Leaked Fuel Inventory
Direct Fueling Pipeline
Marine Corps Naval Air Station
Camp LeJeune, North Carolina

S&ME Job No. 051-83-354-A

SOIL & MATERIAL ENGINEERS INC. ENGINEERING-TESTING-INSPECTION

3109 Spring Forest Road, Box 58069, Raleigh, NC 27658-8069, Phone (919) 872-2660

December 7, 1983

Resident Officer In Charge of Construction
Naval Facilities Engineering Command
Jacksonville Area
Camp LeJeune, NC 28542

Reference: Leaked Fuel Inventory
Direct Fueling Pipeline
Marine Corps Naval Air Station
Camp LeJeune, North Carolina
S&ME Job No. 051-83-354-A

Gentlemen:

Soil & Material Engineers, Inc. has completed the first phase of the authorized inventory of JP-5 fuel leaked from the direct fueling pipeline at the Marine Corps Naval Air Station, Camp Lejeune, North Carolina. The pipeline extends from the tank farm on White Street to the Rapid-Jet flightline fueling stations, a distance of about one mile.

This inventory is the result of an earlier investigation of leakage from the pipeline (S&ME Job No. 057-83-128). As a part of that study, 20 hand auger probes were performed to evaluate the possibility that significant quantities of fuel had leaked from the pipeline. The hand auger records from those probes are attached (Table 1, HA-1 through HA-20). These hand auger probes identified four areas where fuel contamination was indicated, warranting further study. This report covers the first phase of the inventory of fuel contamination in these areas.

Field Exploration

The probes were performed by an engineer using a 3-inch diameter hand auger. The probes were generally extended to depths ranging between 6.5 to 10.4 feet below the ground surface, depending on soil and groundwater conditions encountered. The engineer maintained a field log of each hand auger probe, including a visual description of the soils encountered (see Table I). No samples were retained from the hand auger

probes. At each probe location, the engineer noted the presence and depth of fuel by both visual and odor examinations. After a period of 24 hours, the engineer measured and recorded the water or fuel level below the ground surface in each probehole. Where water or fuel accumulated in the probehole, a sample was retrieved with a 3/4-inch inside diameter clear tube by placing the tube to the bottom of the probehole and sealing off the tube at the bottom. The sample retrieved was noted for the presence of fuel by both visual and odor examination. If fuel was visible in the sample, the thickness of fuel was measured and recorded. The absence or presence of fuel at each probe location and the thickness of any fuel measured are described on Table 1 and summarized on Figures 5 through 8.

At hand auger probe locations HA-27 and HA-65 through HA-72, little or no penetration could be made with the hand auger. Therefore, no information is available for these areas at this time.

Subsurface Conditions

In general, the soil conditions encountered between station 0+00 and 12+15 consisted of 3 to 4 feet of silty sands much of this material being redeposited fill. Underlying the sands are clayey silts which undergo a transition to silty clays within one to two feet. The pipeline apparently lies on the clayey silt or silty clay soil and is located 3 to 5 feet below the ground surface.

The soils between stations 39+75 and 50+00 generally consist of 3 to 5 feet of brown to gray silty fine sand (fill), with a 1 to 2 foot layer of gray fine sandy silty clay or fine sandy clayey silt occurring at most of the probes. The basal portion of the probes generally consist of 3 to 6 feet of white, orange, and gray silty to clayey sand with traces of course sand and gravel.

Twenty-hours hour groundwater levels in the hand auger probes ranged from 3 feet to below the depth to which the auger probes were advanced.

Evidence of fuel contamination during probing or subsequent accumulation of fuel in the probehole (at approximately 24 hours) is presented in Figures 5 through 8. Areas of accumulation include 100 feet west of Station 2+10 and Station 6+50, 100 feet east of Station 12+15, and 50 feet south of Stations 37+75 and 52+00. Assessing the

volumetric extent of the contamination is beyond the scope of this Phase 1 investigation.

Recommendation for Further Investigation

The hand auger probes and fuel measurements indicate that some fuel contamination exists in all four areas. The contamination in Area 1 appears to be limited to the area immediately adjacent to the canal. The major amount of fuel found in Area 2 is across White Street from the pipeline, indicating either movement of fuel beneath the street or a fuel spill unrelated to pipeline leakage. The fuel leakage in Area 3 appears to be fairly limited in area but probably extends somewhat below the concrete aprons and taxiways. The major area of fuel contamination found appears to be in the Rapid Jet area, where measured fuel thicknesses of 1 to 2 feet were typical.

It should be noted that, due to the relative unit weights and viscosities of hydrocarbon fuels and water, the measured fuel thickness in boreholes and wells frequently exceeds the fuel thickness in the soil matrix. The fuel may enter the borehole at a more rapid rate than water, exaggerating the measured fuel thickness.

Based on the results of this Phase I inventory, additional investigation appears to be warranted to further delineate the extent of fuel contamination in these areas. Suggested locations of additional probes are shown on Figures 5 through 8.

It has been a pleasure working with you on this phase of the project. We will contact you shortly regarding the scheduling of the Phase 2 investigation.

Sincerely,
Soil & Material Engineers, Inc.

Phil Rahn, Geologist

Ernest F. Parker, Jr., P.E.

EFP/pjc

TABLE I

SUMMARY OF HAND AUGER PROBES

Boring No.	Depth	Description
HA-1	0-0.8'	Dark Brown Very Silty Fine SAND - Topsoil
	0.8'-1.8'	Tan Silty Fine to Medium SAND
Sta. 1+75	1.8'-3.0'	Dark Gray Fine Sandy Clayey SILT with Fine Sand Seams
	3'-5'	Gray Fine Sandy Silty CLAY (Stale Fuel)
	5'	Boring Terminated at 5' - Water Level Measured at 2.8' after 24 Hours
HA-2	0-0.5'	Dark Brown Very Silty Fine SAND with Roots - Topsoil
	0.5'-2.7'	Brown Silty Fine SAND
Sta. 2+15	2.7'-4'	Gray and Dark Gray Fine Sandy Silty CLAY (Fuel)
	4'	Boring Terminated at 4' - Water Level Measured at 2'8" after 24 Hours
HA-3	0-0.1'	Dark Brown Topsoil
	0.1'-3'	Orange-Brown Fine Sandy SILT
Sta. 2+50	3'-4'	Gray and Orange Fine Sandy Silty CLAY
	4'	Boring Terminated at 4' - Water Level Measured at 3.2' after 24 Hours
HA-4	0-1.5'	Brown Silty Fine SAND with Some Rocks (Fill)
	1.5'-3'	Dark Brown Fine Sandy Clayey SILT with Roots (old Topsoil)
Sta. 6+50	3'-4'	Gray Fine Sandy Silty CLAY (Fuel)
	4'	Boring Terminated at 4' - Dry after 24 Hours
HA-5	0-1'	Light Brown Silty Fine SAND (Fill)
	1'-2'	Dark Brown Fine Sandy Clayey SILT with Roots
Sta. 7+50	2'-4'	Gray Fine Sandy Silty CLAY
	4'	Boring Terminated at 4' - Water Level Measured at 1.1' after 24 Hours

HA-6	0-0.5'	Brown Very Silty Fine SAND (Fill)
	0.5'-2'	Light Brown to Gray Silty Fine SAND (Fill) (Fuel)
Sta. 6+00	2'-4'	Dark Brown Fine Sandy Clayey SILT (Fuel)
	4'	Boring Terminated at 4' - Water Level Measured at 2.1' after 24 Hours
HA-7	0-2'	Dark Brown Fine Sandy SILT with Roots
	2'-4'	Dark Gray to Gray Fine Sandy Silty CLAY
Sta. 5+10	4'	Boring Terminated at 4' - Water Level Measured at 1.7' after 24 Hours
HA-8	0-2'	Dark Brown Very Silty Fine SAND (Fill)
	2'-3.5'	Gray-Brown Silty Fine SAND (Fill)
Sta. 11+50	3.5'-4.5'	Gray Clayey Fine SAND
	4.5'-5'	Gray Silty CLAY
	5'	Boring Terminated at 5' - Water Level Measured at 2.8' after 24 Hours
HA-9	0-1'	Gray-Brown Silty Fine SAND with Roots
	1'-1.5'	Brown Fine Sandy SILT with Roots
Sta. 12+15	1.5'-2'	Gray Clayey Fine SAND
25' Lt. of ℄	2'-3.5'	Gray with Orange Fine Sandy Silty CLAY (Fuel)
	3.5'	Boring Terminated at 3.5' - Water Level Measured at 3" after 24 Hours
HA-10	0-2'	Dark Brown Fine Sandy SILT
	2'-3.5'	Gray-Brown Fine Sandy SILT
Sta. 12+65	3.5'-5'	Gray Fine Sandy Silty CLAY
	5'	Boring Terminated at 5' - Water Level Measured at 3.3' after 24 Hours
HA-11	0-2'	Brown Silty to Very Silty Fine SAND (Fill)
	2'-3.5'	Gray Silty to Clayey Fine SAND (Some Fuel)
Sta. 42+50	3.5'-5.5'	Gray Fine Sandy Silty CLAY (Some Fuel)
	5.5'-6.5'	Gray and Orange Clayey Fine SAND (Fuel)
	6.5'	Boring Terminated at 6.5'

HA-12	0-1'	Brown Silty to Very Silty Fine SAND (Fill)
	1'-3.5'	Gray Slightly Clayey Silty Fine SAND (Fuel at 3')
Sta. 43+25	3.5'-5.5'	Gray Fine Sandy Silty CLAY (Fuel)
	5.5'-6'	Gray Clayey Fine SAND (Fuel)
	6'	Boring Terminated at 6'
HA-13	0-1.5'	Gray Silty SAND with Rocks - Soil Cement (Fill)
	1.5'-3'	Brown Clayey Fine SAND (Fill)
Sta. (See Plans)	3'-5'	Gray Fine Sandy Silty CLAY
	5'-6'	Gray Clayey Fine SAND (Fuel)
	6'	Boring Terminated at 6' - Water Level Measured at 5.3'
HA-14	0-1.5'	Gray Very Silty SAND with Some Rocks - Soil Cement (Fill)
	1.5'-4'	Brown Silty Fine SAND (Fill)
Sta. (See Plans)	4'-7'	Gray SILT to Clayey Fine SAND (Fill)
	7'-8.5'	Orange and Gray Silty Fine SAND (Fill) (Somewhat Stale Fuel)
	8.5'	Boring Terminated at 8.5' - Water Level Measured at 4.8'
HA-15	0-2.5'	Brown Silty Fine SAND with Some Clay Peds (Fill)
	2.5'-5.5'	Gray-Brown Silty to Clayey Fine SAND (Fill)
Sta. (See Plans)	5.5'-7'	Gray Clayey Fine SAND (Some Stale Fuel)
	7'	Boring Terminated at 7' - Hit Something at 7'
HA-16	0-2'	Dark Brown Silty Fine SAND with Some Roots (Fill)
	2'-4.5'	Light Brown Silty Fine SAND with Some Clay Peds (Fill)
Sta. 42+00	4.5'-6.5'	Gray Fine Sandy Silty CLAY
	6.5'-7'	Gray and Orange Clayey Fine SAND (Wet)
	7'	Boring Terminated at 7'

HA-17	0-1.8'	Dark Brown Silty Fine SAND (Fill)
	1.8'-3.7'	Light Gray-Brown Silty Fine SAND (Some Fuel)
Sta. 42+50	3.7'-5.5'	Gray and Orange Fine Sandy Silty CLAY with Sand Seams (Fuel)
25' Rt. of ℄	5.5'-6'	Gray and Light Brown Slightly Clayey Fine SAND (Wet) (Fuel)
	6'	Boring Terminated at 6'
HA-18	0-1.7'	Dark Brown Silty Fine SAND (Fill)
	1.7'-3.5'	Light Gray-Brown Silty to Clayey Fine SAND
Sta. 42+50	3.5'-5'	Gray Fine Sandy Silty CLAY with Fine Sand Seams (Fuel)
50' Rt. of ℄	5'-6'	Gray Slightly Clayey to Clayey Fine SAND (Fuel)
	6'	Boring Terminated at 6'
HA-19	0-1.5'	Gray and Brown Slightly Silty Fine SAND (Fill)
	1.5'-2'	Dark Brown Fine Sandy Clayey SILT - Old Topsoil
Sta. 6+50	2'-6'	Brown to Gray Fine Sandy Silty CLAY with Some Fine Sand Seams
25' Rt. of ℄	6'	Boring Terminated at 6'
HA-20	0-1.3'	Gray and Brown Silty Fine SAND (Fill)
	1.3'-2'	Dark Brown Fine Sandy Clayey SILT with Roots - Old Topsoil
Sta. 6+50	2'-4'	Dark Gray to Gray Fine Sandy Silty CLAY (Fuel at 4')
25' Lt. ℄	4'	Boring Terminated at 4'

HA-21	0-2.0'	Dark Brown Very Silty Fine SAND (Fill)
STA. 2+10	2.0'-3.1'	Orange-Brown and Gray Fine Sandy SILT
75' Lt.	3.1'-5.6'	Orange-Brown and Gray Fine Sandy Silty CLAY (Fuel Odor)
	5.6'-8.0'	Gray Fine Sandy Silty CLAY (Strong Fuel Odor)
	8.0'-9.0'	Gray Silty Clayey Fine SAND (Fuel)
	9.0'	Boring Terminated at 9.0'-Water Level Measured at 5'-10" after 24 hours Strong Fuel Odor in Water Sample (Fuel Water emulsion)
HA-22	0-0.5'	Dark Brown Very Silty Fine SAND-Topsoil with Grass Root Mat
STA. 2+10	0-5'-2.0'	Brown Silty Fine SAND (Fill)
25' Rt.	2.0'-3.5'	Orange-Brown and Gray Slightly Clayey Fine Sandy SILT
	3.5'-4.0'	Orange-Brown and Gray Clayey SILT with Fine Sand (Fuel Odor)
	4.0'-6.0'	Gray and Brown Mottled Silty CLAY with Fine Sand Seams (Fuel)
	6.0'-7.3'	Gray Silty CLAY (Fuel)
	7.3'	Boring Terminated at 7.3'-Water Level Measurement at 5'-3" after 24 hours Strong Fuel Odor in Water sample - Fuel Film Noticed on Water
HA-23	0-0.9'	Dark Brown Silty Fine SAND-Topsoil with Grass Root Mat
STA. 2+10	0.9'-2.8'	Tan and Light Brown Slightly Silty Fine SAND (Fill)
50' Rt	2.8'-3.5'	Gray Slightly Clayey Silty Fine SAND
	3.5'-4.0'	Gray and Brown Clayey Silty Fine SAND
	4.0'-6.0'	Gray and Brown Mottled Silty CLAY with Fine Sand (Fuel Odor)
	6.0'-7.3'	Gray Slightly Sandy Silty CLAY (Fuel)
	7.3'	Boring Terminated at 7.3'-Water Level Measured at 5'-1" after 24 hours Strong Fuel Odor in Water Sample-Fuel Film Noticed on Water

HA-24	0 -0.8'	Dark Brown Silty Fine SAND - Topsoil with Grass Root Mat
STA. 2+10	0.8'-2.5'	Tan and Brown Slightly Silty Fine SAND (Fill)
100' Rt.	2.5'-3.0'	Dark Brown Silty Fine SAND - Old Topsoil
	3.0'-4.0'	Gray Slightly Clayey Silty Fine SAND
	4.0'-6.5'	Gray and Brown Mottled Silty CLAY with Fine Sand (Fuel Odor)
	6.5'-7.3'	Gray Silty CLAY with Organic Matter (Fuel)
	7.3'	Boring Terminated at 7.3' - Water Level Measured at 5'-0" after 24 hours
		1" of Yellow Fuel Measured on Water Sample
HA-25	0 -0.6'	Dark Brown Silty Fine SAND - Topsoil with Grass Root Mat
STA.2+10	0.6'-4.5'	Dark Brown and gray Fine Sandy SILT with Roots
150'Rt.	4.5'-7.0'	Gray and Brown Silty CLAY with Fine Sand (Fuel Odor)
	7.0'-7.3'	Gray Silty CLAY (Fuel)
	7.3'	Boring Terminated at 7.3' - Water Level Measured at 5'-6" after 24 hours
		1/16" of Yellow Fuel Measured on Water Sample
HA-26	0 -0.5'	Dark Brown Silty Fine SAND - Topsoil with Grass Root Mat
STA. 2+50	0.5'-1.0'	Tan Slightly Silty Fine SAND (Fill)
75'Lt.	1.0'-2.0'	Gray and Brown Slightly Clayey Silty Fine SAND
	2.0'-4.5'	Gray and Orange-Brown Mottled Fine Sandy Silty CLAY
	4.5'-5.5'	Gray Silty CLAY with Fine Sand
	5.5'-7.0'	Blue-Gray Silty CLAY
	7.0'-7.3'	Blue-Gray Clayey Fine to Medium SAND
	7.3'	Boring Terminated at 7.3' - water level measured at 3'-11" after 24 hours.
HA-27	0 -0.3'	Dark Brown Silty Fine SAND - Topsoil with Grass Root Mat
STA.2+50	0.3'-1.2'	Dark Gray and Brown Slightly Clayey Fine Sandy SILT
20' Lt	1.2'	Boring Terminated at 1.2' - (Soil Cement)
		Seven Other Unsuccessful Attempts Were Made in the General Area to
		Penetrate Through the Soil Cement Layer with a Hand Auger

HA-28	0 - 0.2'	Dark Brown Topsoil with Grass Root Mat
STA.2+50	0.2'-2.0'	Gray and Tan Silty Fine SAND (Fill)
25' Rt.	2.0'-3.0'	Gray and Brown Slightly Clayey Fine Sandy SILT
	3.0'-3.5'	Orange-Brown and Gray Fine Sandy Silty CLAY
	3.5'-4.4'	Orange-Brown Silty CLAY with Fine Sand Seams
	4.4'-5.0'	Orange and Gray Mottled Silty CLAY with Fine Sand
	5.0'-6.5'	Gray Fine Sandy Silty CLAY
	6.5'	Boring Terminated at 6.5' - Water Level Measured at 5'-3" after 24 hours
HA-29	0 -0.3'	Dark Brown Topsoil with Grass Root Mat
STA. 2+50	0.3'-1.2'	Gray Silty Fine SAND
50' Rt.	1.2'-3.0'	Gray and Tan Slightly Clayey Fine Sandy SILT
	3.0'-4.0'	Gray and Brown Mottled Silty CLAY with Fine Sand and Organic Matter
	4.0'-6.0'	Gray Fine Sandy Silty CLAY with Organic Matter
	6.0'-7.3'	Blue-Gray Silty CLAY
	7.3'	Boring Terminated at 7.3' - Water Level Measured at 5'-3" after 24 hours
HA-30	0 -0.6'	Dark Brown Silty Fine SAND - Topsoil with Grass Root Mat
STA.6+00	0.6'-1.0'	Gray and Tan Silty Fine SAND (Fill)
75' Lt.	1.0'-3.0'	Dark Gray and Dark Brown Slightly Clayey Fine Sandy SILT
	3.0'-3.5'	Gray Slightly Clayey Silty Fine SAND
	3.5'-4.5'	Gray and Brown Mottled Silty CLAY with Fine Sand
	4.5'-7.0'	Gray Silty CLAY
	7.0'	Boring Terminated at 7.0' - Water Level Measured at 3'-2" after 24 hours
HA-31	0 -1.0'	Dark Brown Silty Fine SAND - Topsoil with Grass Root Mat
STA. 6+00	1.0'-1.5'	Tan and Yellow Slightly Silty Fine SAND (Fill)
25' Lt.	1.5'-3.5'	Dark Brown and Gray Clayey SILT with Fine Sand and Organic Matter
	3.5'-6.5'	Dark Gray and Brown Silty CLAY with Organic Matter (Fuel Odor)
	6.5'-7.3'	Dark Gray Silty CLAY with Organic Matter (Fuel Odor)
	7.3'	Boring Terminated at 7.3' - Water Level Measured at 5'-1" after 24 hours
		Fuel Odor in Water Sample - Fuel Film Noticed on Water

HA-32	0 -1.0'	Dark Brown Silty Fine SAND - Topsoil with Grass Root Mat
STA. 6+00	1.0'-1.5'	Tan and Yellow Slightly Silty Fine SAND (Fill)
25' Rt.	1.5'-3.0'	Tan and Light Gray Slightly Silty Fine SAND
	3.0'-3.5'	Dark Brown and Gray Clayey SILT with Fine Sand and Organic Matter
	3.5'-6.5'	Dark Gray Silty CLAY with Fine Sand and Organic Matter (Fuel Odor)
	6.5'-7.3'	Dark Gray Silty CLAY with Organic Matter (Fuel Odor)
	7.3'	Boring Terminated at 7.3' - Water Level Measured at 6'-2" after 24 hours
		Fuel Odor in Water Sample - Fuel Film noticed on Water
HA-33	0 -1.0'	Dark Brown Silty Fine SAND - Topsoil with Grass Root Mat
STA. 6+00	1.0'-1.5'	Tan and Yellow Slightly Clayey Silty Fine SAND
50' Rt.	1.5'-3.5'	Tan and Light Gray Slightly Silty Fine SAND (Wet Sand)
	3.5'-4.0'	Dark Brown and Gray Clayey SILT with Fine Sand and Organic Matter
	4.0'-5.0'	Dark Gray Silty CLAY with Organic Matter
	5.0'	Boring Terminated at 5.0' - Water Level Measurement at 2'-10" after 24 hours
		Caved in at 3.0' after 24 hours.
HA-34	0 -0.5'	Dark Brown and Dark Gray Fine Sandy SILT - Topsoil with Grass Root Mat
STA. 12+15	0.5'-3.0'	Brown and Gray Fine Sandy SILT
100'Lt.	3.0'-4.0'	Gray Slightly Clayey Silty Fine SAND
	4.0'-5.5'	Gray and Brown Mottled Silty CLAY with Fine Sand (Fuel Odor)
	5.5'-10.4'	Blue-Gray Slightly Sandy CLAY with Organic Matter (Fuel)
	10.4'	Boring Terminated at 10.4' - Fuel Level Measured at 9'-5" after 24 hours
		12" of Fuel Measured above Bottom of Borehole.
HA-35	0 -0.5'	Dark Brown Fine Sandy SILT - Topsoil with Grass Root Mat
STA. 12+15	0.5'-2.0'	Gray and Orange-Brown Silty Fine SAND
75' Lt.	2.0'-4.0'	Orange-Brown and Gray Silty CLAY with Fine Sand (Fuel Odor)
	4.0'-5.0'	Gray and Brown Silty CLAY (Fuel Odor)
	5.0'-7.3'	Gray Silty CLAY (Fuel)
	7.3'	Boring Terminated at 7.3' - Water Level Measured at 4'-1" after 24 hours
		Strong Fuel Odor in Water Sample (Fuel Water Emulsion)

HA-36	0 -0.8'	Dark Brown and Dark Gray Silty Fine SAND - Topsoil with Grass Root Mat
STA 40+50	0.8'-4.0'	Orange and Tan Slightly Silty Fine SAND (Fill)
5' Lt.	4.0'-6.5'	Gray Slightly Clayey Silty Fine SAND (Fuel Odor)
	6.5'-10.4'	Light Gray Slightly Silty Slightly Clayey Fine SAND (Strong Fuel Odor)
	10.4'	Boring Terminated at 10.4' - Water Level Measured at 9'-3" after 24 hours Fuel Odor in Water Sample
HA-37	0 -0.5'	Dark Brown and Dark Gray Silty Fine SAND - Topsoil with Grass Root Mat
STA. 40+25	0.5'-2.8'	Brown Silty Fine SAND (Fill)
5' Lt.	2.8'-3.5'	Orange and Tan Slightly Silty Fine SAND (Fill)
	3.5'-5.0'	Orange and Tan Slightly Clayey Silty Fine SAND
	5.0'-5.5'	Orange-Brown and Gray Silty CLAY with Fine Sand Seams
	5.5'-10.4'	Gray and Orange Mottled Slightly Clayey Slightly Silty Fine SAND (Slight Stale Fuel Odor)
	10.4'	Boring Terminated at 10.4' - Water Level Measured at 9'-1" after 24 hours No Fuel Odor in Water Sample
HA-38	0 -0.8'	Dark Brown Silty Fine SAND (Fill)
STA. 40+00	0.8'-1.8'	Dark Brown and Gray Slightly Clayey Silty Fine SAND (Fill)
5' Lt.	1.8'-3.5'	Orange-Brown and Tan Slightly Silty Fine SAND (Fill)
	3.5'-4.5'	Gray Slightly Clayey Silty Fine SAND
	4.5'-6.0'	Gray and Brown Mottled Silty CLAY with Fine Sand Seams
	6.0'-10.4'	Gray and Brown Mottled Slightly Clayey Slightly Silty Fine SAND (Slight Stale Fuel Odor)
	10.4'	Boring Terminated at 10.4' - Water Level Measured at 8'-9" after 24 hours No Fuel Odor in Water Sample
HA-39	0-2.0'	Dark Brown Silty Fine SAND with Thin Silty Clay Layers (Fill)
STA.(See Fig.No.3)	2.0'-3.5'	Orange and Light Gray Slightly Clayey Slightly Silty Fine SAND (Fill)
	3.5'-5.0'	Gray and Orange Mottled Silty CLAY with Fine Sand Seams (Fuel)
	5.0'-7.4'	Gray and Orange Mottled Slightly Clayey Slightly Silty Fine SAND (Fuel Odor)
	7.4'	Boring Terminated 7.4' - Water Level Measured at 6'-11"after 24 hours 3/4"of Fuel Measured on Water Sample

HA-40	0 -0.8'	Dark Brown Silty Fine SAND - Topsoil with Grass Root Mat
STA.(See Fig. No.3)	0.8'-3.5'	Gray and Orange Slightly Silty Fine SAND (Fill)
	3.5'-4.5'	Orange and Gray Mottled Silty CLAY with Fine SAND (Fuel Odor)
	4.5'-7.4'	Orange and Gray Mottled Silty Clayey Fine SAND (Fuel Odor)
	7.4'	Boring Terminated at 7.4' - Water Level Measured at 6'-7" after 14 hours 1¼" of Fuel Measured on Water Sample
HA-41	0 -1.0'	Dark Brown Silty Fine SAND - Topsoil with Grass Root Mat
STA.(See Fig. No.3)	1.0'-4.0'	Dark Gray Slightly Clayey Silty Fine SAND (Fill) (Fuel Odor)
	4.0'-5.0'	Gray and Orange-Brown Mottled Silty CLAY with Fine Sand Seams (Fuel Odor)
	5.0'-6.5'	Gray and Orange-Brown Mottled Slightly Clayey Slightly Silty Fine SAND (Strong Fuel Od
	6.5'-7.4'	Gray Slightly Clayey Slightly Silty Fine Sand
	7.4'	Boring Terminated at 7.4' - Water Level Measured at 6'-10" after 24 hours ½" of Fuel Measured on Water Sample
HA-42	0'-1.7'	Brown and Gray Silty Fine Sand (Fill)
STA.(See Fig. No.3)	1.7'-3.0'	Orange-Brown and Gray Slightly Clayey Slightly Silty Fine SAND
	3.0'-4.5'	Gray and Orange-Brown Mottled Silty CLAY with Fine SAND
	4.5'-5.5'	Gray Slightly Clayey Slightly Silty Fine SAND
	5.5'-6.5'	Orange and Gray Slightly Clayey Slightly Silty Fine SAND
	6.5'-8.0'	Light Gray Slightly Silty Fine SAND
	8.0'-8.5'	Orange and Gray Slightly Silty Fine SAND
	8.5'-10.4'	Orange and Gray Slightly Clayey Slightly Silty Fine SAND
	10.4'	Boring Terminated at 10.4' - Water Level Measured at 9.0' after 24 hours
HA-43	0 -0.8'	Dark Brown Fine Sandy SILT (Fill)
STA.(See Fig. No.3)	0.8'-3.0'	Gray and Orange-Brown Slightly Clayey Silty Fine SAND
	3.0'-4.5'	Gray and Orange-Brown Mottled Silty CLAY with Fine SAND
	4.5'-5.5'	Gray and Slightly Clayey Slightly Silty Fine SAND
	5.5'-6.5'	Gray Slightly Silty Fine SAND
	6.5'-7.5'	White Fine SAND
	7.5'-8.5'	Light Gray and Orange Slightly Silty Fine SAND
	8.5'-10.4'	Light Gray Slightly Clayey Slightly Silty Fine SAND
	10.4'	Boring Terminated at 10.4' - Water Level Measured at 8'-9" after 24 hours

HA-44	0 -1.0'	Dark Brown Silty Fine SAND (Fill)
STA.(See Fig. No.3)	1.0'-3.0'	Gray and Brown Clayey Silty Fine SAND
	3.0'-4.0'	Gray and Brown Mottled Silty Clay with Fine Sand
	4.0'-4.5'	Gray Clayey Silty Fine SAND
	4.5'-5.2'	Gray Slightly Silty Fine SAND
	5.2'-6.5'	Gray and Orange-Brown Slightly Clayey Slightly Silty Fine SAND
	6.5'-8.5'	Light Gray Slightly Silty Fine SAND
	8.5'-9.0'	Gray and Orange Slightly Clayey Slightly Silty Fine SAND
	9.0'-10.4'	Greenish-Gray Slightly Silty Fine SAND with Trace of Coarse Sand
	10.4'	Boring Terminated at 10.4' - Water Level Measured at 8'-5" after 24 hours
HA-45	0 -1.0'	Dark Gray Silty Fine SAND (Fill)
STA.(See Fig. No.3)	1.0'-2.5'	Gray and Orange-Brown Silty Fine SAND
	2.5'-4.0'	Gray and Orange-Brown Mottled Silty CLAY with Fine Sand
	4.0'-5.5'	Gray Slightly Clayey Silty Fine SAND
	5.5'-6.0'	Gray Slightly Silty Fine SAND
	6.0'-9.5'	Light Gray and Orange Mottled Slightly Silty Fine SAND
	9.5'-10.4'	Light Gray Slightly Clayey Slightly Silty Fine SAND
	10.4'	Boring Terminated at 10.4' - Water Level Measured at 8'-9" after 24 hours
HA-46	0 -3.0'	Dark Brown Silty Fine SAND (Slightly Stale Fuel Odor)
STA.(See Fig. No.4)	3.0'-4.5'	Gray Silty Fine SAND with Silty Clay Seams and Roots (Stale Fuel Odor)
	4.5'-7.0'	Gray Silty Slightly Clayey Fine SAND (Stale Fuel Odor)
	7.0'-8.0'	Gray and Brown Mottled Silty CLAY with Fine Sand (Stale Fuel Odor)
	8.0'-9.5'	Gray Silty Clayey Fine SAND (Slight Fuel Odor)
	9.5'-10.0'	Dark Gray Silty Clayey Fine SAND (Slight Fuel Odor)
	10.0'	Boring Terminated at 10.0' - Water Level Measured at 7'-5" after 24 hours Slight Fuel Odor in Water Sample
HA-47	0 -2.0'	Dark Brown Silty Fine SAND (Slightly Stale Fuel Odor)
STA.(See Fig. No.4)	2.0'-3.0'	Gray Slightly Silty Fine SAND (Slight Fuel Odor)
	3.0'-4.5'	Dark Gray Silty Fine SAND with Roots (Slight Fuel Odor)
	4.5'-6.0'	Gray Silty Clayey Fine SAND with Roots (Slight Fuel Odor)
	6.0'-8.0'	Gray and Orange-Brown Mottled Silty CLAY with Fine SAND (Slight Fuel Odor)
	8.0'-10.4'	Gray Silty Clayey Fine SAND (Slight Fuel Odor)
	10.4'	Boring Terminated at 10.4' - Water Level Measured at 8'-6" after 24 hours Slight Fuel Odor in Water Sample

HA-48	0 -0.5'	Dark Gray Silty Fine SAND - Topsoil with Grass Root Mat
STA.(See Fig. No.4)	0.5'-3.5'	Dark Gray and Brown Silty Fine SAND
	3.5'-5.5'	Brown Silty Fine SAND
	5.5'-6.0'	Tan Silty Fine SAND
	6.0'-8.0'	Gray Silty CLAY
	8.0'-9.3'	Gray Slightly Silty Slightly Clayey Fine SAND
	9.3'	Boring Terminated at 9.3" - Water Level Measured at 6'-7" after 24 hours.
HA-49	0 -0.5'	Dark Gray Silty Fine SAND - Topsoil with Grass Root Mat
STA.(See Fig. No.4)	0.5'-1.0'	Orange-Brown and Tan Slightly Silty Fine SAND (Fill)
	1.0'-3.5'	Dark Gray Silty Fine SAND
	3.5'-4.2'	Brown Silty Fine SAND
	4.2'-5.5'	Gray and Brown Slightly Clayey Silty Fine SAND
	5.5'-8.0'	Gray Silty Clayey Fine SAND with Roots
	8.0'-10.3'	Gray Slightly Silty Slightly Clayey Fine SAND
	10.3'	Boring Terminated at 10.3' - Water Level Measured at 6'-6" after 24 hours
HA-50	0 -0.5'	Dark Brown Silty Fine SAND - Topsoil with Grass Root Mat
STA.(See Fig. No.4)	0.5'-0.9'	Orange-Brown and Tan Slightly Silty Fine SAND (Fill)
	0.9'-5.0'	Dark Gray Silty Fine SAND with Roots
	5.0'-6.5'	Gray Silty Fine SAND
	6.5'-7.0'	Gray Slightly Clayey Silty Fine SAND (Slightly Stale Fuel Odor)
	7.0'-7.5'	Gray Silty CLAY with Fine SAND (Slightly Stale Fuel Odor)
	7.5'-9.5'	Gray Slightly Clayey Silty Fine SAND
	9.5'-10.0'	Light Gray Silty Clayey Fine SAND
	10.0'-10.3'	Light Gray Silty CLAY with Fine SAND
	10.3'	Boring Terminated at 10.3' - Water Level Measured at 10.0' after 24 hours No Fuel Odor in Water Sample
HA-51	0 -0.5'	Dark Brown Silty Fine SAND - Topsoil with Grass Root Mat
STA.(See Fig. No.4)	0.5'-1.0'	Orange-Brown and Tan Slightly Silty Fine SAND (Fill)
	1.0'-7.5'	Gray Slightly Clayey Silty Fine SAND
	7.5'-9.0'	Gray Silty Clayey Fine SAND
	9.0'-10.0'	Light Gray Slightly Silty Slightly Clayey Fine SAND
	10.0'	Boring Terminated at 10.0' - Water Level Measured at 9'-6" after 24 hours

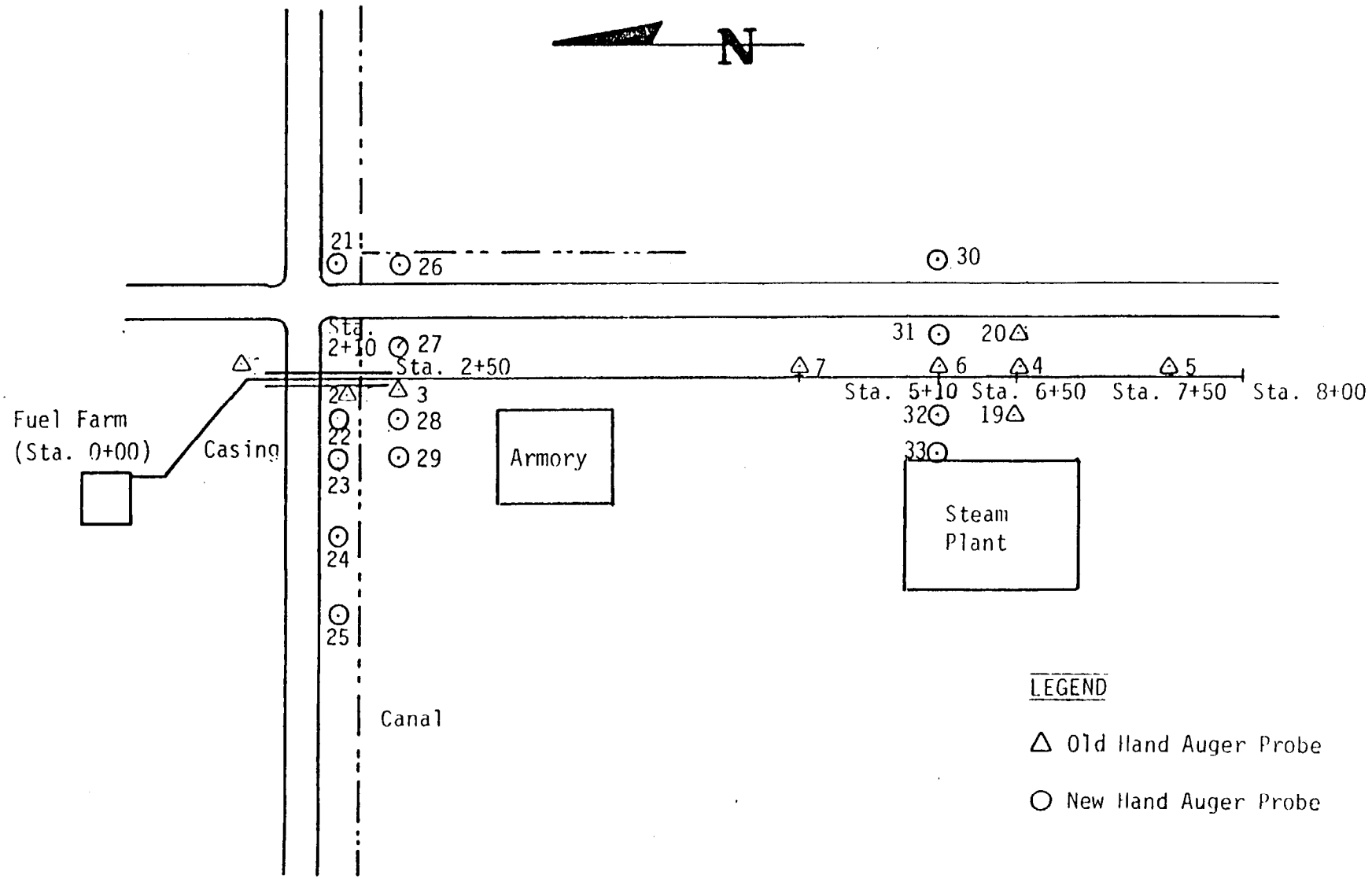
HA- 52	0 -1.0'	Dark Brown Silty Fine SAND - Topsoil with Grass Root Mat
STA.(See Fig. No.4)	1.0'-1.5'	Orange and Tan Slightly Silty Fine SAND (Fill)
	1.5'-2.5'	Tan and Gray Silty Fine SAND (Fill) (Slightly Stale Fuel Odor)
	2.5'-3.5'	Dark Gray Silty Fine SAND - Original Topsoil
	3.5'-5.0'	Gray Silty Fine SAND
	5.0'-7.0'	Gray and Brown Silty CLAY with Fine Sand Seams (Strong Fuel Odor)
	7.0'-8.0'	Gray Silty Clayey Fine SAND (Strong Fuel Odor)
	8.0'-10.3'	Light Gray Slightly Silty Slightly Clayey Fine SAND (Strong Fuel Odor)
	10.3'	Boring Terminated at 10.3' - Water Level Measured at 10'-2" after 24 hours Strong Fuel Odor in Water Sample
HA-53	0 -0.4'	Dark Brown Fine Sandy SILT - Topsoil with Grass Root Mat
STA.(See Fig. No.4)	0.4'-1.0'	Gray and Orange-Brown Silty Fine SAND with Clay (Fill)
	1.0'-2.5'	Orange and Tan Slightly Silty Fine SAND (Fill)
	2.5'-3.0'	Dark Gray Silty Fine SAND - Original Topsoil
	3.0'-4.0'	Gray Slightly Silty Fine SAND
	4.0'-5.0'	Gray and Brown Slightly Silty Slightly Clayey Fine SAND
	5.0'-5.5'	Gray and Brown Mottled Silty Clayey Fine SAND
	5.5'-6.5'	Gray and Brown Mottled Silty CLAY with Fine Sand Seams
	6.5'-10.3'	Gray Slightly Clayey Slightly Silty Fine SAND (Slight Fuel Odor)
	10.3'	Boring Terminated at 10.3' - Water Level Measured at 10'-2" after 24 hours Slightly Stale Fuel Odor in Water Sample
HA- 54	0 -0.6'	Dark Brown Fine Sandy SILT - Topsoil with Grass Root Mat
STA.(See Fig. No.4)	0.6'-2.0'	Gray and Orange-Brown Silty Fine SAND with Clay (Fill)
	2.0'-3.3'	Gray and Light Brown Slightly Clayey Slightly Silty Fine SAND (Fill)
	3.3'-5.0'	Gray Silty Fine SAND
	5.0'-9.0'	Gray Slightly Clayey Slightly Silty Fine SAND (Strong Fuel Odor)
	9.0'-10.3'	Light Gray Slightly Silty Fine SAND (Fuel)
	10.3'	Boring Terminated at 10.3' - Fuel Level Measured at 9'-9" after 24 hours 7" of Fuel Measured above Bottom of Borehole

HA-55	0 -0.4'	Dark Brown Fine Sandy SILT - Topsoil with Grass Root Mat
STA.(See Fig. No.4)	0.4'-1.5'	Tan Silty Fine SAND (Fill)
	1.5'-2.3'	Orange-Brown and Tan Silty Fine SAND (Fill)
	2.3'-3.5'	Gray and Light Brown Slightly Clayey Silty Fine SAND (Fill)
	3.5'-4.5'	Dark Brown Fine Sandy SILT - Original Topsoil
	4.5'-5.0'	Brown Fine Sandy SILT
	5.0'-6.5'	Gray Silty Slightly Clayey Fine SAND (Slight Stale Fuel Odor)
	6.5'-7.0'	Gray and Brown Sandy Silty CLAY (Slight Stale Fuel Odor)
	7.0'-9.0'	Gray and Brown Silty Slightly Clayey Fine SAND (Strong Fuel Odor)
	9.0'-10.3'	Light Gray Slightly Silty Fine SAND (Strong Fuel Odor)
	10.3'	Boring Terminated at 10.3' - Fuel Level Measured at 10'-0" after 24 hours 3" of Fuel Measured above Bottom at Borehole
HA-56	0 -1.0'	Brown Silty Fine SAND - Topsoil with Grass Root Mat
STA.(See Fig.No.4)	1.0'-2.0'	Orange-Brown and Tan Silty Fine SAND
	2.0'-3.5'	Orange-Brown and Gray Mottled Silty CLAY with Fine Sand (Slightly Stale Fuel Od
	3.5'-4.5'	Orange-Brown and Gray Mottled Slightly Clayey Slightly Silty Fine SAND (Stale Fuel Odo
	4.5'-6.0'	Light Gray Slightly Silty Fine SAND (Stale Fuel Odor)
	6.0'-7.0'	Brownish Gray Silty Fine SAND (Fuel Odor)
	7.0'-8.0'	Dark Gray Silty Fine SAND (Fuel Odor)
	8.0'-8.5'	Dark Blue-Gray Silty Fine SAND with Coarse Sand and Gravel (Fuel Odor)
	8.5'-9.0'	Dark Gray Silty Fine SAND (Strong Fuel Odor)
	9.0'-10.3'	Light Gray Slightly Silty Fine SAND (Fuel)
	10.3'	Boring Terminated at 10.3' - Fuel Level Measured at 6'-4" after 24 hours 1'-11" of Fuel Measured above Water Level
HA-57	0 -0.4'	Brown Sandy SILT - Topsoil with Grass Root Mat
STA.(See Fig.No.4)	0.4'-1.1'	Orange-Brown and Gray Slightly Clayey Silty Fine SAND
	1.1'-4.5'	Brown and Gray Sandy SILT with Clay (Slightly Stale Fuel Odor)
	4.5'-6.5'	Blue-Gray and Brown Sandy Silty CLAY (Strong Fuel Odor)
	6.5'-7.5'	Blue-Gray and Brown Slightly Clayey Silty Fine SAND with Coarse Sand and Grav (Strong Fuel Odor)
	7.5'-10.3'	Light Gray Slightly Silty Fine SAND (Fuel)
	10.3'	Boring Terminated at 10.3' - Fuel Level Measured at 7'-11" after 24 hours 2'-4" of Fuel Measured above Bottom of Borehole

HA- 58	0 -0.5'	Dark Brown Silty Fine SAND - Topsoil with Grass Root Mat
STA.(See Fig. No.4)	0.5'-2.3'	Orange-Brown and Tan Slightly Silty Fine SAND (Fill)
	2.3'-2.5'	Brown Silty Fine SAND (Fill)
	2.5'-3.5'	Dark Gray Slightly Clayey Silty Fine SAND
	3.5'-5.5'	Dark Brown Silty Fine SAND
	5.5'-7.5'	Dark Blue-Gray Sandy Silty CLAY (Slightly Stale Fuel Odor)
	7.5'-8.5'	Blue-Gray Silty Clayey Fine SAND with Coarse Sand and Small Gravel (Fuel Odor)
	8.5'-10.3'	Gray Slightly Silty Fine SAND with Coarse Sand (Fuel)
	10.3'	Boring Terminated at 10.3'-Fuel Level Measured at 8'-6" after 24 hours 1'-9" of Fuel Measured above Bottom of Borehole
HA-59	0 -0.9'	Dark Gray Silty Fine SAND-Topsoil with Grass Root Mat
STA.(See Fig. No.4)	0.9'-2.0'	Brown and Tan Silty Fine SAND (Fill)
	2.0'-2.5'	Orange-Brown and Tan Slightly Silty Fine SAND (Fill)
	2.5'-5.5'	Gray Slightly Silty Slightly Clayey Fine SAND (Fuel Odor)
	5.5'-9.5'	Light Gray Slightly Silty Fine SAND (Strong Fuel Odor)
	9.5'	Boring Terminated at 9.5'-Fuel Level Measured at 6'-8" after 24 hours Caved in at 7'-9", 1'-1" of Fuel Measured above Cave-In
HA-60	0 -0.3'	Dark Brown Silty Fine SAND-Topsoil with Grass Root Mat
STA.(See Fig. No.4)	0.3'-1.5'	Orange-Brown and Tan Slightly Silty Slightly Clayey Fine SAND
	1.5'-2.4'	Dark Gray and Brown Slightly Clayey Silty Fine SAND
	2.4'-3.5'	Gray Slightly Clayey Silty Fine SAND
	3.5'-4.0'	Gray and Brown Clayey Silty Fine SAND
	4.0'-4.7'	Gray and Brown Mottled Silty CLAY with Fine SAND
	4.7'-7.0'	Gray and Brown Slightly Silty Slightly Clayey Fine SAND (Fuel Odor)
	7.0'-10.2'	Light Gray Slightly Silty Fine SAND (Fuel)
	10.2'	Boring Terminated at 10.2' uel Level Measured at 7'-4" after 24 hours Caved in at 9'-5", 2'-1" of Fuel Measured above Cave-In

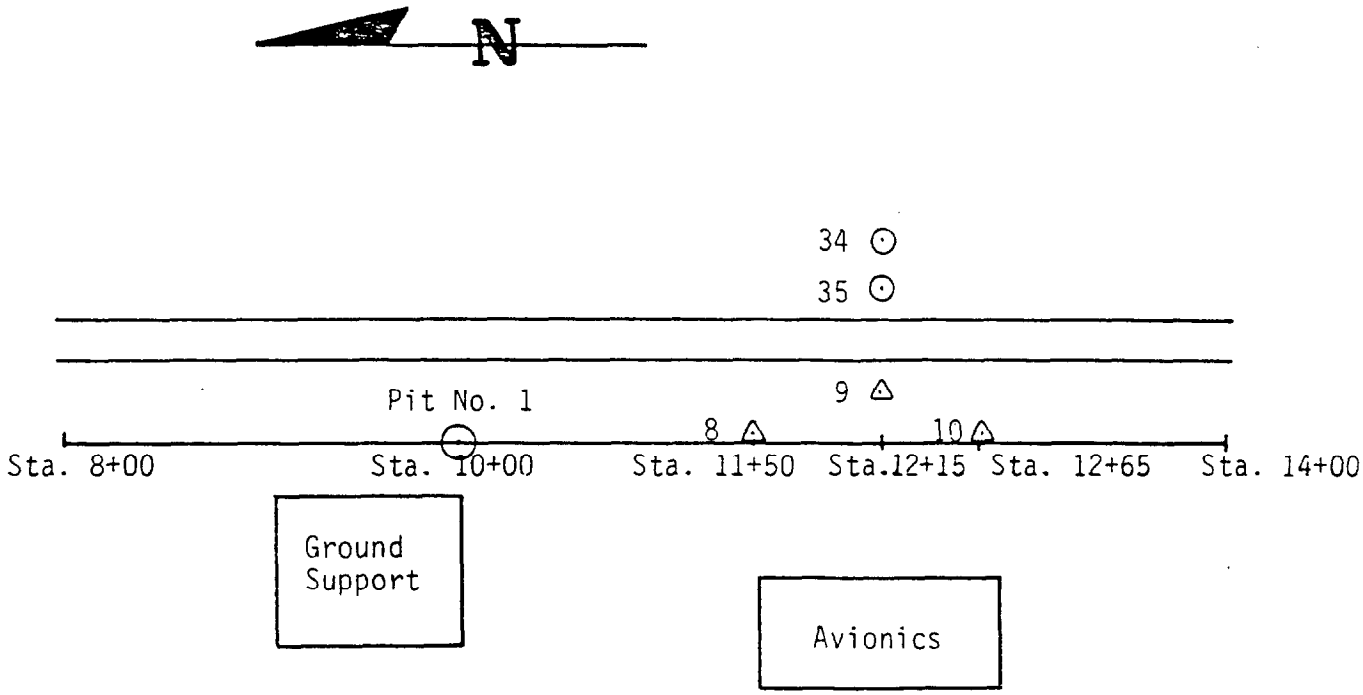
HA-61	0 -1.5'	Brown Silty Fine SAND-Topsoil with Grass Root Mat
STA.(See Fig. No.4)	1.5'-2.0	Gray Slightly Silty Fine SAND
	2.0'-3.0'	Gray and Orange-Brown Slightly Clayey Silty Fine SAND
	3.0'-4.0'	Gray and Orange-Brown Mottled Silty CLAY with Fine Sand
	4.0'-5.3'	Gray Slightly Silty Fine SAND with Trace of Small Gravel
	5.3'-6.0'	Light Gray and Orange-Brown Slightly Silty Fine SAND
	6.0'-10.0'	Light Gray Slightly Silty Fine SAND (Slightly Stale Fuel Odor)
	10.0'	Boring Terminated at 10.0'-Water Level Measured at 7'-10" after 24 hours Caved in at 8'-2"-Slightly Stale Fuel Odor in Water Sample
HA-62	0 -1.0'	Dark Brown Silty Fine SAND-Topsoil with Grass Root Mat
STA.(See Fig. No.4)	1.0'-2.0'	Orange-Brown and Tan Slightly Silty Fine SAND
	2.0'-4.0'	Orange and Gray Clayey Silty Fine SAND
	4.0'-5.0'	Orange and Gray Mottled Silty CLAY with Fine SAND
	5.0'-6.0'	Gray Slightly Clayey Slightly Silty Fine SAND
	6.0'-7.0'	Gray and Orange-Brown Slightly Silty Fine SAND
	7.0'-8.3'	Dark Gray Slightly Silty Slightly Clayey Fine SAND
	8.3'-9.0'	Gray Slightly Silty Slightly Clayey Fine SAND with Trace of Coarse Sand and Small Gravel
	9.0'-10.3'	Gray Slightly Silty Fine SAND
	10.3'	Boring Terminated at 10.3'-Water Level Measured at 8'-9" after 24 hours Caved in at 9'-5"
HA-63	0 -1.2'	Brown Silty Fine SAND-Topsoil with Grass Root Mat
STA.(See Fig. No.4)	1.2'-1.5'	Orange Sandy Clayey SILT
	1.5'-3.8'	Orange and Gray Mottled Silty Clay with Fine SAND
	3.8'-5.5'	Orange-Brown and Gray Slightly Silty Slightly Clayey Fine SAND (Fuel Odor)
	5.5'-7.0'	Gray Slightly Silty Fine SAND (Strong Fuel Odor)
	7.0'-10.0'	Light Gray Slightly Silty Fine SAND (Fuel)
	10.0'	Boring Terminated at 10.0'-Fuel Level Measurement at 6'-2" after 24 hours Caved in at 8'-7",2'-5" of Fuel Measured above Caved-In

HA-64	0 -0.5'	Dark Brown Silty Fine Sand - Topsoil with Grass Root Mat
STA.(See Fig. No.4)	0.5'-1.6'	Orange-Brown and Gray Slightly Silty Fine SAND
	1.6'-2.2'	Orange and Gray Silty Clayey Fine SAND
	2.2'-4.1'	Orange and Gray Mottled Silty CLAY with Fine SAND
	4.1'-7.5'	Gray and Brown Slightly Silty Slightly Clayey Fine SAND (Fuel Odor)
	7.5'-8.5'	Tan Slightly Silty Fine SAND (Strong Fuel Odor)
	8.5'-10.2'	Gray Slightly Silty Fine SAND (Fuel)
	10.2'	Boring Terminated at 10.2'-Fuel Level Measured at 6'-10" after 24 hours Caved in at 8'-11",2'-1" of Fuel Measured above Cave-In
HA-65 Through HA-72		
STA.(See Fig. No.4)	0'	(Soil Cement) Several unsuccessful attempts were made to penetrate through the soil cement layer at the designated locations with a hand auger and a pickax



PROJECT Fuel Pipeline Investigation Camp LeJeune Jacksonville, North Carolina	SOIL & MATERIAL ENGINEERS, INC. RALEIGH, NORTH CAROLINA	SCALE: 1" = 100' JOB NO: 051-83-354-A FIG NO: 1

DOC.No.:CLEJ-00232-1.02-12/07/83

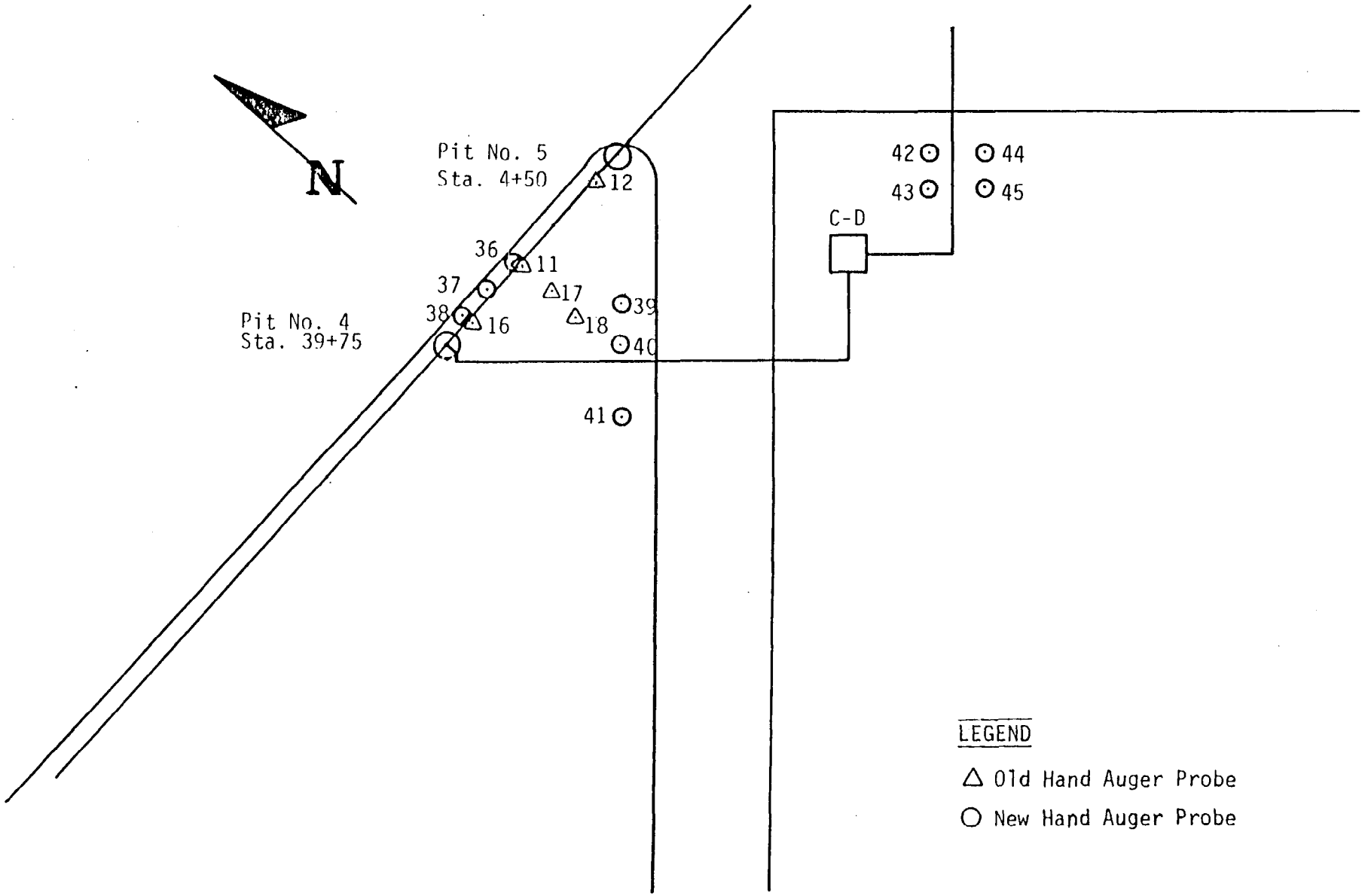


LEGEND

△ Old Hand Auger Probe

○ New Hand Auger Probe

PROJECT	SOIL & MATERIAL ENGINEERS, INC. RALEIGH, NORTH CAROLINA	SCALE: 1" = 100'
Fuel Pipeline Investigation Camp LeJeune		JOB NO: 051-83-354-A
		FIG. NO: 2

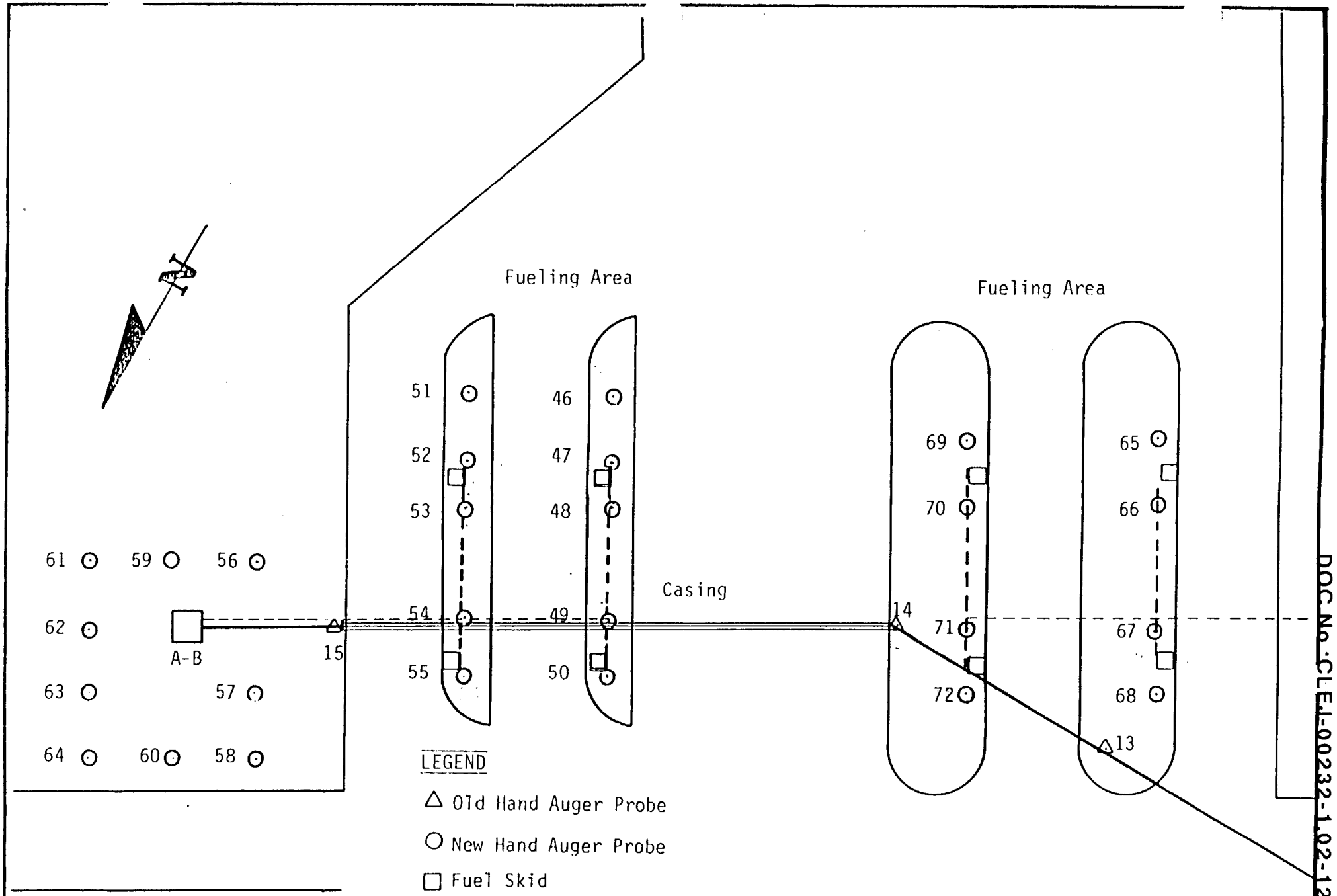


PROJECT Fuel Pipeline Investigation Camp LeJeune Jacksonville, North Carolina	SOIL & MATERIAL ENGINEERS, INC. RALEIGH, NORTH CAROLINA	SCALE: 1" = 100' JOB NO: 051-83-354-A FIG NO: 3

DOC.No.:CLE-00232-1.02-12/07/83

DUNCAN-PARNELL, INC., RALEIGH 281

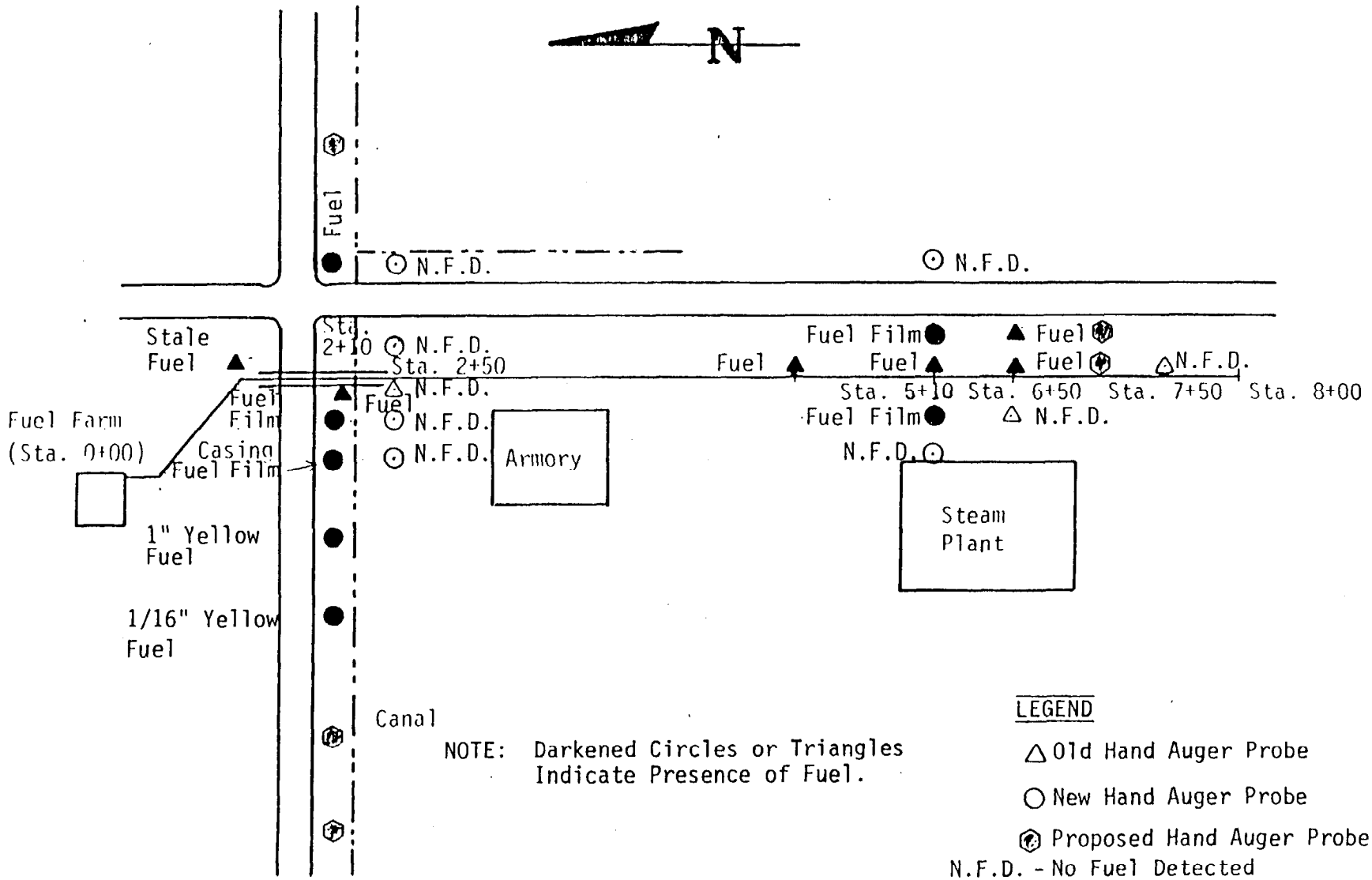
SM-81



DOC No. CLE-I-00232-1.02-12/07/83

DUNCAN-PARNELL, INC., RALEIGH 281

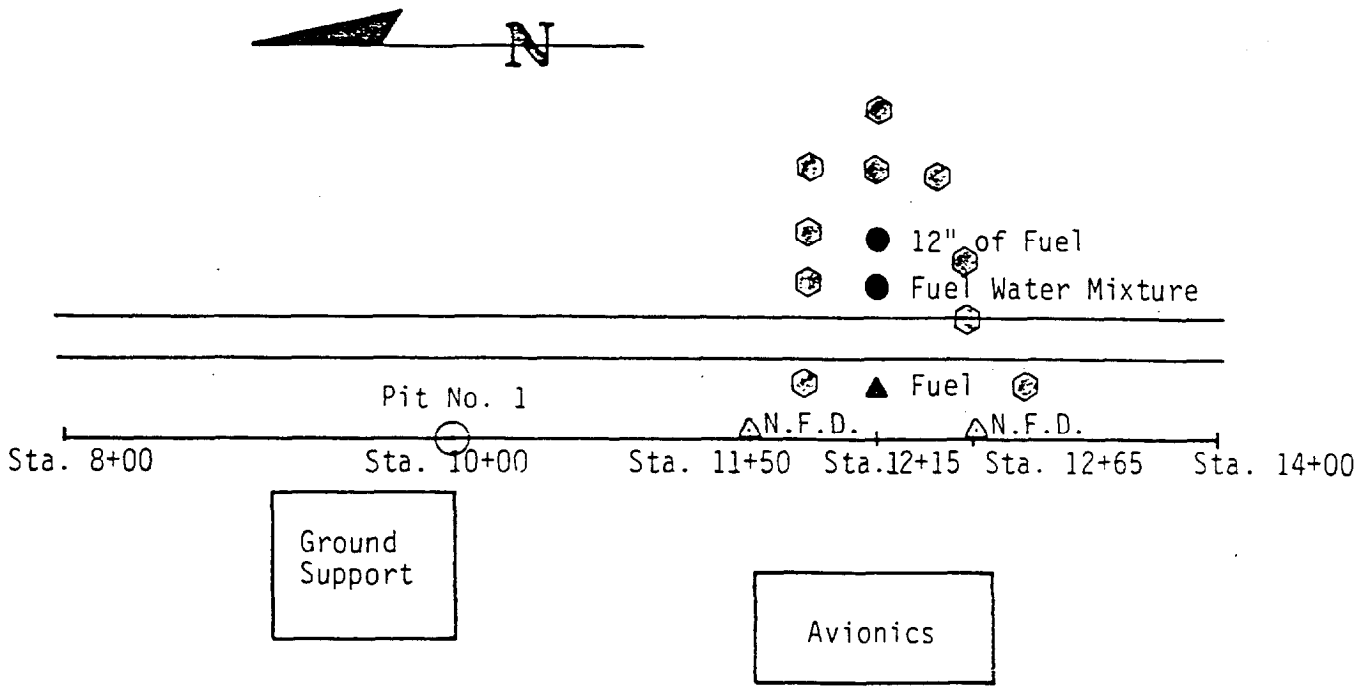
PROJECT	SOIL & MATERIAL ENGINEERS, INC.	SCALE: 1" = 100'
Fuel Pipeline Investigation Camp LeJeune Jacksonville, North Carolina	RALEIGH, NORTH CAROLINA	JOB NO: 051-83-354-A
		FIG NO: 4



PROJECT Fuel Pipeline Investigation Camp LeJeune Jacksonville, North Carolina	SOIL & MATERIAL ENGINEERS, INC. RALEIGH, NORTH CAROLINA	SCALE: 1" = 100' JOB NO: 051-83-354-A FIG NO: 5

DUNCAN-PARNELL, INC., RALEIGH 281

DOC.NO.:CLEJ-00232-1.02-12/07/83



LEGEND

△ Old Hand Auger Probe

○ New Hand Auger Probe

⬡ Proposed Hand Auger Probe

N.F.D. - No Fuel Detected

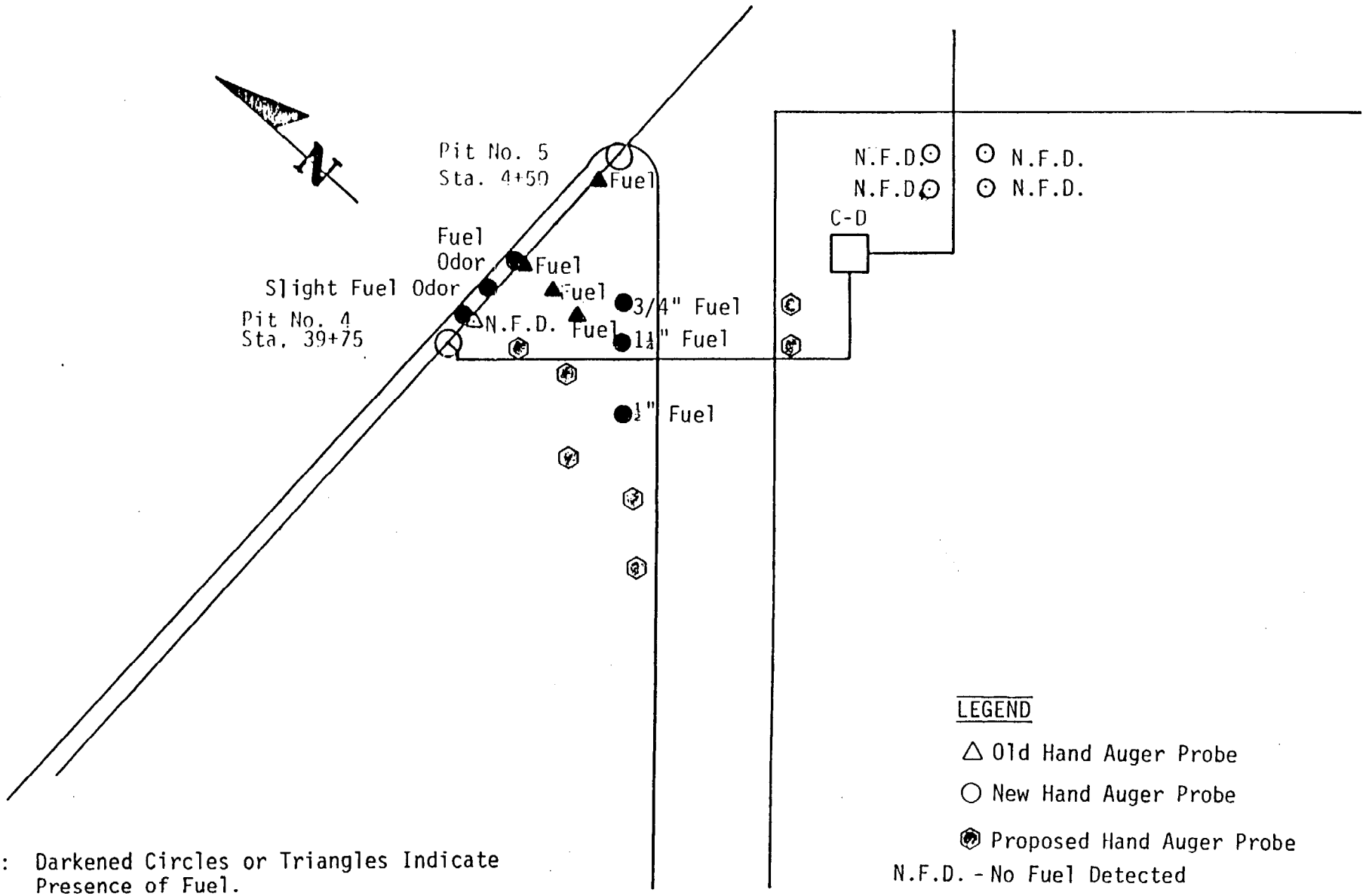
NOTE: Darkened Circles or Triangles Indicate Presence of Fuel.

PROJECT

Fuel Pipeline Investigation
Camp LeJeune
Jacksonville, N. Carolina

SOIL & MATERIAL ENGINEERS, INC.
RALEIGH, NORTH CAROLINA

SCALE: 1" = 100'
JOB NO: 051-83-354-A
FIG. NO: 6

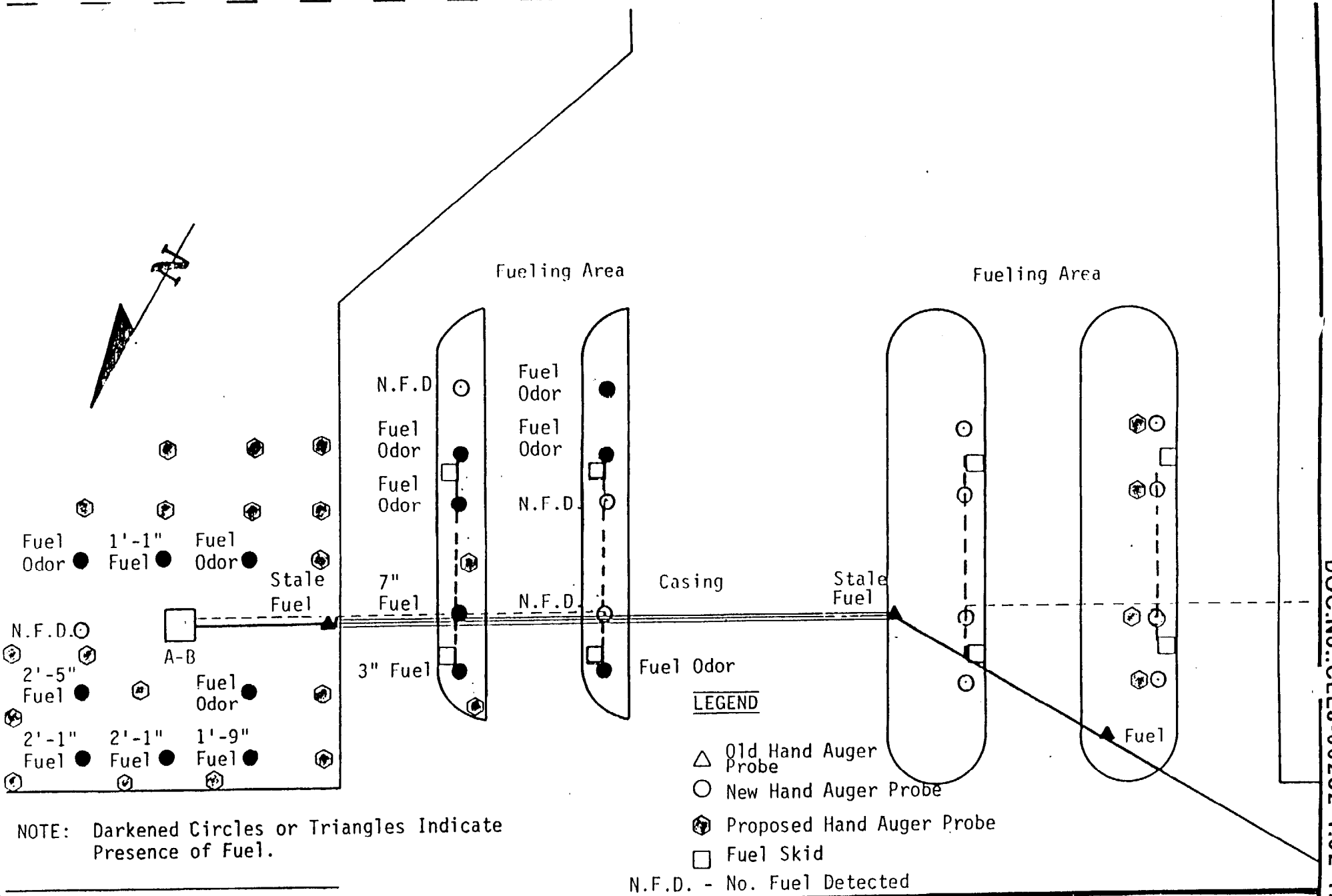


NOTE: Darkened Circles or Triangles Indicate Presence of Fuel.

DOC.No.:CLEJ-00232-1.02-12/07/83

DUNCAN-PARNELL, INC., RALEIGH 281

PROJECT	SOIL & MATERIAL ENGINEERS, INC.	SCALE: 1" = 100'
Fuel Pipeline Investigation Camp LeJeune Jacksonville, North Carolina	RALEIGH, NORTH CAROLINA	JOB NO: 051-83-354-A
		FIG NO: 7



NOTE: Darkened Circles or Triangles Indicate Presence of Fuel.

PROJECT	SOIL & MATERIAL ENGINEERS, INC. RALEIGH, NORTH CAROLINA	SCALE: 1" = 100'
Fuel Pipeline Investigation Camp LeJeune Jacksonville, North Carolina		JOB NO: 051-83-354-A
		FIG NO: 8

DOC.No.:CLEJ-00232-1.02-12/07/83

SM-B1