

DCSI Procedures Applicable to Middlesex Landfill Survey

DCSI Procedure Number	Procedure Title
DENUKE-QA-100.100	Quality Assurance for Radiological Survey Activities
DENUKE-RP-105	Instrumentation and Measurement: General
DENUKE-RP-105.100	Instrumentation: Calibration
DENUKE-RP-105.200	Instrumentation: Setup and Performance Checks
DENUKE-RP-105.300	Instrument Selection and Use
DENUKE-RP-105.302	Operation of Bicron Micro Rem Meter
DENUKE-RP-105.304	Operation of Ludlum Model 2221 Ratemeter/Scaler
DENUKE-RP-105.308	Operation of Ludlum Model 44-10 Gamma Scintillation Detector
DENUKE-RP-105.319	Perform QC Check of the Trimble Pro XRS Sub-Meter GPS
DENUKE-RP-105.320	Checking Satellite Availability for GPS Work
DENUKE-RP-105.323	Field Operation of the Trimble TSC1 Data Collector with Pro XRS Receiver
DENUKE-RP-105.328	Data Processing for GPS Data
DENUKE-RP-105.400	Calculating Detection Sensitivity
DENUKE-RP-105.500	Radiological Survey Activities