42037

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M-114

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Attention: S. W. Ahrends, Director
Technical Services Division

Subject: Bechtel Job No. 14501, FUSRAP Project
DOE Contract No. DE-AC05-81OR20722
Radiological Characterization Report for New Jersey Route 17 in Rochelle Park, New Jersey
Code: 7310/WBS: 138

Dear Mr. Ahrends:

In August and September 1986, Bechtel National, Inc. (BNI) performed a radiological characterization of New Jersey State Route 17 in Rochelle Park, New Jersey. The objective of this survey was to establish the horizontal and vertical limits of radioactive contamination on the property. No chemical characterization was performed. The results of this characterization will be used to provide data for a pathways analysis to evaluate the potential exposure to the public from the materials under and along Route 17 adjacent to the Maywood Interim Storage Site (MISS). This letter describes the methods used to characterize the area and presents the results of the radiological characterization.

SITE DESCRIPTION AND BACKGROUND

Route 17 borders the entire western boundary of the MISS. The section of Route 17 that was characterized is illustrated in Figure 1; it extends along Route 17 from the intersection of the New York, Susquehanna, and Western (NYS&W) Railroad and Route 17, south to Grove Avenue.

CONCURRENCE
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Route 17 was constructed in 1932 through an area formerly owned by the Maywood Chemical Works; the road divided the Maywood Chemical Works property, and was built over two areas previously used as retention ponds to store process residues. These residues resulted from operations conducted by the Maywood Chemical Works to extract thorium from monazite sands, and were buried or otherwise deposited at various locations on the property, including the two retention ponds. The primary contaminant in the residues is thorium-232. Previous investigations by the New Jersey Department of Environmental Protection, the Nuclear Regulatory Commission, H.W. Morton (a consultant to the Stepan Company), the Environmental Protection Agency, and BNI have detected concentrations of thorium-232 and radium-226 exceeding DOE guidelines and unacceptable levels of uranium-238 along the section of Route 17 that is contiguous with the MISS.

RADIOLOGICAL CHARACTERIZATION

To provide sufficiently detailed information regarding the limits of radioactive contamination and to provide data for the development of cost-effective measures for any potential remedial action, both surface and subsurface investigations were performed.

A 50-ft grid was established across the area to be characterized to facilitate the collection of data in a systematic manner. This grid was tied to the New Jersey state grid system to ensure that it could be reestablished if remedial action is undertaken. All characterization data correspond to coordinates on this grid.

Surface Characterization

Surface characterization was conducted with a shielded gamma scintillation detector. Near-surface gamma radiation measurements were taken 12 in. from the ground at the grid line intersections spaced 10 ft apart. The shielded detector was used to ensure that radiation detected by the probe originated from the ground directly beneath the unit. By shielding against lateral gamma flux from nearby areas (MISS and the north Ballod property), the shielded detector minimized possible sources of error in the measurements. Furthermore, this detector was calibrated at the Technical Measurements Center (TMC) in Grand Junction, Colorado, to provide a correlation of counts per minute (cpm) to picocuries per gram (pCi/g). Based on this relationship, locations with measurements of more than 11,000 cpm were noted as exceeding the DOE surface contamination guideline of 5 pCi/g for thorium-232. To better define the limits of contamination, the locations of the soil

samples were chosen systematically by evaluating: locations with measurements of more than 11,000 cpm, locations with measurements at or near 11,000 cpm, and the effect of lateral gamma flux.

The areas with surface contamination found during this survey are shown in Figure 2. The data in Table 1 show the concentrations of thorium-232 in the surface soil samples; the concentrations ranged from 0.9 to 17.7 pCi/g. The sampling locations are shown in Figure 3. Because soil samples were taken from locations where the measurement was at or near the guideline, it should be noted that not all soil samples indicated contamination. Data from the shielded detector establish that the contamination ranges from a background level to approximately 90 pCi/g. An evaluation of the data indicates approximately 1500 yd^3 of surface soil is contaminated.

Subsurface Investigation

After surface characterization was completed, the subsurface investigation was conducted to determine the depth of previously identified surface contamination and to locate subsurface contamination with no surface manifestation. The subsurface investigation was conducted using downhole gamma logging of the drill holes. This technique is significantly more cost effective than collecting and analyzing soil samples, because the logging procedure can be completed more quickly and eliminates the need for laboratory analysis. A 2-in. by 2-in. sodium iodide gamma scintillation detector was used to perform the downhole logging. The instrument was calibrated at TMC where it was determined that a rate of approximately 40,000 cpm corresponds to the 15-pCi/g subsurface guideline for thorium-232. This relationship has been corroborated in results from previous characterizations where thorium-232 was found.

Based on the geological information gained as a result of the borehole drilling during this characterization, it was determined that the embankment could be divided into three distinct sections (Figure 4) based on the slightly different materials and different level of saturation of each section.

The high embankment south of the main NYS&W railroad undercrossing (shown as Section 1 in Figure 4) was constructed primarily of sand with occasional cobbles. Cobbles are found on the slope where the sand matrix appears to have eroded leaving them exposed, although the cobbles were seldom encountered during drilling. The sand

encountered during drilling is generally dry until just above the basal interface with underlying sludges where the embankment materials are damp. The sand-sludge interface was easily recognized by the increasingly difficult drilling. When the auger reached the sand-sludge interface, it tended to bounce along the surface of the interface and enlarge the drill hole in the more easily cut sand and made a shallow, furrow-like cut into the sludge. Cuttings from drilling into the wet sludge came up from the hole as soft, sand-covered balls, with an interior of more cohesive wet sludge. No free water was found in these holes.

The intermediate section of the embankment, south of the railroad spur undercrossing (shown as Section 2 in Figure 4), is 10 to 15 ft high. The construction materials used in this section were sands with some silt. The upper materials were dry, but locally damp to moist zones were encountered. As the auger approached the elevation of the basal interface, the embankment materials became notably wetter. Intermixing of sludge materials into the embankment sands was visible near the interface.

The low embankment section (shown as Section 3 in Figure 4) is 1 to 3 ft high and was constructed of a dark, sticky, silty sand. Local clay zones are present and suggest that construction procedures did not require intermixing or blending of individual truck loads of material during placement. The upper layers of the low embankment are gravels, probably because they are part of the road base sequence. Water was encountered in the angle holes drilled into the low embankment. The embankment materials were wet, grading to saturation. It is possible that water, which accumulates on the east or uphill side of the highway during precipitation events, migrates downgradient through this section of the embankment.

During the course of the subsurface investigation, 19 angled and 10 vertical holes were drilled and gamma logged to determine the depth and approximate concentration of radioactive contamination along Route 17. Borehole locations are shown in Figure 4 (boring logs for these holes will be included in the MISS characterization report). The lengths of the angled boreholes ranged from 30 to 79 ft; the depths of the vertical boreholes ranged from 3 to 6 ft. Gamma logging data for the angled boreholes are given in Table 2, and in Table 3 for the vertical boreholes. The borehole logs were reviewed to identify trends, regardless of whether concentrations exceeded the DOE guidelines.

Based on an evaluation of the borehole data, a vertical profile of the contamination was developed and used to estimate the volume of subsurface contamination, which is approximately 14,000 yd^3. Contamination was indicated by data ranging from 6750 to 1,228,330 cpm, or from background levels to approximately 323 pCi/g. The contamination was found in the two areas formerly used as retention ponds and shown as Areas A and B in Figure 5. The approximate volume of subsurface contamination in these two areas is estimated to be:

Area A	Area B
Under Route 17 - 3,200 yd^3	Under Route 17 - 4,500 yd^3
Under embankments - 6,100 yd^3	Under embankments - 150 yd^3

SUMMARY

The results of the Route 17 characterization are summarized below.

- The estimated volume of surface contamination in excess of the 5-pCi/g guideline is 1500 yd^3.
- The volume of subsurface contamination is estimated at 14,000 yd^3; the depth of contamination ranges from 0.5 to 9 ft below the elevation at the toe of the embankment on each side of Route 17.
- There is an additional area of contamination on the west embankment of Route 17 that was discovered during the 1985 remedial action at the Ballod Associates property. Area C in Figure 2 shows the location of this contamination. Based on data from the 1985 remedial action and the angled boreholes that were drilled in this area, it is likely that the Area C contamination is at the boundary of a contaminated lense that was excavated from the Ballod property and does not extend further into the embankment.

- Surface deposition of contamination has also been found in and around the underpass for the railroad spur under Route 17. The railroad spur is used by the Stepan Company and Sears & Roebuck, Inc.

- The need for monitoring wells along Route 17 to provide groundwater samples for the detection of subsurface migration of radioactive material is being investigating. Installation of these wells would generate data to complete a pathways analysis.

If you have any questions or require any additional information, please contact Chris Leichtweis at 576-1882.

Very truly yours,

for James R. Kannard
Project Manager - FUSRAP

CMO:paj
Enclosures: As stated

cc: R.G. Atkin
J. Berger (ORAU)
B.A. Hughlett
J.F. Nemec
J.F. Wing

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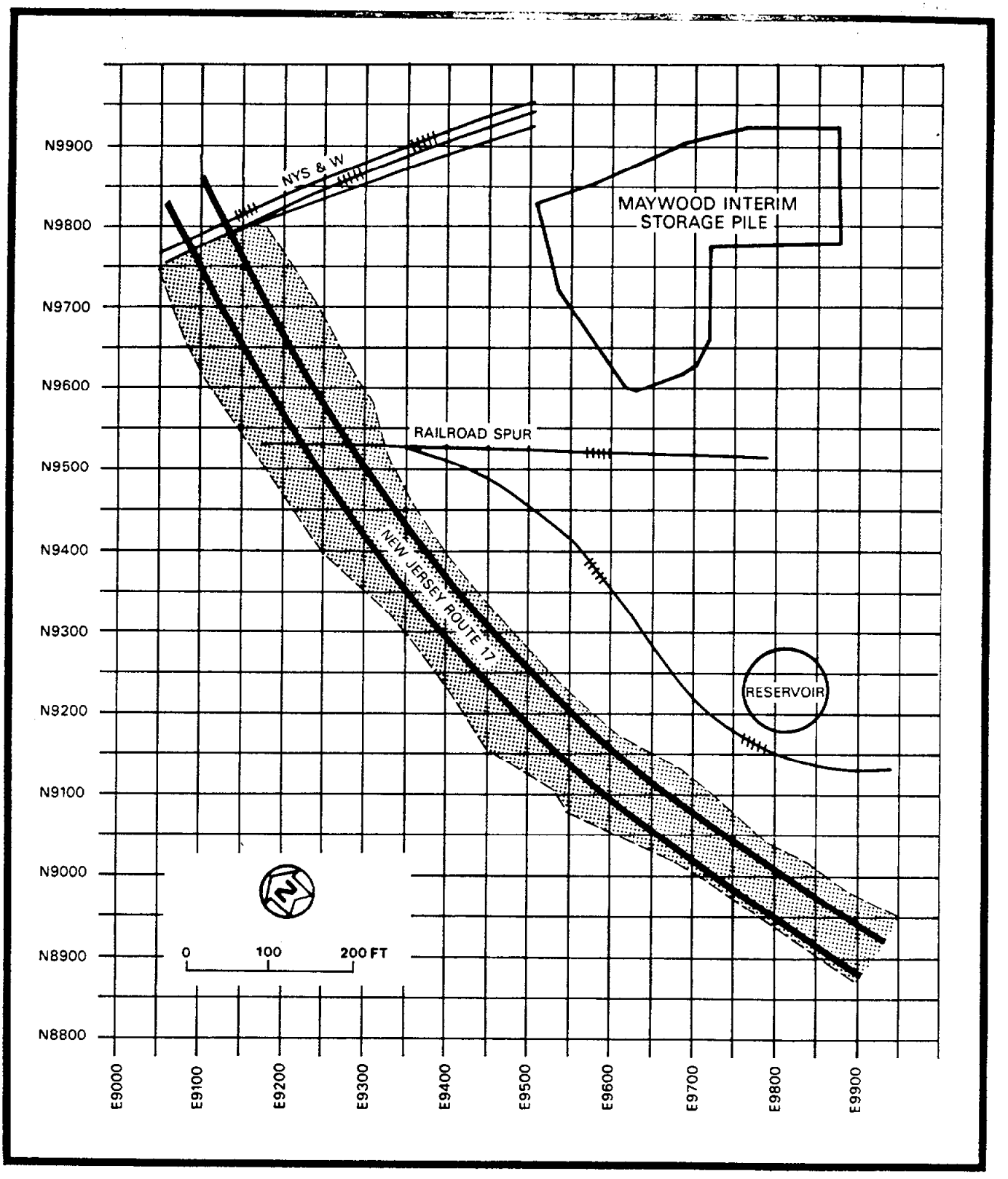

FIGURE 1 AREA OF ROUTE 17 CHARACTERIZATION

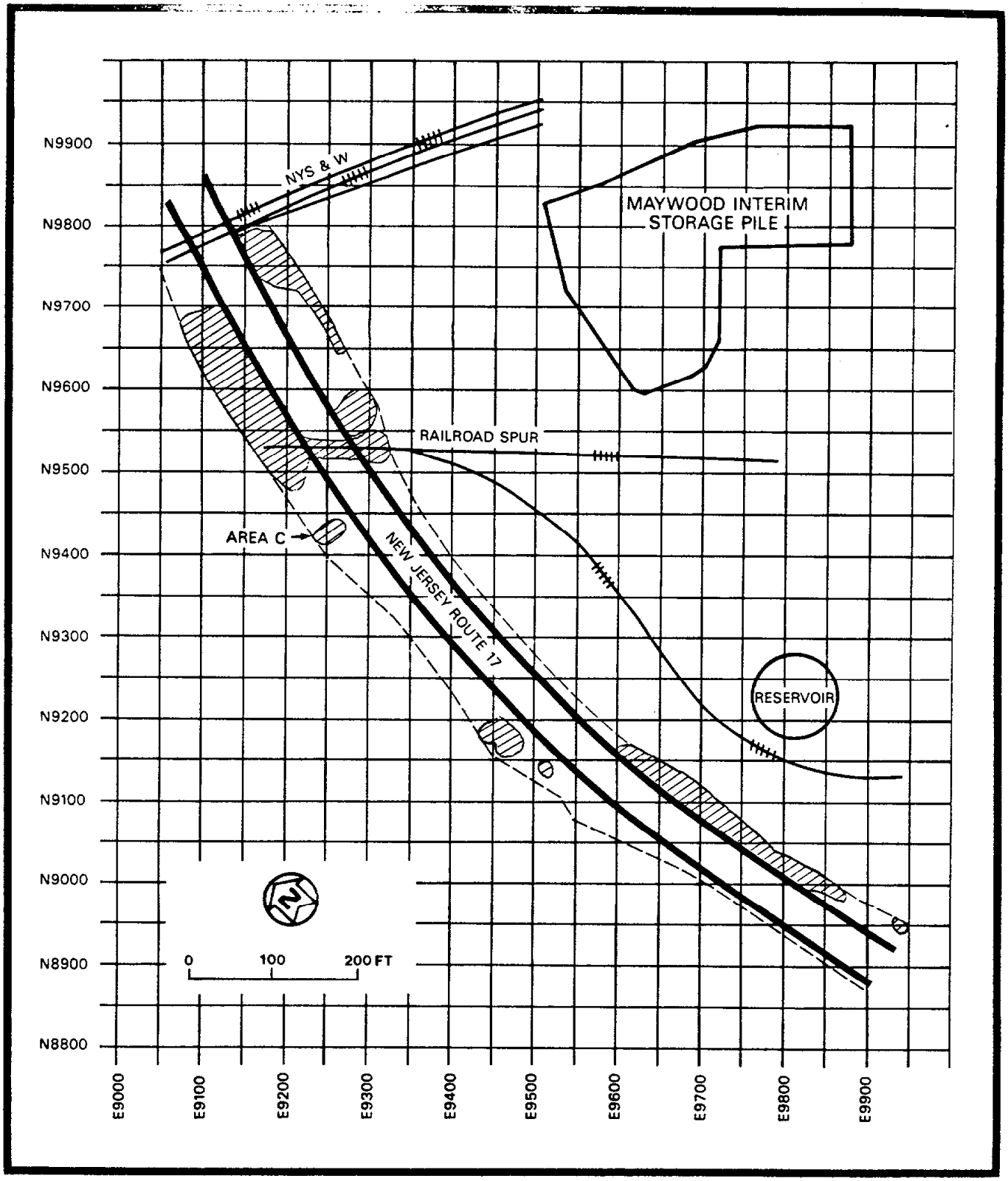

FIGURE 2 BOUNDARIES OF THE SURFACE CONTAMINATION ON THE EMBANKMENTS OF ROUTE 17

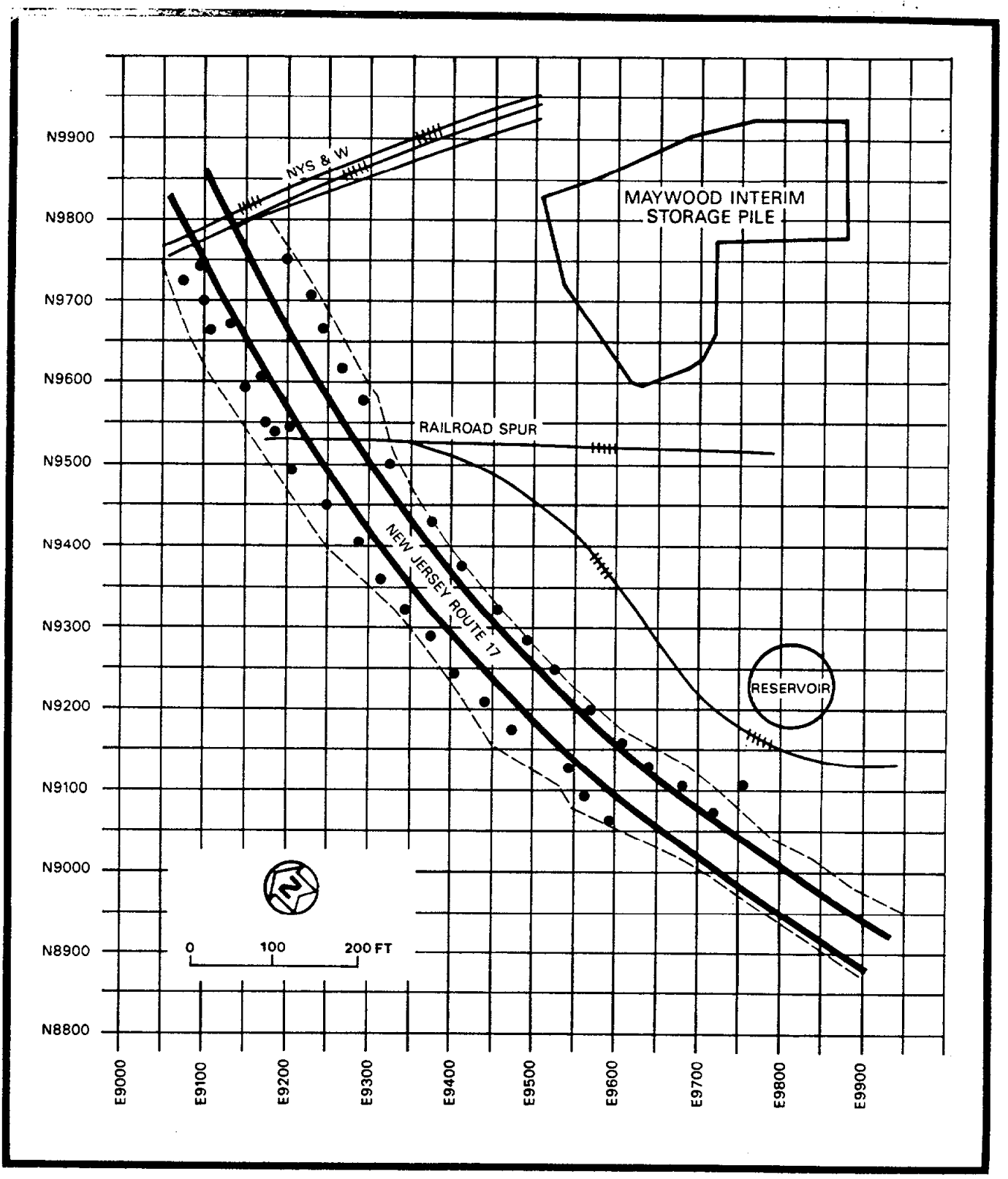

FIGURE 3 SURFACE SOIL SAMPLE LOCATIONS ON THE ROUTE 17 EMBANKMENTS

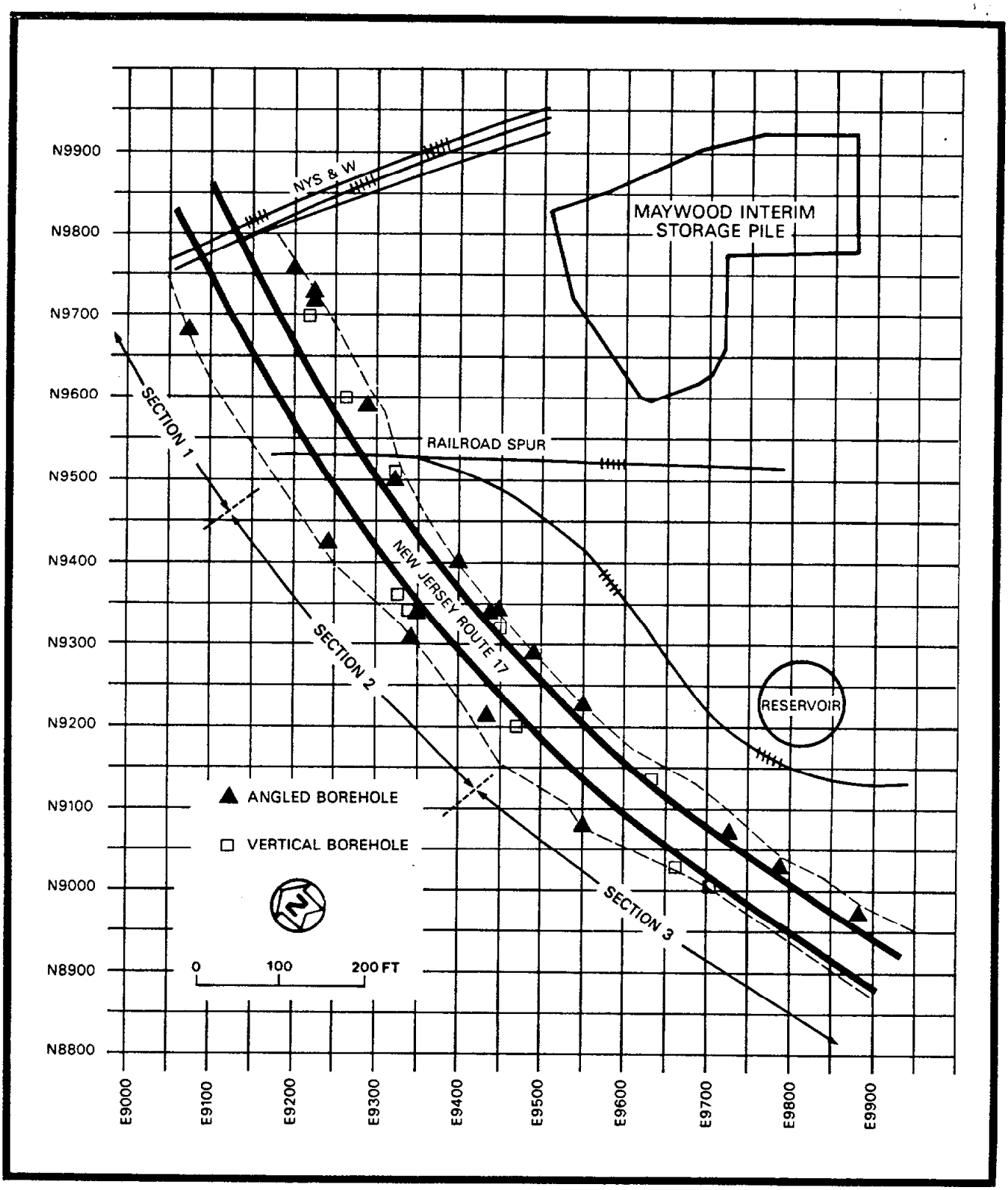

FIGURE 4 ANGLED AND VERTICAL BOREHOLE LOCATIONS ALONG ROUTE 17

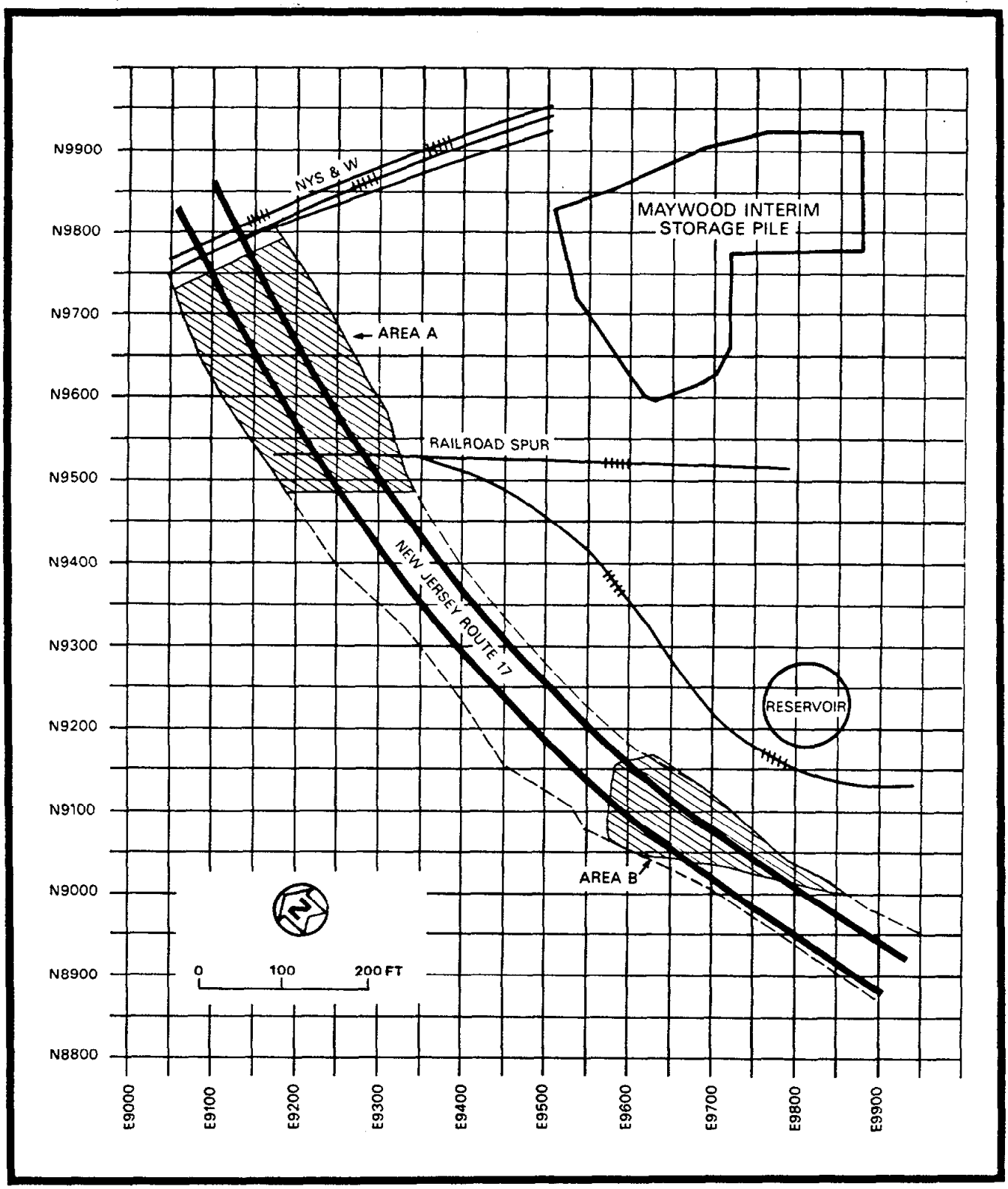

FIGURE 5 LOCATION OF FORMER RETENTION PONDS UNDER ROUTE 17

TABLE 1

SURFACE SOIL SAMPLING RESULTS

Grid Coordinates E,W	Grid Coordinates N,S	Concentrations (pCi/g +/- 1 sigma) Uranium-238	Radium-226	Thorium-232
E9075	N9725	12.4 ± 3.6	1.1 ± 0.1	2.8 ± 0.1
E9100	N9700	13.6 ± 1.5	1.2 ± 0.1	<3.3
E9100	N9743	<5.2	1.2 ± 0.1	1.7 ± 0.6
E9110	N9663	<11.2	1.0 ± 0.1	2.2 ± 1.0
E9132	N9674	6.1 ± 2.9	1.1 ± 0.2	1.6 ± 0.2
E9149	N9595	7.7 ± 4.1	0.8 ± 0.2	2.4 ± 0.2
E9167	N9607	5.5 ± 3.0	1.0 ± 0.1	2.0 ± 0.3
E9175	N9550	<7.0	0.9 ± 0.4	<3.0
E9185	N9541	<13.7	1.1 ± 0.1	12.8 ± 2.0
E9200	N9750	24.2 ± 5.2	<1.7	<4.6
E9204	N9495	<20.9	<2.0	8.7 ± 0.8
E9206	N9542	<6.8	1.0 ± 0.2	2.9 ± 2.0
E9225	N9705	5.6 ± 3.0	1.2 ± 0.3	2.6 ± 0.7
E9245	N9660	19.4 ± 5.5	1.7 ± 0.3	<4.2
E9250	N9450	<7.4	0.9 ± 0.1	2.5 ± 0.7
E9270	N9618	9.5 ± 3.7	1.8 ± 0.5	<3.6
E9285	N9405	10.5 ± 1.6	1.5 ± 0.5	2.0 ± 1.0
E9290	N9575	<16.5	2.0 ± 0.6	<3.1
E9315	N9360	<12.9	1.1 ± 0.2	3.5 ± 0.8
E9325	N9500	14.1 ± 2.0	1.4 ± 0.5	<3.0
E9345	N9320	12.5 ± 2.4	1.5 ± 0.1	2.6 ± 0.8
E9375	N9285	16.0 ± 2.5	1.9 ± 0.7	2.6 ± 1.2
E9375	N9430	<30.0	2.8 ± 1.1	<5.6
E9405	N9245	46.7 ± 4.2	3.9 ± 0.4	1.1 ± 0.9
E9415	N9375	<9.1	0.7 ± 0.1	2.0 ± 1.1
E9440	N9210	14.5 ± 0.4	1.7 ± 0.6	2.4 ± 1.2
E9455	N9325	<16.7	<2.3	4.5 ± 1.4
E9475	N9175	<5.7	1.2 ± 0.3	1.0 ± 0.6
E9490	N9285	<7.2	2.0 ± 0.5	3.5 ± 0.8
E9525	N9250	<13.1	1.3 ± 0.4	<3.5
E9545	N9130	<9.7	1.2 ± 0.1	17.7 ± 0.8
E9560	N9095	<6.1	0.8 ± 0.1	<2.8
E9570	N9200	<9.8	1.1 ± 0.2	4.4 ± 0.5
E9595	N9060	<9.5	0.7 ± 0.1	<2.3
E9605	N9160	6.4 ± 3.5	1.2 ± 0.2	2.6 ± 0.5
E9640	N9130	<8.9	0.9 ± 0.4	<2.5
E9680	N9105	<4.4	<0.8	0.9 ± 0.7
E9720	N9070	<17.4	<2.1	6.2 ± 3.3
E9755	N9105	<8.7	0.5 ± 0.4	4.5 ± 1.2

TABLE 2

ANGLE
Downhole Logging

Hole No. 317
Coordinates: E09075
N09680

Angle of hole: 20 degrees to horizontal

Depth (ft)	cpm	Depth (ft)	cpm	Depth (ft)	cpm
0.5	-	20.5	-	40.5	-
1.0	59,260	21.0	90,320	41.0	600,070
1.5	-	21.5	-	41.5	-
2.0	56,610	22.0	88,540	42.0	509,610
2.5	-	22.5	-	42.5	-
3.0	31,610	23.0	71,250	43.0	406,480
3.5	-	23.5	-	43.5	-
4.0	33,380	24.0	64,990	44.0	321,990
4.5	-	24.5	-	44.5	-
5.0	42,000	25.0	65,510	45.0	232,660
5.5	-	25.5	-	45.5	-
6.0	30,100	26.0	100,640	46.0	159,660
6.5	-	26.5	-	46.5	-
7.0	30,460	27.0	173,540	47.0	121,570
7.5	-	27.5	-	47.5	-
8.0	30,960	28.0	335,230	48.0	97,860
8.5	-	28.5	-	48.5	-
9.0	31,300	29.0	717,740	49.0	78,700
9.5	-	29.5	-	49.5	-
10.0	32,010	30.0	1,006,450	50.0	89,640
10.5	-	30.5	-	50.5	89,160 (a)
11.0	30,100	31.0	994,730		
11.5	-	31.5	-		
12.0	29,550	32.0	1,059,080		
12.5	-	32.5	-		
13.0	30,960	33.0	1,084,370		
13.5	-	33.5	-		
14.0	31,960	34.0	1,228,330		
14.5	-	34.5	-		
15.0	36,940	35.0	1,104,120		
15.5	-	35.5	-		
16.0	39,760	36.0	927,110		
16.5	-	36.5	-		
17.0	41,080	37.0	775,770		
17.5	-	37.5	-		
18.0	45,320	38.0	663,770		
18.5	-	38.5	-		
19.0	66,260	39.0	669,360		
19.5	-	39.5	-		
20.0	94,170	40.0	652,270		

TABLE 2
(continued)

Hole No. 303
Coordinates: E09200 N09755
Angle of hole: 18 degrees to horizontal

Depth (ft)	cpm	Depth (ft)	cpm
0.5	-	20.5	-
1.0	19,150	21.0	33,730
1.5	-	21.5	-
2.0	21,460	22.0	49,690
2.5	-	22.5	-
3.0	37,300	23.0	108,780
3.5	-	23.5	-
4.0	28,340	24.0	209,770
4.5	-	24.5	-
5.0	19,200	25.0	416,920
5.5	-	25.5	-
6.0	19,550	26.0	696,410
6.5	-	26.5	-
7.0	18,990	27.0	822,350
7.5	-	27.5	-
8.0	18,490	28.0	549,660
8.5	-	28.5	-
9.0	18,260	29.0	615,130
9.5	-	29.5	-
10.0	17,780	30.0	540,170
10.5	-	30.5	-
11.0	19,760	31.0	356,850
11.5	-	31.5	-
12.0	19,790	32.0	181,090
12.5	-	32.5	-
13.0	20,400	33.0	194,870
13.5	-	33.5	-
14.0	20,410	34.0	202,460
14.5	-	34.5	-
15.0	18,390	35.0	182,400
15.5	-	35.5	-
16.0	18,870	36.0	182,520
16.5	-	36.5	-
17.0	19,490	37.0	198,820
17.5	-	37.5	-
18.0	20,460	38.0	230,110
18.5	-	38.5	-
19.0	21,610	39.0	209,300
19.5	-	39.5	-
20.0	25,520	40.0	76,380

TABLE 2
(continued)

Hole No. 302
Coordinates: E09225 N09715 Angle of hole: 9 degrees to horizontal

Depth (ft)	cpm	Depth (ft)	cpm	Depth (ft)	cpm	Depth (ft)	cpm
0.5	-	20.5	-	40.5	-	60.5	-
1.0	20,820	21.0	23,770	41.0	47,110	61.0	33,190
1.5	-	21.5	-	41.5	-	61.5	-
2.0	21,630	22.0	24,840	42.0	37,490	62.0	30,930
2.5	-	22.5	-	42.5	-	62.5	-
3.0	22,550	23.0	28,180	43.0	40,990	63.0	35,090
3.5	-	23.5	-	43.5	-	63.5	-
4.0	17,590	24.0	27,020	44.0	48,560	64.0	48,240
4.5	-	24.5	-	44.5	-	64.5	-
5.0	16,550	25.0	25,110	45.0	37,050	65.0	108,510
5.5	-	25.5	-	45.5	-	65.5	-
6.0	16,500	26.0	22,710	46.0	23,340	66.0	324,100
6.5	-	26.5	-	46.5	-	66.5	-
7.0	16,280	27.0	22,280	47.0	21,690	67.0	390,800
7.5	-	27.5	-	47.5	-	67.5	-
8.0	16,670	28.0	17,800	48.0	21,440	68.0	461,590
8.5	-	28.5	-	48.5	-	68.5	-
9.0	17,180	29.0	17,320	49.0	28,400	69.0	610,580
9.5	-	29.5	-	49.5	-	69.5	-
10.0	18,240	30.0	20,090	50.0	30,340	70.0	705,260
10.5	-	30.5	-	50.5	-	70.5	-
11.0	19,990	31.0	22,950	51.0	38,580	71.0	694,400
11.5	-	31.5	-	51.5	-	71.5	-
12.0	20,630	32.0	27,700	52.0	40,420	72.0	544,870
12.5	-	32.5	-	52.5	-	72.5	-
13.0	22,110	33.0	26,740	53.0	43,720	73.0	455,000
13.5	-	33.5	-	53.5	-	73.5	-
14.0	22,170	34.0	34,530	54.0	34,410	74.0	339,960
14.5	-	34.5	-	54.5	-	74.5	-
15.0	26,670	35.0	42,700	55.0	24,660	75.0	289,070
15.5	-	35.5	-	55.5	-		
16.0	35,480	36.0	41,880	56.0	24,210		
16.5	-	36.5	-	56.5	-		
17.0	34,070	37.0	48,050	57.0	28,400		
17.5	-	37.5	-	57.5	-		
18.0	41,970	38.0	53,290	58.0	28,940		
18.5	-	38.5	-	58.5	-		
19.0	47,000	39.0	48,330	59.0	36,490		
19.5	-	39.5	-	59.5	-		
20.0	23,910	40.0	46,890	60.0	40,370		

TABLE 2
(continued)

Hole No. 301
Coordinates: E09225 N09720
Angle of hole: 17 degrees to horizontal

Depth (ft)	cpm	Depth (ft)	cpm	Depth (ft)	cpm
0.5	-	20.5	-	40.5	-
1.0	19,330	21.0	88,420	41.0	11,410
1.5	-	21.5	-	41.5	-
2.0	17,990	22.0	156,900	42.0	12,900
2.5	-	22.5	-	42.5	-
3.0	16,250	23.0	293,990	43.0	13,620
3.5	-	23.5	-	43.5	-
4.0	17,300	24.0	330,690	44.0	15,810
4.5	-	24.5	-	44.5	-
5.0	16,510	25.0	342,960	45.0	12,900
5.5	-	25.5	-	45.5	-
6.0	15,690	26.0	227,020	46.0	13,360
6.5	-	26.5	-	46.5	-
7.0	15,850	27.0	132,640	47.0	12,540
7.5	-	27.5	-	47.5	-
8.0	15,410	28.0	68,020	48.0	13,510
8.5	-	28.5	-	48.5	-
9.0	15,990	29.0	19,210	49.0	13,110
9.5	-	29.5	-	49.5	-
10.0	16,110	30.0	12,380	50.0	14,150
10.5	-	30.5	-	50.5	-
11.0	16,990	31.0	7,870	51.0	13,120
11.5	-	31.5	-	51.5	-
12.0	16,970	32.0	6,920	52.0	13,190
12.5	-	32.5	-	52.5	-
13.0	19,080	33.0	5,600	53.0	13,140
13.5	-	33.5	-	53.5	-
14.0	18,560	34.0	4,910	54.0	14,290
14.5	-	34.5	-	54.5	-
15.0	19,350	35.0	5,500	55.0	14,180
15.5	-	35.5	-	55.5	-
16.0	19,640	36.0	5,140	56.0	13,120
16.5	-	36.5	-	56.5	-
17.0	19,850	37.0	5,810	57.0	13,100
17.5	-	37.5	-		
18.0	22,550	38.0	7,670		
18.5	-	38.5	-		
19.0	30,190	39.0	8,100		
19.5	-	39.5	-		
20.0	55,610	40.0	9,790		

TABLE 2
(continued)

Hole No. 316
Coordinates: E09235 N09425
Angle of hole: 9 degrees to horizontal

Depth (ft)	cpm	Depth (ft)	cpm	Depth (ft)	cpm	Depth (ft)	cpm
0.5	-	20.5	-	40.5	-	60.5	-
1.0	15,920	21.0	9,260	41.0	9,040	61.0	8,390
1.5	-	21.5	-	41.5	-	61.5	-
2.0	13,070	22.0	9,650	42.0	8,760	62.0	8,350
2.5	-	22.5	-	42.5	-	62.5	-
3.0	11,920	23.0	10,070	43.0	8,580	63.0	8,380
3.5	-	23.5	-	43.5	-	63.5	-
4.0	11,080	24.0	9,890	44.0	9,540	64.0	8,600
4.5	-	24.5	-	44.5	-	64.5	-
5.0	9,620	25.0	10,840	45.0	9,560	65.0	8,530
5.5	-	25.5	-	45.5	-	65.5	-
6.0	8,360	26.0	11,140	46.0	9,320	66.0	8,270
6.5	-	26.5	-	46.5	-	66.5	-
7.0	8,560	27.0	10,300	47.0	9,530	67.0	8,730
7.5	-	27.5	-	47.5	-	67.5	-
8.0	8,970	28.0	10,060	48.0	9,450	68.0	8,670
8.5	-	28.5	-	48.5	-	68.5	-
9.0	8,980	29.0	10,340	49.0	9,450	69.0	8,330
9.5	-	29.5	-	49.5	-	69.5	-
10.0	8,590	30.0	9,850	50.0	8,280	70.0	8,390
10.5	-	30.5	-	50.5	-	70.5	-
11.0	8,220	31.0	9,470	51.0	7,900	71.0	8,450
11.5	-	31.5	-	51.5	-	71.5	-
12.0	8,490	32.0	10,550	52.0	8,390	72.0	8,170
12.5	-	32.5	-	52.5	-	72.5	-
13.0	8,440	33.0	9,860	53.0	7,950	73.0	8,520
13.5	-	33.5	-	53.5	-	73.5	-
14.0	8,880	34.0	9,210	54.0	8,530	74.0	8,470
14.5	-	34.5	-	54.5	-	74.5	-
15.0	9,330	35.0	10,150	55.0	8,870	75.0	8,560
15.5	-	35.5	-	55.5	-	75.5	-
16.0	8,810	36.0	9,720	56.0	8,950	76.0	8,420
16.5	-	36.5	-	56.5	-	76.5	-
17.0	8,820	37.0	9,950	57.0	8,280	77.0	8,200
17.5	-	37.5	-	57.5	-	77.5	-
18.0	8,560	38.0	9,990	58.0	8,310	78.0	8,190
18.5	-	38.5	-	58.5	-	78.5	-
19.0	8,940	39.0	8,900	59.0	8,130	79.0	8,320
19.5	-	39.5	-	59.5	-		
20.0	8,620	40.0	9,010	60.0	8,450		

TABLE 2
(continued)

Hole No. 304
Coordinates: E09290 N09590
Angle of hole: 10 degrees to horizontal

Depth (ft)	cpm	Depth (ft)	cpm
0.5	-	20.5	-
1.0	20,710	21.0	16,160
1.5	-	21.5	-
2.0	18,740	22.0	16,960
2.5	-	22.5	-
3.0	16,410	23.0	16,530
3.5	-	23.5	-
4.0	16,620	24.0	16,930
4.5	-	24.5	-
5.0	16,630	25.0	18,130
5.5	-	25.5	-
6.0	15,270	26.0	17,930
6.5	-	26.5	-
7.0	15,240	27.0	17,860
7.5	-	27.5	-
8.0	15,560	28.0	17,020
8.5	-	28.5	-
9.0	16,050	29.0	17,170
9.5	-	29.5	-
10.0	15,860	30.0	16,030
10.5	-	30.5	-
11.0	15,750	31.0	16,950
11.5	-	31.5	-
12.0	15,120	32.0	15,330
12.5	-	32.5	-
13.0	15,940	33.0	14,220
13.5	-	33.5	-
14.0	15,880	34.0	10,140
14.5	-	34.5	-
15.0	16,220	35.0	6,750
15.5	-		
16.0	14,900		
16.5	-		
17.0	15,970		
17.5	-		
18.0	15,960		
18.5	-		
19.0	16,300		
19.5	-		
20.0	16,000		

TABLE 2
(continued)

Hole No. 305
Coordinates: E09325 N09500
Angle of hole: 22.5 degrees to horizontal

Depth (ft)	cpm	Depth (ft)	cpm
0.5	-	20.5	-
1.0	28,360	21.0	25,610
1.5	-	21.5	-
2.0	27,070	22.0	32,140
2.5	-	22.5	-
3.0	20,540	23.0	61,240
3.5	-	23.5	-
4.0	20,150	24.0	142,270
4.5	-	24.5	-
5.0	20,520	25.0	230,370
5.5	-	25.5	-
6.0	20,760	26.0	221,230
6.5	-	26.5	-
7.0	20,310	27.0	209,840
7.5	-	27.5	-
8.0	20,690	28.0	134,570
8.5	-	28.5	-
9.0	20,400	29.0	71,560
9.5	-	29.5	-
10.0	21,700	30.0	40,420
10.5	-	30.5	-
11.0	31,590	31.0	28,880
11.5	-	31.5	-
12.0	26,170	32.0	31,820
12.5	-	32.5	-
13.0	19,600	33.0	28,450
13.5	-	33.5	-
14.0	19,360	34.0	24,800
14.5	-	34.5	-
15.0	20,210	35.0	23,540
15.5	-	35.5	-
16.0	19,220	36.0	25,790
16.5	-	36.5	-
17.0	17,610	37.0	28,060
17.5	-	37.5	-
18.0	17,640	38.0	35,220
18.5	-	38.5	-
19.0	18,610	39.0	35,910
19.5	-	39.5	-
20.0	20,810	40.0	32,740

TABLE 2
(continued)

Hole No. 320
Coordinates: E09341 N09304
Angle of hole: 30 degrees to horizontal

Depth (ft)	cpm	Depth (ft)	cpm
0.5	-	20.5	-
1.0	11,990	21.0	8,860
1.5	-	21.5	-
2.0	14,250	22.0	8,900
2.5	-	22.5	-
3.0	19,560	23.0	10,080
3.5	-	23.5	-
4.0	27,060	24.0	10,270
4.5	-	24.5	-
5.0	18,270	25.0	11,460
5.5	-	25.5	-
6.0	15,490	26.0	12,310
6.5	-	26.5	-
7.0	12,910	27.0	12,720
7.5	-	27.5	-
8.0	11,770	28.0	11,540
8.5	-	28.5	-
9.0	11,100	29.0	10,790
9.5	-	29.5	-
10.0	11,690	30.0	11,100
10.5	-	30.5	-
11.0	11,590	31.0	11,210
11.5	-	31.5	-
12.0	12,540	32.0	11,510
12.5	-	32.5	-
13.0	11,530	33.0	11,330
13.5	-		
14.0	11,260		
14.5	-		
15.0	11,960		
15.5	-		
16.0	22,470		
16.5	-		
17.0	19,680		
17.5	-		
18.0	19,020		
18.5	-		
19.0	15,840		
19.5	-		
20.0	10,130		

TABLE 2
(continued)

Hole No. 319
Coordinates: E09345 N09305 Angle of hole: 9 degrees to horizontal

Depth (ft)	cpm	Depth (ft)	cpm	Depth (ft)	cpm	Depth (ft)	cpm
0.5	-	20.5	-	40.5	-	60.5	-
1.0	14,080	21.0	9,900	41.0	11,710	61.0	12,130
1.5	-	21.5	-	41.5	-	61.5	-
2.0	13,250	22.0	10,350	42.0	11,680	62.0	14,010
2.5	-	22.5	-	42.5	-	62.5	-
3.0	12,150	23.0	9,580	43.0	11,570	63.0	12,000
3.5	-	23.5	-	43.5	-	63.5	-
4.0	10,320	24.0	9,690	44.0	11,690	64.0	9,680
4.5	-	24.5	-	44.5	-	64.5	-
5.0	9,450	25.0	9,550	45.0	10,770	65.0	10,360
5.5	-	25.5	-	45.5	-		
6.0	9,310	26.0	9,450	46.0	11,360		
6.5	-	26.5	-	46.5	-		
7.0	9,250	27.0	10,050	47.0	11,000		
7.5	-	27.5	-	47.5	-		
8.0	9,120	28.0	10,030	48.0	11,160		
8.5	-	28.5	-	48.5	-		
9.0	8,940	29.0	9,760	49.0	10,440		
9.5	-	29.5	-	49.5	-		
10.0	9,230	30.0	9,360	50.0	10,910		
10.5	-	30.5	-	50.5	-		
11.0	8,030	31.0	9,310	51.0	11,320		
11.5	-	31.5	-	51.5	-		
12.0	8,250	32.0	10,510	52.0	11,590		
12.5	-	32.5	-	52.5	-		
13.0	9,090	33.0	10,620	53.0	12,360		
13.5	-	33.5	-	53.5	-		
14.0	9,020	34.0	10,140	54.0	11,020		
14.5	-	34.5	-	54.5	-		
15.0	8,250	35.0	10,560	55.0	10,800		
15.5	-	35.5	-	55.5	-		
16.0	9,730	36.0	10,300	56.0	11,160		
16.5	-	36.5	-	56.5	-		
17.0	9,500	37.0	10,400	57.0	11,380		
17.5	-	37.5	-	57.5	-		
18.0	9,370	38.0	9,680	58.0	11,800		
18.5	-	38.5	-	58.5	-		
19.0	9,570	39.0	10,410	59.0	11,200		
19.5	-	39.5	-	59.5	-		
20.0	9,390	40.0	11,900	60.0	10,980		

TABLE 2
(continued)

Hole No. 306
Coordinates: E09400 N09400 Angle of hole: 23 degrees to horizontal

Depth (ft)	cpm	Depth (ft)	cpm	Depth (ft)	cpm
0.5	-	20.5	-	40.5	-
1.0	15,290	21.0	9,330	41.0	11,750
1.5	-	21.5	-	41.5	-
2.0	11,020	22.0	8,900	42.0	11,570
2.5	-	22.5	-	42.5	-
3.0	9,900	23.0	9,400	43.0	13,080
3.5	-	23.5	-	43.5	-
4.0	9,200	24.0	9,300	44.0	14,610
4.5	-	24.5	-	44.5	-
5.0	9,870	25.0	8,960	45.0	15,920
5.5	-	25.5	-	45.5	-
6.0	9,650	26.0	9,290	46.0	16,980
6.5	-	26.5	-	46.5	-
7.0	8,740	27.0	10,070	47.0	18,130
7.5	-	27.5	-	47.5	-
8.0	9,250	28.0	9,700	48.0	18,930
8.5	-	28.5	-	48.5	-
9.0	8,920	29.0	9,980	49.0	19,880
9.5	-	29.5	-	49.5	-
10.0	9,210	30.0	10,0990	50.0	19,560
10.5	-	30.5	-		
11.0	8,910	31.0	10,630		
11.5	-	31.5	-		
12.0	8,900	32.0	10,750		
12.5	-	32.5	-		
13.0	9,070	33.0	10,670		
13.5	-	33.5	-		
14.0	8,860	34.0	10,430		
14.5	-	34.5	-		
15.0	8,980	35.0	11,220		
15.5	-	35.5	-		
16.0	9,260	36.0	10,620		
16.5	-	36.5	-		
17.0	9,520	37.0	10,900		
17.5	-	37.5	-		
18.0	9,350	38.0	11,130		
18.5	-	38.5	-		
19.0	8,490	39.0	10,740		
19.5	-	39.5	-		
20.0	8,760	40.0	10,790		

TABLE 2
(continued)

Hole No. 321
Coordinates: E09435 N09210 Angle of hole: 20 degrees to horizontal

Depth (ft)	cpm	Depth (ft)	cpm	Depth (ft)	cpm
0.5	-	20.5	-	40.5	-
1.0	12,590	21.0	9,880	41.0	12,810
1.5	-	21.5	-	41.5	-
2.0	13,690	22.0	9,760	42.0	12,960
2.5	-	22.5	-	42.5	-
3.0	14,040	23.0	10,690	43.0	12,190
3.5	-	23.5	-	43.5	-
4.0	14,670	24.0	10,540	44.0	12,310
4.5	-	24.5	-	44.5	-
5.0	13,720	25.0	11,640	45.0	13,170
5.5	-	25.5	-	45.5	-
6.0	10,960	26.0	11,070	46.0	13,410
6.5	-	26.5	-	46.5	-
7.0	10,190	27.0	10,790	47.0	13,440
7.5	-	27.5	-	47.5	-
8.0	9,830	28.0	11,080	48.0	12,990
8.5	-	28.5	-	48.5	-
9.0	9,520	29.0	10,980	49.0	13,140
9.5	-	29.5	-	49.5	-
10.0	9,690	30.0	10,960	50.0	14,140
10.5	-	30.5	-	50.5	-
11.0	8,740	31.0	11,500	51.0	13,430
11.5	-	31.5	-		
12.0	9,510	32.0	11,100		
12.5	-	32.5	-		
13.0	9,560	33.0	11,170		
13.5	-	33.5	-		
14.0	9,280	34.0	11,460		
14.5	-	34.5	-		
15.0	10,300	35.0	11,590		
15.5	-	35.5	-		
16.0	10,580	36.0	11,500		
16.5	-	36.5	-		
17.0	10,330	37.0	11,670		
17.5	-	37.5	-		
18.0	9,860	38.0	11,810		
18.5	-	38.5	-		
19.0	10,340	39.0	13,180		
19.5	-	39.5	-		
20.0	10,100	40.0	12,220		

TABLE 2
(continued)

Hole No. 314
Coordinates: E09444 N09344
Angle of hole: 15 degrees to horizontal

Depth (ft)	cpm
0.5	-
1.0	17,160
1.5	-
2.0	16,620
2.5	-
3.0	16,250
3.5	-
4.0	17,800
4.5	-
5.0	18,630
5.5	-
6.0	20,900
6.5	-
7.0	20,400
7.5	-
8.0	20,830
8.5	-
9.0	20,250
9.5	-
10.0	15,670 (b)
10.5	14,800 (b)

TABLE 2
(continued)

Hole No. 315
Coordinates: E09445 N09345 Angle of hole: 12 degrees to horizontal

Depth (ft)	cpm	Depth (ft)	cpm	Depth (ft)	cpm
0.5	-	20.5	-	40.5	-
1.0	15,000	21.0	10,040	41.0	9,970
1.5	-	21.5	-	41.5	-
2.0	16,650	22.0	10,150	42.0	10,530
2.5	-	22.5	-	42.5	-
3.0	20,010	23.0	9,970	43.0	10,070
3.5	-	23.5	-	43.5	-
4.0	19,420	24.0	9,580	44.0	9,230
4.5	-	24.5	-	44.5	-
5.0	18,970	25.0	10,150	45.0	10,180
5.5	-	25.5	-	45.5	-
6.0	18,180	26.0	9,680	46.0	9,730
6.5	-	26.5	-	46.5	-
7.0	10,080	27.0	9,300	47.0	10,370
7.5	-	27.5	-	47.5	-
8.0	14,900	28.0	9,230	48.0	10,180
8.5	-	28.5	-	48.5	-
9.0	14,030	29.0	9,430	49.0	9,890
9.5	-	29.5	-	49.5	-
10.0	12,610	30.0	9,400	50.0	11,040
10.5	-	30.5	-	50.5	-
11.0	10,490	31.0	9,580	51.0	10,640
11.5	-	31.5	-		
12.0	9,800	32.0	10,190		
12.5	-	32.5	-		
13.0	9,970	33.0	10,260		
13.5	-	33.5	-		
14.0	9,530	34.0	10,820		
14.5	-	34.5	-		
15.0	10,170	35.0	9,980		
15.5	-	35.5	-		
16.0	9,550	36.0	10,000		
16.5	-	36.5	-		
17.0	9,950	37.0	10,010		
17.5	-	37.5	-		
18.0	9,620	38.0	11,140		
18.5	-	38.5	-		
19.0	9,840	39.0	11,500		
19.5	-	39.5	-		
20.0	10,030	40.0	11,390		

TABLE 2
(continued)

Hole No. 308
Coordinates: E09490 N09290
Angle of hole: 14 degrees to horizontal

Depth (ft)	cpm	Depth (ft)	cpm
0.5	-	20.5	-
1.0	26,720	21.0	16,660
1.5	-	21.5	-
2.0	26,500	22.0	13,670
2.5	-	22.5	-
3.0	23,690	23.0	14,350
3.5	-	23.5	-
4.0	20,530	24.0	16,300
4.5	-	24.5	-
5.0	19,030	25.0	15,770
5.5	-	25.5	-
6.0	18,080	26.0	16,160
6.5	-	26.5	-
7.0	16,920	27.0	16,300
7.5	-	27.5	-
8.0	16,220	28.0	15,550
8.5	-	28.5	-
9.0	16,590	29.0	15,930
9.5	-	29.5	-
10.0	16,610	30.0	16,450
10.5	-	30.5	-
11.0	18,580	31.0	19,740
11.5	-	31.5	-
12.0	18,050	32.0	18,860
12.5	-	32.5	-
13.0	18,970	33.0	17,610
13.5	-	33.5	-
14.0	19,480	34.0	17,040
14.5	-	34.5	-
15.0	18,910	35.0	17,360
15.5	-	35.5	-
16.0	18,840	36.0	17,900
16.5	-	36.5	-
17.0	17,820	37.0	19,370
17.5	-	37.5	-
18.0	17,450	38.0	19,780
18.5	-	38.5	-
19.0	16,540	39.0	21,670
19.5	-	39.5	-
20.0	16,080	40.0	21,390

TABLE 2
(counts/minute)

Hole No. 318
Coordinates: E09550 N09080
Angle of hole: 15 degrees to horizontal

Depth (ft)	cpm	Depth (ft)	cpm	Depth (ft)	cpm	Depth (ft)	cpm
0.5	-	20.5	-	40.5	-	60.5	-
1.0	17,500	21.0	18,320	41.0	16,680	61.0	12,820
1.5	-	21.5	-	41.5	-	61.5	-
2.0	20,280	22.0	15,950	42.0	15,530	62.0	11,830
2.5	-	22.5	-	42.5	-	62.5	-
3.0	21,390	23.0	16,620	43.0	16,490	63.0	12,700
3.5	-	23.5	-	43.5	-	63.5	-
4.0	17,090	24.0	16,110	44.0	16,160	64.0	12,240
4.5	-	24.5	-	44.5	-	64.5	-
5.0	14,550	25.0	15,000	45.0	17,250	65.0	13,170
5.5	-	25.5	-	45.5	-	65.5	-
6.0	14,230	26.0	13,680	46.0	18,260	66.0	12,500
6.5	-	26.5	-	46.5	-	66.5	-
7.0	12,740	27.0	13,750	47.0	16,760	67.0	12,360
7.5	-	27.5	-	47.5	-	67.5	-
8.0	13,020	28.0	13,590	48.0	17,340	68.0	12,510
8.5	-	28.5	-	48.5	-		
9.0	13,800	29.0	13,350	49.0	16,470		
9.5	-	29.5	-	49.5	-		
10.0	13,760	30.0	13,860	50.0	17,100		
10.5	-	30.5	-	50.5	-		
11.0	13,950	31.0	15,160	51.0	16,280		
11.5	-	31.5	-	51.5	-		
12.0	14,430	32.0	14,980	52.0	15,740		
12.5	-	32.5	-	52.5	-		
13.0	14,520	33.0	14,590	53.0	15,720		
13.5	-	33.5	-	53.5	-		
14.0	13,820	34.0	14,640	54.0	15,470		
14.5	-	34.5	-	54.5	-		
15.0	13,710	35.0	15,350	55.0	14,950		
15.5	-	35.5	-	55.5	-		
16.0	13,650	36.0	14,640	56.0	13,110		
16.5	-	36.5	-	56.5	-		
17.0	18,700	37.0	16,780	57.0	13,260		
17.5	-	37.5	-	57.5	-		
18.0	20,730	38.0	16,370	58.0	12,790		
18.5	-	38.5	-	58.5	-		
19.0	24,180	39.0	17,240	59.0	12,700		
19.5	-	39.5	-	59.5	-		
20.0	21,730	40.0	15,930	60.0	12,030		

TABLE 2
(continued)

Hole No. 309
Coordinates: E09550
N09225

Angle of hole: 22.5 degrees to horizontal

Depth (ft)	cpm	Depth (ft)	cpm	Depth (ft)	cpm
0.5	-	20.5	-	40.5	-
1.0	19,840	21.0	9,730	41.0	10,320
1.5	-	21.5	-		
2.0	20,560	22.0	10,570		
2.5	-	22.5	-		
3.0	19,190	23.0	12,770		
3.5	-	23.5	-		
4.0	18,920	24.0	12,740		
4.5	-	24.5	-		
5.0	19,910	25.0	12,440		
5.5	-	25.5	-		
6.0	19,470	26.0	11,260		
6.5	-	26.5	-		
7.0	19,130	27.0	10,510		
7.5	-	27.5	-		
8.0	17,940	28.0	9,780		
8.5	-	28.5	-		
9.0	17,600	29.0	9,660		
9.5	-	29.5	-		
10.0	16,100	30.0	9,150		
10.5	-	30.5	-		
11.0	14,340	31.0	9,490		
11.5	-	31.5	-		
12.0	14,000	32.0	8,990		
12.5	-	32.5	-		
13.0	13,130	33.0	9,150		
13.5	-	33.5	-		
14.0	13,890	34.0	9,550		
14.5	-	34.5	-		
15.0	12,580	35.0	9,110		
15.5	-	35.5	-		
16.0	12,530	36.0	8,830		
16.5	-	36.5	-		
17.0	11,680	37.0	9,100		
17.5	-	37.5	-		
18.0	11,440	38.0	9,120		
18.5	-	38.5	-		
19.0	12,240	39.0	9,110		
19.5	-	39.5	-		
20.0	10,460	40.0	9,620		

TABLE 2
(continued)

Hole No. 311
Coordinates: E09725 N09070
Angle of hole: 30 degrees to horizontal

Depth (ft)	cpm	Depth (ft)	cpm
0.5	-	20.5	-
1.0	841,940	21.0	13,670
1.5	-	21.5	-
2.0	821,110	22.0	13,770
2.5	-	22.5	-
3.0	831,980	23.0	13,080
3.5	-	23.5	-
4.0	431,790	24.0	12,960
4.5	-	24.5	-
5.0	166,590	25.0	16,220
5.5	-	25.5	-
6.0	50,080	26.0	15,970
6.5	-	26.5	-
7.0	15,380	27.0	15,730
7.5	-		
8.0	8,280		
8.5	-		
9.0	5,950		
9.5	-		
10.0	8,320		
10.5	-		
11.0	9,680		
11.5	-		
12.0	9,130		
12.5	-		
13.0	9,170		
13.5	-		
14.0	8,080		
14.5	-		
15.0	8,300		
15.5	-		
16.0	8,470		
16.5	-		
17.0	9,270		
17.5	-		
18.0	11,540		
18.5	-		
19.0	13,530		
19.5	-		
20.0	14,620		

TABLE 2
(continued)

Hole No. 313
Coordinates: E09790 N09025
Angle of hole: 14 degrees to horizontal

Depth (ft)	cpm	Depth (ft)	cpm	Depth (ft)	cpm
0.5	-	20.5	-	40.5	-
1.0	336,270	21.0	14,710	41.0	7,790
1.5	-	21.5	-	41.5	-
2.0	435,230	22.0	13,640	42.0	7,710
2.5	-	22.5	-	42.5	-
3.0	524,390	23.0	12,060	43.0	8,150
3.5	-	23.5	-	43.5	-
4.0	475,430	24.0	10,810	44.0	7,540
4.5	-	24.5	-	44.5	-
5.0	411,050	25.0	9,630	45.0	8,100
5.5	-	25.5	-	45.5	-
6.0	274,270	26.0	11,130	46.0	7,790
6.5	-	26.5	-	46.5	-
7.0	88,640	27.0	12,270	47.0	7,860
7.5	-	27.5	-		
8.0	50,460	28.0	12,560		
8.5	-	28.5	-		
9.0	40,410	29.0	11,620		
9.5	-	29.5	-		
10.0	26,000	30.0	10,700		
10.5	-	30.5	-		
11.0	18,140	31.0	11,650		
11.5	-	31.5	-		
12.0	13,480	32.0	11,030		
12.5	-	32.5	-		
13.0	10,520	33.0	9,610		
13.5	-	33.5	-		
14.0	10,510	34.0	9,420		
14.5	-	34.5	-		
15.0	13,640	35.0	8,450		
15.5	-	35.5	-		
16.0	13,590	36.0	8,660		
16.5	-	36.5	-		
17.0	13,340	37.0	8,940		
17.5	-	37.5	-		
18.0	13.340	38.0	8,590		
18.5	-	38.5	-		
19.0	16,450	39.0	8,300		
19.5	-	39.5	-		
20.0	15,790	40.0	7,690		

TABLE 2
(continued)

Hole No. 312
Coordinates: E09880 N08975
Angle of hole: 16 degrees to horizontal

Depth (ft)	cpm	Depth (ft)	cpm
0.5	-	20.5	-
1.0	13,980	21.0	15,130
1.5	-	21.5	-
2.0	13,090	22.0	15,530
2.5	-	22.5	-
3.0	13,670	23.0	14,690
3.5	-	23.5	-
4.0	13,870	24.0	15,210
4.5	-	24.5	-
5.0	13,410	25.0	14,220
5.5	-	25.5	-
6.0	14,240	26.0	13,580
6.5	-	26.5	-
7.0	14,250	27.0	12,190
7.5	-	27.5	-
8.0	14,200	28.0	11,710
8.5	-	28.5	-
9.0	14,290	29.0	11,980
9.5	-	29.5	-
10.0	14,070	30.0	11,020
10.5	-	30.5	-
11.0	14,220	31.0	9,620
11.5	-	31.5	-
12.0	14,600	32.0	9,380
12.5	-	32.5	-
13.0	14,680	33.0	11,060
13.5	-	33.5	-
14.0	13,700	34.0	11,420
14.5	-		
15.0	13,540		
15.5	-		
16.0	13,550		
16.5	-		
17.0	14,420		
17.5	-		
18.0	14,730		
18.5	-		
19.0	15,280		
19.5	-		
20.0	14,820		

(a) Last entry for a set of coordinates indicates bottom of the hole
(b) Concrete

TABLE 3

VERTICAL
Downhole Logging (a)

Depth (ft)	Coordinates E09215 N09700	E09260 N09600	E09325 N09500	E09330 N09360	E09350 N09340	E09445 N09320
0.5	19,133	13,484	13,966	9,585	16,173	15,364
1.0	-	14,493	15,125	9,980	18,998	13,575
1.5	18,911	14,562	16,117	12,372	28,129	13,130
2.0	22,136	16,117	14,175	12,555	26,135	13,475
2.5	27,117	16,145	17,107	13,246	23,484	16,125
3.0	25,135	18,206	-	14,917	23,514	18,191
3.5	19,166	-	-	-	23,216	20,127
4.0	21,121 (b)	-	-	-	24,125	21,226
4.5	-	-	-	-	24,706	-
5.0	-	-	-	-	26,175	-
5.5	-	-	-	-	-	-
6.0	-	-	-	-	-	-
6.5	-	-	-	-	-	-
7.0	-	-	-	-	-	-
7.5	-	-	-	-	-	-
8.0	-	-	-	-	-	-
8.5	-	-	-	-	-	-
9.0	-	-	-	-	-	-
9.5	-	-	-	-	-	-
10.0	-	-	-	-	-	-
10.5	-	-	-	-	-	-
11.0	-	-	-	-	-	-
11.5	-	-	-	-	-	-
12.0	-	-	-	-	-	-
12.5	-	-	-	-	-	-
13.0	-	-	-	-	-	-
13.5	-	-	-	-	-	-
14.0	-	-	-	-	-	-
14.5	-	-	-	-	-	-
15.0	-	-	-	-	-	-

TABLE 3

VERTICAL
Down Hole Logging (a)

Depth (ft)	Coordinates E09215 N09700	E09260 N09600	E09325 N09500	E09330 N09360	E09350 N09340	E09445 N09320
0.5	19,133	13,484	13,966	9,585	16,173	15,364
1.0	–	14,493	15,125	9,980	18,998	13,575
1.5	18,911	14,562	16,117	12,372	28,129	13,130
2.0	22,136	16,117	14,175	12,555	26,135	13,475
2.5	27,117	16,145	17,107	13,246	23,484	16,125
3.0	25,135	18,206	–	14,917	23,514	18,191
3.5	19,166	–	–	–	23,216	20,127
4.0	21,121 (b)	–	–	–	24,125	21,226
4.5	–	–	–	–	24,706	–
5.0	–	–	–	–	26,175	–
5.5	–	–	–	–	–	–
6.0	–	–	–	–	–	–
6.5	–	–	–	–	–	–
7.0	–	–	–	–	–	–
7.5	–	–	–	–	–	–
8.0	–	–	–	–	–	–
8.5	–	–	–	–	–	–
9.0	–	–	–	–	–	–
9.5	–	–	–	–	–	–
10.0	–	–	–	–	–	–
10.5	–	–	–	–	–	–
11.0	–	–	–	–	–	–
11.5	–	–	–	–	–	–
12.0	–	–	–	–	–	–
12.5	–	–	–	–	–	–
13.0	–	–	–	–	–	–
13.5	–	–	–	–	–	–
14.0	–	–	–	–	–	–
14.5	–	–	–	–	–	–
15.0	–	–	–	–	–	–

TABLE 3
(continued)

Depth (ft)	Coordinates E09475 N09200	E09630 N09140	E09660 N09030	E09705 N09005
0.5	10,540	19,127	9,200	9,688
1.0	9,968	12,712	10,527	13,857
1.5	10,256	11,977	12,998	12,527
2.0	13,246	12,475	12,408	11,517
2.5	12,844	11,407	11,132	10,409
3.0	13,870	10,136	11,729	10,565
3.5	16,175	9,246	10,696	10,620
4.0	19,207	8,719	11,882	10,582
4.5	–	8,669	11,584	11,495
5.0	–	–	11,010	13,217
5.5	–	–	11,236	12,827
6.0	–	–	12,459	12,527
6.5	–	–	14,468	11,499
7.0	–	–	15,874	11,199
7.5	–	–	15,832	12,248
8.0	–	–	18,529	12,259
8.5	–	–	16,661	12,397
9.0	–	–	12,290	12,177
9.5	–	–	11,495	11,104
10.0	–	–	11,112	12,111
10.5	–	–	11,132	12,205
11.0	–	–	11,798	13,441
11.5	–	–	12,196	13,880
12.0	–	–	12,220	13,466
12.5	–	–	12,171	–
13.0	–	–	12,998	–
13.5	–	–	12,097	–
14.0	–	–	–	–
14.5	–	–	–	–
15.0	–	–	–	–

(a)All entries are given in counts per minute
(b)Last entry for a set of coordinates indicates bottom of the hole