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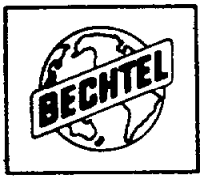
DOE/OR/20722-152

Formerly Utilized Sites Remedial Action Program (FUSRAP)
Contract No. DE-AC05-81OR20722

RADIOLOGICAL AND LIMITED CHEMICAL CHARACTERIZATION REPORT FOR THE HUNTER DOUGLAS PROPERTY

Maywood, New Jersey

July 1987



Bechtel National, Inc.

046670

Bechtel National, Inc.
Engineers — Constructors

Jackson Plaza Tower
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37830

Mail Address: P.O. Box 350, Oak Ridge, TN 37831-0350
Telex: 3785873

AUG 3 1987

U.S. Department of Energy
Oak Ridge Operations
Post Office Box E
Oak Ridge, Tennessee 37831

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

Subject: Bechtel Job No. 14501, FUSRAP Project
DOE Contract No. DE-AC05-81OR20722
Publication of the Radiological and Limited Chemical Characterization Report for the Hunter Douglas Property in Maywood, New Jersey and Radiological and Limited Chemical Characterization Report for the Sunoco Station Property in Maywood, New Jersey

Code: 7310/WBS: 138

Dear Mr. Ahrends:

The following is the response to comments in Steve Oldham's letter (87-388) dated June 22 (our CCN 045685) and additional information exchanged during telephone conversations between Steve Oldham and Tom Dravecky on July 21 and 23. Enclosed are 25 copies of each of the subject reports that incorporates these comments.

Please contact Sherry Livesay (6-0454) if you need additional copies.

Very truly yours,

S. P. Eastwell

FOR J. R. Kannard
Project Manager - FUSRAP

JRK/skl

Enclosures: As stated

CONCURRENCE

SKL				

cc: J. F. Wing, w/o
R. G. Atkin, w/o
S. K. Oldham, w/o
B. A. Hughlett, w/o
J. D. Berger (ORAU), w/e
G. K. Hovey, w/o

1032x

bcc: N. C. Ring (2)
R. M. Howard
C. P. Leichtweis
R. C. Robertson
W. C. Borden
J. A. Blanke (2)
S. G. Wilkinson
L. A. Johnson (2)
S. K. Livesay
TRG (6)
PDCC

This distribution closes out CCN 045685.

DOE/OR/20722-152

RADIOLOGICAL AND LIMITED CHEMICAL CHARACTERIZATION REPORT FOR THE HUNTER DOUGLAS PROPERTY MAYWOOD, NEW JERSEY

JULY 1987

Prepared for

UNITED STATES DEPARTMENT OF ENERGY
OAK RIDGE OPERATIONS OFFICE
Under Contract No. DE-AC05-81OR20722

By

N. C. Ring and S. K. Livesay
Bechtel National, Inc.
Oak Ridge, Tennessee

Bechtel Job No. 14501

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ABBREVIATIONS

cm	centimeter
cm^2	square centimeter
cpm	counts per minute
dpm	disintegrations per minute
ft	foot
h	hour
in.	inch
l	liter
m	meter
m^2	square meter
μR/h	microroentgens per hour
mi	mile
mi^2	square mile
mrad/h	millirad per hour
mrem	millirem
mrem/yr	millirem per year
min	minute
ppb	parts per billion
ppm	parts per million
pCi/g	picocuries per gram
pCi/l	picocuries per liter
WL	working level

1.0 INTRODUCTION AND SUMMARY

1.1 INTRODUCTION

The 1984 Energy and Water Appropriations Act authorized the U.S. Department of Energy (DOE) to conduct a decontamination research and development project at four sites, including the site of the former Maywood Chemical Works (now owned by the Stepan Company) and its vicinity properties. The act was reauthorized in 1985. DOE has constructed the Maywood Interim Storage Site (MISS) on 11.7 acres of land west of the Stepan Company property. The Hunter Douglas property is included as one of the MISS vicinity properties. The work is being administered by the Formerly Utilized Sites Remedial Action Program (FUSRAP), one of two remedial action programs under the direction of the DOE Division of Facility and Site Decommissioning Projects.

The U.S. Government initiated FUSRAP in 1974 to identify, clean up, or otherwise control sites where low-activity radioactive contamination (exceeding current guidelines) remains from the early years of the nation's atomic energy program or from commercial operations that resulted in conditions Congress has mandated DOE to remedy (Ref. 1).

FUSRAP is currently being managed by the DOE Oak Ridge Operations (ORO). As the Project Management Contractor (PMC) for FUSRAP, Bechtel National, Inc. (BNI) is responsible to DOE for planning, managing, and implementing FUSRAP.

1.2 PURPOSE AND OBJECTIVES

A radiological characterization of the Hunter Douglas property has been conducted to establish the horizontal and vertical limits of radioactive contamination and to determine ranges of radionuclide concentrations. The information obtained from this characterization work will be used in planning any required remedial action. The

results will also be used to satisfy an important secondary objective, which is to provide data to aid in the identification and evaluation of pathways by which contamination might have migrated from the property. A limited chemical characterization was also performed to provide the information necessary for development of appropriate employee health protection measures to be implemented during any remedial action at the Hunter Douglas property.

1.3 SUMMARY

This report summarizes the procedures and results of the radiological and limited chemical characterization of the Hunter Douglas property conducted in August and September 1986.

1.3.1 Radiological Summary

The radiological characterization confirmed that thorium-232 is the primary radioactive contaminant. The sediment sample results showed the maximum concentration of thorium-232 to be 33.4 pCi/g, which is in excess of the DOE guideline of 5.0 pCi/g plus background for surface soil. The maximum concentration for radium-226 was 4.8 pCi/g, which does not exceed the guideline. No uranium-238 concentration above the laboratory detection limit was identified.

The results of downhole gamma logging indicate no subsurface contamination.

1.3.2 Chemical Summary

Results of volatile organic analyses (VOA) performed, from the limited chemical characterization of this property, indicated that none were present in the sample. However, only a general evaluation of the data is possible because the analytical laboratory contracted for this work exceeded the holding times for these analyses.

Analyses for base neutral/acid extractables (BNAE) (semi-volatiles) indicated the presence of semi-volatile organics, but all those identified had concentrations below the laboratory's specified detection limit and were not required to be reported. Priority pollutant metals analysis results indicated the presence of one hazardous constituent, cadmium, with a concentration above background level.

Results of the analyses for pesticides and PCBs showed no detectable levels of these constituents. In addition, the sample did not exhibit the hazardous waste characteristics of corrosivity, reactivity, or ignitability. Analysis results for extraction procedure (EP) toxicity indicated trace-level concentrations.

2.0 SITE DESCRIPTION AND BACKGROUND

The Hunter Douglas property is in a highly developed area of the Borough of Maywood, County of Bergen, New Jersey. The population density of the area is approximately 10,000 people per square mile. It is located approximately 12 mi north-northwest of downtown Manhattan (New York City) and 13 mi northeast of Newark, New Jersey. The property is bounded by New Jersey Route 17 on the west and by other commercial properties on the north, east, and south. Figure 2-1 shows the location of the property.

The Hunter Douglas property was shown to be radioactively contaminated during a radiological survey conducted in July 1983 by the NUS Corporation at the request of the U.S. Environmental Protection Agency (EPA) (Ref. 2). The contamination probably originated from the processing of monazite sand (thorium ore) by the Maywood Chemical Works from 1916 through 1956. During this time, slurry containing process wastes from the thorium operations was pumped to diked areas west of the plant. The area west of the plant was generally low and swampy at that time. In 1932, New Jersey Route 17 was built through this disposal area. Some of these process wastes were removed from the Maywood Chemical Works for use as mulch and fill on nearby properties, thereby contaminating them with radioactive thorium (Ref. 3). Additional waste apparently migrated off-site via the natural drainage provided by the former Lodi Brook.

In 1954, the Atomic Energy Commission (AEC) issued License R-103 to the Maywood Chemical Works allowing it to continue to ship, receive, possess, and process radioactive materials under the authority of the Atomic Energy Act of 1954. The Maywood Chemical Works stopped processing thorium in 1956 after approximately 40 years of production. The Maywood Chemical Works was sold to the Stepan Company in 1959 (Ref. 3).

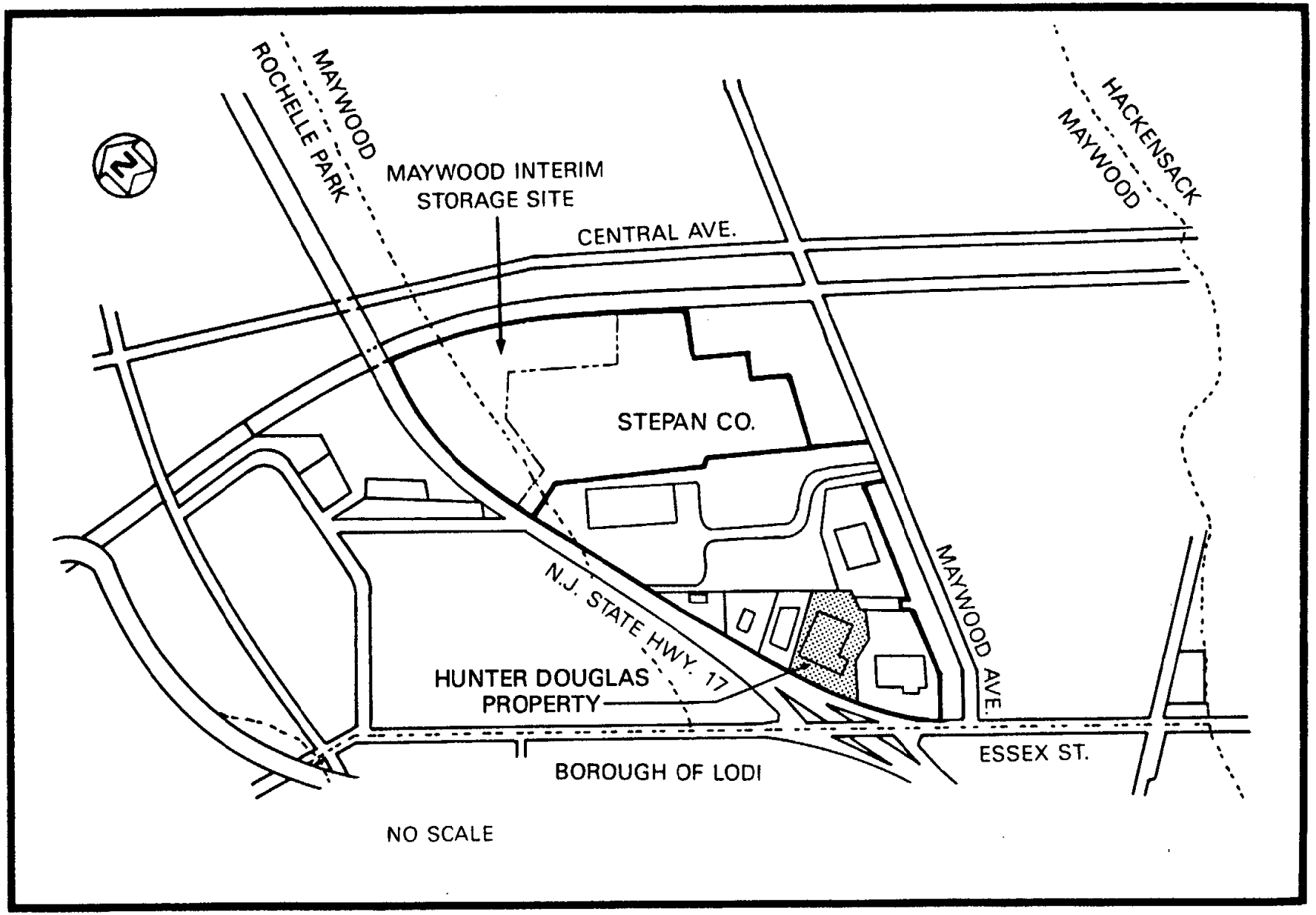

FIGURE 2-1 LOCATION OF THE HUNTER DOUGLAS PROPERTY

3.0 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.

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

3.1 REMEDIAL ACTION GUIDELINES

Information collected during the radiological survey conducted by the NUS Corporation (Ref. 2) indicated that the radioactive contamination at the Hunter Douglas property consists primarily of thorium-232, with typically much lower levels of radium-226 and uranium-238. Thorium is also known to be the primary contaminant at the Stepan property (Ref. 3). Table 3-1 (at the end of Section 3.0) lists the DOE residual contamination guidelines governing the release of formerly contaminated property for unrestricted use (Ref. 4).

3.2 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, the shielded detector minimizes 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). On the basis of this relationship, locations with measurements of more than 11,000 cpm were noted as exceeding the DOE guideline of 5 pCi/g plus background for thorium-232 in surface soil/sediments. To better define the limits of contamination, sediment sample locations were chosen by evaluating locations with measurements of more than 11,000 cpm, locations with measurements at or near 11,000 cpm, and the potential for lateral gamma flux.

Near-surface gamma levels measured on the property ranged from the background level of 5,000 cpm to 19,264 cpm. To identify surface areas where the level of contamination exceeds the DOE guideline for thorium-232, areas having readings in excess of 11,000 cpm were plotted on a grid. In addition, near-surface gamma measurements indicate that contamination extends onto several properties contiguous with the Hunter Douglas property.

The majority of the eastern section of the Hunter Douglas property is asphalt. The calibration correlation of 11,000 cpm for 5 pCi/g was developed for instruments taking readings above contaminated soil; therefore, the same correlation may not be applicable for readings taken above asphalt.

Sediment from the drainage ditch along the eastern boundary of the property (Figure 3-1) was sampled and analyzed for uranium-238, thorium-232, and radium-226. The data in Table 3-2 (at the end of Section 3.0) show the concentrations of thorium-232 in the surface sediment samples. Concentrations ranged from 3.2 to 33.4 pCi/g. Use of the "less than" (<) notation indicates that the radionuclide was not present in measurable concentrations. The value following the less than notation is the minimum detectable amount (MDA). The MDA is based on various factors, including the volume, size, and weight of the sample; the type of detector used; the counting time, and the background count rate. In addition, since radioactive decay is a random process, a correlation between the rate of disintegration and a given radionuclide concentration

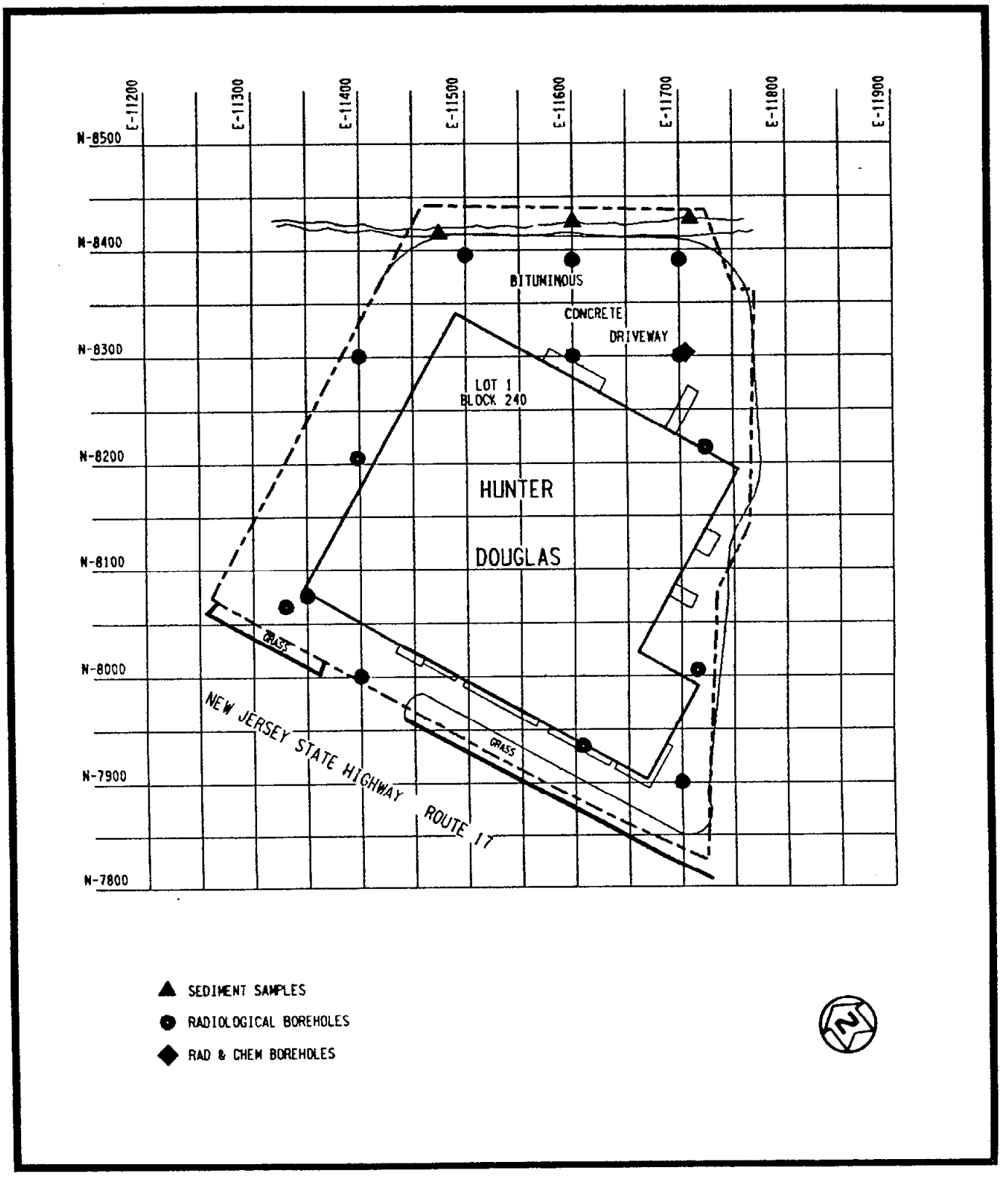

FIGURE 3-1 SAMPLING LOCATIONS AT THE HUNTER DOUGLAS PROPERTY

cannot be precisely established; therefore, the exact concentration of the radionuclide cannot be determined. As such, each value that is equal to or greater than the MDA has an associated uncertainty term (±), which represents the maximum amount by which the actual value can be expected to differ from the value given in the table. The uncertainty term has an associated confidence level of 95 percent.

The maximum concentration for radium-226 was 4.8 pCi/g, which does not exceed the guideline. No uranium-238 concentration above the laboratory MDA was identified.

Since the thorium-232 concentration of one of the three sediment samples exceeds the DOE guideline of 5 pCi/g above background for surface soil/sediments, thorium-232 has been demonstrated to be the site's primary radioactive contaminant. The sampling locations are shown in Figure 3-1. Figure 3-2 shows the areas of surface contamination.

3.3 SUBSURFACE CHARACTERIZATION

After surface characterization was completed, a 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 soil sampling, because the 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 count rate of approximately 40,000 cpm corresponds to the 15-pCi/g guideline for thorium-232 in subsurface soil. This relationship has been corroborated in results from previous characterizations where thorium-232 was found (Ref. 5).

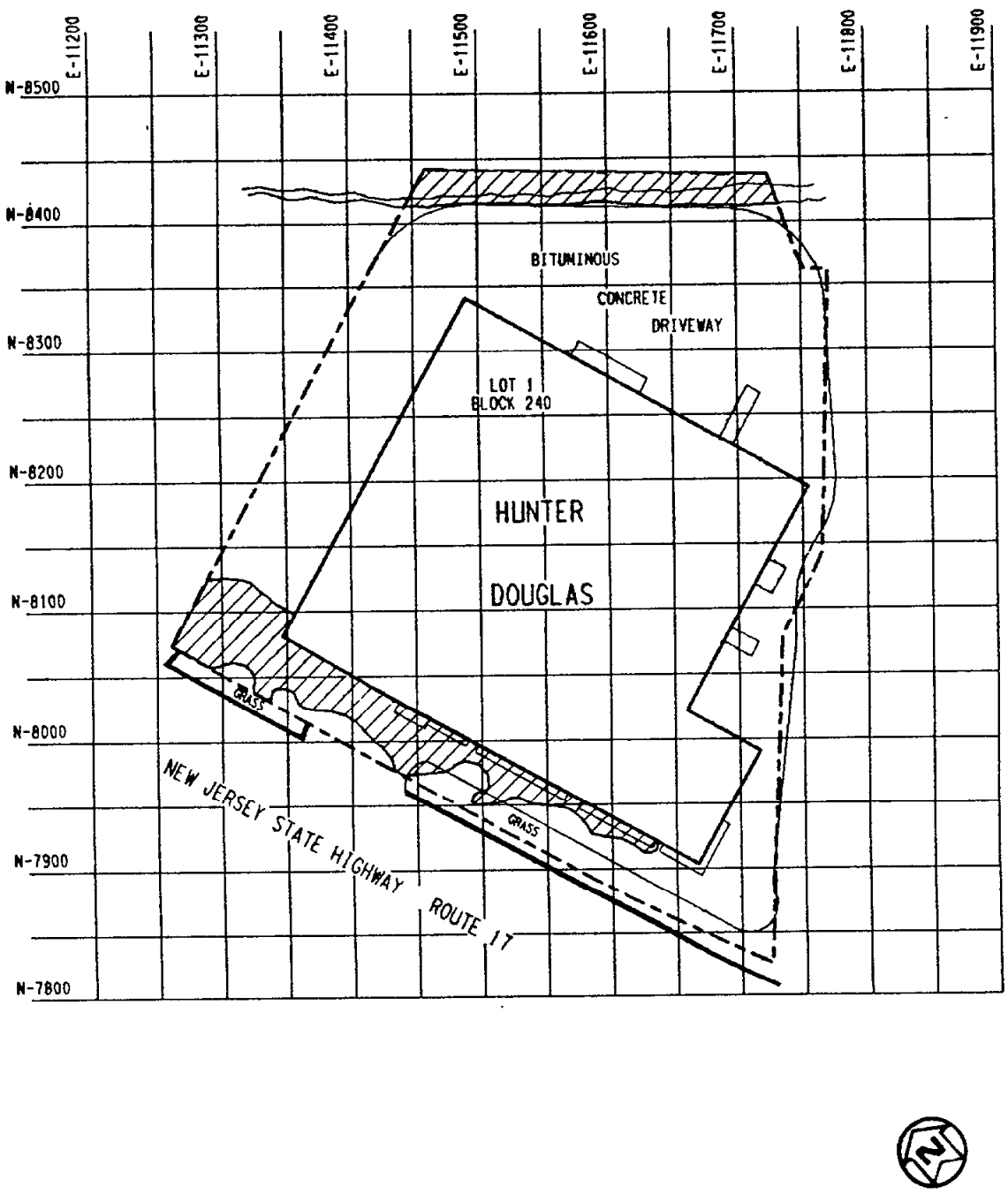

FIGURE 3-2 AREAS OF SURFACE CONTAMINATION AT THE HUNTER DOUGLAS PROPERTY

During the course of the subsurface investigation, 14 radiological boreholes were drilled and gamma logged to determine the depths and concentrations of radioactive contamination. The borehole logs were reviewed to identify trends, regardless of whether concentrations exceeded the guideline. Borehole locations are shown in Figure 3-1. Detailed gamma logging data are presented in Table 3-2 (at the end of Section 3.0). On the basis of the evaluation of the vertical gamma logging data, no instrument readings indicated a concentration of soil contamination in excess of 15 pCi/g.

The ditch located along the eastern boundary of the property was found to contain stream sediments with contamination in excess of the guideline for surface soil. The ditch appears to be a barrier to the contamination. Heavy undergrowth throughout the ditch prohibited drilling in this area. Information obtained during characterization of the adjacent property to the north and east indicates the presence of subsurface contamination to depths of 5 ft immediately adjacent to this ditch (Figure 3-3).

On the basis of geological information gained as a result of this characterization, it was determined that the site is relatively flat (total measured relief of 3.2 ft) with the lowest elevation in the northeast section (43.2 ft m.s.l.) increasing gradually to the south (maximum elevation of 46.4 ft m.s.l.). The site topography generally slopes from the southeast to the north and west. The site is underlain by two types of soil, fill, and the Brunswick sandstone. In the west, as much as 2 ft of black organic silt (cumulous soil) cover decomposed sandstone at depths of 5 to 6 ft. In the far eastern section of the property, the depth to the sandstone decreases as the land elevation increases from a low at the western drainage basin. In this eastern area, a brown residual soil (silty sand) rests atop the parent Brunswick Formation material.

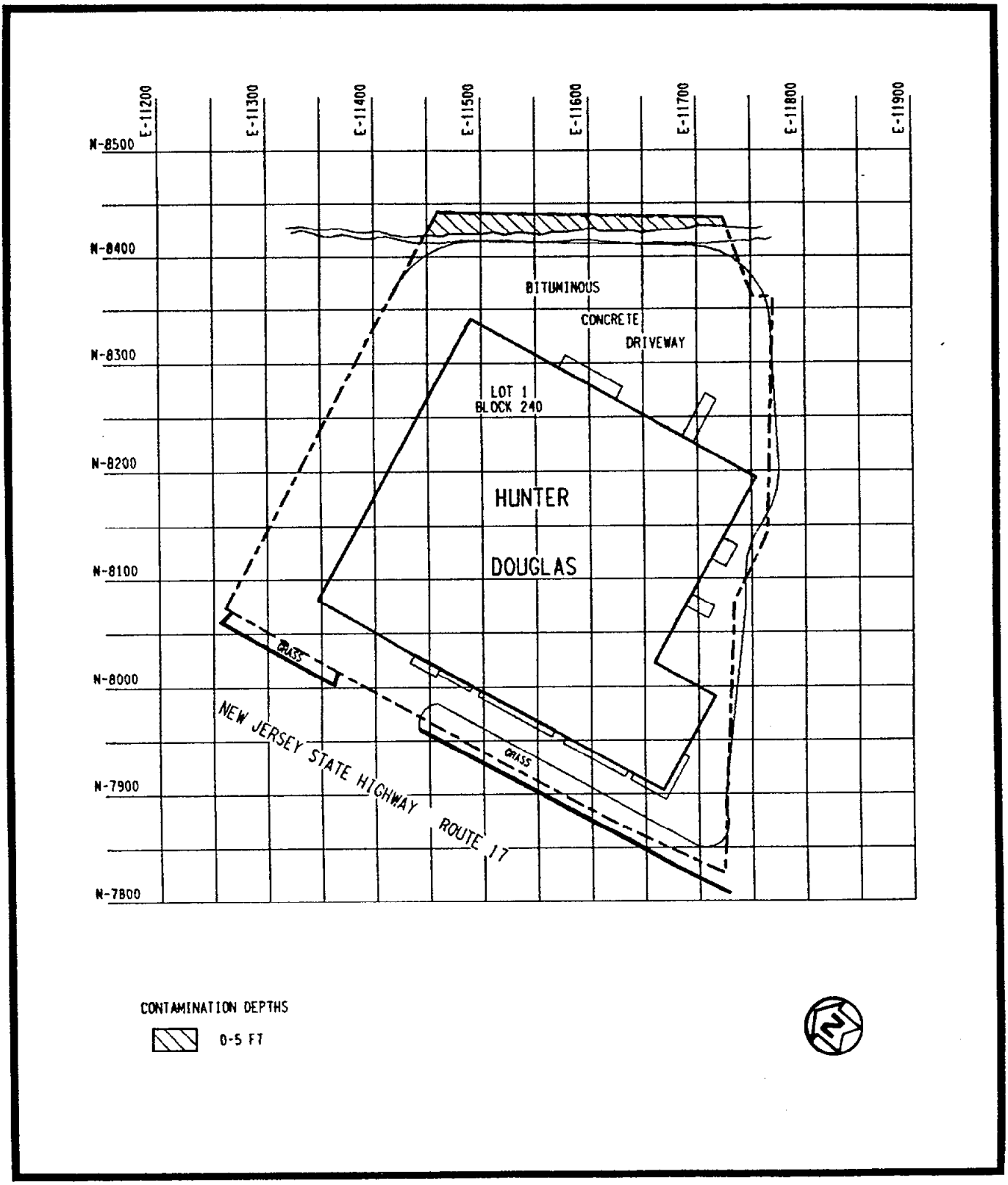

FIGURE 3-3 AREA OF SUBSURFACE CONTAMINATION AT THE HUNTER DOUGLAS PROPERTY

A man-made drainage ditch along the eastern property boundary intercepts southward moving groundwater from the property adjoining the Hunter Douglas property at its southeasternmost corner. Groundwater levels are shallowest adjacent to this drainage ditch but drop off rapidly to the west and south.

TABLE 3-1

SUMMARY OF RESIDUAL CONTAMINATION GUIDELINES FOR THE MAYWOOD SITE

BASIC DOSE LIMITS

The basic limit for the annual radiation dose received by an individual member of the general public is 100 mrem/yr.

SOIL (LAND) GUIDELINES (MAXIMUM LIMITS FOR UNRESTRICTED USE)

Radionuclide	Soil Concentration (pCi/g) above background[a,b,c]
Radium-226 Radium-228 Thorium-230 Thorium-232	5 pCi/g, averaged over the first 15 cm of soil below the surface; 15 pCi/g when averaged over any 15-cm-thick soil layer below the surface layer.
Other radionuclides	Soil guidelines will be calculated on a site-specific basis using the DOE manual developed for this use.

STRUCTURE GUIDELINES (MAXIMUM LIMITS FOR UNRESTRICTED USE)

Airborne Radon Decay Products

Generic guidelines for concentrations of airborne radon decay products shall apply to existing occupied or habitable structures on private property that are intended for unrestricted use; structures that will be demolished or buried are excluded. The applicable generic guideline (40 CFR 192) is: In any occupied or habitable building, the objective of remedial action shall be, and reasonable effort shall be made to achieve, an annual average (or equivalent) radon decay product concentration (including background) not to exceed 0.02 WL.[d] In any case, the radon decay product concentration (including background) shall not exceed 0.03 WL. Remedial actions are not required in order to comply with this guideline when there is reasonable assurance that residual radioactive materials are not the cause.

External Gamma Radiation

The average level of gamma radiation inside a building or habitable structure on a site to be released for unrestricted use shall not exceed the background level by more than 20 μR/h.

Indoor/Outdoor Structure Surface Contamination

	Allowable Residual Surface Contamination[e] (dpm/100 cm^2)		
Radionuclide[f]	Average[g,h]	Maximum[h,i]	Removable[h,j]
Transuranics, Ra-226, Ra-228, Th-230, Th-228 Pa-231, Ac-227, I-125, I-129	100	300	20
Th-Natural, Th-232, Sr-90, Ra-223, Ra-224 U-232, I-126, I-131, I-133	1,000	3,000	200

TABLE 3-1

(continued)

Indoor/Outdoor Structure Surface Contamination (continued)

Radionuclide[f]	Allowable Residual Surface Contamination[e] (dpm/100 cm^2) Average[g,h]	Maximum[h,i]	Removable[h,j]
U-Natural, U-235, U-238, and associated decay products	5,000 α	15,000 α	1,000 α
Beta-gamma emitters (radionuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above	5,000 β -γ	15,000 β -γ	1,000 β -γ

[a]These guidelines take into account ingrowth of radium-226 from thorium-230 and of radium-228 from thorium-232, and assume secular equilibrium. If either thorium-230 and radium-226 or thorium-232 and radium-228 are both present, not in secular equilibrium, the guidelines apply to the higher concentration. If other mixtures of radionuclides occur, the concentrations of individual radionuclides shall be reduced so that the dose for the mixtures will not exceed the basic dose limit.

[b]These guidelines represent unrestricted-use residual concentrations above background averaged across any 15-cm-thick layer to any depth and over any contiguous 100-m^2 surface area.

[c]Localized concentrations in excess of these limits are allowable provided that the average concentration over a 100-m^2 area does not exceed these limits.

[d]A working level (WL) is any combination of short-lived radon decay products in 1 liter of air that will result in the ultimate emission of 1.3×10^5 MeV of potential alpha energy.

[e]As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

[f]Where surface contamination by both alpha- and beta-gamma-emitting radionuclides exists, the limits established for alpha- and beta-gamma-emitting radionuclides should apply independently.

[g]Measurements of average contamination should not be averaged over more than 1 m^2. For objects of less surface area, the average shall be derived for each such object.

[h]The average and maximum radiation levels associated with surface contamination resulting from beta-gamma emitters should not exceed 0.2 mrad/h and 1.0 mrad/h, respectively, at 1 cm.

[i]The maximum contamination level applies to an area of not more than 100 cm^2.

[j]The amount of removable radioactive material per 100 cm^2 of surface area should be determined by wiping that area with dry filter or soft absorbent paper, applying moderate pressure, and measuring the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of surface area less than 100 cm^2 is determined, the activity per unit area should be based on the actual area and the entire surface should be wiped. The numbers in this column are maximum amounts.

TABLE 3-2

SEDIMENT SAMPLING RESULTS FOR THE HUNTER DOUGLAS PROPERTY

Coordinates		Concentration (pCi/g +/- 2 sigma)		
East	North	Uranium-238	Radium-226	Thorium-232
11475	8415	<21.4	4.8 +/- 0.7	33.4 +/- 3.4
11600	8425	<29.0	1.1 +/- 0.4	5.4 +/- 1.2
11710	8430	<25.2	0.7 +/- 0.2	3.2 +/- 0.4

TABLE 3-3

DOWNHOLE GAMMA LOGGING RESULTS FOR THE HUNTER DOUGLAS PROPERTY

Coordinates East	Coordinates North	Depth (a) (ft)	Counts per Minute
11330	8065	0.5	23,000
11330	8065	1.0	19,000
11330	8065	1.5	19,000
11330	8065	2.0	18,000
11330	8065	2.5	19,000
11330	8065	3.0	19,000
11330	8065	3.5	19,000
11330	8065	4.0	18,000
11350	8075	0.5	10,000
11350	8075	1.0	10,000
11350	8075	1.5	12,000
11350	8075	2.0	13,000
11350	8075	2.5	14,000
11350	8075	3.0	14,000
11350	8075	3.5	13,000
11350	8075	4.0	13,000
11350	8075	4.5	12,000
11350	8075	5.0	12,000
11350	8075	5.5	12,000
11350	8075	6.0	12,000
11398	8205	0.5	8,000
11398	8205	1.0	12,000
11398	8205	1.5	15,000
11398	8205	2.0	18,000
11398	8205	2.5	18,000
11398	8205	3.0	20,000
11398	8205	3.5	19,000
11398	8205	4.0	17,000
11398	8205	4.5	15,000
11398	8205	5.0	11,000
11398	8205	5.5	10,000
11398	8205	6.0	10,000
11398	8205	6.5	10,000
11398	8205	7.0	10,000
11398	8205	7.5	10,000
11398	8205	8.0	11,000
11398	8205	8.5	11,000
11400	8000	0.5	9,000
11400	8000	1.0	8,000
11400	8000	1.5	8,000

TABLE 3-3
(continued)

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Coordinates East	Coordinates North	Depth (a) (ft)	Counts per Minute
11400	8000	2.0	10,000
11400	8000	2.5	12,000
11400	8000	3.0	12,000
11400	8000	3.5	13,000
11400	8000	4.0	12,000
11400	8000	4.5	14,000
11400	8000	5.0	12,000
11400	8000	5.5	13,000
11400	8000	6.0	12,000
11400	8000	6.5	11,000
11400	8000	7.0	12,000
11400	8000	7.5	12,000
11400	8000	8.0	11,000
11400	8000	8.5	11,000
11400	8000	9.0	11,000
11400	8000	9.5	10,000
11400	8000	10.0	10,000
11400	8000	10.5	11,000
11400	8000	11.0	11,000
11400	8000	11.5	11,000
11400	8000	12.0	11,000
11400	8000	12.5	10,000
11400	8000	13.0	10,000
11400	8300	0.5	7,000
11400	8300	1.0	11,000
11400	8300	1.5	15,000
11400	8300	2.0	15,000
11400	8300	2.5	14,000
11400	8300	3.0	13,000
11400	8300	3.5	12,000
11400	8300	4.0	12,000
11400	8300	4.5	11,000
11400	8300	5.0	11,000
11400	8300	5.5	10,000
11400	8300	6.0	10,000
11400	8300	6.5	10,000
11400	8300	7.0	11,000
11400	8300	7.5	11,000
11400	8300	8.0	10,000
11400	8300	8.5	11,000
11400	8300	9.0	11,000
11400	8300	9.5	11,000

TABLE 3-3

(continued)

Coordinates East	Coordinates North	Depth (a) (ft)	Counts per Minute
11400	8300	10.0	10,000
11400	8300	10.5	10,000
11400	8300	11.0	9,000
11400	8300	11.5	10,000
11400	8300	12.0	9,000
11400	8300	12.5	9,000
11400	8300	13.0	10,000
11400	8300	13.5	9,000
11500	8395	0.5	9,000
11500	8395	1.0	15,000
11500	8395	1.5	19,000
11500	8395	2.0	19,000
11500	8395	2.5	18,000
11500	8395	3.0	16,000
11500	8395	3.5	14,000
11500	8395	4.0	12,000
11500	8395	4.5	10,000
11500	8395	5.0	9,000
11500	8395	5.5	9,000
11500	8395	6.0	9,000
11500	8395	6.5	9,000
11500	8395	7.0	9,000
11500	8395	7.5	9,000
11500	8395	8.0	10,000
11500	8395	8.5	10,000
11500	8395	9.0	11,000
11500	8395	9.5	11,000
11500	8395	10.0	10,000
11500	8395	10.5	10,000
11500	8395	11.0	11,000
11500	8395	11.5	11,000
11600	8300	0.5	10,000
11600	8300	1.0	11,000
11600	8300	1.5	13,000
11600	8300	2.0	16,000
11600	8300	2.5	16,000
11600	8300	3.0	17,000
11600	8300	3.5	18,000
11600	8300	4.0	17,000
11600	8300	4.5	14,000
11600	8300	5.0	13,000

TABLE 3-3

(continued)

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Coordinates East	Coordinates North	Depth (a) (ft)	Counts per Minute
11600	8300	5.5	13,000
11600	8300	6.0	14,000
11600	8300	6.5	12,000
11600	8300	7.0	12,000
11600	8300	7.5	12,000
11600	8300	8.0	11,000
11600	8300	8.5	12,000
11600	8300	9.0	11,000
11600	8300	9.5	11,000
11600	8390	0.5	8,000
11600	8390	1.0	6,000
11600	8390	1.5	9,000
11600	8390	2.0	13,000
11600	8390	2.5	16,000
11600	8390	3.0	16,000
11600	8390	3.5	16,000
11600	8390	4.0	13,000
11600	8390	4.5	11,000
11600	8390	5.0	10,000
11600	8390	5.5	10,000
11600	8390	6.0	9,000
11600	8390	6.5	9,000
11600	8390	7.0	9,000
11600	8390	7.5	9,000
11600	8390	8.0	9,000
11600	8390	8.5	10,000
11600	8390	9.0	10,000
11600	8390	9.5	9,000
11600	8390	10.0	9,000
11600	8390	10.5	9,000
11600	8390	11.0	9,000
11600	8390	11.5	9,000
11600	8390	12.0	10,000
11600	8390	12.5	10,000
11600	8390	13.0	10,000
11608	7940	0.5	11,000
11608	7940	1.0	13,000
11608	7940	1.5	13,000
11608	7940	2.0	12,000
11608	7940	2.5	12,000
11608	7940	3.0	13,000

TABLE 3-3

(continued)

Page 5 of 7

Coordinates East	Coordinates North	Depth (a) (ft)	Counts per Minute
11608	7940	3.5	13,000
11608	7940	4.0	12,000
11608	7940	4.5	12,000
11608	7940	5.0	12,000
11608	7940	5.5	12,000
11608	7940	6.0	12,000
11608	7940	6.5	12,000
11608	7940	7.0	11,000
11608	7940	7.5	10,000
11608	7940	8.0	10,000
11608	7940	8.5	9,000
11608	7940	9.0	10,000
11608	7940	9.5	10,000
11608	7940	10.0	11,000
11608	7940	10.5	12,000
11608	7940	11.0	13,000
11608	7940	11.5	11,000
11608	7940	12.0	11,000
11608	7940	12.5	11,000
11608	7940	13.0	10,000
11608	7940	13.5	11,000
11608	7940	14.0	11,000
11608	7940	14.5	11,000
11608	7940	15.0	11,000
11700	7900	0.5	6,000
11700	7900	1.0	9,000
11700	7900	1.5	12,000
11700	7900	2.0	12,000
11700	7900	2.5	12,000
11700	7900	3.0	12,000
11700	7900	3.5	11,000
11700	7900	4.0	10,000
11700	7900	4.5	10,000
11700	7900	5.0	8,000
11700	7900	5.5	20,000
11700	7900	6.0	10,000
11700	7900	6.5	11,000
11700	7900	7.0	10,000
11700	7900	7.5	11,000
11700	8300	0.5	5,000
11700	8300	1.0	8,000

TABLE 3-3

(continued)

Coordinates East	Coordinates North	Depth (a) (ft)	Counts per Minute
11700	8300	1.5	11,000
11700	8300	2.0	12,000
11700	8300	2.5	14,000
11700	8300	3.0	14,000
11700	8300	3.5	11,000
11700	8300	4.0	11,000
11700	8300	4.5	10,000
11700	8300	5.0	10,000
11700	8300	5.5	10,000
11700	8390	0.5	7,000
11700	8390	1.0	9,000
11700	8390	1.5	11,000
11700	8390	2.0	13,000
11700	8390	2.5	13,000
11700	8390	3.0	13,000
11700	8390	3.5	13,000
11700	8390	4.0	13,000
11700	8390	4.5	11,000
11700	8390	5.0	11,000
11700	8390	5.5	11,000
11700	8390	6.0	11,000
11700	8390	6.5	11,000
11700	8390	7.0	12,000
11700	8390	7.5	11,000
11700	8390	8.0	11,000
11700	8390	8.5	11,000
11700	8390	9.0	11,000
11700	8390	9.5	11,000
11705	8303	0.5	9,000
11705	8303	1.0	11,000
11705	8303	1.5	12,000
11705	8303	2.0	13,000
11705	8303	2.5	15,000
11705	8303	3.0	12,000
11705	8303	3.5	12,000
11705	8303	4.0	11,000
11705	8303	4.5	11,000
11705	8303	5.0	11,000
11705	8303	5.5	11,000
11705	8303	6.0	12,000
11705	8303	6.5	11,000

TABLE 3-3

(continued)

Coordinates East	Coordinates North	Depth (a) (ft)	Counts per Minute
11705	8303	7.0	11,000
11715	8005	0.5	7,000
11715	8005	1.0	11,000
11715	8005	1.5	12,000
11715	8005	2.0	12,000
11715	8005	2.5	11,000
11715	8005	3.0	12,000
11715	8005	3.5	13,000
11715	8005	4.0	12,000
11715	8005	4.5	12,000
11715	8005	5.0	12,000
11715	8005	5.5	12,000
11715	8005	6.0	11,000
11715	8005	6.5	10,000
11715	8005	7.0	11,000
11715	8005	7.5	12,000
11715	8005	8.0	12,000
11715	8005	8.5	11,000
11715	8005	9.0	10,000
11715	8005	9.5	11,000
11720	8210	0.5	7,000
11720	8210	1.0	10,000
11720	8210	1.5	12,000
11720	8210	2.0	17,000
11720	8210	2.5	15,000
11720	8210	3.0	15,000
11720	8210	3.5	15,000
11720	8210	4.0	14,000
11720	8210	4.5	14,000
11720	8210	5.0	13,000

(a) The variations in depths of boreholes and corresponding results given in this table are based on the boreholes penetrating the contamination or the drill reaching refusal.

4.0 CHEMICAL CHARACTERIZATION

Limited chemical characterization of the Hunter Douglas property was performed to determine whether hazardous waste is mixed with the radioactive waste and to provide the information needed to design an employee health protection program appropriate to the nature of the materials encountered during future remedial action activities. To identify hazardous chemicals on-site, a soil sample was collected from one borehole [Coordinates N8303, E11705 (Figure 3-1)] by continuous split-spoon methodology, i.e., driving a split-spoon sampler in advance of the auger at one drillhole location. The spoon had a 1.4-in. inside diameter and was 2 ft long. Before the sample was taken, the samplers were decontaminated pursuant to EPA methods using methylene chloride, acetone, and steam washes. Split-spoon samplers were driven in 2-ft increments.

Since the purpose of this investigation was to perform a limited chemical characterization, the sample was composited to a maximum drillhole depth of 16 ft. A sample for VOA was placed on ice in the field to minimize volatilization of chemicals in the sample during compositing. The sample was analyzed for VOA, BNAE, priority pollutant metals, pesticides and PCBs, and EPA-specified hazardous waste characteristics [i.e., extraction procedure (EP) toxicity, corrosivity, reactivity, and ignitability]. These parameters were selected to provide a representative cross section of the hazardous constituents listed in the RCRA [40 CFR 261, Appendix VIII (Ref. 6)]. This characterization was planned and implemented in accordance with methods described by the EPA (Ref. 7). The sampling plan was reviewed by the EPA.

VOA indicated that no volatile organics were present in the sample. Only a general evaluation of the data can be given as the holding time for the VOA was exceeded by the laboratory.

The sample showed the presence of BNAE (semi-volatile) organics. All of the semi-volatiles identified had concentrations below the

laboratory's specified detection limit. According to the EPA Contractor Laboratory Program statement of work for organic analyses (May 1984), only analytical results greater than or equal to the laboratory's specified detection limit are required to be reported.

The following semi-volatiles were identified in the sample taken from the borehole adjacent to the Hunter Douglas building: naphthalene, 80 ppb; 2-methylnaphthalene, 88 ppb; and bis (2-ethylhexyl) phthalate, 30 ppb. Naphthalene and bis (2-ethylhexyl) phthalate are listed as hazardous constituents under the New Jersey Administrative Code.

Bis (2-ethylhexyl) phthalate was identified in the sample. This substance, a component of most plastic materials used in laboratory operations, is a common laboratory contaminant.

The sample was analyzed for priority pollutant pesticides and PCBs. No PCBs or pesticides were found in the sample.

The sample was analyzed for priority pollutant metals. These analysis results were compared to the range of concentrations present in soil samples typical of background soil concentration ranges for the specified priority pollutant metal.

The maximum concentration observed for each priority pollutant metal was compared with the EP toxicity concentration for that metal. All of the EP toxicity concentrations were below the criteria level (40 CFR 261.24) (Ref. 8). This may be an indication that these metals are not readily leachable from the soil or are not present in concentrations high enough to produce leachate that exceeds the EPA criteria for hazardous waste according to EP toxicity characteristics. Trace levels of the metal barium were well below the maximum concentration specified under 40 CFR 261.24 (Ref. 8).

The sample was also analyzed for EP toxicity pesticides and as mentioned for the hazardous waste characteristics of corrosivity,

reactivity, and ignitability. The EP toxicity analysis results indicated that no detectable quantities of pesticides were present. In addition, the sample exhibited no corrosivity, reactivity, or ignitability hazardous waste characteristics.

Complete results of the chemical characterization are on file with DOE (Ref. 9).

REFERENCES

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3. Morton, Henry W., Natural Thorium in Maywood, New Jersey, Nuclear Safety Associates, Inc., Potomac, MD, September 29, 1982.

4. U.S. Department of Energy. "U.S. Department of Energy Guidelines for Residual Radioactivity at Formerly Utilized Sites Remedial Action Program and Remote Surplus Facilities Management Program Sites," Rev. 1, July 1985.

5. Trip Report, C. P. Leichtweis, Bechtel National, Inc., to File. "Calibration and Functional Checks of Eberline Instrumentation," CCN 35677, March 25, 1986.

6. U.S. Code of Federal Regulations. 40 CFR 261, Appendix VIII, "Hazardous Constituents," Washington, DC, July 1986.

7. U.S. Environmental Protection Agency. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 2nd edition, Washington, DC, 1982.

8. U.S. Code of Federal Regulations. 40 CFR 261.24, "Characteristic of EP Toxicity," Washington, DC, July 1986.

9. Memorandum, C.P. Leichtweis, Bechtel National, Inc., to T.M. Dravecky, Bechtel National, Inc. "Sears and Vicinity Property Characterization Results (Chemical Data)," CCN 042662, January 16, 1987.

APPENDIX A

GEOLOGIC DRILL LOGS FOR THE

MAYWOOD INTERIM STORAGE SITE - HUNTER DOUGLAS

GEOLOGIC DRILL LOG

PROJECT: FUSRAP	JOB NO.: 14501-138	SHEET NO.: 1 OF 1	HOLE NO.: MISS-112R
SITE: MAYWOOD INTERIM STORAGE SITE-HUNTER DOUGLAS	COORDINATES: N8005, E11715	ANGLE FROM HORIZ.: 90°	BEARING: N/A
BEGUN: 6/18/86	COMPLETED: 6/18/86	DRILLER: MORE TRENCH ENVIRONMENTAL SERVICES	DRILL MAKE AND MODEL: MOBILE B-33
HOLE SIZE: 5"	OVERBURDEN (FT.): 6.0'	ROCK (FT.): 4.0'	TOTAL DEPTH: 10.0'
CORE RECOVERY FT./%: N/A	CORE BOXES: N/A	SAMPLES: N/A	EL. TOP OF CASING: N/A
GROUND EL.: 47.1'	DEPTH/EL. GROUND WATER: 6.0'/41.1'	DEPTH/EL. TOP OF ROCK: 6.0'/41.1'	
SAMPLE HAMMER WEIGHT/FALL: N/A	CASING LEFT IN HOLE: DIA./LENGTH: N/A	LOGGED BY: P.YEH	

SAMPLE TYPE AND DIAMETER	SAMPLER ADVANCE, LENGTH CORE RUN	SAMPLE RECOVERY, CORE RECOVERY	SAMPLE BLOWS per PERCENT CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN ST. 5' EXT.	WATER PRESSURE TESTS: PRESSURE P.S.I. 2000 S'	WATER PRESSURE TESTS: TIME IN MINUTES 2000 5'	ELEVATION	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION *	NOTES ON WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
5" AUGER THROUGHOUT.							47.1	0				
							46.1	LO			0.0-LO': ASPHALT; GRAYISH BLACK (N2).	SITE CHECKED FOR RADIOACTIVE CONTAMINATION BY EBERLINE ANALYTICAL CORPORATION.
							45.1	2.0			LO-2.0': SILT, SOIL; DUSKY BROWN (5YR2/2), SANDY, SLIGHTLY CLAYEY, DRY.	
								5			2.0-6.0': SAND (SC-SM); FINE-GRAINED, SILTY, SLIGHTLY PLASTIC TO NON-PLASTIC, MOIST. 2.0-4.0': PALE YELLOWISH BROWN (10YR6/2). 4.0-6.0': GREENISH GRAY (5GY6/1), CLAYEY.	▽ 6/20/86.
							41.1	6.0			6.0-10.0': SANDSTONE; DARK REDDISH BROWN (10R3/4), SOFT TO MODERATELY HARD, FINE-GRAINED, SILTY, WEATHERED, SATURATED.	EBERLINE ANALYTICAL CORPORATION PERFORMED GAMMA LOGGING.
							37.1	10				
											BOTTOM OF HOLE AT 10.0 FT. HOLE BACKFILLED WITH CEMENT-BENTONITE GROUT, 6/20/86.	*DESCRIPTION AND CLASSIFICATION BY VISUAL EXAMINATION OF CUTTINGS.

SS-SPLIT SPOON ST-SHELBY TUBE; P-PISTON O-OTHER

SITE: MAYWOOD INTERIM STORAGE SITE-HUNTER DOUGLAS

HOLE NO.: MISS-112R

GEOLOGIC DRILL LOG

PROJECT: FUSRAP	JOB NO.: 14501-138	SHEET NO.: 1 OF 1	HOLE NO.: MISS-113R		
SITE: MAYWOOD INTERIM STORAGE SITE-HUNTER DOUGLAS	COORDINATES: N8210,E11720	ANGLE FROM HORIZ.: 90°	BEARING: N/A		
BEGUN: 6/18/86	COMPLETED: 6/18/86	DRILLER: MORETRENCH ENVIRONMENTAL SERVICES	DRILL MAKE AND MODEL: MOBILE B-33	HOLE SIZE: 5"	OVERBURDEN (FT.): 5.0'	ROCK (FT.): 0.0'	TOTAL DEPTH: 5.0'
CORE RECOVERY/FT./%: N/A	CORE BOXES: N/A	SAMPLES: N/A	EL. TOP OF CASING: N/A	GROUND EL.: 43.2'	DEPTH/EL. GROUND WATER: 3.0'/40.2'	DEPTH/EL. TOP OF ROCK: N/A	
SAMPLE HAMMER WEIGHT/FALL: N/A	CASING LEFT IN HOLE: DIA./LENGTH: N/A	LOGGED BY: P.YEH					

SAMPLE TYPE AND DIAMETER	SAMPLER ADVANCE, LENGTH CORE TUBE	SAMPLE RECOVERY, CORE RECOVERY	SAMPLE BLOWS / PERCENT CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN ... GPM	WATER PRESSURE TESTS: PRESSURE P.S.I.	WATER PRESSURE TESTS: TIME IN MINUTES	ELEVATION	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION*	NOTES ON WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
5" AUGER THROUGHOUT.							43.2	0			0.0-1.5': ASPHALT AND CRUSHED ROCK; GRAYISH BLACK (N2).	
							41.7	1.5			1.5-5.0': SAND (SC-SM); DARK REDDISH BROWN (10R3/4), FINE-GRAINED, SILTY, NON-PLASTIC, MOIST TO SATURATED.	▽ 6/20/86.
							38.2	5			BOTTOM OF HOLE AT 5.0 FT. HOLE BACKFILLED WITH CEMENT-BENTONITE GROUT, 6/20/86.	AUGER REFUSAL AT 5.0 FT; POSSIBLE SEWER PIPE AT THIS ELEVATION. SITE CHECKED FOR RADIOACTIVE CONTAMINATION BY EBERLINE ANALYTICAL CORPORATION. EBERLINE ANALYTICAL CORPORATION PERFORMED GAMMA LOGGING. *DESCRIPTION AND CLASSIFICATION BY VISUAL EXAMINATION OF CUTTINGS.

SS=SPLIT SPOON; ST=SHELBY TUBE; D=DENISON; P=PITCHER; O=OTHER

SITE: MAYWOOD INTERIM STORAGE SITE-HUNTER DOUGLAS

HOLE NO.: MISS-113R

GEOLOGIC DRILL LOG

PROJECT: FUSRAP	JOB NO.: 14501-138	SHEET NO.: 1 OF 1	HOLE NO.: MISS-114R
SITE: MAYWOOD INTERIM STORAGE SITE-HUNTER DOUGLAS	COORDINATES: N8300,E11700	ANGLE FROM HORIZ.: 90°	BEARING: N/A

DRILLED	COMPLETED	DRILLER	DRILL MAKE AND MODEL	HOLE SIZE	OVERBURDEN (FT.)	ROCK (FT.)	TOTAL DEPTH
6/18/86	6/18/86	MORETRENCH ENVIRONMENTAL SERVICES	MOBILE B-33	5"	4.0'	1.0'	5.0'

CORE RECOVERY (FT.)/%	CORE BOXES	SAMPLES	EL. TOP OF CASING	GROUND EL.	DEPTH/EL. GROUND WATER	DEPTH/EL. TOP OF ROCK
N/A	N/A	N/A	N/A	44.4'	3.0'/41.4'	4.0'/40.4'

SAMPLE HAMMER WEIGHT/FALL	CASING LEFT IN HOLE: DIA./LENGTH	LOGGED BY:
N/A	N/A	P. YEH

SAMPLE TYPE AND DIAMETER	SAMPLER ADVANCE/ LENGTH CORE RUN	SAMPLE RECOVERY/ CORE RECOVERY	SAMPLE BLOWS per FOOT/% CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN GAL./FT.	WATER PRESSURE TESTS: PRESSURE P.S.I.	WATER PRESSURE TESTS: TIME IN MINUTES	ELEVATION	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION *	NOTES ON WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
5" AUGER THROUGHOUT.							44.4	0				
							43.4	1.0			0.0-1.0': ASPHALT; GRAYISH BLACK (N2).	
											1.0-4.0': SAND (SC-SM); DARK REDDISH BROWN (10R3/4), FINE-GRAINED, SILTY, NON-PLASTIC, MOIST TO SATURATED.	▽ 6/20/86.
							40.4	4.0			4.0-5.0': SANDSTONE: LIGHT OLIVE GRAY (5Y5/2), SOFT TO MODERATELY HARD, FINE-GRAINED, SILTY, WEATHERED, SATURATED.	
							39.4	5			BOTTOM OF HOLE AT 5.0 FT. HOLE BACKFILLED WITH CEMENT-BENTONITE GROUT, 6/20/86.	AUGER REFUSAL AT 5.0 FT.

SITE: MAYWOOD INTERIM STORAGE SITE-HUNTER DOUGLAS

HOLE NO.: MISS-114R

SITE CHECKED FOR RADIOACTIVE CONTAMINATION BY EBERLINE ANALYTICAL CORPORATION.

EBERLINE ANALYTICAL CORPORATION PERFORMED GAMMA LOGGING.

HEAVY ODOR OF GASOLINE ABOVE GROUND, EXCEEDING THE EXPLOSIVE LIMIT.

POSSIBLE SITE OF ABANDONED FUEL STATION, AS REPORTED BY PERSONS FROM ADJACENT BUILDING.

*DESCRIPTION AND CLASSIFICATION BY VISUAL EXAMINATION OF CUTTINGS.

GEOLOGIC DRILL LOG

PROJECT: FUSRAP	JOB NO.: 14501-138	SHEET NO.: 1 OF 1	HOLE NO.: MISS-115R
SITE: MAYWOOD INTERIM STORAGE SITE- HUNTER DOUGLAS	COORDINATES: N8395,E11500	ANGLE FROM HORIZ.: 90°	BEARING: N/A

STARTED	COMPLETED	DRILLER	DRILL MAKE AND MODEL	HOLE SIZE	OVERBURDEN (FT.)	ROCK (FT.)	TOTAL DEPTH
6/18/86	6/18/86	MORETRENCH ENVIRONMENTAL SERVICES	MOBILE B-33	5"	8.0'	3.5'	11.5'

CORE RECOVERY/FT./%	CORE BARREL	SAMPLES	EL. TOP OF CASING	GROUND EL.	DEPTH/EL. GROUND WATER	DEPTH/EL. TOP OF ROCK
N/A	N/A	N/A	N/A	44.8'	3.0'/41.8'	8.0'/36.8'

SAMPLE HAMMER WEIGHT/FALL	CASING LEFT IN HOLE: DIA./DEPTH	LOGGED BY:
N/A	N/A	P. YEH

SAMPLE TYPE AND DIAMETER	SAMPLER ADVANCE LENGTH CORE RUN	SAMPLE RECOVERY CORE RECOVERY	SAMPLE BLOWS "N" PERCENT CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN GAL./MIN.	WATER PRESSURE TESTS: PRESSURE P.S.I.	WATER PRESSURE TESTS: TIME IN MINUTES	ELEVATION	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION *	NOTES ON WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
5" AUGER THROUGHOUT.							44.8	0				
							43.8	L0			0.0-L0': ASPHALT; GRAYISH BLACK (N2).	
								5			L0-8.0': SAND (SC-SM); FINE-GRAINED, SILTY, NON-PLASTIC TO SLIGHTLY PLASTIC, MOIST TO SATURATED. L0-5.0': DARK REDDISH BROWN (10R3/4). 5.0-6.0': GREENISH GRAY (5G6/1). 6.0-8.0': GRAYISH ORANGE (10YR7/4).	▽ 6/20/86. SITE CHECKED FOR RADIOACTIVE CONTAMINATION BY EBERLINE ANALYTICAL CORPORATION.
							36.8	8.0			L0-11.5': SANDSTONE; MODERATE REDDISH BROWN (10R4/6), SOFT, FINE-GRAINED, SILTY, WEATHERED, NON-PLASTIC, SATURATED.	EBERLINE ANALYTICAL CORPORATION PERFORMED GAMMA LOGGING.
							33.3	10 11.5			BOTTOM OF HOLE AT 11.5 FT. HOLE BACKFILLED WITH CEMENT-BENTONITE GROUT. 6/20/86.	*DESCRIPTION AND CLASSIFICATION BY VISUAL EXAMINATION OF CUTTINGS.

SS=SPLIT SPOON; ST=SHELBY TUBE; R=ROCKBOX; P=PITCHER; O=OTHER

SITE: MAYWOOD INTERIM STORAGE SITE- HUNTER DOUGLAS

HOLE NO.: MISS-115R

GEOLOGIC DRILL LOG

PROJECT: FUSRAP	JOB NO.: 14501-138	SHEET NO.: 1 OF 1	HOLE NO.: MISS-11GR		
SITE: MAYWOOD INTERIM STORAGE SITE-HUNTER DOUGLAS	COORDINATES: N8390,E11600	ANGLE FROM HORIZ.: 90°	BEARING: N/A		
BEGAN: 6/18/86	COMPLETED: 6/18/86	DRILLER: MORE TRENCH ENVIRONMENTAL SERVICES	DRILL MAKE AND MODEL: MOBILE B-33	HOLE SIZE: 5"	OVERBURDEN (FT.): 11.0'	ROCK (FT.): 4.0'	TOTAL DEPTH: 15.0'
CORE RECOVERY/FT./%: N/A	CORE BOXES: N/A	SAMPLES: N/A	EL. TOP OF CASING: N/A	GROUND EL.: 45.6'	DEPTH/EL. GROUND WATER: 0.5'/45.1'	DEPTH/EL. TOP OF ROCK: 11.0'/34.6'	
SAMPLE HAMMER WEIGHT/FALL: N/A	CASING LEFT IN HOLE; DIA./LENGTH: N/A	LOGGED BY: P.YEN					

SAMPLE TYPE AND DIAMETER	SAMPLER ADVANCE LENGTH CORE RUN	SAMPLE RECOVERY CORE RECOVERY	SAMPLE TX ORE % PERCENT CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN GAL. PER MIN.	WATER PRESSURE TESTS: PRESSURE P.S.I.	WATER PRESSURE TESTS: TIME IN MINUTES	ELEVATION	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION*	NOTES ON WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
5' AUGER THROUGHOUT.							45.6	0			0.0-1.0': ASPHALT: GRAYISH BLACK (N2).	▽ 6/20/86.
							44.6	1.0			1.0-8.0': SAND (SC-SM), FINE-GRAINED, SILTY, NON-PLASTIC, MOIST TO DRY (1.0-8.0 FT), SATURATED (8.0-11.0 FT). 1.0-2.0': DARK REDDISH BROWN (10R3/4). 2.0-3.0': MODERATE BROWN (5YR3/4). 3.0-4.0': DARK REDDISH BROWN (10R3/4). 4.0-7.0': GREENISH GRAY (5GY6/1). 7.0-8.0': PINKISH GRAY (5YR8/1). 8.0-9.0': GRAYISH ORANGE (10YR7/4). 9.0-11.0': YELLOWISH GRAY (5Y7/2).	SITE CHECKED FOR RADIOACTIVE CONTAMINATION BY EBERLINE ANALYTICAL CORPORATION. EBERLINE ANALYTICAL CORPORATION PERFORMED GAMMA LOGGING.
								5				
								10				
							34.6	11.0			11.0-15.0': SANDSTONE: MODERATE REDDISH BROWN (10R4/6), SOFT TO MODERATELY HARD, FINE-TO MEDIUM-GRAINED, SILTY, SATURATED.	
							30.6	15				
											BOTTOM OF HOLE AT 15.0 FT. BACKFILLED WITH CEMENT-BENTONITE GROUT, 6-20-86.	*DESCRIPTION AND CLASSIFICATION BY VISUAL EXAMINATION OF CUTTINGS.

S=SPLIT SPOON; ST=SHELBY TUBE; P=PISTON; O=OTHER

SITE: MAYWOOD INTERIM STORAGE SITE-HUNTER DOUGLAS

HOLE NO.: MISS-11GR

GEOLOGIC DRILL LOG

PROJECT: FUSRAP	JOB NO.: 14501-138	SHEET NO.: 1 OF 1	HOLE NO.: MISS-117R		
SITE: MAYWOOD INTERIM STORAGE SITE - HUNTER DOUGLAS	COORDINATES: N8390,E11700	ANGLE FROM HORIZ.: 90°	BEARING: N/A		
BEGUN: 6/19/86	COMPLETED: 6/19/86	DRILLER: MORETRENCH ENV. SERV.	DRILL MAKE AND MODEL: MOBILE B-33	HOLE SIZE: 6"	OVERBURDEN (FT.): 8.0'	ROCK (FT.): 1.5'	TOTAL DEPTH: 9.5'
CORE RECOVERY FT./%: N/A	CORE BARREL: N/A	SAMPLES: N/A	EL. TOP OF CASING: N/A	GROUND EL.: 45.2'	DEPTH/EL. GROUND WATER: 3.5'/41.7'	DEPTH/EL. TOP OF ROCK: 8.0'/37.2'	
SAMPLE HAMMER WEIGHT/FALL: N/A	CASING LEFT IN HOLE: DIA./LENGTH: N/A	LOGGED BY: P. YEN					

SAMPLE TYPE AND DIAMETER	SAMPLER ADVANCE, LENGTH CORE RUN	SAMPLE RECOVERY, CORE RECOVERY	SAMPLE BLOWS TO 1' PERCENT CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN GPM	WATER PRESSURE TESTS: PRESSURE P.S.I.	WATER PRESSURE TESTS: TIME IN MINUTES	ELEVATION	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION *	NOTES ON WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
6" AUGER THROUGHOUT							45.2	0				
							44.7	0.5			0.0-0.5': ASPHALT, GRAYISH BLACK (N2).	
								5			0.5-8.0': SAND (SC-SM) FINE-GRAINED, SILTY, NON-PLASTIC, MOIST. 0.5-3.0': DUSKY RED (5YR3/4). 3.0-4.0': GRAYISH BROWN (5YR3/2). 4.0-5.0': GREENISH GRAY (5GY6/1), SLIGHTLY CLAYEY. (4-5'),MOIST.	▽ 6/20/86. SITE CHECKED FOR RADIOACTIVE CONTAMINATION AND HOLE GAMMA LOGGED BY EBERLINE ANALYTICAL CORPORATION.
							37.2	8.0			8.0-9.5': SANDSTONE, DUSKY RED (5R3/4), SOFT, FINE-GRAINED, SILTY, WEATHERED, SATURATED.	
							35.7	9.5			BOTTOM OF HOLE AT 9.5 FT. HOLE BACKFILLED WITH CEMENT-BENTONITE GROUT, 6/20/86.	AUGER REFUSAL AT 9.5 FT.
								10				
								15				
								20				
								25				
								30				
								35				* DESCRIPTION AND CLASSIFICATION BY VISUAL EXAMINATION.

SS=SPLIT SPOON; ST=SHELBY TUBE; C=CORE BARREL; P=PISTON; O=OTHER

SITE: MAYWOOD INTERIM STORAGE SITE-HUNTER DOUGLAS

HOLE NO.: MISS-117R

GEOLOGIC DRILL LOG

PROJECT: FUSRAP	JOB NO.: 14501-138	SHEET NO.: 1 of 1	HOLE NO.: MISS-118R		
SITE: MAYWOOD STORAGE SITE-HUNTER DOUGLAS	COORDINATES: N8300 E11600		ANGLE FROM HORIZ.: 90	BEARING: N/A	
BEGUN: 6-19-86	COMPLETED: 6-19-86	DRILLER: MORETRENCH ENVIRONMENTAL SERVICES	DRILL MAKE AND MODEL: MOBILE B-33	HOLE SIZE: 6"	OVERBURDEN (FT.): 5.0'
ROCK (FT.): 4.0'	TOTAL DEPTH: 9.0'				
CORE RECOVERY FT./%: N/A	CORE BOXES: N/A	SAMPLES: N/A	EL. TOP OF CASING: N/A	GROUND EL.: 44.0'	DEPTH/EL. GROUND WATER: 3.0/41.0'
DEPTH/EL. TOP OF ROCK: 5.0/39.0'					
SAMPLE HAMMER WEIGHT/FALL: N/A	CASING LEFT IN HOLE: DIA./LENGTH: N/A	LOGGED BY: P. YEH			

SAMPLE TYPE AND DIAMETER	SAMPLER ADVANCE, LENGTH CORE RUN	SAMPLE & RECOVERY CORE RECOVERY	SAMPLE BLOWS "N" PERCENT CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN GPM	WATER PRESSURE TESTS: PRESSURE PSI	WATER PRESSURE TESTS: TIME IN MINUTES	ELEVATION	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION *	REMARKS ON WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
6" AUGER THROUGHOUT							44.0					
							43.0	1.0			0-1.0': ASPHALT GRAYISH BLACK (N2).	
											1.0-3.0': CRUSHED ROCK MEDIUM DARK GRAY (N4).	
							41.0	3.0			3.0-5.0': SAND DUSKY RED (5R 3/4), FINE-GRAINED, SILTY, NON-PLASTIC, MOIST.	▽ 6-20-86 SITE CHECKED FOR RADIOACTIVE CONTAMINATION BY EBERLINE ANALYTICAL CORPORATION.
							39.0	5			5.0-9.0': SANDSTONE PALE YELLOWISH BROWN (10YR5/2) SOFT TO MODERATELY HARD, FINE-GRAINED, SILTY, WEATHERED, MOIST TO SATURATED.	
							35.0	9.0				
											BOTTOM OF HOLE AT 9.0 FT. BACKFILLED WITH CEMENT-BENTONITE GROUT, 6-20-86	EBERLINE ANALYTICAL CORPORATION PERFORMED GAMMA LOGGING.

*DESCRIPTION AND CLASSIFICATION BY VISUAL EXAMINATION OF CUTTINGS.

SS-SPLIT SPOON ST-SHELBY TUBE; D-DENISON P-PITCHER O-OTHER

SITE: MAYWOOD STORAGE SITE-HUNTER DOUGLAS

HOLE NO.: MISS-118R

GEOLOGIC DRILL LOG

PROJECT: FUSRAP	JOB NO.: 14501-138	SHEET NO.: 1 OF 1	HOLE NO.: MISS-119R
SITE: MAYWOOD INTERIM STORAGE SITE-HUNTER DOUGLAS	COORDINATES: N8205,E11398	ANGLE FROM HORIZ.: 90°	BEARING: N/A

BEGUN	COMPLETED	DRILLER	DRILL MAKE AND MODEL	HOLE SIZE	OVERBURDEN (FT.)	ROCK (FT.)	TOTAL DEPTH
6/19/86	6/19/86	MORETRENCH ENVIRONMENTAL SERVICES	MOBILE B-33	6"	6.0'	4.0'	10.0'

CORE RECOVERY(FT.)/%	CORE BARREL	SAMPLES	EL. TOP OF CASING	GROUND EL.	DEPTH/EL. GROUND WATER	DEPTH/EL. TOP OF ROCK
N/A	N/A	N/A	N/A	45.6'	6.0'/39.6'	6.0'/39.6'

SAMPLE HAMMER WEIGHT/FALL	CASING LEFT IN HOLE: DIA./LENGTH	LOGGED BY:
N/A	N/A	P. YEH

SAMPLE TYPE AND DIAMETER	SAMPLER ADVANCE, LENGTH CORE RUN	SAMPLE RECOVERY, CORE RECOVERY	SAMPLE BLOWS / % PERCENT CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN GPM	WATER PRESSURE TESTS: PRESSURE P.S.I.	WATER PRESSURE TESTS: TIME IN MINUTES	ELEVATION	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION *	NOTES ON WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							45.6	0				
6" AUGER THROUGHOUT							45.1 44.6	0.5 1.0			0.0-0.5': ASPHALT; GRAYISH BLACK (N2). 0.5-1.0': CRUSHED ROCK; MEDIUM GRAY (N5). 1.0-5.0': SAND (SC-SM); DUSKY RED (5R3/4); FINE-GRAINED; SILTY; NON-PLASTIC.	SITE CHECKED FOR RADIOACTIVE CONTAMINATION AND HOLE GAMMA LOGGED BY EBERLINE ANALYTICAL CORPORATION.
							40.6	5				▽ 6/20/86
							39.6	6.0			5.0-6.0': PEAT; DUSKY BROWN (5YR2/2) AND LIGHT OLIVE GRAY (5Y5/2); CLAYEY; WITH ROOTS. 6.0-10.0': SANDSTONE; PALE YELLOWISH BROWN (10YR6/2); SOFT TO MODERATELY HARD; FINE-GRAINED, SILTY, WEATHERED, MOIST TO SATURATED.	
							35.6	10			BOTTOM OF HOLE AT 10.0 FT. HOLE BACKFILLED WITH CEMENT-BENTONITE GROUT, 6/20/86.	* DESCRIPTION AND CLASSIFICATION BY VISUAL EXAMINATION OF CUTTINGS.

SS=SPLIT SPOON; ST=SHELBY TUBE; D=DIEDRICH; P=PITCHER; O=OTHER

SITE: MAYWOOD INTERIM STORAGE SITE-HUNTER DOUGLAS

HOLE NO.: MISS-119R

GEOLOGIC DRILL LOG

PROJECT: FUSRAP							JOB NO.: 14501-138	SHEET NO.: 1 OF 1	HOLE NO.: MISS-120R
SITE: MAYWOOD INTERIM STORAGE SITE-HUNTER DOUGLAS				COORDINATES: N8075,E11350			ANGLE FROM HORIZ.: 90°		BEARING: N/A
BEGUN: 6/19/86	COMPLETED: 6/19/86	DRILLER: MORETRENCH ENV. SERV.		DRILL MAKE AND MODEL: MOBILE B-33		HOLE SIZE: 6"	OVERBURDEN (FT.): 0.75'	ROCK (FT.): 6.25'	TOTAL DEPTH: 7.0'
CORE RECOVERY FT./%: N/A		CORE BOXES: N/A	SAMPLES: N/A	EL. TOP OF CASING: N/A	GROUND EL.: 45.0'	DEPTH/EL. GROUND WATER: UNABLE TO DETERMINE		DEPTH/EL. TOP OF ROCK: 0.75'/44.25'	
SAMPLE HAMMER WEIGHT/FALL: N/A		CASING LEFT IN HOLE: DIA./LENGTH: N/A		LOGGED BY: P. YEN					

SAMPLE TYPE AND DIAMETER	SAMPLER ADVANCE/LENGTH CORE RUN	SAMPLE RECOVERY/CORE RECOVERY	SAMPLE BLOWS/PERCENT CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN GPM	WATER PRESSURE TESTS: PRESSURE PSI	WATER PRESSURE TESTS: TIME IN MINUTES	ELEVATION	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION •	NOTES ON WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
6" AUGER THROUGHOUT							45.0	0				
							44.25	.75			0.0-0.75': ASPHALT; GRAYISH BLACK (N2).	SITE CHECKED FOR RADIOACTIVE CONTAMINATION AND HOLE GAMMA LOGGED BY EBERLINE ANALYTICAL CORPORATION.
								5			0.75-7.0': SANDSTONE; DUSKY RED (5R3/4); SOFT TO MODERATELY HARD; FINE-GRAINED; SILTY; MOIST.	GROUND WATER LEVEL MEASURED ON 6/20/86.
							38.0	7.0			BOTTOM OF HOLE AT 7.0 FT. HOLE BACKFILLED WITH CEMENT-BENTONITE GROUT, 6/20/86.	

• DESCRIPTION AND CLASSIFICATION BY VISUAL EXAMINATION OF CUTTINGS.

SS=SPLIT SPOON; ST=SHELBY TUBE; D=DIEDRICH; P=PITCHER; O=OTHER

SITE: MAYWOOD INTERIM STORAGE SITE-HUNTER DOUGLAS

HOLE NO.: MISS-120R

GEOLOGIC DRILL LOG

PROJECT: FUSRAP	JOB NO.: 14501-138	SHEET NO.: 1 OF 1	HOLE NO.: MISS-121R		
SITE: MAYWOOD INTERIM STORAGE SITE-HUNTER DOUGLAS	COORDINATES: N7900,E11700		ANGLE FROM HORIZ.: 90°	BEARING: N/A	
BEGAN: 6/19/86	COMPLETED: 6/19/86	DRILLER: MORETRENCH ENV. SERV.	DRILL MAKE AND MODEL: MOBILE B-33	HOLE SIZE: 6"	OVERBURDEN (FT.): 7.0'
ROCK (FT.): 1.0'	TOTAL DEPTH: 8.0'				
CORE RECOVERY/FT./%: N/A	CORE BOXES: N/A	SAMPLES: N/A	EL. TOP OF CASING: N/A	GROUND EL.: 46.4'	DEPTH/EL. GROUND WATER: 8.0'/38.4'
DEPTH/EL. TOP OF ROCK: 7.0'/39.4'					
SAMPLE HAMMER WEIGHT/FALL: N/A	CASING LEFT IN HOLE: DIA./LENGTH: N/A	LOGGED BY: P. YEN			

SAMPLE TYPE AND DIAMETER	SAMPLER ADVANCE/ LENGTH CORE RUN	SAMPLE RECOVERY/ CORE RECOVERY	SAMPLE BLOWS PER 6" / PERCENT CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M.	WATER PRESSURE TESTS: PRESSURE P.S.I.	WATER PRESSURE TESTS: TIME IN MINUTES	ELEVATION	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION •	NOTES ON WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
6" AUGER THROUGHOUT.							46.4	0				
								0.5			0.0-0.5': ASPHALT; GRAYISH BLACK (N2).	SITE CHECKED FOR RADIOACTIVE CONTAMINATION AND HOLE GAMMA LOGGED BY EBERLINE ANALYTICAL CORPORATION.
											0.5-0.75': CRUSHED ROCK; MEDIUM GRAY (N5).	
											0.75-5.0': SAND (SC-SM); MODERATE BROWN (5YR3/4) AND DUSKY BROWN (5YR2/2); FINE-GRAINED; SILTY; NON-PLASTIC.	
								5			5.0-7.0': SILT (ML); PALE OLIVE (10Y6/2); CLAYEY; SANDY WITH 50% SLUDGE.	
							39.4	7.0			7.0-8.0': SANDSTONE; DUSKY RED (5R3/4); SOFT; FINE-GRAINED; WEATHERED; MOIST.	▽ 6/20/86
							38.4	8.0			BOTTOM OF HOLE AT 8.0 FT.	
											HOLE BACKFILLED WITH CEMENT-BENTONITE GROUT, 6/20/86.	

• DESCRIPTION AND CLASSIFICATION BY VISUAL EXAMINATION OF CUTTINGS.

SS=SPLIT SPOON; ST=SHELBY TUBE; R=ROCKBARREL; P=PITCHER; O=OTHER	SITE: MAYWOOD INTERIM STORAGE SITE-HUNTER DOUGLAS	HOLE NO.: MISS-121R

GEOLOGIC DRILL LOG

PROJECT: FUSRAP	JOB NO.: 14501-138	SHEET NO.: 1 OF 1	HOLE NO.: MISS-122R
SITE: MAYWOOD INTERIM STORAGE SITE-HUNTER DOUGLAS	COORDINATES: N7940,E11606	ANGLE FROM HORIZ.: 90°	BEARING: N/A

BEGIN	COMPLETED	DRILLER	DRILL MAKE AND MODEL	HOLE SIZE	OVERBURDEN (FT.)	ROCK (FT.)	TOTAL DEPTH
6/23/86	6/23/86	MORETRENCH ENV. SERV.	MOBILE B-33	6"	6.0'	9.0'	15.0'

CORE RECOVERY/FT./%	CORE BOXES	SAMPLES	EL. TIP OF CASING	GROUND EL.	DEPTH/EL. GROUND WATER	DEPTH/EL. TIP OF ROCK
N/A	N/A	N/A	N/A	46.3'	6.0'/40.3'	6.0'/40.3'

SAMPLE HAMMER WEIGHT/FALL	CASING LEFT IN HOLE: DIA./LENGTH	LOGGED BY:
N/A	N/A	P. YEN

SAMPLE TYPE AND NUMBER	SAMPLER ADVANCE LENGTH FOR EARTH CORE RUN	SAMPLE RECOVERY CORE RECOVERY	SAMPLE METHOD % PERCENT CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M.	WATER PRESSURE TESTS: PRESSURE P.S.I.	WATER PRESSURE TESTS: TIME IN MINUTES	ELEVATION	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION •	NOTES ON WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
6" AUGER THROUGHOUT.							46.3	0				
							45.8	0.5			0.0-0.5': ASPHALT; GRAYISH BLACK (N2).	SITE CHECKED FOR RADIOACTIVE CONTAMINATION AND HOLE GAMMA LOGGED BY EBERLINE ANALYTICAL CORPORATION.
							45.3	1.0			0.5-1.0': CRUSHED ROCK; MEDIUM GRAY (N5); 2.0" MINUS.	
											1.0-6.0': SAND (SC-SM); DUSKY RED (5R3/4, 0.0-0.4'); MODERATE BROWN (5YR4/4, 4.0-6.0'); FINE-GRAINED; SILTY; NON-PLASTIC; MOIST.	▽ 6/25/86
							40.3	6.0			6.0-15.0': SANDSTONE; DUSKY RED (5R3/4); SOFT; FINE-GRAINED; NON PLASTIC; SILTY; WEATHERED; SATURATED AT 13.0-15.0'.	
							31.3	15			BOTTOM OF HOLE AT 15.0 FT.	
											HOLE BACKFILLED WITH CEMENT-BENTONITE GROUT, 6/25/86.	• DESCRIPTION AND CLASSIFICATION BY VISUAL EXAMINATION OF CUTTINGS.

SS-SPLIT SPOON; ST-SHELBY TUBE; P-PISTON; O-OTHER

SITE: MAYWOOD INTERIM STORAGE SITE-HUNTER DOUGLAS

HOLE NO.: MISS-122R

GEOLOGIC DRILL LOG

PROJECT: FUSRAP	JOB NO.: 14501-138	SHEET NO.: 1 OF 1	HOLE NO.: MISS-124R		
SITE: MAYWOOD INTERIM STORAGE SITE-HUNTER DOUGLAS	COORDINATES: N8300,E11400	ANGLE FROM HORIZ.: 90°	BEARING: N/A		
BEGUN: 6/20/86	COMPLETED: 6/20/86	DRILLER: NORETRENCH ENVIRONMENTAL SERVICES	DRILL MAKE AND MODEL: MOBILE B-33	HOLE SIZE: 6"	OVERBURDEN (FT.): 7.0'
ROCK (FT.): 7.0'	TOTAL DEPTH: 14.0'				
CORE RECOVERY FT./%: N/A	CORE BARREL: N/A	SAMPLES: N/A	EL. TOP OF CASING: N/A	GROUND EL.: 45.9'	DEPTH/EL. GROUND WATER: 6.0'/39.9'
DEPTH/EL. TOP OF ROCK: 7.0'/38.9'					
SAMPLE HAMMER WEIGHT/FALL: N/A	CASING LEFT IN HOLE: DIA./LENGTH: N/A	LOGGED BY: P.YEH			

SAMPLE TYPE AND DIAMETER	SAMPLER ADVANCE, LENGTH CORE RUN	SAMPLE RECOVERY, CORE RECOVERY	SAMPLE BLOWS "N" PERCENT CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN G.P.M.	WATER PRESSURE TESTS: PRESSURE P.S.I.	WATER PRESSURE TESTS: TIME IN MINUTES	ELEVATION	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION *	NOTES ON WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
AUGER, 6", THROUGHOUT.							45.9	0				SITE CHECKED FOR RADIOACTIVE CONTAMINATION BY EBERLINE ANALYTICAL CORPORATION.
								0.5			0.0-0.5': ASPHALT; GRAYISH BLACK (N2).	
											0.5-7.0': SAND (SC-SM), FINE-GRAINED, SILTY, NON-PLASTIC, MOIST. 0.5-3.5': DUSKY RED (5R3/4). 3.5-6.0': DUSKY BROWN (5YR2/2). 6.0-7.0': GRAYISH GREEN (10GY5/2). CLAYEY.	
								5				▽ 6/20/86
							38.9	7.0			7.0-14.0': SANDSTONE; SOFT, FINE-GRAINED, SILTY, WEATHERED, SATURATED. 7.0-10.0': PALE YELLOWISH BROWN (10YR6/2). 10.0-14.0': LIGHT BROWN (5YR6/4).	EBERLINE ANALYTICAL CORPORATION PERFORMED GAMMA LOGGING.
								10				
							31.9	14.0			BOTTOM OF HOLE AT 14.0 FT. HOLE BACKFILLED WITH CEMENT-BENTONITE GROUT, 6/20/86.	* DESCRIPTION AND CLASSIFICATION BY VISUAL EXAMINATION OF CUTTINGS.

SS-SPLIT SPOON; ST-SHELBY TUBE; P-PISTON; O-OTHER

SITE: MAYWOOD INTERIM STORAGE SITE-HUNTER DOUGLAS

HOLE NO.: MISS-124R

GEOLOGIC DRILL LOG

PROJECT: FUSRAP	JOB NO.: 14501-138	SHEET NO.: 1 OF 1	HOLE NO.: MISS-125R		
SITE: MAYWOOD INTERIM STORAGE SITE-HUNTER DOUGLAS	COORDINATES: N8000,E11400	ANGLE FROM HORIZ.: 90°	BEARING: N/A		
BEGUN: 6/23/86	COMPLETED: 6/23/86	DRILLER: MORETRENCH ENVIRONMENTAL SERVICES	DRILL MAKE AND MODEL: MOBILE B-33	HOLE SIZE: 6"	OVERBURDEN (FT.): 1.0'	ROCK (FT.): 11.5'	TOTAL DEPTH: 12.5'
CORE RECOVERY (FT./%): N/A	CORE BOXES: N/A	SAMPLES: N/A	EL. TOP OF CASING: N/A	GROUND EL.: 44.6'	DEPTH/EL. GROUND WATER: 4.5'/40.1'	DEPTH/EL. TOP OF ROCK: 1.0'/43.6'	
SAMPLE HAMMER WEIGHT/FALL: N/A	CASING LEFT IN HOLE: DIA./LENGTH: N/A	LOGGED BY: P.YEH					

SAMPLE TYPE AND DIAMETER	SAMPLED ADVANCE/LENGTH CORE RUN	SAMPLE RECOVERY/CORE RECOVERY	SAMPLE % OR PERCENT CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN GPM	WATER PRESSURE TESTS: PRESSURE PSI	WATER PRESSURE TESTS: TIME IN MINUTES	ELEVATION	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION *	NOTES ON WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
AUGER 6" THROUGHOUT.							44.6	0				
							44.1	0.5			0.0-0.5': ASPHALT; GRAYISH BLACK (N2).	
							43.6	1.0			0.5-1.0': CRUSHED ROCK; DARK GRAY (N3), ANGULAR BASALT, 2" MINUS.	
											1.0-12.5': SANDSTONE; DUSKY RED (5R3/4), SOFT TO MODERATELY HARD, FINE-TO MEDIUM-GRAINED, SILTY, SLIGHTLY CLAYEY, WEATHERED. MOIST TO SATURATED.	SITE CHECKED FOR RADIOACTIVE CONTAMINATION BY EBERLINE ANALYTICAL CORPORATION.
								5			10.0-12.5': SATURATED SANDSTONE.	▽ 6/25/86
								10				EBERLINE ANALYTICAL CORPORATION PERFORMED GAMMA LOGGING.
							32.1	12.5			BOTTOM OF HOLE AT 12.5 FT. HOLE BACKFILLED WITH CEMENT-BENTONITE GROUT, 6/25/86.	AUGER REFUSAL AT 12.5 FT.
												* DESCRIPTION AND CLASSIFICATION BY VISUAL EXAMINATION OF CUTTINGS.

SS-SPLIT SPOON; ST-SHELBY TUBE; P-PISTON; O-OTHER

SITE: MAYWOOD INTERIM STORAGE SITE-HUNTER DOUGLAS

HOLE NO.: MISS-125R

GEOLOGIC DRILL LOG

PROJECT: FUSRAP	JOB NO.: 14501-138	SHEET NO.: 1 OF 1	HOLE NO.: MISS-328C
SITE: MAYWOOD INTERIM STORAGE SITE-HUNTER DOUGLAS	COORDINATES: N8383,E11705	ANGLE FROM HORIZ.: 90°	BEARING: N/A
BEGUN: 8/29/86	COMPLETED: 8/29/86	DRILLER: MORE TRENCH ENVIRONMENTAL SERVICES	DRILL MAKE AND MODEL: MOBILE B-33
HOLE SIZE: 8"	OVERBURDEN (FT.): 6.0'	ROCK (FT.): 3.0'	TOTAL DEPTH: 9.0'
CORE RECOVERY FT./%: N/A	CORE BARREL: N/A	SAMPLES: 1	EL. TOP OF CASING: N/A
GROUND EL.: 44.4'	DEPTH/EL. GROUND WATER: N/A	DEPTH/EL. TOP OF ROCK: 6.0'/38.4'	
SAMPLE HAMMER WEIGHT/FALL: N/A	CASING LEFT IN HOLE: DIA./LENGTH: N/A	LOGGED BY: P. YEN	

SAMPLE TYPE AND DIAMETER	SAMPLER ADVANCE/LENGTH CORE BBL	SAMPLE RECOVERY/CORE RECOVERY	SAMPLE BLOWS per 6" / PERCENT CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN GPM AT PSI	WATER PRESSURE TESTS: PRESSURE P.S.I.	WATER PRESSURE TESTS: TIME IN MINUTES	ELEVATION	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION •	NOTES ON WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
							44.4					
							43.4	1.0			0.0-1.0': ASPHALT AND CRUSHED ROCK; PAVEMENT AND ROAD BASE.	SITE CHECKED FOR RADIOACTIVE CONTAMINATION BY EBERLINE ANALYTICAL CORPORATION.
SS 1.5'	24"	N/A	N/A							1	1.0-6.0': SAND (SC-SM) FINE-GRAINED, SILTY, MOIST, TRACE OF 1/4" GRAVEL. 1.0-4.5': GRAYISH RED (5R4/2). 4.5-6.0': MEDIUM LIGHT GRAY (N6).	EBERLINE ANALYTICAL CORPORATION PERFORMED GAMMA LOGGING.
								5.0				
							38.4	6.0			6.0-9.0': SANDSTONE; DUSKY RED (5R3/4), SOFT, FINE-GRAINED, SILTY, WEATHERED.	ADVANCED HOLE WITH HOLLOW STEM AUGER (4x8 INCH).
							35.4	9.0				
											BOTTOM OF HOLE AT 9.0 FT. HOLE BACKFILLED WITH CEMENT-BENTONITE GROUT, 9/5/86.	• DESCRIPTION AND CLASSIFICATION BY VISUAL EXAMINATION OF CUTTINGS.

SS-SPLIT SPOON; ST-SHELBY TUBE; D-DIAMOND; P-PITCHER; O-OTHER

SITE: MAYWOOD INTERIM STORAGE SITE-HUNTER DOUGLAS

HOLE NO.: MISS-328C

GEOLOGIC DRILL LOG

PROJECT: FUSRAP	JOB NO.: 14501-138	SHEET NO.: 1 OF 1	HOLE NO.: MISS-340R		
SITE: MAYWOOD INTERIM STORAGE SITE- HUNTER DOUGLAS	COORDINATES: N8065,E11330	ANGLE FROM HORIZ.: 90°	BEARING: N/A		
BEGUN: 9/17/86	COMPLETED: 9/17/86	DRILLER: MORETRENCH ENVIRONMENTAL SERVICES	DRILL MAKE AND MODEL: MOBILE B-33	HOLE SIZE: 6"	OVERBURDEN (FT.): 5.0'
ROCK (FT.): 0.0'	TOTAL DEPTH: 5.0'				
CORE RECOVERY FT./%: N/A	CORE BOXES: N/A	SAMPLES: N/A	EL. TOP OF CASING: N/A	GROUND EL.: 46.9'	DEPTH/EL. GROUND WATER: NONE OBSERVED
DEPTH/EL. TOP OF ROCK: N/A					
SAMPLE HAMMER WEIGHT/FALL: N/A	CASING LEFT IN HOLE: DIA./DEPTH: N/A	LOGGED BY: D McGRANE			

SAMPLE TYPE AND DIAMETER	SAMPLER ADVANCE/ CORE RUN	SAMPLE RECOVERY/ CORE RECOVERY	SAMPLE BLOWS	PERCENT CORE RECOVERY	WATER PRESSURE TESTS: LOSS IN GAL./FT.	WATER PRESSURE TESTS: PRESSURE P.S.I.	WATER PRESSURE TESTS: TIME IN MINUTES	ELEVATION	DEPTH	GRAPHIC LOG	SAMPLE	DESCRIPTION AND CLASSIFICATION*	NOTES ON WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
								45.9	0				
AUGER, 6", THROUGHOUT.								45.6	0.3			0.0-0.3': ASPHALT. 0.3-5.0': SILTY SAND (SM), COLOR STRATIFIED; FINE TO MEDIUM-GRAINED; NUMEROUS PIECES OF HARD 1.0-3.0" GRAVEL (0.3-2.5 FT); POORLY CONSOLIDATED (LOOSE); DRY TO MOIST. 0.3-1.0': MODERATE BROWN (5YR3/4); DRY. 1.0-5.0': DARK REDDISH BROWN (10R3/4); OCCASIONAL PIECES OF ROUNDED GRAVEL; MOIST. BOTTOM OF HOLE AT 5.0 FT. HOLE WAS IMMEDIATELY BACKFILLED WITH CEMENT-BENTONITE GROUT AND FINISHED WITH CEMENT.	SITE CHECKED FOR RADIOACTIVE CONTAMINATION AND HOLE GAMMA LOGGED BY EBERLINE ANALYTICAL CORPORATION. REFUSAL AT 5.0 FT.
								40.9	5				

* DESCRIPTION AND CLASSIFICATION BY VISUAL EXAMINATION OF CUTTINGS.

SS=SPLIT SPOON; ST=SHELBY TUBE; P=PISTON; PT=PITCHER; O=OTHER

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