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COMPREHENSIVE SITE ASSESSMENT

FOR

KOCH NORTH TERMINAL PARA-XYLENE INCIDENTS

3325 RIVER ROAD
WILMINGTON, NORTH CAROLINA

CATLIN PROJECT NO. 199-160-20

PREPARED FOR:

KOCH *PETROLEUM GROUP,* LP
WILMINGTON, NORTH CAROLINA

August 7, 2000

NORTH CAROLINA PROFESSIONAL SEAL 10724 ENGINEER KEITH P. BULLA

8/21/00

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August 21, 2000

North Carolina Department of Environment
and Natural Resources
Division of Water Quality
Attn: Mr. Seth Chipman
127 Cardinal Drive Extension
Wilmington, North Carolina 28405

Re: Comprehensive Site Assessment
Koch North Terminal: Para-xylene Incidents
3325 River Road
Wilmington, North Carolina
CATLIN Project No. 199-160-20

Dear Mr. Chipman:

On behalf of Koch Petroleum Group, LP, enclosed is the Comprehensive Site Assessment (C.S.A.) concerning the above-referenced site. Koch and CATLIN personnel would like to meet with you regarding our additional remediation activities strategy.

Upon your review, please contact Mr. Frank Van Ryn on a suitable date and time.

Sincerely,

Stephan A. Tyler
Project Manager

Keith P. Bulla, P.E.
Project Engineer

Enclosure
SAT/hab
cc: Jim Strickland, Koch Petroleum Group
Frank Van Ryn, Reiss

9160st05.ltr

DIVISION OF WATER QUALITY
Certification for the Submittal of a Comprehensive Site Assessment

Responsible Party: Koch Petroleum Group,LP
Contact Person: Mr. James H. Strickland
Address: P.O. Box 3958
City: Wilmington, **State:** NC, **Zip Code:** 28406

Site Name: Koch North Terminal
Address: 3325 River Road
City: Wilmington, **State:** NC, **Zip Code:** 28406
Groundwater Incident Number:_____, **Site Priority Ranking:**_____
AST 801

I, Keith Bulla, a Professional Engineer/Licensed Geologist (circle one) for Catlin Engineers & Scientists, Inc. (firm or company of employment) do hereby certify that the information indicated below is enclosed as part of the required Comprehensive Site Assessment (CSA) and that to the best of my knowledge the data, assessments, conclusions, recommendations and other associated materials are correct, complete and accurate.

(Each item must be initialed by the certifying licensed professional)

1. KPB The source of the contamination has been identified. A list of all potential sources of the contamination is attached.
2. KPB Imminent hazards to public health and safety have been identified.
3. KPB Potential receptors and significant exposure pathways have been identified.
4. KPB Geological and hydrogeological features influencing the movement of groundwater have been identified. The chemical and physical character of the contaminants have been identified.
5. KPB The CSA sufficiently characterizes the cause, significance and extent of groundwater and soil contamination such that a Corrective Action Plan can be developed.

If any of the above statements have been altered or items not initialed, provide a detailed explanation. Failure to initial any item or to provide written justification for the lack thereof will result in immediate return of the CSA to the responsible party.

(Please Affix Seal and Signature)

NORTH CAROLINA PROFESSIONAL SEAL 10724 ENGINEER KEITH P. BULLA

Keith P. Bulla 8/21/00

GW-100(csa) 3/17/97

COMPREHENSIVE SITE ASSESSMENT
FOR
KOCH PETROLEUM GROUP LP
KOCH NORTH TERMINAL

EXECUTIVE SUMMARY

The subject site is the Koch North Facility at 3325 River Road in Wilmington, North Carolina. Since the facility was constructed by Philips Petroleum in 1929, it has been utilized as a bulk storage tank facility handling various gasolines, additives, #2 fuel oils and para-xylene (PX). During Koch's ownership (since November 1981) operation of the facility has been divided into two areas, Gasoline/Fuel Oil Bulk Storage and Para-xylene Bulk Storage.

Since 1929 there have been several product releases. Product releases since 1980 have been assessed and are currently on file at the Wilmington Regional Office (WIRO) of the North Carolina Department of Environment and Natural Resources (NCDENR). NCDENR issued a correspondence to Koch on January 7, 2000 requesting that several areas of concern be addressed at the Koch North Terminal. Specifically these areas of concern involve ground water quality at Aboveground Storage Tanks (ASTs) K-1, K-4, K-5 as the gasoline/fuel oil bulk storage area and further assess ground water/soil conditions at the Px bulk storage area.

KOCH NORTH GASOLINE/FUEL OIL BULK STORAGE AREA

On January 11, 2000, representative ground water samples were collected from selected monitoring wells (MW1, MW2, MW14, and MW20) located along the downgradient perimeter of the Koch North Terminal gasoline/#2 fuel oil facility. Samples were analyzed for gasoline constituents per Environmental Protection Agency (EPA) Method 602.

A review of the water quality data shows minor dissolved gasoline contamination downgradient of AST K-1[MW-14 - ethylbenzene 36 parts per billion (ppb); limit 29 ppb] and AST K-4 (MW20 - ethylbenzene 180 ppb and total xylenes 2,330 ppb; limit 539 ppb). Analysis of downgradient monitoring wells MW-1 and MW-2 revealed compliant concentrations of all EPA Method 602 analytes.

The January 7, 2000 NCDENR letter referenced a 10,000-gallon gasoline release near AST K-5. Since Koch purchased the property in November 1981, AST K-5 and nearby K-6 have been utilized to store #2 fuel oil. In 1992, AST K-5 was cut and modified for its current use as a wastewater treatment plant. According to Koch personnel, there have been no known releases of product from AST K-5.

KOCH NORTH PARA-XYLENE (PX) STORAGE AREA

Areas of concern within the Koch North PX facility warranted additional subsurface date to augment the existing site monitoring wells and historical information. Characterization of site soil/geology was based on samples obtained during monitoring well installation and a Ground Penetrating Radar

(GPR) survey. To augment the existing Type II and III monitoring well network an additional eleven Type II (MW-9 through MW-20) and one Type III (TMW-2) were installed.

The area of investigation is underlain primarily by fine to medium grained, poorly sorted sand with occasional plagioclase grains and 1mm to 15mm gravel. This formation also includes interlain silty sand and clayey sand lenses. This matches the "surficial sand" formation encountered throughout New Hanover County. This formation lies unconformably on older lower units and survey-wide ranges in thickness from 10 feet to >20 feet thick.

Underlying the "surficial sand" formation are fine to medium grained, poorly sorted clayey/silty sands with occasional shell fragments, black phosphatic sands. This description matches the "undifferentiated Pliocene/Pleistocene strata" encountered throughout most of New Hanover County. This strata within the survey area ranged from possibly absent to ±20 feet thick. Utilizing the GPR data the topography of the "undifferentiated Pliocene/Pleistocene" strata was contoured. The resulting pattern suggests remnants of a buried channel structure, within the surficial aquifer, trending east to west.

While installing Type III monitoring wells TMW-1 and TMW-2, a sequence of fine grained clay (moderate plasticity), sand with shell fragments followed by dense limestone were encountered at 30 feet and 28 feet below the ground surface, respectively. This sequence is generally recognized as the Castle Hayne Formation. Total thickness of this formation within the subject site was not determined.

Site surficial ground water flow is predominantly to the West-northwest toward the Cape Fear River.

During the field work phase of this assessment free-phase product was not evident at any of the site monitoring wells.

Site soil quality was evaluated using analytical laboratory techniques (EPA Methods 8260 and 8270) and conducting a Fugro Geosciences, Rapid Optical Screening Tool (ROST™) survey. During the investigation several zones of PX and/or Kerosene soil contamination were delineated.

Site ground water quality was evaluated by obtaining ground water samples from site monitoring wells for analyses of M/P xylene concentrations per EPA Method 602. The most recent data revealed surficial ground water contamination (7,530 ppb M/P xylenes) from south of AST 601 west to River Road (±850 feet) and from ASTs 301, 401, 501 north to the property boundary (±850 feet). Also, high concentrations of contaminants were identified around monitoring well MW-14 (270,000 ppb) and west of AST 801 (MW-7, 130,000 ppb and MW-11 110,000 ppb).

Site remediation modification alternatives to be investigated include using additional ground water recovery efforts around monitoring well 117 to control surficial ground water migration in this area and traditional remediation approaches for addressing surficial ground water hot spots and the multiple zones of soil contamination.

TABLE OF CONTENTS

		Page
1.0	**INTRODUCTION**	1
1.0	BACKGROUND	1
1.2	PURPOSE	1
2.0	**GENERAL INFORMATION**	2
2.1	FACILITY IDENTIFICATION	2
2.2	CURRENT FACILITY OWNER/OPERATOR	2
2.3	ENVIRONMENTAL CONSULTANT	2
2.4	FACILITY OPERATIONS AND ABOVEGROUND STORAGE TANK DATA	2
2.5	PROPERTY HISTORY	3
2.6	PRODUCT RELEASE HISTORY	4
3.0	**POTENTIAL RECEPTORS AND MIGRATION PATHWAYS**	5
3.1	POTENTIAL RECEPTORS	5
3.2	UTILITIES	6
3.3	WATER WELL INVENTORY	7
3.4	SITE TOPOGRAPHY AND SURFACE WATER FEATURES	8
4.0	**KOCH NORTH GASOLINE/FUEL OIL BULK STORAGE AREA**	8
4.1	ASTS K1 AND K4	8
4.2	AST K5	8
5.0	**KOCH NORTH PARA-XYLENE BULK STORAGE AREA**	9
5.1	SOIL INVESTIGATION	9
	5.1.1 Regional Geology	9
	5.1.2 Monitoring Well Network/Ground Penetrating Radar	9
	5.1.3 Description of Subsurface Soil/Geology	11
5.2	SOIL CONTAMINATION	11
	5.2.1 Soil Sample Collection	11
	5.2.2 Soil Quality	13

TABLE OF CONTENTS - continued

6.0	**HYDROGEOLOGY**	14
6.1	REGIONAL HYDROGEOLOGY	14
6.2	DEPTH TO GROUND WATER TABLE	14
6.3	FREE-PHASE PRODUCT	15
6.4	PROPERTIES OF THE SITE SURFICIAL GROUND WATER	15
6.5	GROUND WATER SAMPLE COLLECTION AND LABORATORY ANALYSIS	17
6.6	EPA METHOD 602 (M/P-XYLENES) - GROUND WATER	17
6.7	RATE OF CONTAMINATION MIGRATION	17
7.0	**SITE REMEDIATION EFFORTS**	18
7.1	SURFICIAL GROUND WATER RECOVERY	19
7.2	SOIL VAPOR EXTRACTION	19
7.3	AIR SPARGE	20
8.0	**SUMMARY**	20
9.0	**RECOMMENDATIONS**	21
10.0	**REFERENCES**	22

TABLES

TABLE 1	**Summary of Laboratory Results - Ground Water EPA Method 602**
TABLE 2	**Summary of Laboratory Results - Soil Volatiles - EPA Method 8260**
TABLE 3	**Summary of Laboratory Results - Soil Semivolatiles - EPA Method 8270**
TABLE 4	**Summary of Ground Water Elevations at Selected Monitoring Wells - February 28, 2000**
TABLE 5	**Summary of Laboratory Results - Ground Water**

FIGURES

FIGURE 1	**General Location Map**
FIGURE 2	**Site Map**
FIGURE 3	**Historical Product Thickness From Reported Releases**
FIGURE 4	**Site Utilities Map**

TABLE OF CONTENTS - continued

FIGURE 5	Water Supply Well Location Map
FIGURE 6	Benzene/Combined BTEX Concentration Data As Of January 11, 2000
FIGURE 7	Interpreted Sand Silt/Clay Topographic Map
FIGURE 8	Soil Sampling and Rost™
FIGURE 9	Cross Section $A\text{-}A_1$
FIGURE 10	Cross Section $B\text{-}B_1$
FIGURE 11	Surficial Water Table Contours As Of February 28, 2000
FIGURE 12	Surficial Ground Water M/P Xylenes Contours As Of 2/28/00 and 3/1/2000
FIGURE 13	Layout of Existing Site Remediation System
FIGURE 14	Estimated Areal Extent Of Detected Site Soil And Ground Water Contamination

APPENDICES

APPENDIX A	Material Safety Data Sheets (MSDS-
APPENDIX B	Laboratory Analytical Reports/Chain of Custody Records
APPENDIX C	Boring Logs and North Carolina Well Construction Records
APPENDIX D	Right-To-Enter Agreement
APPENDIX E	Selected GPR Profiles
APPENDIX F	ROST™ Survey Data Sheets
APPENDIX G	Rising Head Tests Data - Hydraulic Conductivity
APPENDIX H	Contamination Velocity Calculations

COMPREHENSIVE SITE ASSESSMENT
FOR
KOCH NORTH TERMINAL
PARA-XYLENE INCIDENTS

3325 RIVER ROAD
WILMINGTON, NORTH CAROLINA
CATLIN PROJECT NO. 199-060-20

PREPARED FOR:
KOCH *PETROLEUM GROUP*, LP

1.0 INTRODUCTION

1.1 BACKGROUND

Koch North Terminal (Koch North) is located at 3325 River Road in Wilmington, North Carolina (refer to Figures 1 and 2).. The area of interest is the 33-acre area located on the east side of River Road. Koch North's remaining four acres, located on the west side of River Road, have not been investigated in this report. Since the facility's construction by Philips Petroleum in 1929, it has been utilized as a bulk storage tank facility handling various gasolines, additives, #2 fuel oil, and para-xylene (PX).

Since 1929 there have been several unintentional and intentional (part of pre-1980 standard operating procedures) product releases. Product releases since 1980 have been assessed and are currently on file at the Wilmington Regional Office (WiRO) of the North Carolina Department of Environment and Natural Resources (NCDENR).

1.2 PURPOSE

Historical PX concentration trends from analytical testing of ground water in selected Koch North monitoring wells suggest undefined sources of PX contamination. Issues raised to NCDENR by IT Corporation concerning PX concentrations culminated in a January 7, 2000 NCDENR letter requesting that Koch Petroleum Group, LP address several areas of concern within the Koch North facility. More specifically, these areas of concern involve aboveground storage tanks (ASTs) K-1 (gas), K-4 (gas), K-5 (gas), 301 (PX), 801 (PX), and the 1981 pipeline (PX) incident. The purpose of this Comprehensive Site Assessment (CSA) is to accomplish the following goals:

- Assess ground water quality at AST K-1, K-4 and K-5 within the gasoline/oil bulk storage facility at Koch North.

- Further assess subsurface soils and surficial ground water conditions within the PX bulk storage facility at Koch North.

- For regulatory compliance, surficial ground water quality has been compared to applicable interim standards and the standards established in North Carolina Administrative Code, Title 15A, Subchapter 2L .0202 (NCAC 15A 2L .0202).

- Compile field and laboratory data in a CSA report.

2.0 GENERAL INFORMATION

2.1 FACILITY IDENTIFICATION

Facility Name: Koch North Terminal

Facility Address and County: 3325 River Road
Wilmington, North Carolina 28403
New Hanover County

2.2 CURRENT FACILITY OWNER/OPERATOR

Koch *Petroleum Group, LP*
3334 River Road
Wilmington, North Carolina 28403
New Hanover County
Telephone: (910) 791-0180

2.3 ENVIRONMENTAL CONSULTANT

CATLIN Engineers and Scientists
220 Old Dairy Road
P.O. Box 10279
Wilmington, North Carolina 28404-0279
Telephone: (910) 452-5861

2.4 FACILITY OPERATIONS AND ABOVEGROUND STORAGE TANK DATA
(Refer to Appendix A)

Tank No.	Capacity (Barrels)	Current Contents	Installed
K1	58,800	Gasoline	1942
K2	58,800	Gasoline	1942

Tank No.	Capacity (Barrels)	Current Contents	Installed
K3	60,400	#2 Fuel Oil	1942
K4	58,300	Gasoline	1942
K5	43,333	Gasoline/#2 Fuel Oil Waste Water Aeration Tank as of 1992	1929
K6	32,500	#2 Fuel Oil	1929
K7	10,000	Gasoline	1929
K8	288	Additive	1973
K9	40,481	Gasoline	1973
K10	72	Additive	1994
K11	91	Additive	1993
K12	239	Additive	1994
K13	191	Additive	1994
K14	190	Additive	1994
301	28,216	Para-Xylene	1955
401	38,221	Para-Xylene	1955
402	38,339	Para-Xylene	1955
501	56,035	Para-Xylene	1955
601	62,446	Para-Xylene	1978
801	77,410	Para-Xylene	1954
1101	103,723	Para-Xylene	1990

Note: 1 barrel equals 42 gallons

Copies of Material Safety Data Sheets (MSDS) for PX, gasoline, and #2 fuel oil have been included as Appendix A.

2.5 PROPERTY HISTORY

Philips Petroleum built and operated the facility in the 1920s. Sunmark Industries purchased the PX section of the North Terminal from Philips Petroleum in the early 1970s. The entire facility was bought by Koch Refining Company (now Koch Petroleum Group, LP) from Sunmark Industries (now Sun Refining and Marketing Company) in November of 1981.

2.6 *PRODUCT RELEASE HISTORY*

(Refer to Figure 3)

Prior to the Early 1980s

Prior to environmental awareness "Standard Operating Procedure" (SOP), product pump/pipeline and AST maintenance/repairs often involved direct release of product onto the ground. This aspect of SOP has repeatedly occurred at the subject site as well as most bulk fuel oil storage facilities operating prior to the 1980s.

In 1992, Koch had an on-site collection and wastewater treatment system installed. This system was designed to collect all discharge from AST water bottoms, ground water recovery well, and loading rack drainage for treatment at the site wastewater treatment plant (NPDES Permit No.NC0076732). Product releases reported as of 1980 can be summarized as follows:

AST K1 and K4 - ASTs K1 and K4 are both floating top style ASTs which tend to periodically accumulate volumes of water bottom. Since installation (1942) until the 1980s it was standard operating procedure to simply drain any water bottom onto the ground. This resulted in free-phase product and dissolved gasoline constituents at ASTs K1 and K4. From 1985 until 1991 a pump and treat system was maintained at both AST K1 and AST K4 for removal of free-phase product and reduction of dissolved-phase gasoline constituents.

AST K-5 - The January 7, 2000 NCDENR letter referenced a 10,000-gallon gasoline release near AST K-5. Since Koch purchased the property in November 1981, AST K-5 and nearby AST K-6 have been utilized to store #2 fuel oil. In 1992, AST K-5 was cut and modified for its current use as a wastewater treatment plant. According to Koch personnel, there have been no known releases of product from AST K-5 during Koch ownership.

PX Pipeline - In January 1981, prior to Koch's ownership, 291,000 gallons of PX were released at a subsurface pipeline 100 feet northwest of Tank 301. Former and ongoing remediation activities concerning this release have been well documented, and are on file at the NCDENR-WiRO. Figure 3 illustrates the historical free-phase product thickness following the release.

Boiler Room Fuel Oil Tank - In January 1981, prior to Koch's ownership, "Several hundred" gallons of fuel oil was released (Carlyle, May 21, 1984, pg.3). No details regarding actual volume and remediation actions were detailed.

AST 301 - On March 19, 1995, approximately 12,306 gallons of PX were released at AST 301. Initial remedial actions involved excavation of all accessible impacted soils and pumping free-phase product from recovery wells installed adjacent to AST 301. A soil vapor extraction (SVE) and ground water recovery system are operated

continuously to address remnant soil and ground water contamination. Figure 3 illustrates the historical free-phase product thickness following the release.

AST 801 - On July 20, 1999, approximately 594 gallons of PX were released at AST 801. Initial remedial actions involved excavating accessible impacted soils and recovering free-phase product from site excavations. Figure 3 illustrates the historical free-phase product thickness following the release.

Unknown(s) - In assessing the AST 301 and AST 801 incidents, it became evident that there were soil and surficial ground water contamination sources other than the above listed incidents.

Since March 1995, ground water quality and site remediation progress have been monitored on a regular basis. From March 1995 to February 2000, approximately 23,068 gallons of PX have been recovered from site subsurface soils and ground water. This amount does not take into account PX reduction due to the existing air sparge system or factors such as biodegradation and natural attenuation.

Remediation efforts in the vicinity of AST 301 (soil, SVE, recovery wells) accounts for 16,320 gallons of PX. Approximately 557 gallons of PX were recovered during the AST 801 abatement activities. The discrepancy in lost versus recovered PX can be attributed to remnants of the 1981 PX pipeline incident and unknown release(s) contamination.

3.0 POTENTIAL RECEPTORS AND MIGRATION PATHWAYS

3.1 POTENTIAL RECEPTORS

Petroleum migration may result in multi-media contamination, upon its release to the land surface or subsurface environment. As petroleum seeps through the subsurface, petroleum-related hydrocarbons adsorb onto soil particles and volatilize into pore spaces. The remaining petroleum moves vertically downward (in the absence of preferred lateral routes of migration) until it reaches the capillary fringe (in the absence of an impermeable barrier above the capillary fringe). Upon reaching the capillary fringe, petroleum spreads laterally and also dissolves into the ground water. As a result, receptors may be potentially exposed to petroleum hydrocarbons (contaminants) through a variety of mechanisms.

As defined by the NCDENR in NCAC T15A 2L .0102, potential receptors include any human, plant, animal or structure with the potential to be adversely affected by the release or migration of contaminants. Guidance documents issued by the regulatory agency indicate that structures may include items such as utility lines, basements, and elevator shafts. Although not specifically included in the rule definition (NCAC T15A 2L .0202), regulatory officials also consider potential receptors to include environmental resources such as water supply wells, surface

waters, drinking water supplies, and "regions of ground water that have been identified for planned resource development".

The potential receptor survey involved an evaluation of the presence of potential receptors and evaluated transport mechanisms (e.g., ground water migration) by which the contaminants (in this case, petroleum hydrocarbons) could be transported from the source to the receptor. The survey also involved a cursory evaluation of exposure pathways including ingestion, inhalation, and adsorption, with respect to human receptors. Contaminants found in the soil can be exposed to potential human receptors through inhalation of volatilized compounds and dermal contact with contaminated soil. Ingestion of drinking water obtained from contaminated water wells or contaminated public water supplies is an additional human exposure pathway.

Potable water for the subject site is reportedly supplied by the City of Wilmington Water Department. Petroleum exposure to drinking water supply wells appears to be unlikely due the location and distance between detected petroleum constituents and any current drinking water supply wells.

The Cape Fear River is the nearest mapped body of surface water, located approximately 1,000 feet west of the site.

The North Carolina State Ports Authority (NCSPA), Petroleum Fuel Terminal Company, and several residences on Worth Drive are located in the near vicinity of the site. The structures at these surrounding sites appear to be slab-on-grade construction. Underground utilities in the area of investigation include abandoned sanitary sewer, fuel lines, free product recovery lines, water, and telephone lines.

3.2 UTILITIES

(Refer to Figure 4)

Underground utilities, including potable water lines, abandoned sanitary sewer, telephone lines, fuel lines, and free product recovery lines were identified through field observation. Utilities are displayed on Figure 4, and listed as follows:

Water - A 12-inch diameter underground municipal water line lies along the western side of River Road. This line is buried approximately 3.5 to five feet deep. Three fire hydrants in the area of interest (just southwest of AST 301, and south of AST 401 and AST 402) are plumbed to the municipal water supply line.

Sanitary Sewer - An abandoned sanitary sewer line lies east to west through the center of the subject site. The pipe diameter varies from 15 inches on the eastern end of the property to 18 inches near River Road on the western end. The abandoned sanitary

sewer line lies underground approximately six to eight feet deep.

Telephone- Two underground telephone lines lie in a north-south direction on the west side of River Road. These lines are buried approximately four feet deep.

Electric - Aboveground electric lines also lie along River Road between the subject site.

Ground Water Recovery Lines - *An abandoned* 1-1/2 inch diameter PVC ground water recovery line lies 200 feet east (*two feet underground*) of River Road through the site. *This line is from the inactive ground water remediation system from the former CP&L site west of Koch North Terminal.* Two-inch PVC ground water recovery lines run from KRW-3 and SD-1 to the aeration treatment. These lines are buried one to two feet below the ground surface.

Pipelines - Above/below ground para-xylene pipelines run from Tanks 301, 401, 501, 402, 801, 601, and 1101 due west to the north truck loading dock and railcar loading rack area.

Two abandoned (1988) PX pipelines run (feet underground parallel from just west of AST 301 to the northwest property boundary and off-site.

Many of these utilities are located within the impacted areas of the site. Subsurface utilities along River Road may intersect the seasonal high water table; therefore, may act as a preferential pathway for plume migration.

3.3 WATER WELL INVENTORY

(Refer to Figure 5)

Four non-potable water wells are located within 1,500 feet of the subject site. These water systems are located at:

	On-Site	Usage
Koch North Terminal	Refer to Figure 5	Non-potable
	Off-Site	
Koch South Terminal 3334 River Road	±1,300 feet southwest; the well is currently utilized for sanitation purposes.	Non-potable

Citgo Asphalt Refining Company 3345 River Road	±1,400 feet south; this well supplies water to the boiler.	Non-potable
Altamar, Inc. (Atlantic Marine, Inc.) 3330 River Road	±1,000 feet southwest of the subject site; this well is used for sanitation purposes.	Non-potable

The NCSPA controls the land from River Road (downgradient) to the Cape Fear River. No potable water wells are located on the NCSPA facility which is currently served by the City of Wilmington municipal water system.

3.4 SITE TOPOGRAPHY AND SURFACE WATER FEATURES

The Koch North Terminal is located within the Cape Fear River Flood Plain. Except where the land has been cut and graded, the project area is dominated by a relatively flat topography, with a gradual grade to the west in the direction of the Cape Fear River. The nearest body of water is the Cape Fear River, located approximately 1,000 feet west of the project site.

4.0 KOCH NORTH GASOLINE/FUEL OIL BULK STORAGE AREA

(Refer to Table 1, Figure 6, and Appendix B)

Areas of concern within the Koch North gasoline/oil fuel oil bulk storage area involved potential gasoline ground water contamination at AST K-1, K-4, and K-5.

4.1 AST K-1 AND AST K-4

As recent as January 11, 2000, representative ground water samples were collected from selected monitoring wells (MW1, MW2, MW14, and MW20) located along the downgradient perimeter of the Koch North Terminal gasoline/#2 fuel oil facility. Samples were analyzed for gasoline constituents per Environmental Protection Agency (EPA) Method 602. Results of the laboratory analysis have been summarized in Table 1. Locations of benzene/combined benzene, toluene, ethylbenzene, and total xylenes (BTEX) data are illustrated on Figure 6. Copies of the laboratory analysis report are contained in Appendix B.

A review of the water quality data shows minor dissolved gasoline contamination downgradient of AST K-1 [14 - ethylbenzene 36 parts per billion (ppb); limit 29 ppb] and AST K-4 (20 - ethylbenzene 180 ppb and total xylenes 2,330 ppb; limit 539 ppb). Analysis of downgradient monitoring wells MW-1 and MW-2 revealed compliant concentrations of all EPA Method 602 analytes.

4.2 AST K-5

The January 7, 2000 NCDENR letter referenced a 10,000-gallon gasoline release near AST K-5. Since Koch purchased the property in November 1981, AST K-5 and

nearby K-6 have been utilized to store #2 fuel oil. In 1992, AST K-5 was cut and modified for its current use as a wastewater treatment plant. According to Koch personnel, there have been no known releases of product from AST K-5.

5.0 KOCH NORTH PARA-XYLENE BULK STORAGE AREA

Areas of concern within the Koch North PX facility warranted additional data to augment the existing site monitoring wells and historical information.

5.1 SOIL INVESTIGATION

5.1.1 Regional Geology

The project site lies within the southeastern portion of the Outer Coastal Plain Physiographic province of North Carolina. The Outer Coastal Plain, as described by David R. Soller and Hugh H. Mills in *The Geology of the Carolinas* (1991) is the eastern portion of the Coastal Plain where constructional topography is evident or dominant

According to Horton and Zullo in *The Geology of the Carolinas* (1991), the Coastal Plain is comprised of a seaward thickening wedge of post-Triassic, primarily unconsolidated, siliciclastic sediments and carbonate rocks that extend from the Fall Line to the continental shelf break. Coastal Plain sediments were deposited in a number of different environments including but not limited to, off-shore marine, near-shore marine, lagoonal, and deltaic. The eustatic rise and fall of sea level has resulted in numerous sedimentary packages of transgressive and regressive sequences deposited throughout the Coastal Plain.

In New Hanover County the pre-Mesozoic crystalline basement rock, onto which the Coastal Plain was deposited, lies within 500 meters below mean sea level (MSL). The dominant structural feature within the surrounding area of the subject site is the Cape Fear arch.

5.1.2 Monitoring Well Network/Ground Penetrating Radar
(Refer to Appendices C and D)

Characterization of site soil/geology was based on samples obtained during monitoring well installation and a Ground Penetrating Radar (GPR) survey. To augment the existing Type II and III monitoring well network an additional eleven Type II (MW-9 through MW-20) and one Type III (TMW-2) were installed. Boring logs and well construction records have been provided in Appendix C. Installation of the off-site monitoring (MW-20) required the property owners' consent (see Appendix D).

The GPR survey was conducted across the northwest sector of the subject site. GPR is an electromagnetic geophysical method that utilizes a transmitter and receiver combined (in an antennae) to radiate and receive short duration radar waves into the earth as the antennae is moved across the ground surface. These radar waves are reflected back to the receiver at the interface of materials with different dielectric constants. The intensity of the reflected signal is a function of the contrast in the dielectric constant between the materials, the conductivity of the material through which the wave is traveling, and the frequency of the signal. Subsurface features which commonly cause such reflections are: 1) natural geologic conditions such as changes in sediment composition, bedding and cementation horizons, voids, and water content; or 2) unnatural changes to the subsurface such as disturbed soils, soil backfill, buried debris, tanks, pipelines, and utilities. The profiling recorder processes the signal from the receiver and produces a continuous cross-section of the subsurface interface reflections, referred to as reflectors.

The field work was performed on February 10th 2000. A Geophysical Survey Systems, Inc. SIR System-2 GPR recorder system was used with a 200 mega-Hertz antenna. A time range setting of 150-175 nano-seconds (ns) was used during the entire investigation.

Predominant soil and geological formations encountered (from mean sea level to 100 feet below the ground surface) in New Hanover County can be summarized as follows:

Surficial Sands - An unfossiliferous surficial unit which includes the modern surface and shallow subsurface sediments which overly the older fossiliferous units. The surficial sand unit is generally a light-gray to light-yellow medium to fine grained sand with trace quantities of clay, opaque mineral grains, coarse-grained sand, pebbles, and feldspar. Peat is locally abundant (Zarra, 1991).

Pliocene/Pleistocene (Undifferentiated) - Available logs and data do not provide enough data to separate these strata into component formations. The Pliocene/Pleistocene strata are made up of shelly quartz sands and shelly carbonates. The quartz sands are typically unconsolidated, fine grained, and contain well preserved whole shells to fragmental shell hash. In some localities the shells are stained black. The carbonates vary between loosely consolidated sandy shell hash and sand marl to indurated sand moldic limestone (Zarra, 1991).

Castle Hayne Formation - The Castle Hayne Formation is generally recognized as a light gray or white moldic limestone or bryozoan-rich limestone. The limestone cuttings from the upper part of the Castle Hayne Formation often contain traces of finely disseminated phosphate or glauconite. In some wells, the limestone section grades downward to a very

calcareous fine-grained sandstone, and the limestone section is overlain by a thin silty fossiliferous clay.

5.1.3 Description of Subsurface Soil/Geology
(Refer to Figure 7 and Appendix E)

The area of investigation is underlain primarily by fine to medium grained, poorly sorted sand with occasional plagioclase grains and 1mm to 15mm gravel. This formation also includes interlain silty sand and clayey sand lenses. This matches the "surficial sand" formation encountered throughout New Hanover County. This formation lies unconformably on older lower units and survey-wide ranges in thickness from 10 feet to >20 feet thick.

Underlying the "surficial sand" formation are fine to medium grained, poorly sorted clayey/silty sands with occasional shell fragments, black phosphatic sands. This description matches the "undifferentiated Pliocene/Pleistocene strata" encountered throughout most of New Hanover County. This strata within the survey area ranged from possibly absent to ±20 feet thick. Utilizing the GPR data the topography of the "undifferentiated Pliocene/Pleistocene" strata was contoured (see Figure 7). The resulting pattern suggests remnants of a buried channel structure, within the surficial aquifer, trending east to west. Copies of selected GPR profiles (L9, L3, L1G3, L10EW and L3G2) have been provided in Appendix E.

While installing Type III monitoring wells TMW-1 and TMW-2, a sequence of fine grained clay (moderate plasticity), sand with shell fragments followed by dense limestone were encountered at 30 feet and 28 feet below the ground surface, respectively. This sequence is generally recognized as the Castle Hayne Formation. Total thickness of this formation within the subject site was not determined.

5.2 SOIL CONTAMINATION

5.2.1 Soil Sample Collection
(Refer to Table 2 and Appendices F)

Soils were evaluated using several sampling and analytical techniques. Initially (February 24, 2000) soil samples were obtained from just above the seasonal high water table with a hand auger at 15 locations (S-1 through S-15) across the subject site. Sample locations were based on pipeline maintenance zones (pumps, valves, etc.) Near ASTs 401, 402, 501, 601 and selected downgradient locations. Samples were analyzed for meta and para (M/P) xylene concentrations per Environmental Protection Agency (EPA) Method *8260*. Taking into account the site storage and release history and due to the difficulty in analytically separating the two isomers, all M/P xylene analytical results have been evaluated as Para-xylene (PX) data.

An evaluation of the February 24, 2000 soil sample analysis revealed several data gaps, therefore additional means of soil quality assessment were initiated. From May 15 to 19, 2000, Fugro Geosciences personnel were brought on-site to conduct a Rapid Optical Screening Tool (ROST™) survey across the subject site. This technology is useful for delineating hydrocarbon sources from free-phase conditions down to residual concentrations in soils, both above and below the water table. Aside from free-phase product, the instrument does not measure contamination in the ground water. The ROST™ method utilizes a laser-induced fluorescence system mated with Geoprobe® equipment to assess subsurface soils for petroleum hydrocarbon material. The laser and associated equipment transmit 50 pulses of light per second to the sensor through a fiber optic cable. The wavelength of the pulsed excitation light is tunable and can be set to wavelengths between 280 and 300 nanometers (nm). An excitation wavelength of 290 nm was used for each test during this project. The laser light passes through the sapphire window and is absorbed by aromatic hydrocarbon molecules in contact with the window, as the probe is advanced. This addition of energy (photons) to the aromatic hydrocarbons causes them to fluoresce. A portion of the fluorescence emitted from any encountered aromatic constituents is returned through the sapphire window and conveyed by a second fiber optic laser light, is averaged into one reading per one-second interval (approximately one reading per 2 cm vertical interval) and is recorded continuously. For this project, ROST™ was operated in multi-wavelength mode (MWL).

In MWL mode, the emitted fluorescence is measured simultaneously at four monitoring wavelengths (340, 390, 440, and 490 nm). The four monitoring wavelengths cover the range of light produced by light fuels through heavy contaminants such as coal tar and creosote and enhance detection of widely ranging product types. The emission data is reported continuously as a total of the fluorescence intensity recorded at each of the four wavelengths. The total fluorescence intensity data is presented in real-time on a computer monitor as a graph of fluorescence intensity versus depth (FVD).

The relative percentage of fluorescence measured at each of the monitoring wavelengths (340, 390, 440, and 490 nm) is plotted continuously on the ROST™ logs as four continuous "color bands". The width of each color band represents the relative percentage of fluorescence emitted by the contaminant at each of the monitoring wavelengths (340, 390, 440, and 490 nm). For general interpretation purposes, lighter aromatic hydrocarbon molecules will emit fluorescence at shorter wavelengths and heavier, longer chained hydrocarbons will emit fluorescence at longer wavelengths.

The fluorescence intensity of a reference solution placed on the sapphire window was measured immediately prior to conducting each test. This reference solution measurement serves two purposes. First, as a quality

control check, the solution is used to ensure that the performance of the system is within specifications. Second, it allows for normalization of the data from different test locations for variation in laser power, operating conditions, and monitored emission wavelength. The reference solution used for this project was the standard M1 reference, which is a proprietary petroleum hydrocarbon-containing solution. M1 provides consistent fluorescence response across the portion of the spectrum analyzed by ROST and, therefore, allows the fluorescence data collected to be consistently normalized to intensities recorded as a percentage of M1.

During testing, waveforms, which are "spectral signatures" of the encountered petroleum hydrocarbons, are displayed on the computer monitor in real-time. The waveforms can be compared with waveforms typical of common hydrocarbon products to determine the likely product type that has been encountered (see Appendix F). Some probe locations exhibited waveforms and odors indicate of kerosene (low sulfur No. 2 fuel oil) as well as PX. Accessibility to some areas was limited by facility structures (pipelines, pumps, etc.). Total fluorescence intensity is a relative measure of hydrocarbon contamination. Therefore, to compare the Fugro ROST™ data with quantitative data, additional soil samples were obtained (May 26, 2000) from selected ROST™ survey locations for analysis of volatiles and semi-volatiles per EPA Methods 8260 and 8270 respectively. All soils samples were analyzed at the Pace Analytical Services, Inc. Laboratory in Huntersville, North Carolina.

5.2.2 Soil Quality
(Refer to Tables 3 and 4, Figures 8, 9, 10 and Appendix B).

EPA Method 8260 Volatiles - Soil
Results of the laboratory analysis per EPA Method 8260 have been summarized on Table 3. Copies of the Laboratory Reports are contained in Appendix B.

EPA Method 8270 Semivolatiles - Soil
Results of the laboratory analysis per EPA Method 8270 are summarized on Table 4. Copies of the Laboratory Reports have been contained in Appendix B.

As expected several subsurface PX contamination zones were encountered; however, some of the ROST™ probe locations exhibited fluorescence waveforms and odors indicate of kerosene (low sulfur No. 2 diesel fuel). The analytical/chromatograph data (Appendix B) for samples BH-6 (5.5-6.') and 01-1 (7-7.5') were reviewed by petroleum chemists. Their conclusion was that the volatiles (except for PX) present are likely associated with old degraded kerosene.

Figure 8 illustrates the location of the soil samples and pertinent laboratory analysis data. In addition, the location of the ROST™ survey probes and contours of the resulting fluorescence reading. Upon review note the areas of interest south of ASTs 601, 801 and north of ASTs 301, 401. Also note the area of interest from AST 301 and trending north west to River Road. Two cross-sections (A-A_1 and B-B_1) have been prepared to illustrate the depths of detected soil contamination at the site (see Figures 9 and 10). Interpretation of the subsurface soils/geology is based on the boring log records and GPR results.

6.0 HYDROGEOLOGY

6.1 REGIONAL HYDROGEOLOGY

(Refer to Appendix C)

The PX facility already had 27 Type II monitoring wells and one Type III monitoring well in place. To assess additional areas of interest and fill in data gaps, 12 additional Type II monitoring wells and one Type III monitoring well were installed. As stated previously, North Carolina Well Construction Records and boring logs are provided in Appendix C. All monitoring wells were constructed in accordance with NCAC T15A:02L "Well Construction Standard." All drilling and sampling equipment was decontaminated between boreholes to prevent possible cross-contamination.

Two separate aquifers were encountered during this site assessment. The Type II monitoring well screen intervals are within the site surficial aquifer. The Type III monitoring well screen intervals are within the Castle Hayne Aquifer.

6.2 DEPTH TO GROUND WATER TABLE

(Refer to Table 5 and Figure 11)

Selected site monitoring wells were gauged for depth to water table and potential free-phase product on February 28, 2000. Depth to surficial ground water table ranged from 3.24 feet to 10.12 feet below the ground surface. Depth to water table within the Type III monitoring wells ranged from 5.66 feet to 9.63 feet below the ground surface. Drill cuttings of the clay layer on the Castle Hayne limestone did not appear to be characteristic of a tight aquitard. However, well pairs 108 and TMW-1, MW-10 and TMW-2 reveal a water table elevation difference of 2.19 feet and 4.27 feet, respectively. Ground water table elevations are provided in Table 5.

Figure 11 illustrates the site surficial ground water table contours. The contours indicate the surficial ground water trend is west-northwest toward the Cape Fear River. The contours also reflect the effects of ground water pumping efforts at recovery wells KRW-3, KRW-4 and KRW-5.

6.3 *FREE-PHASE PRODUCT*

No measurable levels (less than 0.005 feet) of free-phase product were detected at any of the site monitoring wells on February 28, 2000. No free-phase product has been detected at the site since December, 1999.

6.4 *PROPERTIES OF THE SITE SURFICIAL GROUND WATER*

(Refer to Appendix G)

Strict interpolation of the surficial water table elevations revealed ground water flow trend towards the west-northwest. The hydraulic gradient was calculated using water level measurement from two monitoring wells apparently not influenced by site surficial ground water remediation efforts. The hydraulic gradient (dh/dl) calculated from water level measurements between wells MW-10 and 113 on March 23, 2000 was determined to be 0.02 feet per feet.

To estimate the hydraulic conductivity of the surficial aquifer, rising head/recovery tests were performed on shallow monitoring wells MW-9 and MW-15 on March 23, 2000. To perform the test, the static head of the ground water was measured. A solid "slug" was introduced into the well and the water table was allowed to return to static levels. The slug was instantaneously removed and the recovery rate of the ground water was measured utilizing a pressure transducer. Data was recorded with a Hermit 2000® data logger. The recovery data was processed by the AQTESOLV™ aquifer test solving software program which utilizes the Bouwer and Rice (1976) method. Program assumptions are as follows:

- Aquifer has infinite areal extent
- Aquifer is homogeneous and of uniform thickness
- Aquifer potentiometric surface is initially horizontal
- A volume of water, V, is injected into or discharged from the well instantaneously
- Flow is steady
- Aquifer is confined or unconfined

The AQTESOLV program uses the following equation to derive the hydraulic conductivity:

$$\ln(s_0)-\ln(s_t) = \frac{2KLt}{r_{ce}^2 \ln(R_e/r_{we})}$$

where:

K = Hydraulic conductivity in feet per day

s_0 = initial displacement in well or slug due to instantaneous removal of slug from well

s_t = displacement in well at time t

r_{ce} = $[r_c^2 + n(r_w^2 - r_c^2)]^{0.5}$

$\ln(R_e/r_{we})$ = empirical "shape factor" determined from graphs provided in Bouwer and Rice (1976)

r_{we} = $r_w [(K^2/K_r)]^{0.5}$

r_c = radius of well where water level is rising during the slug test

r_w = radius of the screened or open section of the well plus the thickness of a sand or gravel pack. Thus, r_w is the radial distance from the center of the well to the normal K of the aquifer.

R_e = effective radial distance over which head loss occurs

L = saturated length of screened, perforated, or otherwise open section of well

t = time interval

To solve for the hydraulic conductivity (K), the above equation yields K as follows:

$$K = \frac{r_c^2 \ln(R_e/r_w)}{2L} \frac{1}{t} \ln \frac{s_0}{s_t}$$

Anomalies ("double straight line effect") sometimes observed in the measured rate of the rise of the water level in the well are attributed to drainage of a gravel pack or developed zone around the well following lowering of the water level. The effect of this drainage was eliminated by ignoring the early data points and matching a line through the second straight line portion in the data plot for calculation of hydraulic conductivity (Bouwer, 1989).

Hydraulic conductivity (K) values at MW-9 and MW-15 were determined to be 19.03 feet per day and 4.22 feet per day. These values yielded an average K value of 11.62 feet per day. The slug test calculations are contained in Appendix G.

6.5 GROUND WATER SAMPLE COLLECTION AND LABORATORY ANALYSIS

CATLIN personnel gauged depth to water table and potential free-phase product at site monitoring wells on February 28, 2000. The field data has been summarized in Table 3.

From February 29 to March 1, 2000, thirty-two selected site monitoring wells were purged (minimum three volumes) and ground water samples were collected. Ground water samples were placed in laboratory prepared glassware, labeled and chilled (<4° C) prior to transportation to Pace Analytical Services, Inc. in Wilmington, North Carolina. All ground water samples were analyzed for M/P xylenes concentrations per EPA Method 602.

6.6 EPA METHOD 602 (M/P XYLENES) - GROUND WATER

(Refer to Table 6, Figure 12 and Appendix B)

The most recent as well as historical dissolved M/P xylenes concentration data has been summarized in Table 6. Figure 12 illustrates the latest (2/28/00) M/P xylenes concentration contours in the site surficial water table. The most recent on-site plume boundary (>530 ppb M/P xylenes) extends from just south of AST 601 west to River Road (N850 feet) and from ASTs 301, 401, 501 north to the property boundary (N850 feet). Upon review of Figure 10 note M/P xylene concentration highs. Around monitoring well MW-14 (270,000 ppb) and west of AST 801 (MW-7, 130,000 ppb and MW-11 110,0000 ppb). A copy of the laboratory report is contained in Appendix B.

6.7 RATE OF CONTAMINANT MIGRATION

(Refer to Appendices G and H)

Ground water travel time or average ground water linear flow velocity serves as the basis for estimating the rate of contaminant migration at the facility. Ground water flow rates should represent the maximum rate of contaminant migration with variations among contaminants due to geohydrochemical processes including molecular diffusion, mechanical mixing, sorption-desorption, ion-exchange, hydrolysis, and biodegradation. However, due to the difficulties in estimating the effects of many of the processes on contaminant migration rates and the desire to produce relatively conservative (higher) estimates, only adsorption processes are incorporated into rate calculations.

The average ground water linear flow velocity was calculated using the following modification of Darcy's Law (Todd, 1980):

$$V_{avg} = K_{avg}/n_e \, (dh/dl)$$

Where: K_{avg} = Average hydraulic conductivity (feet per day) 11.62

n_e = Effective porosity (unitless) 0.39

dh/dl = Hydraulic gradient (feet per feet) 0.02

Calculation of the average ground water linear flow velocity was determined to be 0.59 feet per day to the west-northwest (see Appendix G).

Estimates of bulk density and porosity were determined from results of visual/manual classification of soils. The average velocity of the petroleum contaminant constituent was then calculated in accordance with the following equation (USEPA, 1985):

$$V_c = V_{avg}/R_d$$

Where: V_c = Average velocity of contaminant constituent (feet per day)

V_{avg} = Average ground water linear flow velocity (feet per day)

R_d = Retardation factor (unitless)

As shown on the calculations in Appendix H, the V_c for para-xylenes was found to be 0.00055 feet per day.

7.0 SITE REMEDIATION EFFORTS

(Refer to Figure 13)

Former and on-going remediation activities concerning the Koch North Terminal have been well documented, and are on file at the NCDENR Wilmington Regional Office. The site PX remediation efforts as of March 1995 are summarized as follows:

7.1 *SURFICIAL GROUND WATER RECOVERY SYSTEM*

Each of the recovery wells have been operating greater than 98% of the time since each was installed. The approximate volumes of PX removed have been calculated utilizing the total volumes removed from each location and applicable PX concentration data. As of April 7, 2000 the volumes recovered can be summarized as follows:

RW-2 (Operating since March 25, 1995)
Ground Water Recovered: 4,249,488 gallons (gals.)
Approximate Volume of Dissolved PX Removed: 298 gals.

KRW-3 (Has been operating prior to March 19, 1995 event)
Ground Water Recovered since March 19, 1995: 8,445,480 gals.
Approximate Volume of Dissolved PX Removed: 4,378 gals.

KRW-4 (Operating since November 3, 1997)
Ground Water Recovered: 8,887,390 gals.
Approximate Volume of Dissolved PX Removed: 1,813 gals.

KRW-5 (Operating since November 3, 1997)
Ground Water Recovered: 8,714,850 gals.
Approximate Volume of Dissolved PX Removed: 5,099 gals.

Experience has repeatedly demonstrated that ground water recovery efforts are more effective in containment as opposed to accelerated contaminant reduction. The KRW-3 was installed in 1986 to intercept the middle of the interpolated PX plume at the northwest property boundary. Recovery efforts at RW-2 are maintained in order to contain any remnants of the AST 301 Release. Recovery wells KRW-4 and KRW-5 were installed in order to impact areas of high dissolved PX concentration interpolated in 1997. As stated previously, Figure 11 illustrates the influence of recovery well pumping efforts upon the area ground water table. It should be noted that the KRW-3 cone of depression apparently extends off-site and may be drawing some *off-site* ground water contamination back onto the site.

7.2 *SOIL VAPOR EXTRACTION SYSTEM*

The only site soil vapor extraction (SVE) effort is the 2 hp SVE system installed to address remnant AST 301 soil contamination. This system has been operating continuously since it was installed on March 21, 1995. Since start-up approximately 2,051 gallons of residual PX have been removed from subsurface soils at AST 301.

7.3 AIR SPARGE SYSTEM

The air sparge system is designed to remediate the dissolved PX in the site surficial ground water as it migrates below the northwest property boundary and between site monitoring wells 113 and 106. This is a vertical air sparge system with aeration points installed to 38 feet below the ground surface. After the system was fully operational (February 6, 1998) field observations indicated that some air sparge points were not achieving the anticipated radius of aeration. Additional field investigations revealed that multiple subsurface silt/clay layers (18 to 20' below the surface) were impeding upward aeration migration, often deflecting aeration efforts upgradient or eastward.

Therefore, additional air sparge wells (18 to 20 feet deep) were installed to maintain aeration within the original target zones. The performance of the air sparge system is primarily based on the subsequent trends of M/P xylenes concentration data in the site surficial ground water (refer to Figure 12). Upon review of Figure 12, note the declines in M/P xylenes have been achieved within the zones of aeration (example wells 120, MW-17, MW-13 and MW-19) along the northwest property boundary. However, the historical monitoring well data downgradient (monitor wells 106 and 121) of the 106 to 113 air sparge array indicate an appreciable decline in M/P xylenes concentrations has yet to be achieved.

8.0 SUMMARY

The findings of the gasoline/#2 fuel oil bulk storage assessment can be summarized as follows:

- AST K-5 - No information has been identified involving product release at AST K5.
- AST K-1 - Analysis of the water sample collected from downgradient monitoring well MW-14 revealed low levels of ethylbenzene at 36 ppb (NCAC T15:02L limit 29 ppb). Analysis of further downgradient monitoring well MW-2 revealed below detectable levels of al EPA Method 602 analytes.
- AST K-4 - Analysis of the water sample collected from downgradient monitoring well MW-20 revealed concentrations of ethylbenzene at 180 ppb and total xylenes at 2,330 ppb. (Limit 530 ppb). Analysis of the water sample from further downgradient well MW-1 revealed compliant concentrations of all EPA Method 602 analytes.

The findings of the PX facility site assessment can be summarized as follows:

- A review of the field and laboratory data indicates evidence of several releases which have occurred throughout the history of this site. Remnants of PX and kerosene (low sulfur #2 fuel oil) are evident in the site subsurface soils and surficial ground water.

- The extent of site soil contamination is best illustrated in Figures 8, 9 and 10. As anticipated evidence of previous releases remain as soil contamination above the surficial water table. What was unexpected is the extent of contamination below the surficial water table as a result of past major releases.

- Figures 9 and 10 illustrate the natural attenuation factors (attenuation, biodegradation, etc.), are active in reducing subsurface contamination down to an average of 2 feet below the surficial water table.

- Figures 9 and 10 also illustrate that natural attenuation is not occurring from 2 to 5 feet below the surficial water table. These saturated residual contamination zones are acting as a secondary source for continued surficial ground water contamination. This may explain the high concentration of analytes at monitoring wells (106, 121, etc.) which are downgradient of active air sparge arays.

- During the 1981 pipeline release the pipeline backfill may have acted as a conduit of preferential flow for the free-phase product as indicated of the data profile (Figure 9) of the area around the abandoned PX pipeline. This impacted backfill is the probable source of contamination currently found at monitoring well 117.

- The extent of site surficial ground water contamination is illustrated on Figure 12. The effects of active remediation (air sparge and ground water recovery) are evident all along the northwest property except for MW-117. MW-117 is located in an area outside the range of active remediation. Active remediation efforts between MW- 120 and MW-19 are impacting subsurface ground water and soil contamination zones.

- Remnants of ASTs 601, 801 historical maintenance and incidental releases are evident on-site.

- Remnants of past incidents at ASTs 301, 401 and associated pipelines are evident on-site.

- Remnants of soil and ground contamination from the 1981 pipeline incident is evident from the original source, extending to the northwest.

- Figure 14 illustrates the estimated horizontal extent of site surficial ground water and soil contamination.

9.0 RECOMMENDATIONS

- Evaluate using additional ground water recovery efforts around monitoring well 117 to control surficial ground water migration in this area.

- Evaluate various remediation approaches for addressing surficial ground water hot spots and the multiple zones of soil contamination.

10.0 REFERENCES

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TABLES

TABLE 1

SUMMARY OF LABORATORY RESULTS - GROUND WATER
EPA METHOD 602
AS OF JANUARY 11, 2000

KOCH NORTH TERMINAL
WILMINGTON, NORTH CAROLINA

SAMPLE I.D.	BENZENE	TOLUENE	ETHYL-BENZENE	M&P/ O-XYLENES	MTBE
KOCH-1	<1	<1	15	<96	<1
KOCH-2	<1	<1	<1	<1	15
KOCH-14	<20	320	36	256	<20
KOCH-20	<1	<1	180	2,330	<1
CAS #	71-43-2	108-88-3	100-41-4	7816-60-0/ 95-47-6	1634-04-4
NCAC 2L Groundwater Standards	1	1,000	29	530	200

All results in parts per billion (ppb)
Shaded values indicate concentrations in excess of current NCAC 2L Groundwater Quality Standards.

NMT = No measurable thickness

TABLE 2 (Page 1 of 2)
SUMMARY OF LABORATORY RESULTS - SOIL VOLATILES - EPA METHOD 8260

KOCH NORTH TERMINAL
WILMINGTON, NORTH CAROLINA

	S-1 (3.5)	S-2 (3.5)	S-3 (3)	S-4 (3)	S-5 (3)	S-6 (3)	S-7 (3)	S-8 (3)	S-9 (3)	S-10 (3)	S-11 (3)	S-12 (3)
DATE SAMPLED	2/24/00	2/24/00	2/24/00	2/24/00	2/24/00	2/24/00	2/24/00	2/24/00	2/24/00	2/24/00	2/24/00	2/24/00
ANALYTE												
Methylene chloride	---	---	---	---	---	---	---	1,000	---	---	---	---
Ethylbenzene	---	---	---	---	---	---	---	BDL	---	---	---	---
M & P xylenes	<0.011	<0.011	0.011	0.230	110,000	0.024	0.090	100,000	670	0.013	0.013	<0.011
O-xylenes	---	---	---	---	---	---	---	BDL	---	---	---	---
n-propylbenzene	---	---	---	---	---	---	---	BDL	---	---	---	---
1,3,5-Trimethylbenzene	---	---	---	---	---	---	---	BDL	---	---	---	---
1,2,4-Trimethylbenzene	---	---	---	---	---	---	---	BDL	---	---	---	---
sec-Butylbenzene	---	---	---	---	---	---	---	BDL	---	---	---	---
p-isopropylbenzene	---	---	---	---	---	---	---	BDL	---	---	---	---
n-Butylbenzene	---	---	---	---	---	---	---	BDL	---	---	---	---
Naphthalene	---	---	---	---	---	---	---	BDL	---	---	---	---
Remaining 8260 Analytes	---	---	---	---	---	---	---	BDL	---	---	---	---

BDL - Below detection limits. Refer to laboratory analytical report for individual analyte detection limits.
--- Analyte not analyzed
( ) Sample depth below land surface

NE - None established
mg/Kg - Milligram per kilogram

TABLE 2 (Page 2 of 2)
SUMMARY OF LABORATORY RESULTS - SOIL VOLATILES - EPA METHOD 8260

KOCH NORTH TERMINAL
WILMINGTON, NORTH CAROLINA

	S-13 (4)	S-14 (3)	S-15 (6)	401-13 (5-5.5)	401-13 (7-7.5)	601-7 (7-7.5)	801-4 (7-7.5)	BH-6 (5.5-6)	BH-15 (6.5-7)	BH-17 (7-7.5)	BH-19 (6-6.5)
DATE SAMPLED	2/24/00	2/24/00	2/24/00	5/26/00	5/26/00	5/26/00	5/26/00	5/26/00	5/26/00	5/26/00	5/26/00
Methylene chloride	---	---	---	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ethylbenzene	---	---	---	550	BDL	BDL	BDL	12,000	BDL	BDL	BDL
M & P xylenes	150,000	<0.011	<0.011	660,000	120,000	10,000	58,000	510,000	240,000	29,000	21,000
O-xylenes	---	---	---	360	BDL	BDL	BDL	1,900	310	BDL	BDL
n-propylbenzene	---	---	---	BDL	BDL	BDL	BDL	490	BDL	BDL	BDL
1,3,5-Trimethylbenzene	---	---	---	BDL	890	BDL	BDL	2,500	BDL	3,000	BDL
1,2,4-Trimethylbenzene	---	---	---	BDL	1,900	BDL	BDL	5,400	390	4,600	BDL
Sec-Butylbenzene	---	---	---	BDL	BDL	BDL	BDL	360	BDL	430	BDL
p-isopropylbenzene	---	---	---	BDL	350	BDL	BDL	530	BDL	790	BDL
n-Butylbenzene	---	---	---	BDL	BDL	BDL	BDL	530	BDL	330	BDL
Naphthalene	---	---	---	BDL	BDL	BDL	BDL	BDL	BDL	980	BDL
Remaining 8260 Analytes	---	---	---	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

BDL - Below detection limits. Refer to laboratory analytical report for individual analyte detection limits.
--- Analyte not analyzed
( ) Sample depth below land surface

NE - None established
mg/Kg - Milligram per kilogram

TABLE 3
SUMMARY OF LABORATORY RESULTS - SOIL SEMIVOLATILES - EPA METHOD 8270

KOCH NORTH TERMINAL
WILMINGTON, NORTH CAROLINA

	401-13 (5-5.5)	401-13 (7-7.5)	601-7 (7-7.5)	801-4 (7-7.5)	BH-6 (5.5-6)	BH-15 (6.5-7)	BH-17 (7-7.5)	BH-19 (6-6.5)
DATE SAMPLED	5/26/00	5/26/00	5/26/00	5/26/00	5/26/00	5/26/00	5/26/00	5/26/00
ANALYTE								
3 & 4 Methylphenol	BDL	BDL	BDL	BDL	BDL	1.3	BDL	BDL
2,4 -Dimethylphenol	BDL	BDL	BDL	BDL	BDL	2.7	BDL	3.7
Naphthalene	0.53	41	BDL	BDL	BDL	1.7	17	1.1
2 -Methylnaphthalene	1.7	BDL	BDL	BDL	35	3.7	35	5.7
Dibenzofuran	BDL	BDL	BDL	BDL	BDL	BDL	0.77	BDL
Fluorene	BDL	BDL	BDL	BDL	BDL	BDL	0.64	BDL
Butylbenzylphalate	BDL	BDL	0.910	BDL	BDL	2.3	0.68	BDL
Remaining Analytes	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

mg/Kg = Milligram per Kilogram
BDL = Below detection limits. Refer to Laboratory Analytical Report for individual analyte detection limits.
NE = None established
( ) = Sample depth below land surface

TABLE 4 (Page 1 of 2)

SUMMARY OF GROUND WATER ELEVATIONS AT SELECTED MONITORING WELLS - FEBRUARY 28, 2000

KOCH NORTH TERMINAL
WILMINGTON, NORTH CAROLINA

DATA POINT	TOP OF CASING ELEVATION (in feet)	DEPTH TO WATER (in feet)	FREE PRODUCT THICKNESS (in feet)	SPECIFIC GRAVITY ADJUSTMENT	WATER TABLE ELEVATION (IN FEET)
TYPE II MONITORING WELLS					
MW-1	39.45	6.94	NMT	--	32.51
MW-3	37.84	7.07	NMT	--	30.77
MW-4	33.39	9.16	NMT	--	24.23
MW-5	39.56	7.26	NMT	--	32.30
MW-9	36.88	3.24	NMT	--	33.64
MW-10	35.45	3.52	NMT	--	31.93
MW-11	35.14	3.91	NMT	--	31.23
MW-12	35.23	6.09	NMT	--	29.14
MW-13	33.90	5.89	NMT	--	28.01
MW-14	29.39	4.98	NMT	--	24.41
MW-15	28.82	5.86	NMT	--	22.96
MW-16	28.21	5.82	NMT	--	22.39
MW-17	25.57	2.40	NMT	--	23.17
MW-18	26.92	9.44	NMT	--	17.48
MW-19	27.59	9.82	NMT	--	17.77
MW-20	29.29	10.12	NMT	--	19.17
MW-28	36.41	4.63	NMT	--	31.78
MW-30	35.20	5.67	NMT	--	29.53
101	28.88	2.99	NMT	--	25.89

NMT = No measurable thickness

TABLE 4 (Page 2 of 2)

SUMMARY OF GROUND WATER ELEVATIONS AT SELECTED MONITORING WELLS - FEBRUARY 28, 2000

KOCH NORTH TERMINAL
WILMINGTON, NORTH CAROLINA

DATA POINT	TOP OF CASING ELEVATION (in feet)	DEPTH TO WATER (in feet)	FREE PRODUCT THICKNESS (in feet)	SPECIFIC GRAVITY ADJUSTMENT	WATER TABLE ELEVATION (IN FEET)
102	29.88	3.87	NMT	--	26.01
106	30.62	5.67	NMT	--	24.95
108	31.50	6.43	NMT	--	25.07
119	26.68	4.40	NMT	--	22.28
121	29.30	4.51	NMT	--	24.79
TYPE III MONITORING WELLS					
TMW-1	30.43	9.63	NMT	--	20.80
TMW-2	35.40	5.66	NMT	--	29.74
RECOVERY WELLS					
RW-2	36.18	12.13	NMT	--	24.00
KRW-3	29.07	15.95	NMT	--	13.12
KRW-4	27.82	7.42	NMT	--	20.40
KRW-5	32.58	10.34	NMT	--	22.24

NMT = No measurable thickness

TABLE 5 (Page 1 of 7)
SUMMARY OF LABORATORY RESULTS - GROUND WATER
EPA METHOD 602 (M/P XYLENES)

KOCH NORTH TERMINAL
WILMINGTON, NORTH CAROLINA

WELL I.D.	DATE	M/P-XYLENE (PPB)
TYPE II MONITORING WELLS		
MW-1	12/8/95	29,000
	2/13/96	11,000
	6/24/96	9,400
	1/28/97	340
	12/4/97	4,000
	6/13/98	360
	1/19/99	250
	7/14/99	26
	2/29/00	<1
MW-3	12/8/95	180,000
	6/24/96	28,000
	1/28/97	53,000
	12/4/97	100,000
	6/13/98	35,000
	1/19/99	49,000
	7/14/99	20,000
	2/29/00	37,000
MW-4	12/8/95	1,600,000
	3/18/96	140,000
	6/24/96	140,000
	1/28/97	190,000
	12/4/97	220,000

NMT = No measurable thickness

TABLE 5 (Page 2 of 7)
SUMMARY OF LABORATORY RESULTS - GROUND WATER
EPA METHOD 602 (M/P XYLENES)

KOCH NORTH TERMINAL
WILMINGTON, NORTH CAROLINA

WELL I.D.	DATE	M/P-XYLENE (PPB)
	6/13/98	180,000
	1/19/99	190,000
	7/14/99	300,000
	2/29/00	100,000
MW-5	2/13/96	9,800
	6/24/96	2,500
	1/28/97	1,400
	12/4/97	790
	6/13/98	7,800
	1/19/99	2,400
	7/14/99	4,900
	2/29/00	2,100
MW-7	10/15/99	150,000
	2/29/00	130,000
MW-8	10/5/99	4,400
	2/29/00	12,000
MW-9	2/29/00	<1
MW-10	2/29/00	96,000
MW-11	2/29/00	110,000

NMT = No measurable thickness

TABLE 5 (Page 3 of 7)
SUMMARY OF LABORATORY RESULTS - GROUND WATER
EPA METHOD 602 (M/P XYLENES)

KOCH NORTH TERMINAL
WILMINGTON, NORTH CAROLINA

WELL I.D.	DATE	M/P-XYLENE (PPB)
MW-12	2/29/00	56,000
MW-13	2/29/00	85,000
MW-14	2/29/00	270,000
MW-15	2/29/00	49,000
MW-16	2/29/00	79,000
MW-17	2/29/00	24,000
MW-18	2/29/00	13,000
MW-19	2/29/00	1,400
MW-20	3/01/00	7,900
MW-28	2/13/96	370
	6/24/96	740
	1/28/97	14
	12/4/97	2,300
	6/13/98	59
	7/14/99	BQL

NMT = No measurable thickness

TABLE 5 (Page 4 of 7)
SUMMARY OF LABORATORY RESULTS - GROUND WATER
EPA METHOD 602 (M/P XYLENES)

KOCH NORTH TERMINAL
WILMINGTON, NORTH CAROLINA

WELL I.D.	DATE	M/P-XYLENE (PPB)
	3/01/00	<1
MW-30	1/19/99	BQL
	7/14/99	BQL
	3/01/00	<1
102	12/8/95	800
	6/24/96	200
	1/28/97	1,100
	12/4/97	26
	6/13/98	270
	1/19/99	49
	7/14/99	760
	2/29/00	1,300
106	12/8/95	350,000
	6/24/96	<10
	1/28/97	120,000
	6/13/98	No Data
	1/19/99	140,000
	7/14/99	29,000
	3/01/00	130,000
113	1/19/99	11
	7/14/99	BQL

NMT = No measurable thickness

TABLE 5 (Page 5 of 7)
SUMMARY OF LABORATORY RESULTS - GROUND WATER
EPA METHOD 602 (M/P XYLENES)

KOCH NORTH TERMINAL
WILMINGTON, NORTH CAROLINA

WELL I.D.	DATE	M/P-XYLENE (PPB)
	2/29/00	370
114	6/13/98	42
117	12/8/95	86,000
	6/24/96	59,000
	1/28/97	80,000
	12/4/97	46,000
	6/13/98	130,000
	1/19/99	120,000
	7/14/99	140,000
	2/29/00	78,000
119	6/24/96	<2
	1/28/97	1,500
	12/4/97	15
	6/13/98	3,000
	1/19/99	390
	7/14/99	420
	2/29/00	4,900
120	12/8/95	1,600
	6/24/96	600
	1/28/97	4,300
	12/4/97	1,500

NMT = No measurable thickness

TABLE 5 (Page 6 of 7)
SUMMARY OF LABORATORY RESULTS - GROUND WATER
EPA METHOD 602 (M/P XYLENES)

KOCH NORTH TERMINAL
WILMINGTON, NORTH CAROLINA

WELL I.D.	DATE	M/P-XYLENE (PPB)
	6/13/98	1,500
	1/19/99	1,000
	7/14/99	400
	WELL WAS DAMAGED	
121	12/8/95	300,000
	6/24/96	100,000
	1/28/97	100,000
	12/4/97	140,000
	6/13/98	160,000
	1/19/99	110,000
	7/14/99	140,000
	3/01/00	190,000
D-O	12/8/95	160,000
	6/24/96	62,000
	1/28/97	3,400
TYPE III MONITORING WELLS		
TMW-1	12/8/95	220
	2/29/00	300
TMW-2	2/29/00	4.2
RECOVERY WELLS		
RW-2	12/4/97	8,100

NMT = No measurable thickness

TABLE 5 (Page 7 of 7)
SUMMARY OF LABORATORY RESULTS - GROUND WATER
EPA METHOD 602 (M/P XYLENES)

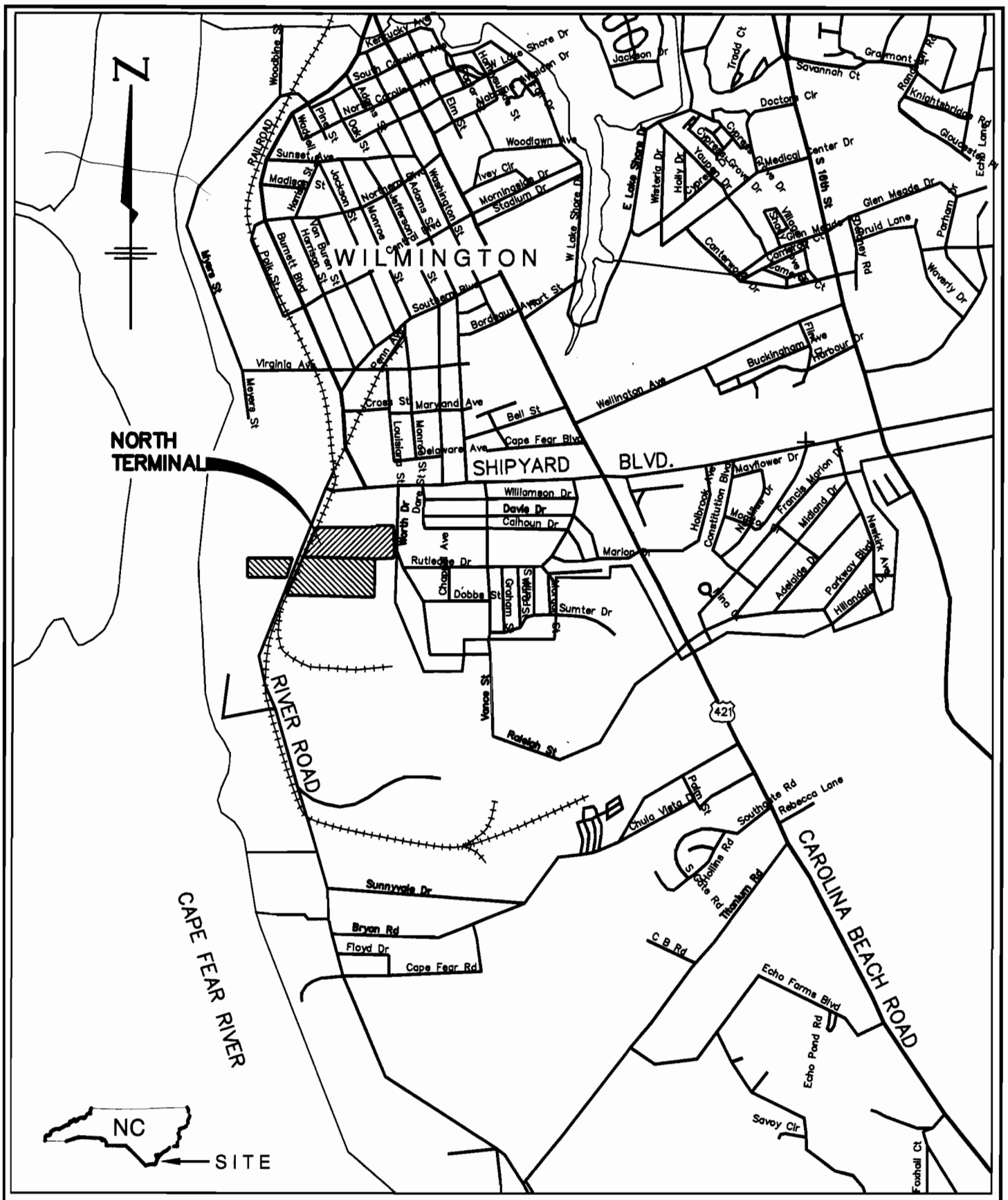
KOCH NORTH TERMINAL
WILMINGTON, NORTH CAROLINA

WELL I.D.	DATE	M/P-XYLENE (PPB)
	6/13/98	14,000
	1/19/99	8,200
	7/14/99	9,200
	3/01/00	26,000
KRW-3	12/4/97	87,000
	6/13/98	120,000
	1/19/99	67,000
	7/14/99	86,000
	2/29/00	17,000
KRW-4	12/4/97	27,000
	6/13/98	60,000
	1/19/99	18,000
	7/14/99	86,000
	2/29/00	61,000
KRW-5	12/4/97	180,000
	6/13/98	130,000
	1/19/99	84,000
	7/14/99	390,000
	2/29/00	150,000

PPB = Parts Per Billion
Laboratory analysis performed by Paradigm Analytical Laboratories, Inc.

NMT = No measurable thickness

FIGURES



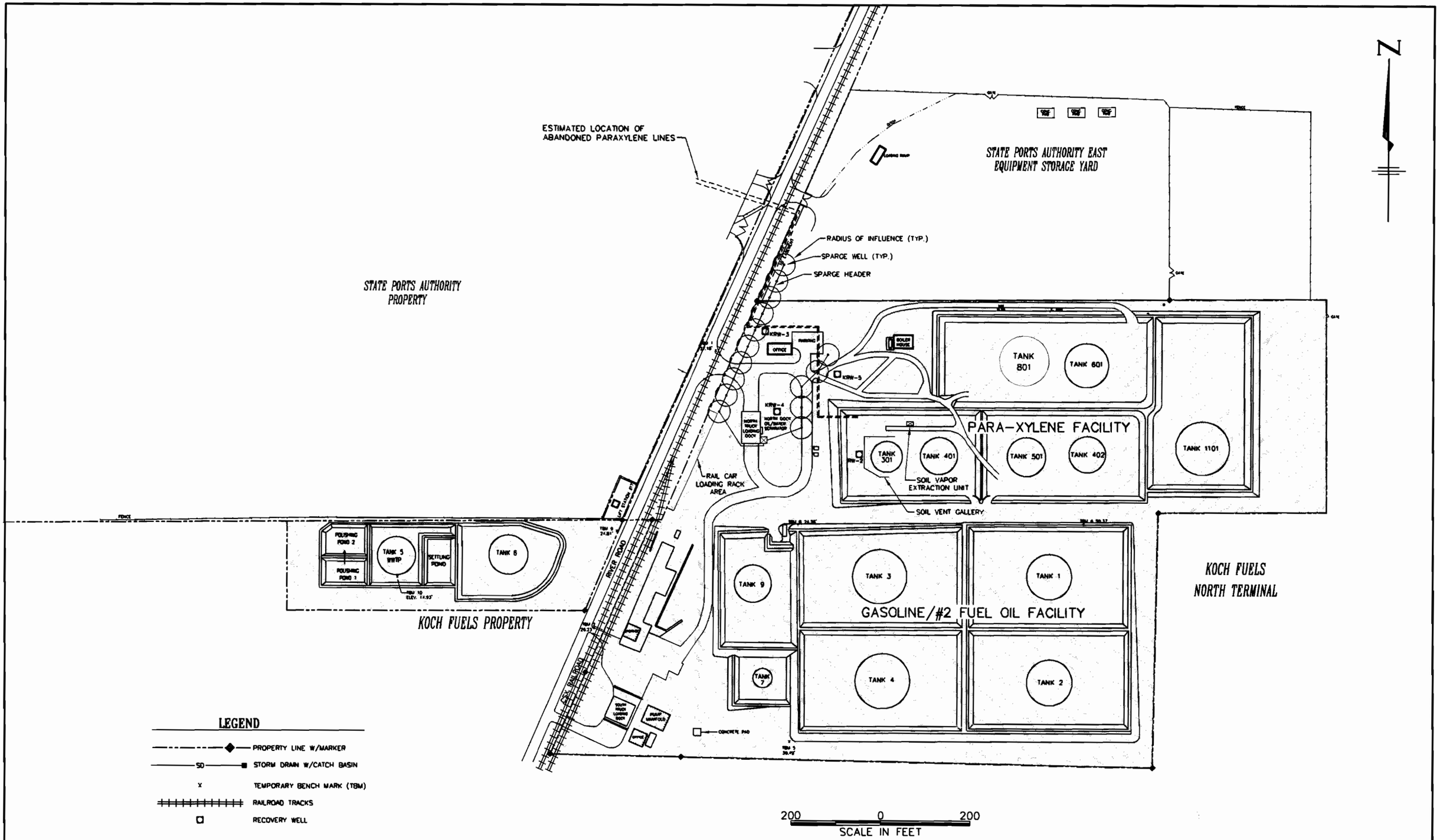
2000 0 2000

SCALE IN FEET

FROM SYLVAN ASCENT CD/MAPS 7.5 MINUTE MAP, WILMINGTON, N.C.

CALIN ENGINEERS and SCIENTISTS, WILMINGTON, NORTH CAROLINA	PROJECT: KOCH NORTH TERMINAL, RIVER ROAD, WILMINGTON, N.C.	TITLE: GENERAL LOCATION MAP			FIGURE 1
	JOB NO: 99160-20	DATE: AUG 2000	SCALE: 1"=2000'	DRAWN BY: JCR	CHECKED BY: ST

9160F01

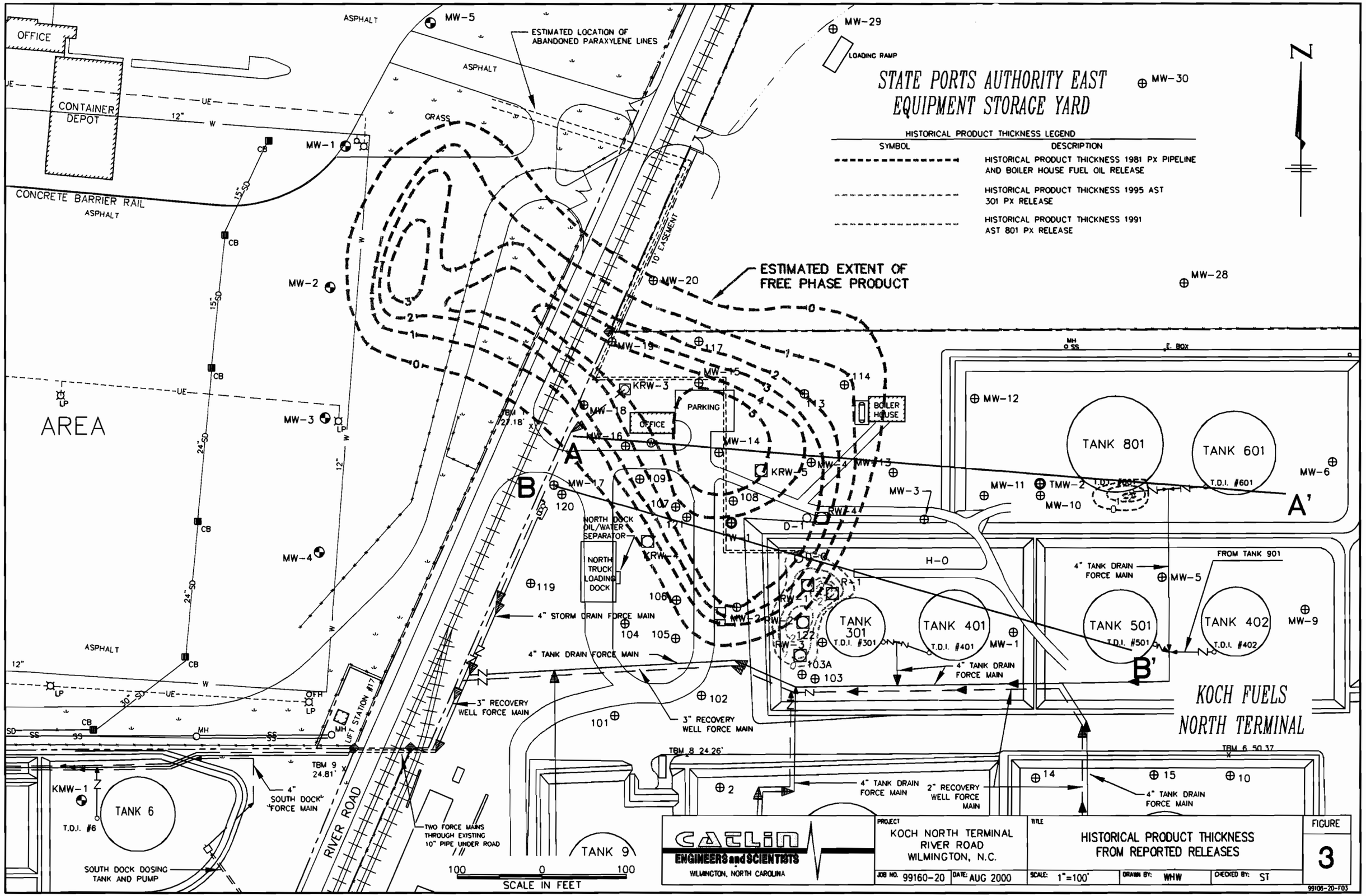


CATLIN ENGINEERS and SCIENTISTS
WILMINGTON, NORTH CAROLINA

PROJECT	TITLE	FIGURE
KOCH NORTH TERMINAL RIVER ROAD WILMINGTON, N.C.	SITE MAP	2

JOB NO. 99160-20 | DATE: AUG 2000 | SCALE: 1"=200' | DRAWN BY: WHW | CHECKED BY: ST

99160-20-F02


STATE PORTS AUTHORITY EAST
EQUIPMENT STORAGE YARD
HISTORICAL PRODUCT THICKNESS LEGEND
SYMBOL
DESCRIPTION
HISTORICAL PRODUCT THICKNESS 1981 PX PIPELINE AND BOILER HOUSE FUEL OIL RELEASE
HISTORICAL PRODUCT THICKNESS 1995 AST 301 PX RELEASE
HISTORICAL PRODUCT THICKNESS 1991 AST 801 PX RELEASE
ESTIMATED EXTENT OF FREE PHASE PRODUCT
ESTIMATED LOCATION OF ABANDONED PARAXYLENE LINES
OFFICE
CONTAINER DEPOT
CONCRETE BARRIER RAIL
ASPHALT
GRASS
LOADING RAMP
10' EASEMENT
AREA
PARKING
BOILER HOUSE
NORTH DOCK OIL/WATER SEPARATOR
NORTH TRUCK LOADING DOCK
4" STORM DRAIN FORCE MAIN
4" TANK DRAIN FORCE MAIN
3" RECOVERY WELL FORCE MAIN
2" RECOVERY WELL FORCE MAIN
FROM TANK 901
TANK 801
TANK 601
TANK 301
TANK 401
TANK 501
TANK 402
TANK 6
TANK 9
LIFT STATION #17
4" SOUTH DOCK FORCE MAIN
SOUTH DOCK DOSING TANK AND PUMP
TWO FORCE MAINS THROUGH EXISTING 10" PIPE UNDER ROAD
RIVER ROAD
KOCH FUELS NORTH TERMINAL
SCALE IN FEET
CATLIN ENGINEERS and SCIENTISTS
WILMINGTON, NORTH CAROLINA
PROJECT
KOCH NORTH TERMINAL
RIVER ROAD
WILMINGTON, N.C.
TITLE
HISTORICAL PRODUCT THICKNESS FROM REPORTED RELEASES
FIGURE
3
JOB NO. 99160-20
DATE: AUG 2000
SCALE: 1"=100'
DRAWN BY: WHW
CHECKED BY: ST
99106-20-F03

N.C. STATE PORTS AUTHORITY
EQUIPMENT STORAGE YARD

ESTIMATED LOCATION OF ABANDONED PARAXYLENE LINES

10' EASEMENT

RIVER RD

24" FORCE MAIN

N.C STATE PORTS AUTHORITY
STORAGE AREA

KOCH FUELS
NORTH TERMINAL

OFFICE

PARKING

BOILER HOUSE

TANK 801

TANK 601

NORTH TRUCK LOADING DOCK

NORTH DOCK OIL/WATER SEPARATOR

TANK 301

TANK 401

TANK 501

TANK 402

TANK 1101

RAILCAR LOADING RACK AREA

LIFT STATION NO. 17

24" 312' (ABANDONED)

(ABANDONED) 8" 286'

15" 1054'

(ABANDONED)

TOP 29.72
INV 19.46
INV 19.26

POLISHING POND 2

POLISHING POND 1

TANK 5

SETTLING POND

TANK 6

TREATMENT SYSTEM

KOCH REFINING COMPANY, L.P.

TANK 9

TANK 3

TANK 1

TANK 7

TANK 4

TANK 2

PRODUCT LINES

PUMP MANIFOLD

SOUTH TRUCK LOADING DOCK

OFFICE

CONCRETE PAD

KOCH REFINING COMPANY, LP
(KOCH NORTH TERMINAL)

PETROLEUM FUEL TERMINAL CO.
(APEX OIL COMPANY)

TANK

EXTENT OF BURIED LINES IS NOT SHOWN

4" FUEL LINE (INSULATED)

1 1/2" PVC DISCHARGE LINE

12" PARAXYLENE LINE (INSULATED)

14" FUEL LINE

N

LEGEND

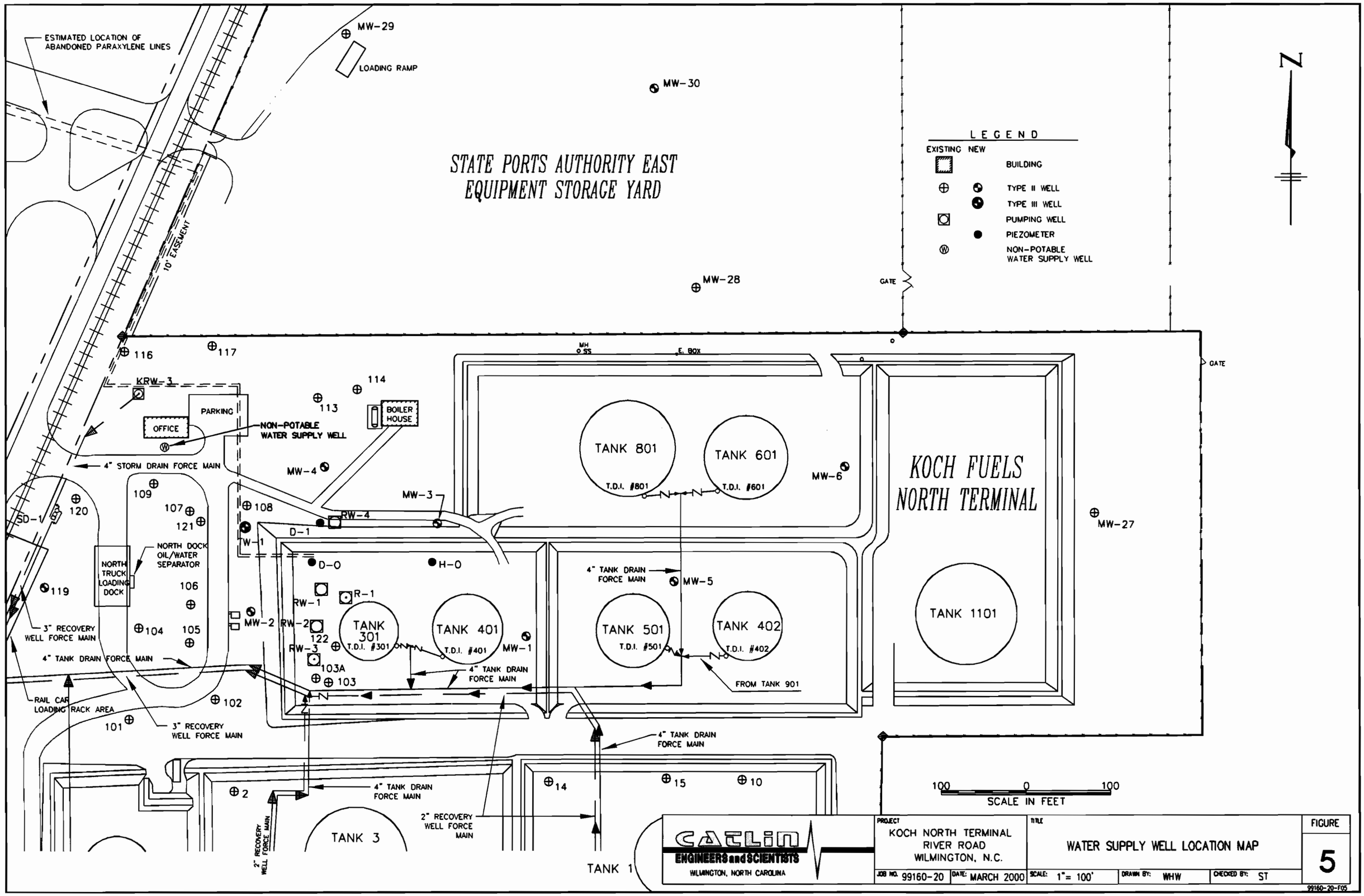
	BUILDING
SD	STORM DRAIN LINE
S	STEAM LINE
SS	SANITARY SEWER
W	WATERLINE W/VALVE
PP P	POWER LINE W/POLE
FIRE	WATERLINE FOR FIRE PROTECTION
FH	FIRE HYDRANT
MH	MANHOLE
	POWER TRANSFORMER
	AREA LIGHT
CB	CATCH BASIN

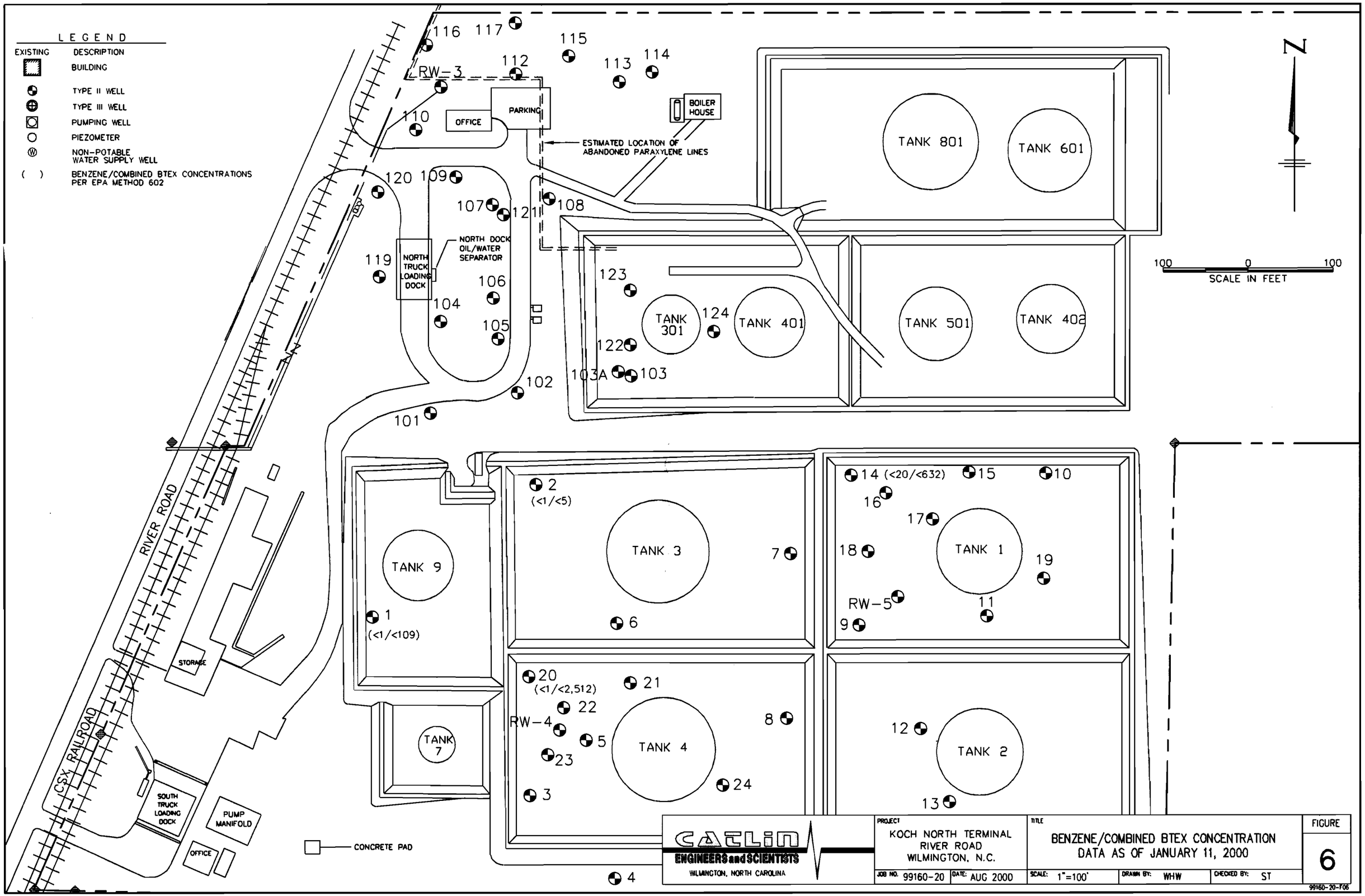
150 0 150
SCALE IN FEET

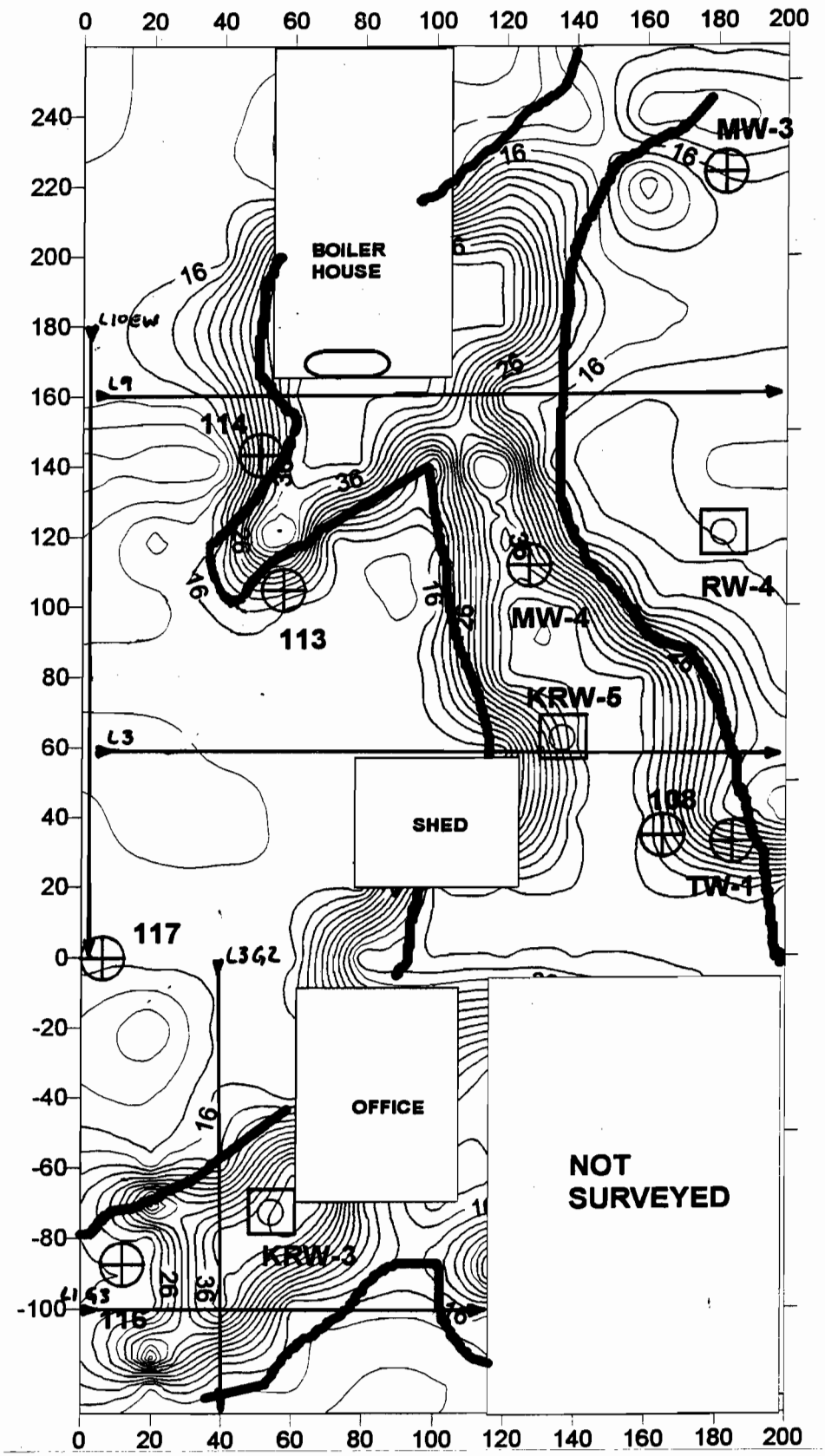
CATLIN
ENGINEERS and SCIENTISTS
WILMINGTON, NORTH CAROLINA

PROJECT: KOCH NORTH TERMINAL RIVER ROAD WILMINGTON, N.C.	TITLE: SITE UTILITIES INVENTORY MAP		FIGURE 4
JOB NO. 99160-20	DATE: AUG 2000	SCALE: 1" = 150'	DRAWN BY: WHW	CHECKED BY: ST

99160-20-F04


ESTIMATED LOCATION OF ABANDONED PARAXYLENE LINES
MW-29
LOADING RAMP
MW-30
STATE PORTS AUTHORITY EAST EQUIPMENT STORAGE YARD
LEGEND
EXISTING NEW
BUILDING
TYPE II WELL
TYPE III WELL
PUMPING WELL
PIEZOMETER
NON-POTABLE WATER SUPPLY WELL
N
10' EASEMENT
MW-28
GATE
116
117
114
113
KRW-3
PARKING
OFFICE
NON-POTABLE WATER SUPPLY WELL
BOILER HOUSE
4" STORM DRAIN FORCE MAIN
MW-4
MH
E. BOX
TANK 801
T.D.I. #801
TANK 601
T.D.I. #601
MW-6
KOCH FUELS NORTH TERMINAL
MW-27
109
107
121
120
SD-1
108
RW-4
MW-3
D-1
RW-1
NORTH DOCK OIL/WATER SEPARATOR
NORTH TRUCK LOADING DOCK
106
119
D-0
H-0
R-1
RW-1
RW-2
122
RW-3
MW-2
TANK 301
T.D.I. #301
TANK 401
T.D.I. #401
MW-1
4" TANK DRAIN FORCE MAIN
MW-5
TANK 501
T.D.I. #501
TANK 402
T.D.I. #402
FROM TANK 901
TANK 1101
3" RECOVERY WELL FORCE MAIN
104
105
4" TANK DRAIN FORCE MAIN
103A
103
RAIL CAR LOADING RACK AREA
102
101
3" RECOVERY WELL FORCE MAIN
4" TANK DRAIN FORCE MAIN
2
4" TANK DRAIN FORCE MAIN
14
15
10
2" RECOVERY WELL FORCE MAIN
TANK 3
2" RECOVERY WELL FORCE MAIN
TANK 1
100 0 100
SCALE IN FEET
CATLIN ENGINEERS and SCIENTISTS
WILMINGTON, NORTH CAROLINA
PROJECT
KOCH NORTH TERMINAL
RIVER ROAD
WILMINGTON, N.C.
TITLE
WATER SUPPLY WELL LOCATION MAP
FIGURE
5
JOB NO. 99160-20
DATE: MARCH 2000
SCALE: 1"= 100'
DRAWN BY: WHW
CHECKED BY: ST
99160-20-F05


LEGEND
EXISTING
DESCRIPTION
BUILDING
TYPE II WELL
TYPE III WELL
PUMPING WELL
PIEZOMETER
NON-POTABLE WATER SUPPLY WELL
( )
BENZENE/COMBINED BTEX CONCENTRATIONS PER EPA METHOD 602
N
100 0 100
SCALE IN FEET
116
117
115
112
113
114
RW-3
110
OFFICE
PARKING
BOILER HOUSE
ESTIMATED LOCATION OF ABANDONED PARAXYLENE LINES
TANK 801
TANK 601
120
109
107
121
108
NORTH DOCK OIL/WATER SEPARATOR
119
NORTH TRUCK LOADING DOCK
106
104
105
123
TANK 301
124
TANK 401
TANK 501
TANK 402
122
103A
103
102
101
RIVER ROAD
2
(<1/<5)
TANK 3
7
14 (<20/<632)
15
10
16
17
18
TANK 1
19
RW-5
11
9
TANK 9
1
(<1/<109)
6
STORAGE
20
(<1/<2,512)
21
22
RW-4
5
8
TANK 4
TANK 7
23
3
24
12
TANK 2
13
CSX RAILROAD
SOUTH TRUCK LOADING DOCK
PUMP MANIFOLD
OFFICE
CONCRETE PAD
4
CATLIN
ENGINEERS and SCIENTISTS
WILMINGTON, NORTH CAROLINA
PROJECT
KOCH NORTH TERMINAL
RIVER ROAD
WILMINGTON, N.C.
TITLE
BENZENE/COMBINED BTEX CONCENTRATION
DATA AS OF JANUARY 11, 2000
FIGURE
6
JOB NO. 99160-20
DATE: AUG 2000
SCALE: 1"=100'
DRAWN BY: WHW
CHECKED BY: ST
99160-20-F06



CATLIN ENGINEERS and SCIENTISTS, WILMINGTON, NORTH CAROLINA	PROJECT: KOCH NORTH TERMINAL, RIVER ROAD, WILMINGTON, N.C.	TITLE: INTERPRETED SANDY SILT/CLAY TOPOGRAPHIC MAP			FIGURE 7
	JOB NO: 99160-20	DATE: AUG 2000	SCALE: AS SHOWN	DRAWN BY: WHW	CHECKED BY: ST

99160-20-F07

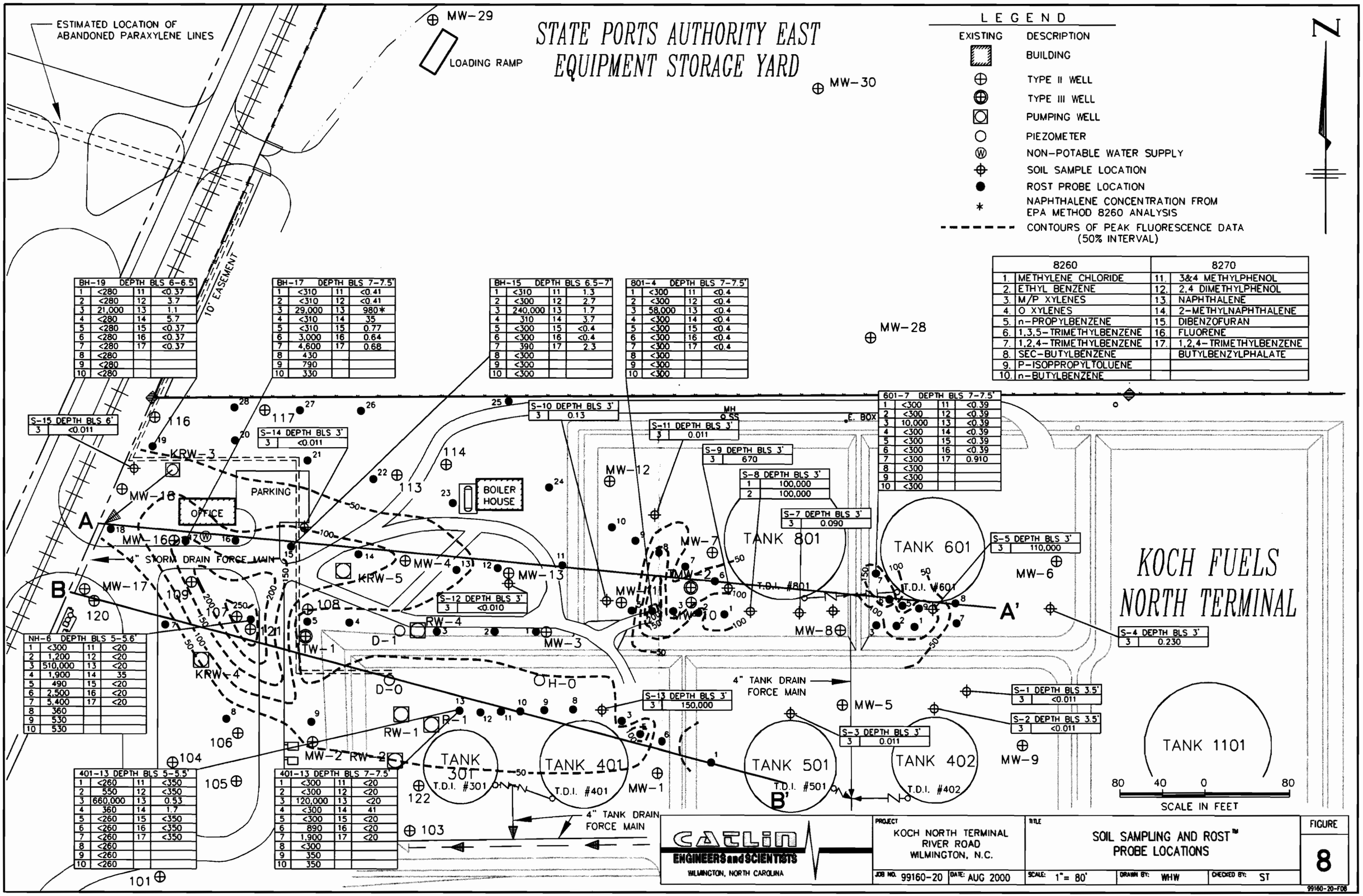
STATE PORTS AUTHORITY EAST EQUIPMENT STORAGE YARD

LEGEND

EXISTING	DESCRIPTION
	BUILDING
	TYPE II WELL
	TYPE III WELL
	PUMPING WELL
	PIEZOMETER
	NON-POTABLE WATER SUPPLY
	SOIL SAMPLE LOCATION
	ROST PROBE LOCATION
*	NAPHTHALENE CONCENTRATION FROM EPA METHOD 8260 ANALYSIS
- - - - - -	CONTOURS OF PEAK FLUORESCENCE DATA (50% INTERVAL)

N

8260		8270	
1.	METHYLENE CHLORIDE	11.	3&4 METHYLPHENOL
2.	ETHYL BENZENE	12.	2,4 DIMETHYLPHENOL
3.	M/P XYLENES	13.	NAPHTHALENE
4.	O XYLENES	14.	2-METHYLNAPHTHALENE
5.	n-PROPYLBENZENE	15.	DIBENZOFURAN
6.	1,3,5-TRIMETHYLBENZENE	16.	FLUORENE
7.	1,2,4-TRIMETHYLBENZENE	17.	1,2,4-TRIMETHYLBENZENE
8.	SEC-BUTYLBENZENE		BUTYLBENZYLPHALATE
9.	P-ISOPPROPYLTOLUENE		
10.	n-BUTYLBENZENE		



BH-19 DEPTH BLS 6-6.5'			
1	<280	11	<0.37
2	<280	12	3.7
3	21,000	13	1.1
4	<280	14	5.7
5	<280	15	<0.37
6	<280	16	<0.37
7	<280	17	<0.37
8	<280		
9	<280		
10	<280		

BH-17 DEPTH BLS 7-7.5'			
1	<310	11	<0.41
2	<310	12	<0.41
3	29,000	13	980*
4	<310	14	35
5	<310	15	0.77
6	3,000	16	0.64
7	4,600	17	0.68
8	430		
9	790		
10	330		

BH-15 DEPTH BLS 6.5-7'			
1	<310	11	1.3
2	<300	12	2.7
3	240,000	13	1.7
4	310	14	3.7
5	<300	15	<0.4
6	<300	16	<0.4
7	390	17	2.3
8	<300		
9	<300		
10	<300		

801-4 DEPTH BLS 7-7.5'			
1	<300	11	<0.4
2	<300	12	<0.4
3	58,000	13	<0.4
4	<300	14	<0.4
5	<300	15	<0.4
6	<300	16	<0.4
7	<300	17	<0.4
8	<300		
9	<300		
10	<300		

601-7 DEPTH BLS 7-7.5'			
1	<300	11	<0.39
2	<300	12	<0.39
3	10,000	13	<0.39
4	<300	14	<0.39
5	<300	15	<0.39
6	<300	16	<0.39
7	<300	17	0.910
8	<300		
9	<300		
10	<300		

S-15 DEPTH BLS 6'	
3	<0.011

S-14 DEPTH BLS 3'	
3	<0.011

S-10 DEPTH BLS 3'	
3	0.13

S-11 DEPTH BLS 3'	
3	0.011

S-9 DEPTH BLS 3'	
3	670

S-8 DEPTH BLS 3'	
1	100,000
2	100,000

S-7 DEPTH BLS 3'	
3	0.090

S-5 DEPTH BLS 3'	
3	110,000

S-12 DEPTH BLS 3'	
3	<0.010

S-4 DEPTH BLS 3'	
3	0.230

S-13 DEPTH BLS 3'	
3	150,000

S-1 DEPTH BLS 3.5'	
3	<0.011

S-2 DEPTH BLS 3.5'	
3	<0.011

S-3 DEPTH BLS 3'	
3	0.011

NH-6 DEPTH BLS 5-5.6'			
1	<300	11	<20
2	1,200	12	<20
3	510,000	13	<20
4	1,900	14	35
5	490	15	<20
6	2,500	16	<20
7	5,400	17	<20
8	360		
9	530		
10	530		

401-13 DEPTH BLS 5-5.5'			
1	<260	11	<350
2	550	12	<350
3	660,000	13	0.53
4	360	14	1.7
5	<260	15	<350
6	<260	16	<350
7	<260	17	<350
8	<260		
9	<260		
10	<260		

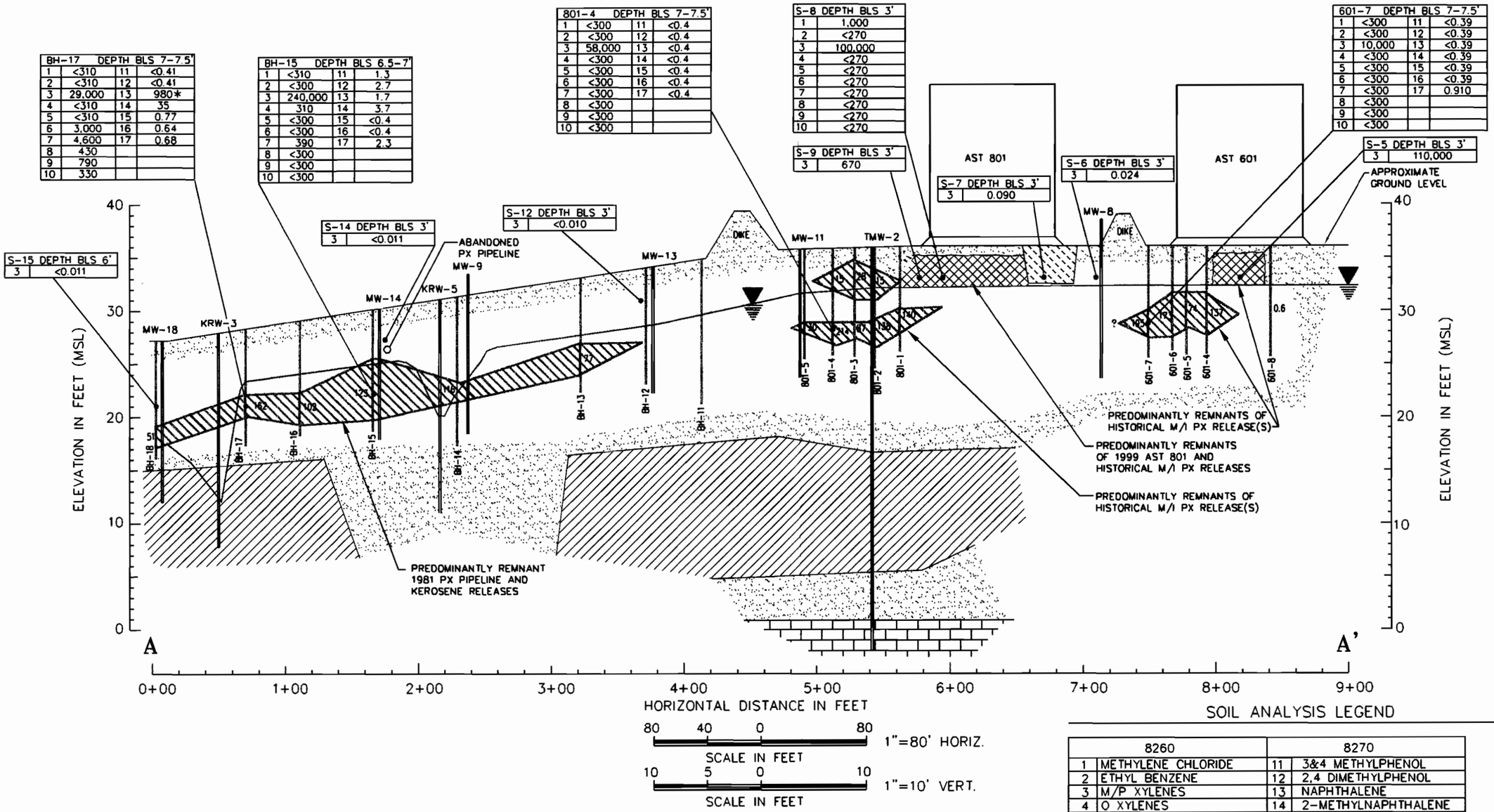
401-13 DEPTH BLS 7-7.5'			
1	<300	11	<20
2	<300	12	<20
3	120,000	13	<20
4	<300	14	41
5	<300	15	<20
6	890	16	<20
7	1,900	17	<20
8	<300		
9	350		
10	350		

CATLIN ENGINEERS and SCIENTISTS
WILMINGTON, NORTH CAROLINA

PROJECT	TITLE	FIGURE
KOCH NORTH TERMINAL RIVER ROAD WILMINGTON, N.C.	SOIL SAMPLING AND ROST™ PROBE LOCATIONS	8

JOB NO. 99160-20 | DATE: AUG 2000 | SCALE: 1"= 80' | DRAWN BY: WHW | CHECKED BY: ST

99160-20-F08



BH-17 DEPTH BLS 7-7.5'			
1	<310	11	<0.41
2	<310	12	<0.41
3	29,000	13	980*
4	<310	14	35
5	<310	15	0.77
6	3,000	16	0.64
7	4,600	17	0.68
8	430		
9	790		
10	330		

BH-15 DEPTH BLS 6.5-7'			
1	<310	11	1.3
2	<300	12	2.7
3	240,000	13	1.7
4	310	14	3.7
5	<300	15	<0.4
6	<300	16	<0.4
7	390	17	2.3
8	<300		
9	<300		
10	<300		

801-4 DEPTH BLS 7-7.5'			
1	<300	11	<0.4
2	<300	12	<0.4
3	58,000	13	<0.4
4	<300	14	<0.4
5	<300	15	<0.4
6	<300	16	<0.4
7	<300	17	<0.4
8	<300		
9	<300		
10	<300		

S-8 DEPTH BLS 3'	
1	1,000
2	<270
3	100,000
4	<270
5	<270
6	<270
7	<270
8	<270
9	<270
10	<270

601-7 DEPTH BLS 7-7.5'			
1	<300	11	<0.39
2	<300	12	<0.39
3	10,000	13	<0.39
4	<300	14	<0.39
5	<300	15	<0.39
6	<300	16	<0.39
7	<300	17	0.910
8	<300		
9	<300		
10	<300		

S-15 DEPTH BLS 6'	
3	<0.011

S-14 DEPTH BLS 3'	
3	<0.011

S-12 DEPTH BLS 3'	
3	<0.010

S-9 DEPTH BLS 3'	
3	670

S-7 DEPTH BLS 3'	
3	0.090

S-6 DEPTH BLS 3'	
3	0.024

S-5 DEPTH BLS 3'	
3	110,000

80 40 0 80 — 1"=80' HORIZ.
SCALE IN FEET

10 5 0 10 — 1"=10' VERT.
SCALE IN FEET

SOIL ANALYSIS LEGEND

8260		8270	
1	METHYLENE CHLORIDE	11	3&4 METHYLPHENOL
2	ETHYL BENZENE	12	2,4 DIMETHYLPHENOL
3	M/P XYLENES	13	NAPHTHALENE
4	O XYLENES	14	2-METHYLNAPHTHALENE
5	n-PROPYLBENZENE	15	DIBENZOFURAN
6	1,3,5-TRIMETHYLBENZENE	16	FLUORENE
7	1,2,4-TRIMETHYLBENZENE	17	1,2,4-TRIMETHYLBENZENE
8	SEC-BUTYLBENZENE		BUTYLBENZYLPHALATE
9	P-ISOPPROPYLTOLUENE		
10	n-BUTYLBENZENE		

• SOIL SAMPLE LOCATION

* NAPHTHALENE CONCENTRATION FROM EPA METHOD 8260 ANALYSIS

ESTIMATED EXTENT OF PX SOIL CONTAMINATION BASED ON SOIL SAMPLING DATA

SOILS LEGEND

- SANDS
- SILTY SANDS / CLAYS
- LIMESTONE
- LIMITS OF 801 SOIL EXCAVATION

ROST LEGEND

- <10% FLUORESCENCE
- 162 PEAK FLUORESCENCE <10%
- INTERPOLATED LIMITS OF ZONES WITH >10% FLUORESCENCE

MONITORING LEGEND

- CASING
- SCREENED INTERVAL
- SURFICIAL WATER TABLE LEVEL AS OF 2/28/00

NOTE:
M/I = MAINTENANCE AND INCIDENTAL

CATLIN ENGINEERS and SCIENTISTS
WILMINGTON, NORTH CAROLINA

PROJECT: KOCH NORTH TERMINAL
RIVER ROAD
WILMINGTON, N.C.

TITLE: CROSS SECTION - A-A'

FIGURE 9

JOB NO. 99160-20 | DATE: AUG 2000 | SCALE: AS SHOWN | DRAWN BY: WHW | CHECKED BY: ST

99160-20-F09

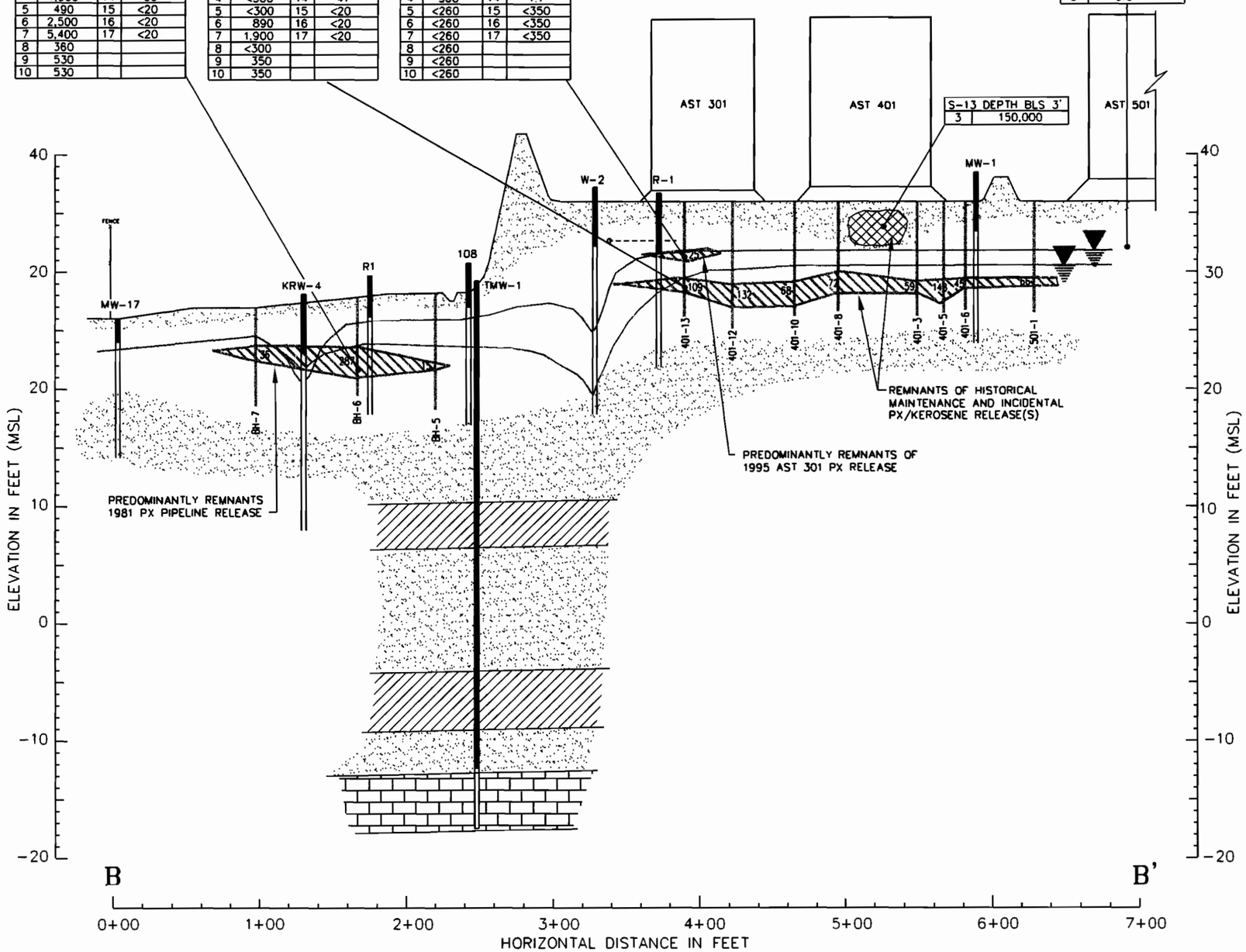
BH-6 DEPTH BLS 5-5.6'			
1	<300	11	<20
2	1,200	12	<20
3	510,000	13	<20
4	1,900	14	35
5	490	15	<20
6	2,500	16	<20
7	5,400	17	<20
8	360		
9	530		
10	530		

401-13 DEPTH BLS 7-7.5'			
1	<300	11	<20
2	<300	12	<20
3	120,000	13	<20
4	<300	14	41
5	<300	15	<20
6	890	16	<20
7	1,900	17	<20
8	<300		
9	350		
10	350		

401-13 DEPTH BLS 5-5.5'			
1	<260	11	<350
2	550	12	<350
3	660,000	13	0.53
4	360	14	1.7
5	<260	15	<350
6	<260	16	<350
7	<260	17	<350
8	<260		
9	<260		
10	<260		

S-3 DEPTH BLS 3'	
3	0.011

S-13 DEPTH BLS 3'	
3	150,000



80 40 0 80
SCALE IN FEET
1"=80' HORIZ.

10 5 0 10
SCALE IN FEET
1"=10' VERT.

SOIL ANALYSIS LEGEND

	8260		8270
1	METHYLENE CHLORIDE	11	3&4 METHYLPHENOL
2	ETHYL BENZENE	12	2,4 DIMETHYLPHENOL
3	M/P XYLENES	13	NAPHTHALENE
4	O XYLENES	14	2-METHYLNAPHTHALENE
5	n-PROPYLBENZENE	15	DIBENZOFURAN
6	1,3,5-TRIMETHYLBENZENE	16	FLUORENE
7	1,2,4-TRIMETHYLBENZENE	17	BUTYLBENZYLPHALATE
8	SEC-BUTYLBENZENE		
9	P-ISOPPROPYLTOLUENE		
10	n-BUTYLBENZENE		

• SOIL SAMPLE LOCATION

ESTIMATED EXTENT OF PX SOIL CONTAMINATION BASED ON SOIL SAMPLING DATA

SOILS LEGEND

SANDS

SILTY SANDS / CLAYS

LIMESTONE

LIMITS OF 801 SOIL EXCAVATION

NOTE:
M/I = MAINTENANCE AND INCIDENTAL
SOIL VENT GALLERY

ROST LEGEND

<10% FLUORESCENCE

162 PEAK FLUORESCENCE <10%

INTERPOLATED LIMITS OF ZONES WITH >10% FLUORESCENCE

MONITORING LEGEND

CASING

SCREENED INTERVAL

SURFICIAL WATER TABLE LEVEL AS OF 2/28/00

SURFICIAL WATER TABLE LEVEL AS OF 12/04/97

CATLIN ENGINEERS and SCIENTISTS
WILMINGTON, NORTH CAROLINA

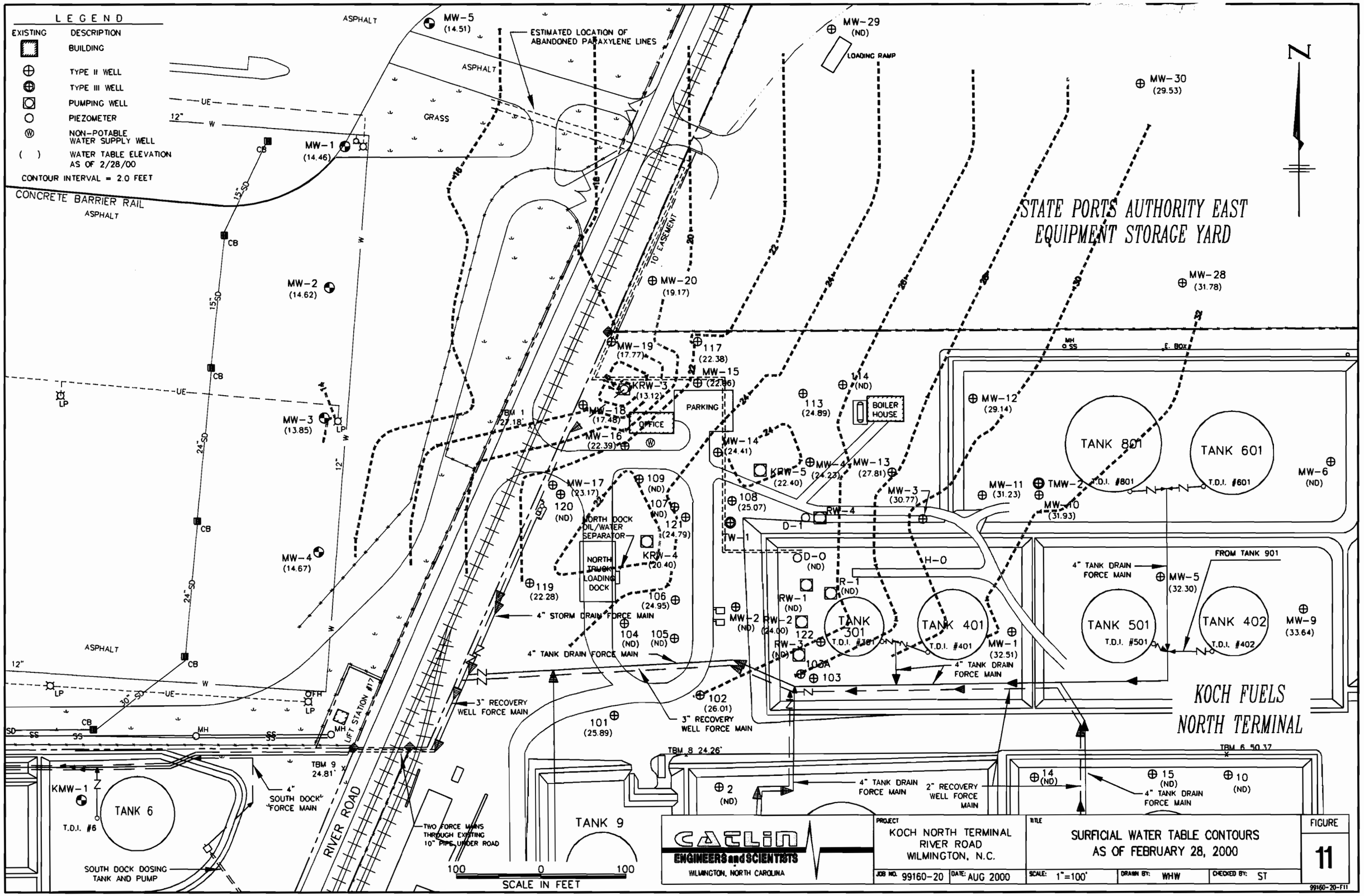
PROJECT: KOCH NORTH TERMINAL
RIVER ROAD
WILMINGTON, N.C.

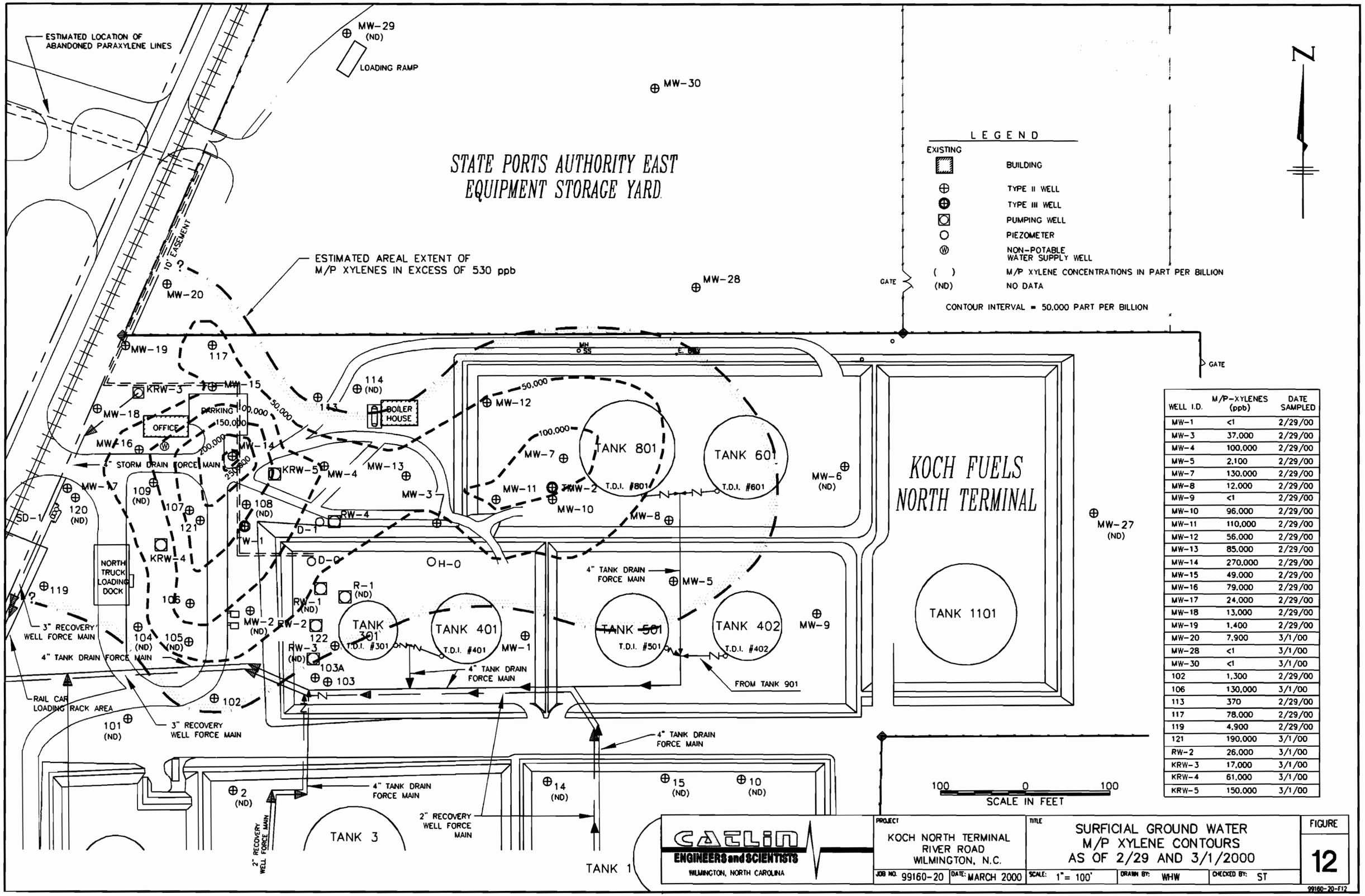
TITLE: CROSS SECTION - B-B'

FIGURE 10

JOB NO. 99160-20 | DATE: AUG 2000 | SCALE: AS SHOWN | DRAWN BY: WHW | CHECKED BY: ST

99160-20-F10


LEGEND
EXISTING DESCRIPTION
BUILDING
TYPE II WELL
TYPE III WELL
PUMPING WELL
PIEZOMETER
NON-POTABLE WATER SUPPLY WELL
( ) WATER TABLE ELEVATION AS OF 2/28/00
CONTOUR INTERVAL = 2.0 FEET
STATE PORTS AUTHORITY EAST EQUIPMENT STORAGE YARD
KOCH FUELS NORTH TERMINAL
ESTIMATED LOCATION OF ABANDONED PARAXYLENE LINES
CONCRETE BARRIER RAIL
ASPHALT
GRASS
LOADING RAMP
BOILER HOUSE
OFFICE
PARKING
NORTH DOCK OIL/WATER SEPARATOR
NORTH TRUCK LOADING DOCK
LIFT STATION #17
RIVER ROAD
TANK 801
TANK 601
TANK 301
TANK 401
TANK 501
TANK 402
TANK 6
TANK 9
FROM TANK 901
4" TANK DRAIN FORCE MAIN
4" STORM DRAIN FORCE MAIN
3" RECOVERY WELL FORCE MAIN
2" RECOVERY WELL FORCE MAIN
4" SOUTH DOCK FORCE MAIN
TWO FORCE MAINS THROUGH EXISTING 10" PIPE UNDER ROAD
SOUTH DOCK DOSING TANK AND PUMP
10' EASEMENT
SCALE IN FEET
CATLIN ENGINEERS and SCIENTISTS
WILMINGTON, NORTH CAROLINA
PROJECT: KOCH NORTH TERMINAL RIVER ROAD WILMINGTON, N.C.
TITLE: SURFICIAL WATER TABLE CONTOURS AS OF FEBRUARY 28, 2000
FIGURE 11
JOB NO. 99160-20
DATE: AUG 2000
SCALE: 1"=100'
DRAWN BY: WHW
CHECKED BY: ST
99160-20-F11



WELL I.D.	M/P-XYLENES (ppb)	DATE SAMPLED
MW-1	<1	2/29/00
MW-3	37,000	2/29/00
MW-4	100,000	2/29/00
MW-5	2,100	2/29/00
MW-7	130,000	2/29/00
MW-8	12,000	2/29/00
MW-9	<1	2/29/00
MW-10	96,000	2/29/00
MW-11	110,000	2/29/00
MW-12	56,000	2/29/00
MW-13	85,000	2/29/00
MW-14	270,000	2/29/00
MW-15	49,000	2/29/00
MW-16	79,000	2/29/00
MW-17	24,000	2/29/00
MW-18	13,000	2/29/00
MW-19	1,400	2/29/00
MW-20	7,900	3/1/00
MW-28	<1	3/1/00
MW-30	<1	3/1/00
102	1,300	2/29/00
106	130,000	3/1/00
113	370	2/29/00
117	78,000	2/29/00
119	4,900	2/29/00
121	190,000	3/1/00
RW-2	26,000	3/1/00
KRW-3	17,000	3/1/00
KRW-4	61,000	3/1/00
KRW-5	150,000	3/1/00

CATLIN ENGINEERS and SCIENTISTS
WILMINGTON, NORTH CAROLINA

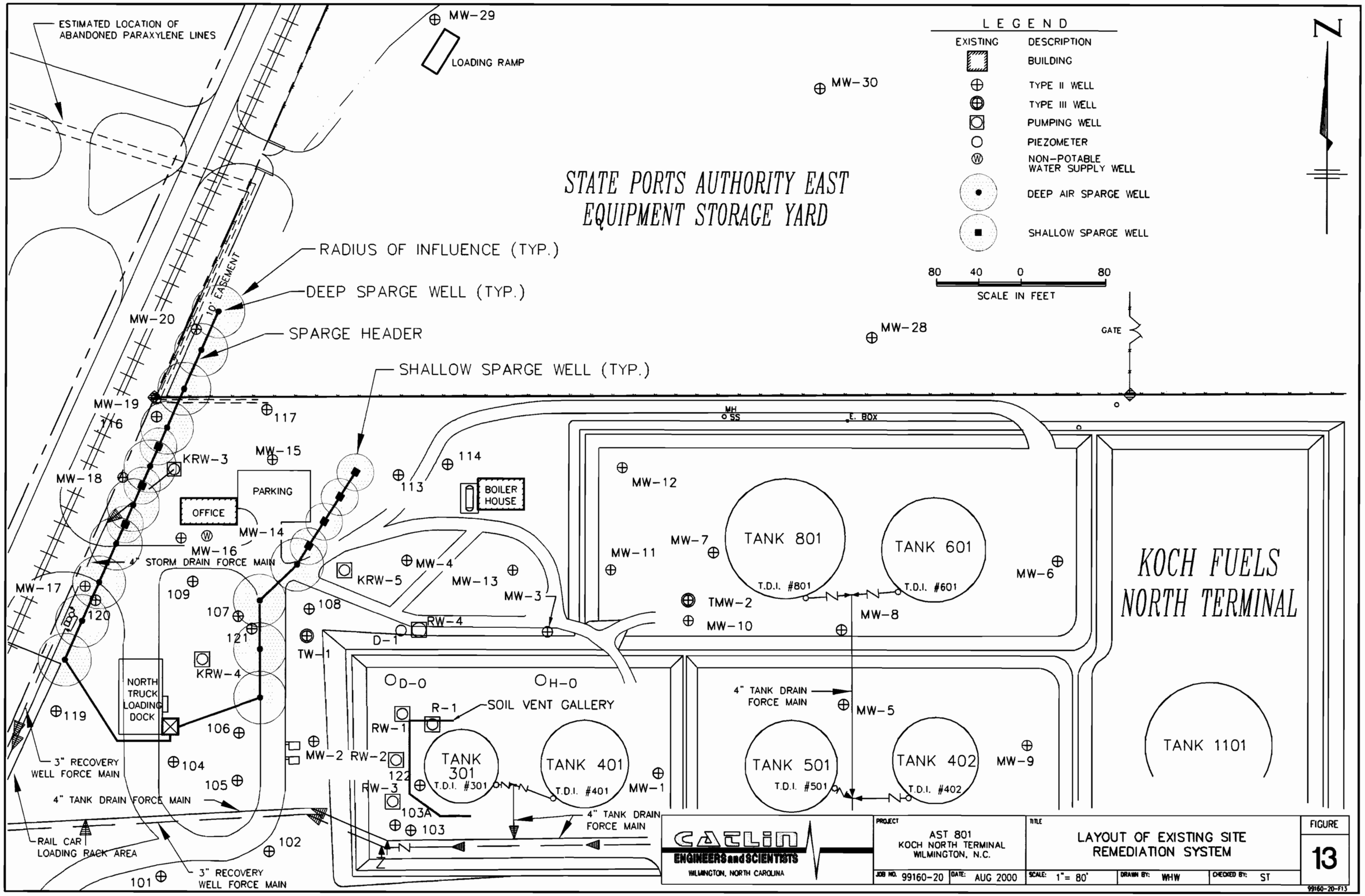
PROJECT: KOCH NORTH TERMINAL, RIVER ROAD, WILMINGTON, N.C.

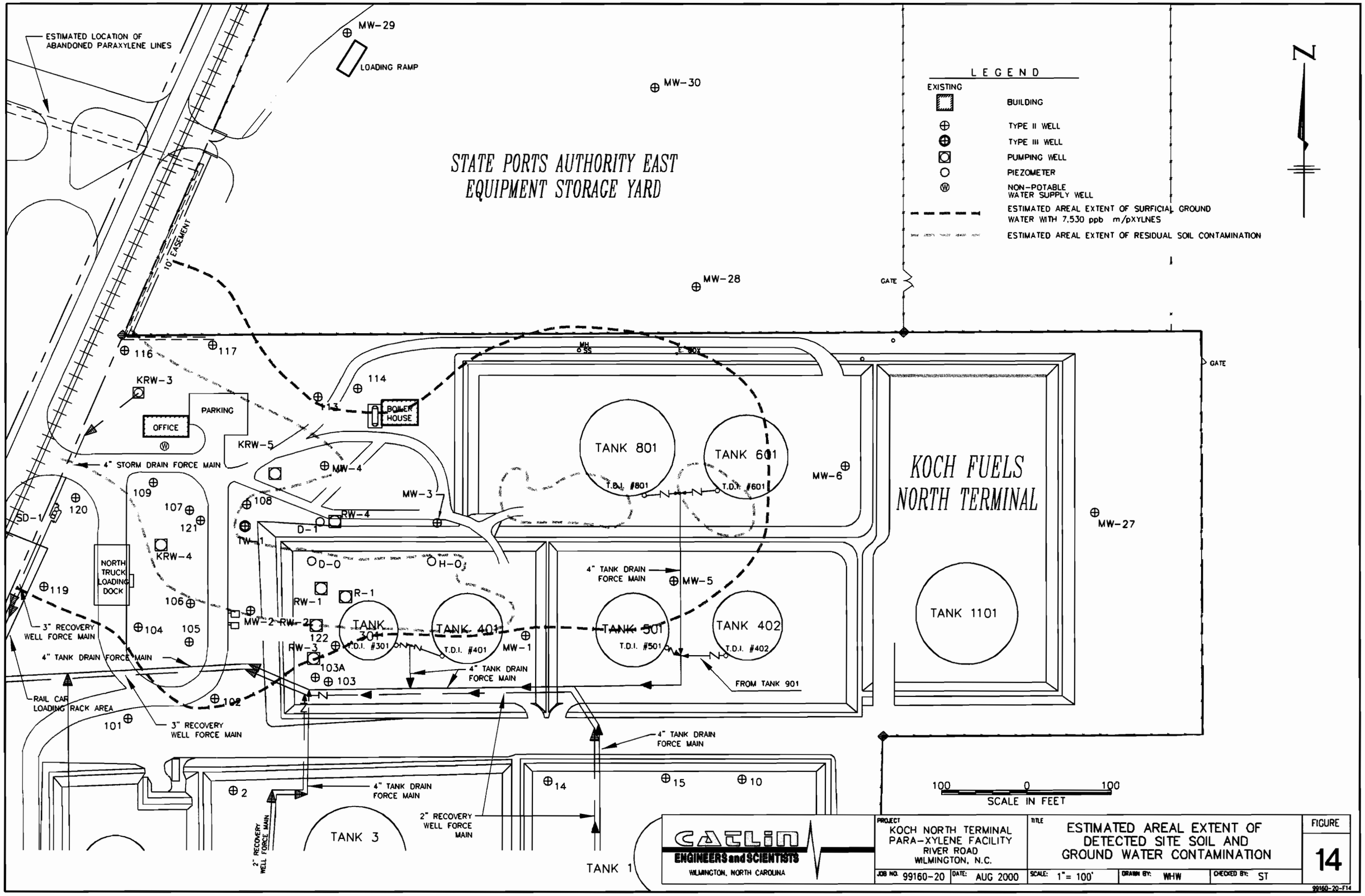
TITLE: SURFICIAL GROUND WATER M/P XYLENE CONTOURS AS OF 2/29 AND 3/1/2000

FIGURE 12

JOB NO. 99160-20 | DATE: MARCH 2000 | SCALE: 1"= 100' | DRAWN BY: WHW | CHECKED BY: ST

99160-20-F12


ESTIMATED LOCATION OF ABANDONED PARAXYLENE LINES
MW-29
LOADING RAMP
MW-30
LEGEND
EXISTING
DESCRIPTION
BUILDING
TYPE II WELL
TYPE III WELL
PUMPING WELL
PIEZOMETER
NON-POTABLE WATER SUPPLY WELL
DEEP AIR SPARGE WELL
SHALLOW SPARGE WELL
80 40 0 80
SCALE IN FEET
N
STATE PORTS AUTHORITY EAST
EQUIPMENT STORAGE YARD
RADIUS OF INFLUENCE (TYP.)
DEEP SPARGE WELL (TYP.)
SPARGE HEADER
SHALLOW SPARGE WELL (TYP.)
10' EASEMENT
MW-20
MW-28
GATE
MW-19
116
117
MW-15
KRW-3
MW-18
PARKING
OFFICE
MW-14
MW-16
4" STORM DRAIN FORCE MAIN
113
114
BOILER HOUSE
MH
SS
E. BOX
MW-12
MW-11
MW-7
TANK 801
T.D.I. #801
TANK 601
T.D.I. #601
MW-6
TMW-2
MW-10
MW-8
KOCH FUELS
NORTH TERMINAL
MW-17
120
109
107
108
KRW-5
MW-4
MW-13
MW-3
RW-4
D-1
121
TW-1
KRW-4
NORTH TRUCK LOADING DOCK
119
106
D-0
H-0
R-1
SOIL VENT GALLERY
RW-1
MW-2
RW-2
TANK 301
T.D.I. #301
TANK 401
T.D.I. #401
MW-1
4" TANK DRAIN FORCE MAIN
MW-5
TANK 501
T.D.I. #501
TANK 402
T.D.I. #402
MW-9
TANK 1101
3" RECOVERY WELL FORCE MAIN
104
105
122
RW-3
103A
103
4" TANK DRAIN FORCE MAIN
RAIL CAR LOADING RACK AREA
102
101
3" RECOVERY WELL FORCE MAIN
CATLIN
ENGINEERS and SCIENTISTS
WILMINGTON, NORTH CAROLINA
PROJECT
AST 801
KOCH NORTH TERMINAL
WILMINGTON, N.C.
TITLE
LAYOUT OF EXISTING SITE REMEDIATION SYSTEM
FIGURE
13
JOB NO. 99160-20
DATE: AUG 2000
SCALE: 1"= 80'
DRAWN BY: WHW
CHECKED BY: ST
99160-20-F13


ESTIMATED LOCATION OF ABANDONED PARAXYLENE LINES
MW-29
LOADING RAMP
MW-30
STATE PORTS AUTHORITY EAST EQUIPMENT STORAGE YARD
LEGEND
EXISTING
BUILDING
TYPE II WELL
TYPE III WELL
PUMPING WELL
PIEZOMETER
NON-POTABLE WATER SUPPLY WELL
ESTIMATED AREAL EXTENT OF SURFICIAL GROUND WATER WITH 7,530 ppb m/pXYLNES
ESTIMATED AREAL EXTENT OF RESIDUAL SOIL CONTAMINATION
N
10' EASEMENT
MW-28
GATE
116
117
114
113
KRW-3
PARKING
OFFICE
BOILER HOUSE
KRW-5
4" STORM DRAIN FORCE MAIN
MW-4
MW-3
TANK 801
T.D.I. #801
TANK 601
T.D.I. #601
MW-6
KOCH FUELS NORTH TERMINAL
MW-27
109
108
107
121
120
SD-1
RW-4
D-1
TW-1
KRW-4
NORTH TRUCK LOADING DOCK
D-0
H-0
4" TANK DRAIN FORCE MAIN
MW-5
119
106
R-1
RW-1
3" RECOVERY WELL FORCE MAIN
104
105
MW-2
RW-2
122
TANK 301
T.D.I. #301
TANK 401
T.D.I. #401
TANK 501
T.D.I. #501
TANK 402
T.D.I. #402
TANK 1101
MW-1
RW-3
103A
103
4" TANK DRAIN FORCE MAIN
FROM TANK 901
RAIL CAR LOADING RACK AREA
102
101
3" RECOVERY WELL FORCE MAIN
4" TANK DRAIN FORCE MAIN
2
14
15
10
4" TANK DRAIN FORCE MAIN
2" RECOVERY WELL FORCE MAIN
2" RECOVERY WELL FORCE MAIN
TANK 3
TANK 1
100 0 100
SCALE IN FEET
CATLIN ENGINEERS and SCIENTISTS
WILMINGTON, NORTH CAROLINA
PROJECT
KOCH NORTH TERMINAL
PARA-XYLENE FACILITY
RIVER ROAD
WILMINGTON, N.C.
TITLE
ESTIMATED AREAL EXTENT OF DETECTED SITE SOIL AND GROUND WATER CONTAMINATION
FIGURE
14
JOB NO. 99160-20
DATE: AUG 2000
SCALE: 1" = 100'
DRAWN BY: WHW
CHECKED BY: ST
99160-20-F14

2

APPENDICES

APPENDIX A

MATERIAL SAFETY DATA SHEETS (MSDS)

KOCH

MATERIAL SAFETY DATA SHEET

CHEMICAL PRODUCT & COMPANY IDENTIFICATION

TRADE NAME	FUEL OIL NO. 2 (LOW SULFUR)
CAS NUMBER	68476-30-2
MSDS NUMBER	5465
PRODUCT CODE	ND
SYNONYM(S)	2 OIL, NO. 2 LOW SULFUR DIESEL, NO. 2 LOW SULFUR FUEL, HEATING OIL, PREMIUM DIESEL (LOW SULFUR), DIESEL FUEL, ARCTIC DIESEL, DIESEL FUEL NO. 2, DIESEL OIL, D-GRADE FUEL OIL, RAILROAD DIESEL, VIRGIN DIESEL APPLICABLE TO ALL GRADES
MANUFACTURER / SUPPLIER	Koch Petroleum Group, LP. PO Box 2256 Wichita, KS 67201

TELEPHONE NUMBERS - 24 HOUR EMERGENCY ASSISTANCE

Chemtrec:	800-424-9300
Koch Security:	316-828-6777

TELEPHONE NUMBERS - GENERAL ASSISTANCE

8-5 (M-F)	316-828-6777
8-5 (M-F, CST) MSDS Assistance	316-828-8488

2 COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient Name	CAS Number	Concentration*	Exposure Limits / Health Hazards
C9-C16 HYDROCARBONS PRODUCED BY THE DISTILLATION OF CRUDE OIL	68476-30-2	99 - 100 %	ND
1,2,4-TRIMETHYLBENZENE	95-63-6	0 - 0.6 %	25 ppm 8-Hour TWA (ACGIH)
BIPHENYL	92-52-4	0 - 0.3 %	0.2 ppm 8-Hour TWA (OSHA) 0.2 ppm 8-Hour TWA (ACGIH)
NAPHTHALENE	91-20-3	0 - 0.2 %	10 ppm 8-Hour TWA (OSHA) 10 ppm 8-Hour TWA (ACGIH) 15 ppm 15-Min STEL (ACGIH)
XYLENES	1330-20-7	0 - 0.2 %	100 ppm 8-Hour TWA (OSHA) 100 ppm 8-Hour TWA (ACGIH) 150 ppm 15-Min STEL (ACGIH)
CUMENE	98-82-8	Trace	50 ppm 8-Hour TWA (OSHA) 50 ppm 8-Hour TWA (ACGIH)

Ingredient Name	CAS Number	Concentration*	Exposure Limits / Health Hazards
TOLUENE	108-88-3	Trace	200 ppm 8-Hour TWA (OSHA) 50 ppm 8-Hour TWA (ACGIH)

Values do not reflect absolute minimums and maximums; these values are typical which may vary from time to time.

This Material Safety Data Sheet is intended to communicate potential health hazards and potential physical hazards associated with the product(s) covered by this sheet, and is not intended to communicate product specification information. For product specification information, contact your Koch Petroleum Group, LP. representative.

3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

HEALTH HAZARDS
WARNING!
MAY BE IRRITATING TO THE SKIN, EYES AND RESPIRATORY TRACT
OVEREXPOSURE MAY CAUSE CNS DEPRESSION
ASPIRATION HAZARD IF SWALLOWED-CAN ENTER LUNGS AND CAUSE DAMAGE
POTENTIAL REPRODUCTIVE HAZARD
SKIN CANCER HAZARD BASED ON TESTS WITH LABORATORY ANIMALS

FLAMMABILITY HAZARDS
COMBUSTIBLE
PER OSHA GUIDELINES, 29 CFR 1910.1200(c)

REACTIVITY HAZARDS
STABLE

POTENTIAL HEALTH EFFECTS, SKIN

MODERATELY IRRITATING. Repeated or prolonged skin contact may cause drying, reddening, itching and cracking.

No significant effects are expected to occur following short term exposure. Repeated or prolonged contact with large amounts of this material may result in absorption through the skin to produce toxic effects.

Contact with heated material may cause thermal burns.

POTENTIAL HEALTH EFFECTS, EYE

SLIGHTLY IRRITATING. Exposure to vapors, fumes or mists may cause irritation. May cause slight transient irritation, lacrimation (tears) and a burning sensation in the eyes. Prolonged or repeated exposure may cause irritation and conjunctivitis.

Contact with heated material may cause thermal burns.

POTENTIAL HEALTH EFFECTS, INHALATION

Petroleum mists at high exposure levels may be irritating to the nose, throat and lungs.

May cause central nervous system depression or effects. Symptoms may include headache, excitation, euphoria, dizziness, incoordination, drowsiness, light-headedness, blurred vision, fatigue, tremors, convulsions, loss of consciousness, coma, respiratory arrest and death, depending on the concentration and duration of exposure.

Overexposure to this material may cause systemic damage including target organ effects listed under "Special Toxic Effects."

Other specific symptoms of exposure are listed under "Special Toxic Effects."

POTENTIAL HEALTH EFFECTS, INGESTION

PRACTICALLY NON-TOXIC. Ingestion of large amounts may cause gastrointestinal disturbances. May cause irritation of the mouth, throat and gastrointestinal tract. Symptoms may include salivation, pain, nausea, vomiting and diarrhea.

Aspiration into lungs may cause chemical pneumonia and lung damage.

Exposure may also cause central nervous system symptoms similar to those listed under "Inhalation" (see Inhalation section).

Overexposure to this material may cause systemic damage including target organ effects listed under "Special Toxic Effects."

Other specific symptoms of exposure are listed under "Special Toxic Effects."

SPECIAL TOXIC EFFECTS

Acute or chronic overexposure to this material or its components may cause systemic toxicity, including adverse effects to the following: liver and kidney.

Exposure to components of this material may cause the following specific symptoms, depending on the concentration and duration of exposure: irritation of the hair follicles and blockage of the sebaceous glands.

This product contains C9 aromatics which may cause adverse reproductive and/or developmental effects.

IARC has determined that there is limited evidence for the carcinogenicity of fuel oil no. 2 in experimental animals and inadequate evidence in humans.

Lifetime exposure to whole diesel exhaust has been shown to cause cancer in laboratory animals. NIOSH recommends that whole diesel exhaust be regarded as a potential occupational carcinogen.

Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage (sometimes referred to as solvent or painter's syndrome). Intentional misuse by deliberately concentrating and inhaling this product may be harmful or fatal.

Pre-existing medical conditions which may be aggravated by exposure include disorders of the skin, eye and respiratory system.

This product has not been tested as a whole for all potential health effects.

WARNING: The use of any hydrocarbon fuel in an area without adequate ventilation may result in hazardous levels of combustion products and inadequate oxygen levels.

4 FIRST AID MEASURES

SKIN

Immediately wash skin with plenty of soap and water while removing contaminated clothing and shoes. GET IMMEDIATE MEDICAL ATTENTION.

Place contaminated clothing in closed container for storage until laundered or discarded. If clothing is to be laundered, inform person performing operation of contaminant's hazardous properties. Discard contaminated leather goods.

EYE

Flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Get medical attention if irritation persists.

INHALATION

Remove to fresh air. If not breathing, institute cardiopulmonary resuscitation (CPR). If breathing is difficult, ensure airway is clear and give oxygen.

Keep affected person warm and at rest. GET IMMEDIATE MEDICAL ATTENTION.

INGESTION
Do not induce vomiting because of danger of aspirating liquid into lungs, causing serious damage and chemical pneumonitis. If spontaneous vomiting occurs keep head below hips to prevent aspiration and monitor for breathing difficulty. Gastric lavage should be performed only by qualified medical personnel.

..eep affected person warm and at rest. GET IMMEDIATE MEDICAL ATTENTION.

NOTES TO PHYSICIAN
Gastric lavage may be indicated if ingested. If spontaneous vomiting has occurred after ingestion, the patient should be monitored for difficult breathing, as adverse effects of aspiration into the lungs may be delayed up to 48 hours.

5 FIRE FIGHTING MEASURES

HAZARDOUS COMBUSTION PRODUCTS
Combustion may produce COx, NOx, SOx, reactive hydrocarbons, irritating vapors and hydrogen sulfide.

EXTINGUISHING MEDIA
Use water spray, dry chemical, alcohol foam, all purpose AFFF or carbon dioxide to extinguish fire.

BASIC FIRE FIGHTING PROCEDURES
Evacuate area and fight fire from a safe distance. If leak or spill has not ignited, ventilate area and use water spray to disperse gas or vapor and to protect personnel attempting to stop a leak.

Use water spray to cool adjacent structures and to protect personnel. Shut off source of flow if possible. Stay away from storage tank ends. Withdraw immediately in case of rising sound from venting safety device or any discoloration of storage tank due to fire.

Firefighters must wear MSHA/NIOSH approved positive pressure breathing apparatus (SCBA) with full face mask and full protective equipment.

UNUSUAL FIRE & EXPLOSION HAZARDS
Vapors may form explosive mixture with air. Vapors can travel to a source of ignition and flash back.

.xplosion hazard if exposed to extreme heat or to physical or thermal shock.

Fires involving this product may release COx, NOx, SOx, reactive hydrocarbons, irritating vapors and hydrogen sulfide.

Flash Point	> 125 F (> 52 C) PENSKY-MARTENS CLOSED CUP
Autoignition Temperature	494 F (257 C)
Flammability Limits in Air, Lower, % by Volume	0.6 %
Flammability Limits in Air, Upper, % by Volume	7.5 %

6 ACCIDENTAL RELEASE MEASURES

EMERGENCY ACTION
Eliminate and/or shut off ignition sources and keep ignition sources out of the area. Keep unnecessary people away; isolate hazard area and deny entry. Stay upwind. Isolate for 1/2 mile in all directions if tank, rail car or tank truck is involved in release. Evacuate area endangered by release as required. (See Personal Protection Information Section.)

ENVIRONMENTAL PRECAUTIONS
Eliminate all sources of ignition. Isolate hazard area and deny entry.

If product is released to the environment, take immediate steps to stop and contain release. Caution should be exercised regarding personnel safety and exposure to the released product. Notify local authorities and the National Response Center, if required.

SPILL OR LEAK PROCEDURE
Keep ignition sources out of area and shut off all ignition sources. Absorb spill with inert material (e. g. dry sand or earth) then place in a chemical waste container. Large Spills: Dike far ahead of liquid spill for later disposal. Stop leak when safe to do so.

See Exposure Controls/Personal Protection (Section 8).

HANDLING & STORAGE

HANDLING

Ground lines and equipment used during transfer to reduce the possibility of static spark-initiated fire or plosion. Use non-sparking tools. Do not cut, grind, drill, weld or reuse containers unless adequate precautions are taken against these hazards.

Do not eat, drink or smoke in areas of use or storage.

STORAGE

Store in tightly closed containers in a cool, dry, isolated, well-ventilated area away from heat, sources of ignition and incompatibles. Avoid contact with strong oxidizers.

Empty containers may contain product residue. Do not reuse without adequate precautions.

Do not eat, drink or smoke in areas of use or storage.

3 EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS

Ventilation and other forms of engineering controls are the preferred means for controlling exposures.

EYE PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

Wear chemical safety goggles and face shield. Have eye washing facilities readily available where eye contact can occur.

SKIN PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

Avoid skin contact with this material. Use appropriate chemical protective gloves when handling.

Use good personal hygiene.

RESPIRATORY PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

A NIOSH/MSHA approved air purifying respirator with an organic vapor cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure nits. Protection provided by air purifying respirators is limited. Use a positive pressure air supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air purifying respirators may not provide adequate protection.

9 PHYSICAL & CHEMICAL PROPERTIES

ODOR AND APPEARANCE

CRYSTAL CLEAR TO PALE YELLOW OR GREEN COLORED LIQUID WITH HYDROCARBON ODOR; FOR TAX EXEMPT PURPOSES, THIS FUEL MAY CONTAIN RED DYE

Boiling Point	325 - 700 F (163-371 C)
Specific Gravity	0.835 - 0.9
Melting Point	-20 F (-29 C)
Percent Volatile	100 %
Vapor Pressure	2.6 mmHg AT 122 F (50 C)
Vapor Density	8
Bulk Density	ND
Solubility in Water	INSOLUBLE
Octanol/Water Partn	ND
Volatile Organic	ND
Pour Point	-20 TO 10 F (-29 TO -12 C) [ARCTIC DIESEL < -50 F (< -45 C)]
pH Value	ND
Freezing Point	ND
Viscosity	32.6 - 40.1 SSU AT 100 F (38 C)
Evaporation Rate	0.01

Molecular Formula	NA
Molecular Weight	ND
Chemical Family	HYDROCARBON MIXTURE
Odor Threshold	ND

10 STABILITY & REACTIVITY

STABILITY/INCOMPATABILITY

Incompatible with oxidizing agents. See precautions under Handling & Storage (Section 7).

HAZARDOUS REACTIONS/DECOMPOSITION PRODUCTS

Combustion may produce COx, NOx, SOx, reactive hydrocarbons, irritating vapors and hydrogen sulfide.

11 TOXICOLOGICAL INFORMATION

TOXICOLOGICAL DATA

See Special Toxic Effects (Section 3).

12 ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

ND

13 DISPOSAL CONSIDERATIONS

WASTE DISPOSAL

This product, as supplied, when discarded or disposed of, is a hazardous waste according to Federal Regulations (40 CFR 261) due to its ignitability. Under the Resource Conservation and Recovery Act (RCRA), it is the responsibility of the user of the product to determine, at the time of disposal, whether the material is a hazardous waste subject to RCRA.

The transportation, storage, treatment and disposal of RCRA waste material must be conducted in compliance with 40 CFR 262, 263, 264, 268 and 270. Disposal can occur only in properly permitted facilities. Check state and local regulations for any additional requirements as these may be more restrictive than federal laws and regulations. Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate or otherwise inappropriate. Disposal of this material must be conducted in compliance with all federal, state and local regulations.

14 TRANSPORT INFORMATION

BILL OF LADING - BULK (U. S. DOT)

Fuel Oil (No. 2), Combustible Liquid, NA1993, PG III

U. S. Department of Transportation (DOT) Requirements

General Transportation Information for Bulk Shipments

Proper Shipping Name	Fuel Oil (No. 2)		
Hazard Class	Combustible Liquid	UN/NA Code	NA1993
Packaging Group	PG III		
Labels Required	None		
Placards Required	Combustible Liquid, NA1993		
Reportable Quantity	See Regulatory Information (Section 15)		

General Transportation Information for Non-Bulk Shipments

Proper Shipping Name	Non-Regulated		
Hazard Class	NA	UN/NA Code	NA
Packaging Group	NA		
Labels Required	NA		
Placards Required	NA		
Reportable Quantity	NA		

Non-bulk shipments of this product are non-regulated for domestic ground transportation when they meet the requirements of 49 CFR 173.150(f).

15 REGULATORY INFORMATION

FEDERAL REGULATIONS

All known major components of this product are listed on the TSCA Inventory and/or are otherwise in compliance with TSCA.

A release of this product, as supplied, is exempt from reporting under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) by the petroleum exclusion. Releases may be reportable to the National Response Center (800-424-8802) under the Clean Water Act, 33 U.S.C. 1321(b)(3) and (5). Check state and local regulations for any additional requirements as these may be more restrictive than federal laws and regulations. Failure to report may result in substantial civil and criminal penalties.

This product does not contain toxic chemicals (in excess of the applicable de minimis concentration) that are subject to the annual toxic chemical release reporting requirements of the Superfund Amendments and Reauthorization Act (SARA) Section 313 (40 CFR 372).

This product contains one or more components designated as hazardous substances or toxic pollutants pursuant to the Federal Clean Water Act (40 CFR 116.4 Table A; 40 CFR 401.15). Any unpermitted introduction of this product into a facility stormwater or wastewater discharge may constitute a violation of the Clean Water Act. Facilities must notify the appropriate permitting agency prior to introducing this product into the aforementioned discharges.

This product contains one or more substances listed as hazardous, toxic or flammable air pollutants under Section 112 of the Clean Air Act.

There may be specific regulations at the local, regional or state/provincial level that pertain to this product.

STATE REGULATIONS

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

SARA TITLE III RATINGS

Immediate Hazard	X	Delayed Hazard	X	Fire Hazard	X	Pressure Hazard	-
Reactivity Hazard	-						

NFPA RATINGS

Health	1	Flammability	2	Reactivity	0	Special Hazards	-

HMIS RATINGS

Health	2*	Flammability	2	Reactivity	0

Following ingredients of this product are listed in SARA313

SARA Listed Ingredient Name	CAS Number	Maximum %
XYLENES	1330-20-7	0.2

16 OTHER INFORMATION

DISCLAIMER

NOTICE: The information presented herein is based on data considered to be accurate as of the date of preparation of this Material Safety Data Sheet. However, MSDS may not be used as a commercial specification sheet of manufacturer or seller, and no warranty or representation, expressed or implied, is made as to the accuracy or comprehensiveness of the foregoing data and safety information, nor is any authorization given or implied to practice any patented invention without a license. In addition, no responsibility can be assumed by vendor for any damage or injury resulting from abnormal use, from any failure to adhere to recommended practices, or from any hazards inherent in the nature of the product

Completed On	12/23/98	Replaces Sheet Dated	6/15/98
Completed By	Safety & Emergency Response, Koch Industries, Inc.		

KOCH

MATERIAL SAFETY DATA SHEET

1 CHEMICAL PRODUCT & COMPANY IDENTIFICATION

TRADE NAME	FUEL OIL NO. 2 (HIGH SULFUR)
CAS NUMBER	68476-30-2
MSDS NUMBER	5433
PRODUCT CODE	ND
SYNONYM(S)	HOME HEATING OIL, NO. 2 DIESEL (HIGH SULFUR), 2 OIL, PREMIUM DIESEL (HIGH SULFUR), NO. 2 FUEL OIL (HIGH SULFUR), VIRGIN DIESEL
MANUFACTURER / SUPPLIER	Koch Petroleum Group, LP. PO Box 2256 Wichita, KS 67201

TELEPHONE NUMBERS - 24 HOUR EMERGENCY ASSISTANCE

Chemtrec:	800-424-9300
Koch Security:	316-828-6777

TELEPHONE NUMBERS - GENERAL ASSISTANCE

8-5 (M-F)	316-828-6777
8-5 (M-F, CST) MSDS Assistance	316-828-8468

COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient Name	CAS Number	Concentration*	Exposure Limits / Health Hazards
C9-C16 HYDROCARBONS PRODUCED BY THE DISTILLATION OF CRUDE OIL	68476-30-2	99 - 100 %	ND
1,2,4-TRIMETHYLBENZENE	95-63-6	0.3 - 0.6 %	25 ppm 8-Hour TWA (ACGIH)
BIPHENYL	92-52-4	0 - 0.3 %	0.2 ppm 8-Hour TWA (OSHA) 0.2 ppm 8-Hour TWA (ACGIH)
NAPHTHALENE	91-20-3	0 - 0.2 %	10 ppm 8-Hour TWA (OSHA) 10 ppm 8-Hour TWA (ACGIH) 15 ppm 15-Min STEL (ACGIH)
XYLENES	1330-20-7	0 - 0.2 %	100 ppm 8-Hour TWA (OSHA) 100 ppm 8-Hour TWA (ACGIH) 150 ppm 15-Min STEL (ACGIH)
CUMENE	98-82-8	Trace	50 ppm 8-Hour TWA (OSHA) 50 ppm 8-Hour TWA (ACGIH)
TOLUENE	108-88-3	Trace	200 ppm 8-Hour TWA (OSHA) 50 ppm 8-Hour TWA (ACGIH)

*Values do not reflect absolute minimums and maximums; these values are typical which may vary from time to time.

This Material Safety Data Sheet is intended to communicate potential health hazards and potential physical hazards associated with the product(s) covered by this sheet, and is not intended to communicate product specification information. For product specification information, contact your Koch Refining Company epresentative.

3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

HEALTH HAZARDS
WARNING!
MAY BE IRRITATING TO THE SKIN, EYES AND RESPIRATORY TRACT
OVEREXPOSURE MAY CAUSE CNS DEPRESSION
ASPIRATION HAZARD IF SWALLOWED-CAN ENTER LUNGS AND CAUSE DAMAGE
POTENTIAL REPRODUCTIVE HAZARD
SKIN CANCER HAZARD BASED ON TESTS WITH LABORATORY ANIMALS

FLAMMABILITY HAZARDS
COMBUSTIBLE
PER OSHA GUIDELINES, 29 CFR 1910.1200(c)

REACTIVITY HAZARDS
STABLE

POTENTIAL HEALTH EFFECTS, SKIN

MODERATELY IRRITATING. Repeated or prolonged skin contact may cause drying, reddening, itching and cracking.

No significant effects are expected to occur following short term exposure. Repeated or prolonged contact with large amounts of this material may result in absorption through the skin to produce toxic effects.

Contact with heated material may cause thermal burns.

POTENTIAL HEALTH EFFECTS, EYE

SLIGHTLY IRRITATING. Exposure to vapors, fumes or mists may cause irritation. May cause slight transient irritation, lacrimation (tears) and a burning sensation in the eyes. Prolonged or repeated exposure may cause irritation and conjunctivitis.

Contact with heated material may cause thermal burns.

POTENTIAL HEALTH EFFECTS, INHALATION

Petroleum mists at high exposure levels may be irritating to the nose, throat and lungs.

May cause central nervous system depression or effects. Symptoms may include headache, excitation, euphoria, dizziness, incoordination, drowsiness, light-headedness, blurred vision, fatigue, tremors, convulsions, loss of consciousness, coma, respiratory arrest and death, depending on the concentration and duration of exposure.

Overexposure to this material may cause systemic damage including target organ effects listed under "Special Toxic Effects."

Other specific symptoms of exposure are listed under "Special Toxic Effects."

POTENTIAL HEALTH EFFECTS, INGESTION
PRACTICALLY NON-TOXIC. Ingestion of large amounts may cause gastrointestinal disturbances. May cause irritation of the mouth, throat and gastrointestinal tract. Symptoms may include salivation, pain, nausea, vomiting and diarrhea.

Aspiration into lungs may cause chemical pneumonia and lung damage.

Exposure may also cause central nervous system symptoms similar to those listed under "Inhalation" (see Inhalation section).

Overexposure to this material may cause systemic damage including target organ effects listed under "Special Toxic Effects."

Other specific symptoms of exposure are listed under "Special Toxic Effects."

SPECIAL TOXIC EFFECTS
Acute or chronic overexposure to this material or its components may cause systemic toxicity, including adverse effects to the following: liver and kidney.

Exposure to components of this material may cause the following specific symptoms, depending on the concentration and duration of exposure: Irritation of the hair follicles and blockage of the sebaceous glands.

This product contains C9 aromatics which may cause adverse reproductive and/or developmental effects.

IARC has determined that there is limited evidence for the carcinogenicity of fuel oil no. 2 in experimental animals and inadequate evidence in humans.

Lifetime exposure to whole diesel exhaust has been shown to cause cancer in laboratory animals. NIOSH recommends that whole diesel exhaust be regarded as a potential occupational carcinogen.

Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage (sometimes referred to as solvent or painter's syndrome). Intentional misuse by deliberately concentrating and inhaling this product may be harmful or fatal.

Pre-existing medical conditions which may be aggravated by exposure include disorders of the skin, eye and respiratory system.

This product has not been tested as a whole for all potential health effects.

WARNING: The use of any hydrocarbon fuel in an area without adequate ventilation may result in hazardous levels of combustion products and inadequate oxygen levels.

4 FIRST AID MEASURES

SKIN
Immediately wash skin with plenty of soap and water while removing contaminated clothing and shoes. GET IMMEDIATE MEDICAL ATTENTION.

Place contaminated clothing in closed container for storage until laundered or discarded. If clothing is to be laundered, inform person performing operation of contaminant's hazardous properties. Discard contaminated leather goods.

EYE
Flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Get medical attention if irritation persists.

INHALATION
Remove to fresh air. If not breathing, institute cardiopulmonary resuscitation (CPR). If breathing is difficult, ensure airway is clear and give oxygen.

Keep affected person warm and at rest. GET IMMEDIATE MEDICAL ATTENTION.

INGESTION
Do not induce vomiting because of danger of aspirating liquid into lungs, causing serious damage and chemical pneumonitis. If spontaneous vomiting occurs keep head below hips to prevent aspiration and monitor for breathing difficulty. Gastric lavage should be performed only by qualified medical personnel.

Keep affected person warm and at rest. GET IMMEDIATE MEDICAL ATTENTION.

NOTES TO PHYSICIAN
Gastric lavage may be indicated if ingested. If spontaneous vomiting has occurred after ingestion, the patient should be monitored for difficult breathing, as adverse effects of aspiration into the lungs may be delayed up to 48 hours.

5 FIRE FIGHTING MEASURES

HAZARDOUS COMBUSTION PRODUCTS
Combustion may produce COx, NOx, SOx, reactive hydrocarbons, irritating vapors and hydrogen sulfide.
EXTINGUISHING MEDIA
Use water spray, dry chemical, alcohol foam, all purpose AFFF or carbon dioxide to extinguish fire.
BASIC FIRE FIGHTING PROCEDURES
Evacuate area and fight fire from a safe distance.

If leak or spill has not ignited, ventilate area and use water spray to disperse gas or vapor and to protect personnel attempting to stop a leak.

Use water spray to cool adjacent structures and to protect personnel. Shut off source of flow if possible. Stay away from storage tank ends. Withdraw immediately in case of rising sound from venting safety device or any discoloration of storage tank due to fire.

Firefighters must wear MSHA/NIOSH approved positive pressure breathing apparatus (SCBA) with full face mask and full protective equipment.
UNUSUAL FIRE & EXPLOSION HAZARDS
Vapors may form explosive mixture with air. Vapors can travel to a source of ignition and flash back.

Explosion hazard if exposed to extreme heat or to physical or thermal shock.

Fires involving this product may release COx, NOx, SOx, reactive hydrocarbons, irritating vapors and hydrogen sulfide.

Flash Point	> 125 F (> 52 C) PENSKY-MARTENS CLOSED CUP
Autoignition Temperature	494 F (257 C)
Flammability Limits in Air, Lower, % by Volume	0.6 %
Flammability Limits in Air, Upper, % by Volume	7.5 %

6 ACCIDENTAL RELEASE MEASURES

EMERGENCY ACTION
Eliminate and/or shut off ignition sources and keep ignition sources out of the area. Keep unnecessary people away; isolate hazard area and deny entry. Stay upwind. Isolate for 1/2 mile in all directions if tank, rail car or tank truck is involved in release. Evacuate area endangered by release as required. (See Personal Protection Information Section.)
ENVIRONMENTAL PRECAUTIONS
Eliminate all sources of ignition. Isolate hazard area and deny entry.

If product is released to the environment, take immediate steps to stop and contain release. Caution should be exercised regarding personnel safety and exposure to the released product. Notify local authorities and the National Response Center, if required.

SPILL OR LEAK PROCEDURE

Keep ignition sources out of area and shut off all ignition sources. Absorb spill with inert material (e. g. dry sand or earth) then place in a chemical waste container. Large Spills: Dike far ahead of liquid spill for later disposal. Stop leak when safe to do so.

See Exposure Controls/Personal Protection (Section 8).

7 HANDLING & STORAGE

HANDLING

Ground lines and equipment used during transfer to reduce the possibility of static spark-initiated fire or explosion. Use non-sparking tools. Do not cut, grind, drill, weld or reuse containers unless adequate precautions are taken against these hazards.

Do not eat, drink or smoke in areas of use or storage.

STORAGE

Store in tightly closed containers in a cool, dry, isolated, well-ventilated area away from heat, sources of ignition and incompatibles. Avoid contact with strong oxidizers.

Empty containers may contain product residue. Do not reuse without adequate precautions.

Do not eat, drink or smoke in areas of use or storage.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS

Ventilation and other forms of engineering controls are the preferred means for controlling exposures.

EYE PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

Wear chemical safety goggles and face shield. Have eye washing facilities readily available where eye contact can occur.

SKIN PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

Avoid skin contact with this material. Use appropriate chemical protective gloves when handling.

Use good personal hygiene.

RESPIRATORY PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

A NIOSH/MSHA approved air purifying respirator with an organic vapor cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air purifying respirators is limited. Use a positive pressure air supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air purifying respirators may not provide adequate protection.

9 PHYSICAL & CHEMICAL PROPERTIES

ODOR AND APPEARANCE

CRYSTAL CLEAR TO PALE YELLOW OR GREEN COLORED LIQUID WITH HYDROCARBON ODOR; FOR TAX EXEMPT PURPOSES, THIS FUEL MAY CONTAIN RED DYE

Boiling Point	325 - 700 F (163-371 C)
Specific Gravity	0.835 - 0.9
Melting Point	-20 F (-29 C)
Percent Volatile	100 %
Vapor Pressure	2.6 mmHg AT 122 F (50 C)
Vapor Density	8
Bulk Density	ND
Solubility in Water	INSOLUBLE
Octanol/Water Partn	ND
Volatile Organic	ND
Pour Point	-20 TO 10 F (-29 TO -12 C) [ARCTIC DIESEL < -50 F (< -45 C)]
pH Value	ND
Freezing Point	ND
Viscosity	32.6 - 40.1 SSU AT 100 F (38 C)
Evaporation Rate	0.01
Molecular Formula	NA
Molecular Weight	ND
Chemical Family	HYDROCARBON MIXTURE
Odor Threshold	ND

10 STABILITY & REACTIVITY

STABILITY/INCOMPATABILITY

Incompatible with oxidizing agents. See precautions under Handling & Storage (Section 7).

HAZARDOUS REACTIONS/DECOMPOSITION PRODUCTS

Combustion may produce COx, NOx, SOx, reactive hydrocarbons, irritating vapors and hydrogen sulfide.

11 TOXICOLOGICAL INFORMATION

TOXICOLOGICAL DATA

See Special Toxic Effects (Section 3).

12 ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

ND

13 DISPOSAL CONSIDERATIONS

WASTE DISPOSAL

This product, as supplied, when discarded or disposed of, is a hazardous waste according to Federal Regulations (40 CFR 261) due to its ignitability. Under the Resource Conservation and Recovery Act (RCRA), it is the responsibility of the user of the product to determine, at the time of disposal, whether the material is a hazardous waste subject to RCRA.

The transportation, storage, treatment and disposal of RCRA waste material must be conducted in compliance with 40 CFR 262, 263, 264, 268 and 270. Disposal can occur only in properly permitted facilities. Check state and local regulations for any additional requirements as these may be more restrictive than federal laws and regulations. Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate or otherwise inappropriate. Disposal of this material must be conducted in compliance with all federal, state and local regulations.

14 TRANSPORT INFORMATION

BILL OF LADING - BULK (U. S. DOT)
Fuel Oil (No. 2), Combustible Liquid, NA1993, PG III
U. S. Department of Transportation (DOT) Requirements

General Transportation Information for Bulk Shipments

Proper Shipping Name	Fuel Oil (No. 2)		
Hazard Class	Combustible Liquid	UN/NA Code	NA1993
Packaging Group	PG III		
Labels Required	None		
Placards Required	Combustible Liquid, NA1993		
Reportable Quantity	See Regulatory Information (Section 15)		

General Transportation Information for Non-Bulk Shipments

Proper Shipping Name	Non-Regulated		
Hazard Class	NA	UN/NA Code	NA
Packaging Group	NA		
Labels Required	NA		
Placards Required	NA		
Reportable Quantity	NA		

Non-bulk shipments of this product are non-regulated for domestic ground transportation when they meet the requirements of 49 CFR 173.150(f).

15 REGULATORY INFORMATION

FEDERAL REGULATIONS

All known major components of this product are listed on the TSCA Inventory and/or are otherwise in compliance with TSCA.

A release of this product, as supplied, is exempt from reporting under the Comprehensive Environmental esponse Compensation and Liability Act (CERCLA) by the petroleum exclusion. Releases may be reportable .o the National Response Center (800-424-8802) under the Clean Water Act, 33 U.S.C. 1321(b)(3) and (5). Check state and local regulations for any additional requirements as these may be more restrictive than federal laws and regulations. Failure to report may result in substantial civil and criminal penalties.

This product does not contain toxic chemicals (in excess of the applicable de minimis concentration) that are subject to the annual toxic chemical release reporting requirements of the Superfund Amendments and Reauthorization Act (SARA) Section 313 (40 CFR 372).

This product contains one or more components designated as hazardous substances or toxic pollutants pursuant to the Federal Clean Water Act (40 CFR 116.4 Table A; 40 CFR 401.15). Any unpermitted introduction of this product into a facility stormwater or wastewater discharge may constitute a violation of the Clean Water Act. Facilities must notify the appropriate permitting agency prior to introducing this product into the aforementioned discharges.

This product contains one or more substances listed as hazardous, toxic or flammable air pollutants under Section 112 of the Clean Air Act.

There may be specific regulations at the local, regional or state/provincial level that pertain to this product.

STATE REGULATIONS

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

SARA TITLE III RATINGS

Immediate Hazard	X	Delayed Hazard	X	Fire Hazard	X	Pressure Hazard	-
Reactivity Hazard	-						

NFPA RATINGS

Health	1	Flammability	2	Reactivity	0	Special Hazards	-

HMIS RATINGS

Health	2*	Flammability	2	Reactivity	0

16 OTHER INFORMATION

DISCLAIMER

NOTICE: The information presented herein is based on data considered to be accurate as of the date of preparation of this Material Safety Data Sheet. However, MSDS may not be used as a commercial specification sheet of manufacturer or seller, and no warranty or representation, expressed or implied, is made as to the accuracy or comprehensiveness of the foregoing data and safety information, nor is any authorization given or implied to practice any patented invention without a license. In addition, no responsibility can be assumed by vendor for any damage or injury resulting from abnormal use, from any failure to adhere to recommended practices, or from any hazards inherent in the nature of the product

Completed On	12/23/98	Replaces Sheet Dated	3/26/98
Completed By	Safety & Emergency Response, Koch Industries, Inc.		

MATERIAL SAFETY DATA SHEET

1 CHEMICAL PRODUCT & COMPANY IDENTIFICATION

TRADE NAME	**UNLEADED GASOLINE**
CAS NUMBER	MIXTURE
MSDS NUMBER	5466
PRODUCT CODE	ND
SYNONYM(S)	UNLEADED GASOLINE NO LEAD GASOLINE MOTOR FUEL APPLICABLE TO ALL GRADES
MANUFACTURER	Koch Refining Company, L. P. PO Box 2256 Wichita, KS 67201

TELEPHONE NUMBERS - 24 HOUR EMERGENCY ASSISTANCE

Chemtrec:	800-424-9300
Koch Security:	316-828-6777

TELEPHONE NUMBERS - GENERAL ASSISTANCE

8-5 (M-F)	316-828-6777
8-5 (M-F, CST) MSDS Assistance	316-828-8488

2 COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient Name	CAS Number	Concentration*	Exposure Limits / Health Hazards
GASOLINE, UNLEADED	MIXTURE	100 %	300 ppm 8-Hour TWA (OSHA) 500 ppm 15-Min STEL (OSHA) 300 ppm 8-Hour TWA (ACGIH) 500 ppm 15-Min STEL (ACGIH)
XYLENES	1330-20-7	0 - 25 %	100 ppm 8-Hour TWA (OSHA) 100 ppm 8-Hour TWA (ACGIH) 150 ppm 15-Min STEL (ACGIH)
TOLUENE	108-88-3	0 - 20 %	200 ppm 8-Hour TWA (OSHA) 50 ppm 8-Hour TWA (ACGIH)
N-HEXANE	110-54-3	0 - 7 %	500 ppm 8-Hour TWA (OSHA) 50 ppm 8-Hour TWA (ACGIH)
BENZENE	71-43-2	0 - 5 %	1 ppm 8-Hour TWA (OSHA) 5 ppm 15-Min STEL (OSHA) 0.5 ppm 8-Hour TWA (ACGIH) 2.5 ppm 15-Min STEL (ACGIH)
1,2,4-TRIMETHYLBENZENE	95-63-6	0 - 3 %	25 ppm 8-Hour TWA (ACGIH)
ETHYLBENZENE	100-41-4	0 - 2 %	100 ppm 8-Hour TWA (OSHA) 100 ppm 8-Hour TWA (ACGIH) 125 ppm 15-Min STEL (ACGIH)
CYCLOHEXANE	110-82-7	0 - 1 %	300 ppm 8-Hour TWA (OSHA) 300 ppm 8-Hour TWA (ACGIH)

CUMENE	98-82-8	0 - 1 %	50 ppm 8-Hour TWA (OSHA) 50 ppm 8-Hour TWA (ACGIH)
NAPHTHALENE	91-20-3	0 - 1 %	10 ppm 8-Hour TWA (OSHA) 10 ppm 8-Hour TWA (ACGIH) 15 ppm 15-Min STEL (ACGIH)

*Values do not reflect absolute minimums and maximums; these values are typical which may vary from time to time.

This Material Safety Data Sheet is intended to communicate potential health hazards and potential physical hazards associated with the product(s) covered by this sheet, and is not intended to communicate product specification information. For product specification information, contact your Koch Refining Company representative.

3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

HEALTH HAZARDS
WARNING!
MAY BE IRRITATING TO THE SKIN, EYES AND RESPIRATORY TRACT
MAY BE HARMFUL OR FATAL IF SWALLOWED OR INHALED
OVEREXPOSURE MAY CAUSE CNS DEPRESSION
ASPIRATION HAZARD IF SWALLOWED-CAN ENTER LUNGS AND CAUSE DAMAGE
MAY CAUSE CARDIAC SENSITIZATION
POTENTIAL REPRODUCTIVE HAZARD
POTENTIAL CANCER HAZARD
CONTAINS BENZENE WHICH IS A KNOWN HUMAN CARCINOGEN

FLAMMABILITY HAZARDS
DANGER!
EXTREMELY FLAMMABLE
FORMS EXPLOSIVE MIXTURES WITH AIR

REACTIVITY HAZARDS
STABLE

POTENTIAL HEALTH EFFECTS, SKIN

SLIGHTLY TO MODERATELY IRRITATING. Contact may cause reddening, itching and inflammation. Repeated or prolonged contact may result in drying, reddening, itching, pain, inflammation, cracking and possible secondary infection with tissue damage. Defatting agent.

Absorption from prolonged or repeated skin contact may cause systemic toxicity.

POTENTIAL HEALTH EFFECTS, EYE

Direct contact may cause irritation, redness, tearing and blurred vision.

SLIGHTLY TOXIC. Breathing of the mists, vapors or fumes may irritate the nose, throat and lungs. Symptoms may include sore throat, coughing, labored breathing, sneezing and burning sensation, depending on the concentration and duration of exposure.

Exposure to high concentrations of mists may lead to oil chemical pneumonia.

May cause central nervous system depression or effects. Symptoms may include headache, excitation, euphoria, dizziness, incoordination, drowsiness, light-headedness, blurred vision, fatigue, tremors, convulsions, loss of consciousness, coma, respiratory arrest and death, depending on the concentration and duration of exposure. Repeated or prolonged exposures may cause behavioral changes.

May cause cardiac sensitization, including arrhythmias (irregular heart beats) and death due to cardiac arrest.

Overexposure to this material may cause systemic damage including target organ effects listed under "Special Toxic Effects."

Other specific symptoms of exposure are listed under "Special Toxic Effects."

POTENTIAL HEALTH EFFECTS, INGESTION

SLIGHTLY TOXIC. May cause irritation of the mouth, throat and gastrointestinal tract. Symptoms may include salivation, pain, nausea, vomiting and diarrhea.

Aspiration into lungs may cause chemical pneumonia and lung damage.

Exposure may also cause central nervous system symptoms similar to those listed under "Inhalation" (see Inhalation section).

Overexposure to this material may cause systemic damage including target organ effects listed under "Special Toxic Effects."

Other specific symptoms of exposure are listed under "Special Toxic Effects."

Acute or chronic overexposure to this material or its components may cause systemic toxicity, including adverse effects to the following: kidney, liver, spleen, pancreas, pituitary, thyroid, adrenals, thymus, respiratory and central nervous systems. .

Exposure may cause the following specific symptoms, depending on the concentration and duration of exposure: anemia, pallor, nervousness, loss of appetite and anxiety.

Wholly vaporized unleaded gasoline produced an increased incidence of liver cancers in female mice and kidney cancers in male rats following a two-year inhalation period. Subsequent investigations indicate that kidney damage, linked to kidney cancer, may be specific to the male rat. IARC has determined that there is limited evidence for the carcinogenicity of unleaded gasoline in experimental animals and inadequate evidence in humans. (IARC Class-2B) Solvent extracts of gasoline exhaust particles produced skin cancer in laboratory animals, leading IARC to categorize gasoline engine exhaust as a possible human cancer hazard. Has been shown to be positive in mutagenicity assays.

This material contains benzene. Benzene is carcinogenic to laboratory animals when given by intubation or by inhalation. There is an association between occupational exposure to benzene and human leukemia. Carcinogenic determinations: IARC Human positive and Animal suspected carcinogen; NTP Known carcinogen; ACGIH Suspected carcinogen; OSHA carcinogen. Acute benzene poisoning causes central nervous system depression. Chronic exposure affects the hematopoietic system causing blood disorders including anemia and pancytopenia. Mutagenic and clastogenic in mammalian and non-mammalian test systems. Reproductive or developmental toxicant only at doses that are maternally toxic, based on tests with animals.

This material contains n-hexane. n-Hexane is a skin, eye and respiratory tract irritant. It is a cardiac sensitizer, central nervous system depressant and a neurotoxin. Acute exposure may result in dizziness, asphyxia, anesthesia, brain damage and cardiac arrest at high concentrations. Repeated or prolonged exposure may result in peripheral neuropathy, characterized by progressive weakness, facial and limb numbness, color vision abnormalities and paralysis of the limbs. It has been observed to cause damage to the testes and fetal effects in a two generation animal study. NTP has reported it to cause liver tumors in female mice. Persons with skin, lung, liver or kidney disorders may be at increased risk.

This material may contain ethylbenzene. Ethylbenzene has shown clear evidence of carcinogenicity in male rats and some evidence of carcinogenicity in female rats and male and female mice.

Has been shown to be positive in mutagenicity assays.

This product contains toluene, xylene and C9 aromatics which may cause adverse reproductive and/or developmental effects. Pregnant women may be at an increased risk from exposure. Consumption of alcoholic beverages may enhance toxic effects.

Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage (sometimes referred to as solvent or painter's syndrome). Intentional misuse by deliberately concentrating and inhaling this product may be harmful or fatal.

Pre-existing medical conditions which may be aggravated by exposure include disorders of the skin, kidney, liver, cardiovascular and respiratory systems.

WARNING: The use of any hydrocarbon fuel in an area without adequate ventilation may result in hazardous levels of combustion products and inadequate oxygen levels.

FIRST AID MEASURES

SKIN

Immediately wash skin with plenty of soap and water while removing contaminated clothing and shoes. Get medical attention if irritation develops or persists.

Place contaminated clothing in closed container for storage until laundered or discarded. If clothing is to be laundered, inform person performing operation of contaminant's hazardous properties. Discard contaminated leather goods.

Flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Get medical attention if irritation persists.

INHALATION

Remove to fresh air. If not breathing, institute cardiopulmonary resuscitation (CPR). If breathing is difficult, ensure airway is clear and give oxygen. Keep affected person warm and at rest. GET IMMEDIATE MEDICAL ATTENTION.

INGESTION

Do not induce vomiting because of danger of aspirating liquid into lungs, causing serious damage and chemical pneumonitis. If spontaneous vomiting occurs keep head below hips to prevent aspiration and monitor for breathing difficulty. Gastric lavage should be performed only by qualified medical personnel. GET IMMEDIATE MEDICAL ATTENTION.

Keep affected person warm and at rest.

NOTES TO PHYSICIAN

Aspiration of low viscosity petroleum hydrocarbons may cause severe pneumonitis (oil pneumonia). Vomiting should not be induced. In unconscious victims, use of an endotracheal tube should be considered, if gastric lavage is undertaken. If spontaneous vomiting has occurred, the patient should be monitored for symptoms of pneumonitis, as this effect may be delayed up to 48 hours.

In cases of acute poisoning, artificial respiration with administration of oxygen is useful for support. DO NOT GIVE EPINEPHRINE, EPHEDRINE, OR SIMILAR ADRENERGIC DRUGS. THEY MAY INDUCE FATAL VENTRICULAR FIBRILLATION. Electrocardiographic monitoring should be carried out with severely ill patients to anticipate possible cardiac arrest.

Anemia may require the usual supportive measures. Medical evaluation of acute overexposure should include hematological determinations until stable. In severe acute and chronic poisoning, both renal and hepatic damage may occur and should be anticipated in such cases. Respiratory and pulmonary problems may require special attention. After severe acute symptoms have been alleviated, it may be advisable to consider periodic monitoring of the patient until such time as the likelihood of other adverse effects can be discounted.

INHALATION ABUSE: Gasoline is one of the solvents used by chemical substance abusers. These patients may present acute or chronic CNS signs or symptoms as well as arrhythmias.

FIRE FIGHTING MEASURES

HAZARDOUS COMBUSTION PRODUCTS

Combustion may produce CO, NOx, SOx and reactive hydrocarbons.

BASIC FIRE FIGHTING PROCEDURES

Use water spray, dry chemical, alcohol foam, all purpose AFFF or carbon dioxide to extinguish fire. Evacuate area and fight fire from a safe distance.

If leak or spill has not ignited, ventilate area and use water spray to disperse gas or vapor and to protect personnel attempting to stop a leak.

Use water spray to cool adjacent structures and to protect personnel. Shut off source of flow if possible. Stay away from storage tank ends. Withdraw immediately in case of rising sound from venting safety device or any discoloration of storage tank due to fire.

Firefighters must wear MSHA/NIOSH approved positive pressure breathing apparatus (SCBA) with full face mask and full protective equipment.

UNUSUAL FIRE & EXPLOSION HAZARDS

Extremely flammable. Vapors form flammable or explosive mixtures with air at room temperature. Vapor or gas may spread to distant ignition sources and flash back.

Explosion hazard if exposed to extreme heat or to physical or thermal shock.

Fires involving this product may release carbon monoxide, carbon dioxide, reactive hydrocarbons and irritating vapors.

Autoignition Temperature	536 - 853 F (280-456 C)
Flammability Limits in Air, Lower, % by Volume	1.2 %
Flammability Limits in Air, Upper, % by Volume	7.6 %

6 ACCIDENTAL RELEASE MEASURES

EMERGENCY ACTION

Eliminate and/or shut off ignition sources and keep ignition sources out of the area. Keep unnecessary people away; isolate hazard area and deny entry. Stay upwind. Isolate for 1/2 mile in all directions if tank, rail car or tank truck is involved in release. Evacuate area endangered by release as required. (See Personal Protection Information Section.)

ENVIRONMENTAL PRECAUTIONS

Eliminate all sources of ignition. Isolate hazard area and deny entry.

If product is released to the environment, take immediate steps to stop and contain release. Caution should be exercised regarding personnel safety and exposure to the released product. Notify local authorities and the National Response Center, if required.

SPILL OR LEAK PROCEDURE

Keep ignition sources out of area and shut off all ignition sources. Absorb spill with inert material (e. g. dry sand or earth) then place in a chemical waste container. Large Spills: Dike far ahead of liquid spill for later disposal. Stop leak when safe to do so.

See Exposure Controls/Personal Protection (Section 8).

7 HANDLING & STORAGE

HANDLING

Ground lines and equipment used during transfer to reduce the possibility of static spark-initiated fire or explosion. Use non-sparking tools. Do not cut, grind, drill, weld or reuse containers unless adequate precautions are taken against these hazards.

Do not eat, drink or smoke in areas of use or storage.

STORAGE

Store in tightly closed containers in a cool, dry, isolated, well-ventilated area away from heat, sources of ignition and incompatibles. Avoid contact with strong oxidizers.

Empty containers may contain product residue. Do not reuse without adequate precautions.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS

Ventilation and other forms of engineering controls are the preferred means for controlling exposures.

EYE PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

Wear chemical safety goggles and face shield. Have eye washing facilities readily available where eye contact can occur.

SKIN PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

Avoid skin contact with this material. Use appropriate chemical protective gloves when handling.

Use good personal hygiene.

RESPIRATORY PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

A NIOSH/MSHA approved air purifying respirator with an organic vapor cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air purifying respirators is limited. Use a positive pressure air supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air purifying respirators may not provide adequate protection.

PHYSICAL & CHEMICAL PROPERTIES

ODOR AND APPEARANCE

CLEAR, COLORLESS TO LIGHT COLORED LIQUID WITH AN AROMATIC ODOR

Boiling Point	80 F (27 C)
Specific Gravity	0.7 - 0.75
Melting Point	-130 F (-90 C)
Percent Volatile	100 %
Vapor Pressure	348 - 750 mmHg
Vapor Density	3 - 4
Bulk Density	ND
Solubility in Water	NEGLIGIBLE
Octanol/Water Partn	ND
Volatile Organic	ND
Pour Point	ND
pH Value	ESSENTIALLY NEUTRAL
Freezing Point	ND
Viscosity	ND
Evaporation Rate	MODERATELY FAST
Molecular Formula	MIXTURE
Molecular Weight	NA
Chemical Family	HYDROCARBON MIXTURE
Odor Threshold	ND

10 STABILITY & REACTIVITY

STABILITY/INCOMPATABILITY

Incompatible with oxidizing agents. See precautions under Handling & Storage (Section 7).

HAZARDOUS REACTIONS/DECOMPOSITION PRODUCTS

Combustion may produce CO, NOx, SOx and reactive hydrocarbons.

11 TOXICOLOGICAL INFORMATION

TOXICOLOGICAL DATA

See Special Toxic Effects (Section 3).

12 ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

ND

WASTE DISPOSAL

This product, as supplied, when discarded or disposed of, is a hazardous waste according to Federal Regulations (40 CFR 261) due to its ignitability and benzene content. Under the Resource Conservation and Recovery Act (RCRA), it is the responsibility of the user of the product to determine, at the time of disposal, whether the material is a hazardous waste subject to RCRA.

The transportation, storage, treatment and disposal of RCRA waste material must be conducted in compliance with 40 CFR 262, 263, 264, 268 and 270. Disposal can occur only in properly permitted facilities. Check state and local regulations for any additional requirements as these may be more restrictive than federal laws and regulations. Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate or otherwise inappropriate. Disposal of this material must be conducted in compliance with all federal, state and local regulations.

14 TRANSPORT INFORMATION

BILL OF LADING - BULK (U. S. DOT)
Gasoline, 3, UN1203, PG II

U. S. Department of Transportation (DOT) Requirements

General Transportation Information for Bulk Shipments

Proper Shipping Name	Gasoline		
Hazard Class	3	UN/NA Code	UN1203
Packaging Group	PG II		
Labels Required	Flammable Liquid		
Placards Required	Flammable Liquid, UN1203		
Reportable Quantity	See Regulatory Information (Section 15)		

General Transportation Information for Non-Bulk Shipments

Proper Shipping Name	Gasoline		
Hazard Class	3	UN/NA Code	UN1203
Packaging Group	PG II		
Labels Required	Flammable Liquid		
Placards Required	Flammable Liquid, UN1203		
Reportable Quantity	See Regulatory Information (Section 15)		

15 REGULATORY INFORMATION

FEDERAL REGULATIONS

All known major components of this product are listed on the TSCA Inventory and/or are otherwise in compliance with TSCA.

Consult OSHA's Benzene standard 29 CFR 1910.1028 for provisions on air monitoring, employee training, medical monitoring, etc.

A release of this product, as supplied, is exempt from reporting under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) by the petroleum exclusion. Releases may be reportable to the National Response Center (800-424-8802) under the Clean Water Act, 33 U.S.C. 1321(b)(3) and (5). Check state and local regulations for any additional requirements as these may be more restrictive than federal laws and regulations. Failure to report may result in substantial civil and criminal penalties.

This product contains one or more components designated as hazardous substances or toxic pollutants pursuant to the Federal Clean Water Act (40 CFR 116.4 Table A; 40 CFR 401.15). Any unpermitted introduction of this product into a facility stormwater or wastewater discharge may constitute a violation of the Clean Water Act. Facilities must notify the appropriate permitting agency prior to introducing this product into the aforementioned discharges.

This product contains one or more substances listed as hazardous, toxic or flammable air pollutants under Section 112 of the Clean Air Act.

There may be specific regulations at the local, regional or state/provincial level that pertain to this product.

STATE REGULATIONS

WARNING: This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

SARA TITLE III RATINGS

Immediate Hazard	X	Delayed Hazard	X	Fire Hazard	X	Pressure Hazard	-
Reactivity Hazard	-						

NFPA RATINGS

Health	1	Flammability	3	Reactivity	0	Special Hazards	-

HMIS RATINGS

Health	-	Flammability	-	Reactivity	-

Following ingredients of this product are listed in SARA313

SARA Listed Ingredient Name	CAS Number	Maximum %
XYLENES	1330-20-7	25.0
TOLUENE	108-88-3	20.0
N-HEXANE	110-54-3	7.0
BENZENE	71-43-2	5.0
1,2,4-TRIMETHYLBENZENE	95-63-6	3.0
ETHYLBENZENE	100-41-4	2.0
CYCLOHEXANE	110-82-7	1.0
CUMENE	98-82-8	1.0
NAPHTHALENE	91-20-3	1.0

16 OTHER INFORMATION

DISCLAIMER

NOTICE: The information presented herein is based on data considered to be accurate as of the date of preparation of this Material Safety Data Sheet. However, MSDS may not be used as a commercial specification sheet of manufacturer or seller, and no warranty or representation, expressed or implied, is made as to the accuracy or comprehensiveness of the foregoing data and safety information, nor is any authorization given or implied to practice any patented invention without a license. In addition, no responsibility can be assumed by vendor for any damage or injury resulting from abnormal use, from any failure to adhere to recommended practices, or from any hazards inherent in the nature of the product.

Completed By Safety & Emergency Response, Koch Industries, Inc.

KOCH

MATERIAL SAFETY DATA SHEET

1 CHEMICAL PRODUCT & COMPANY IDENTIFICATION

TRADE NAME: **PARAXYLENE**
CAS NUMBER: 106-42-3
MSDS NUMBER: 5028
PRODUCT CODE: 7100
SYNONYMS: P-XYLENE
1,4-DIMETHYLBENZENE
P-DIMETHYLBENZENE
P-METHYLTOLUENE
4-METHYLTOLUENE
1,4-XYLENE
P-XYLOL

MANUFACTURER/ SUPPLIER: Koch Refining Company, L. P.
PO Box 2608
Corpus Christi, TX
78403

TELEPHONE NUMBERS - 24 HOUR EMERGENCY ASSISTANCE:
Koch Refining Co.: 512-241-4811
CHEMTREC: 800-424-9300

TELEPHONE NUMBERS - GENERAL ASSISTANCE:
8-5 (M-F) 512-241-4811
8-5 (M-F) 316-828-8488

2 COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient Name	CAS Number	Percentage*	Exposure Limits / Health Hazards
PARAXYLENE	106-42-3	99.7 - 100 %	100 ppm 8-Hour TWA (OSHA) 100 ppm 8-Hour TWA (ACGIH) 150 ppm 15-Min STEL (ACGIH)
ETHYLBENZENE	100-41-4	0 - 0.3 %	100 ppm 8-Hour TWA (OSHA) 100 ppm 8-Hour TWA (ACGIH) 125 ppm 15-Min STEL (ACGIH)
METAXYLENE	108-38-3	0 - 0.2 %	100 ppm 8-Hour TWA (OSHA) 100 ppm 8-Hour TWA (ACGIH) 150 ppm 15-Min STEL (ACGIH)
ORTHOXYLENE	95-47-6	0 - 0.1 %	100 ppm 8-Hour TWA (OSHA) 100 ppm 8-Hour TWA (ACGIH) 150 ppm 15-Min STEL (ACGIH)
TOLUENE	108-88-3	0 - 0.1 %	200 ppm 8-Hour TWA (OSHA) 50 ppm 8-Hour TWA (ACGIH)
BENZENE	71-43-2	0 - 10 PPM	1 ppm 8-Hour TWA (OSHA) 5 ppm 15-Min STEL (OSHA) 10 ppm 8-Hour TWA (ACGIH)

*Values do not reflect absolute minimums and maximums; those values may vary from time to time.

SPECIAL TOXIC EFFECTS

Exposure may cause the following specific symptoms, depending on the concentration and duration of exposure: anemia, pallor and loss of appetite. Acute or chronic overexposure to this material or its components may cause systemic toxicity, including adverse effects to the following: kidney, liver, fetus and central nervous system.

IARC has determined that there is inadequate evidence for the carcinogenicity of xylene in humans and experimental animals. (IARC Class 3).

Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage (sometimes referred to as solvent or painter's syndrome). Intentional misuse by deliberately concentrating and inhaling this product may be harmful or fatal.

May cause adverse reproductive and/or developmental effects. Pregnant women may be at an increased risk from exposure. Consumption of alcoholic beverages may enhance toxic effects.

Pre-existing medical conditions which may be aggravated by exposure include disorders of the skin, heart, kidney, liver and respiratory system.

4 FIRST AID MEASURES

SKIN

Immediately wash skin with plenty of soap and water while removing contaminated clothing and shoes. Get medical attention if irritation develops or persists.

Place contaminated clothing in closed container for storage until laundered or discarded. If clothing is to be laundered, inform person performing operation of contaminant's hazardous properties. Discard contaminated leather goods.

EYE

Flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Get medical attention if irritation persists.

INHALATION

Remove to fresh air. If not breathing, institute cardiopulmonary resuscitation (CPR). If breathing is difficult, ensure clear airway and give oxygen. Keep affected person warm and at rest. GET IMMEDIATE MEDICAL ATTENTION.

INGESTION

Do not induce vomiting because of danger of aspirating liquid into lungs, causing serious damage and chemical pneumonitis. If spontaneous vomiting occurs keep head below hips to prevent aspiration and monitor for breathing difficulty. Gastric lavage should be performed only by qualified medical personnel. GET IMMEDIATE MEDICAL ATTENTION.

Keep affected person warm and at rest.

6 ACCIDENTAL RELEASE MEASURES

EMERGENCY ACTION

Keep ignition sources out of area. Keep unnecessary people away; isolate hazard area and deny entry. Stay upwind. (See Exposure Controls/Personal Protection Section.) Keep unnecessary people at least 150 feet upwind of spill; greater distances may be necessary for people downwind.

ENVIRONMENTAL PRECAUTIONS

Eliminate all sources of ignition. Isolate hazard area and deny entry.

If product is released to the environment, take immediate steps to stop and contain release. Caution should be exercised regarding personnel safety and exposure to the released product. Notify local authorities and the National Response Center, if required.

SPILL OR LEAK PROCEDURE

Keep ignition sources out of area and shut off all ignition sources. Absorb spill with inert material (e. g. dry sand or earth) then place in a chemical waste container. Large Spills: Dike far ahead of liquid spill for later disposal. Shut off leak if safe to do so.

See Exposure Controls/Personal Protection section.

7 HANDLING & STORAGE

HANDLING

Ground lines and equipment used during transfer to reduce the possibility of static spark-initiated fire or explosion. Use non-sparking tools. Do not cut, grind, drill, weld or reuse containers unless adequate precautions are taken against these hazards.

Do not eat, drink or smoke in areas of use or storage.

STORAGE

Store in tightly closed containers in a cool, dry, isolated, well-ventilated area away from heat, sources of ignition and incompatibles. Avoid contact with strong oxidizers.

Empty containers may contain product residue. Do not reuse without adequate precautions.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS

Ventilation and other forms of engineering controls are the preferred means for controlling exposures.

EYE PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

Wear chemical safety goggles and face shield. Have eye washing facilities readily available where eye contact can occur.

11 TOXICOLOGICAL INFORMATION

TOXICOLOGICAL DATA
See Special Toxic Effects (Section 3)

12 ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION
This product contains paraxylene which biodegrades in soil and water and oxidizes in air. This product is not expected to bioaccumulate in aquatic organisms.

13 DISPOSAL CONSIDERATIONS

WASTE DISPOSAL
This product, as supplied, when discarded or disposed of, is a hazardous waste according to Federal Regulations (40 CFR 261) due to its ignitability and benzene content. Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste.

The transportation, storage, treatment and disposal of this waste material must be conducted in compliance with 40 CFR 262, 263, 264, 268 and 270. Disposal can occur only in properly permitted facilities. Check state and local regulations for any additional requirements as these may be more restrictive than federal laws and regulations. Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate or otherwise inappropriate. Disposal of this material must be conducted in compliance with all federal, state and local regulations.

14 TRANSPORT INFORMATION

BILL OF LADING (DOT)
Xylenes, (Paraxylene), 3, UN1307, PG III, RQ

Department of Transportation (DOT) Requirements:

Proper Shipping Name:	XYLENES, (PARAXYLENE)		
Hazard Class:	3	UN/NA Code:	UN1307
Packaging Group:	PG III		
Labels Required:	FLAMMABLE LIQUID		
Placards Required:	FLAMMABLE LIQUID, UN1307		
Reportable Quantity:	See Regulatory Information (Section 15)		

APPENDIX B

LABORATORY ANALYTICAL REPORTS/ CHAIN OF CUSTODY RECORDS

Pace Analytical

Pace Analytical Services, Inc.
9800 Kincey Avenue, Suite 100
Huntersville, NC 28078

Tel: 704-875-9092
Fax: 704-875-9091

orig to file

January 21, 2000

Mr. Steve Tyler
Catlin Engineers & Scientist
220 Old Dairy Road
P.O. Box 10279
Wilmington, NC 28405

RE: Pace Project Number: 9211361
Client Project ID: Koch North Terminal

Dear Mr. Tyler:

Enclosed are the results of analyses for sample(s)received by the laboratory on January 13, 2000. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

for Felicia Grogan
Project Manager

Enclosures

Pace Analytical Services, Inc.
9800 Kincey Avenue, Suite 100
Huntersville, NC 28078
Tel: 704-875-9092
Fax: 704-875-9091

Pace Analytical

DATE: 01/21/00
PAGE: 1

:atlin Engineers & Scientist
:20 Old Dairy Road
:.O. Box 10279
/ilmington, NC 28405

Pace Project Number: 9211361
Client Project ID: Koch North Terminal

\ttn: Mr. Steve Tyler
'hone: (910)452-5861

olid results are reported on a dry weight basis

ace Sample No: 92802727 Date Collected: 01/11/00 Matrix: Water
lient Sample ID: KOCH-14 Date Received: 01/13/00

arameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
C Volatiles								
Purgeable Aromatics		Method: EPA 602			Prep Method: EPA 602			
Methyl-tert-butyl Ether	ND	ug/l	20	20.0	01/17/00	KST	1634-04-4	
Benzene	ND	ug/l	20	20.0	01/17/00	KST	71-43-2	
Toluene	320	ug/l	20	20.0	01/17/00	KST	108-88-3	
Ethylbenzene	36	ug/l	20	20.0	01/17/00	KST	100-41-4	
m&p-Xylene	160	ug/l	20	20.0	01/17/00	KST	7816-60-0	
o-Xylene (1,2-Dimethylbenzene)	96	ug/l	20	20.0	01/17/00	KST	95-47-6	
1-Chloro-3-fluorobenzene (S)	99	%		1.00	01/17/00	KST	625-98-9	

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Pace Project Number: 9211361
Client Project ID: Koch North Terminal

'ace Sample No: 92802735 Date Collected: 01/11/00 Matrix: Water
:lient Sample ID: KOCH-2 Date Received: 01/13/00

'arameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
:C Volatiles								
Purgeable Aromatics		Method: EPA 602			Prep Method: EPA 602			
Methyl-tert-butyl Ether	15	ug/l	10	10.0	01/17/00	KST	1634-04-4	
Benzene	ND	ug/l	1	1.00	01/17/00	KST	71-43-2	
Toluene	ND	ug/l	1	1.00	01/17/00	KST	108-88-3	
Ethylbenzene	ND	ug/l	1	1.00	01/17/00	KST	100-41-4	
m&p-Xylene	ND	ug/l	1	1.00	01/17/00	KST	7816-60-0	
o-Xylene (1,2-Dimethylbenzene)	ND	ug/l	1	1.00	01/17/00	KST	95-47-6	
1-Chloro-3-fluorobenzene (S)	99	%		1.00	01/17/00	KST	625-98-9	

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Pace Project Number: 9211361
Client Project ID: Koch North Terminal

'ace Sample No: 92802743 Date Collected: 01/11/00 Matrix: Water
:lient Sample ID: KOCH-20 Date Received: 01/13/00

'arameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
;C Volatiles								
Purgeable Aromatics	Method: EPA 602				Prep Method: EPA 602			
Methyl-tert-butyl Ether	ND	ug/l	1	1.00	01/16/00	KST	1634-04-4	
Benzene	ND	ug/l	1	1.00	01/16/00	KST	71-43-2	
Toluene	ND	ug/l	1	1.00	01/16/00	KST	108-88-3	
Ethylbenzene	180	ug/l	100	100	01/16/00	KST	100-41-4	
m&p-Xylene	1500	ug/l	100	100	01/16/00	KST	7816-60-0	
o-Xylene (1,2-Dimethylbenzene)	830	ug/l	100	100	01/16/00	KST	95-47-6	
1-Chloro-3-fluorobenzene (S)	100	%		1.00	01/16/00	KST	625-98-9	

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Pace Project Number: 9211361
Client Project ID: Koch North Terminal

'ace Sample No: 92802750 Date Collected: 01/11/00 Matrix: Water
:lient Sample ID: KOCH-1 Date Received: 01/13/00

'arameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
;C Volatiles								
Purgeable Aromatics		Method: EPA 602			Prep Method: EPA 602			
Methyl-tert-butyl Ether	ND	ug/l	1	1.00	01/17/00	KST	1634-04-4	
Benzene	ND	ug/l	1	1.00	01/17/00	KST	71-43-2	
Toluene	ND	ug/l	1	1.00	01/17/00	KST	108-88-3	
Ethylbenzene	15	ug/l	5	5.00	01/17/00	KST	100-41-4	
m&p-Xylene	92	ug/l	5	5.00	01/17/00	KST	7816-60-0	
o-Xylene (1,2-Dimethylbenzene)	ND	ug/l	1	1.00	01/17/00	KST	95-47-6	
1-Chloro-3-fluorobenzene (S)	102	%		1.00	01/17/00	KST	625-98-9	

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Huntersville, NC 28078

Tel: 704-875-9092
Fax: 704-875-9091

Pace Project Number: 9211361
Client Project ID: Koch North Terminal

ARAMETER FOOTNOTES

D	Not Detected
C	Not Calculable
RL	Pace Reporting Limit
S)	Surrogate
pp. DF	Applied Dilution Factor

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QUALITY CONTROL DATA

DATE: 01/21/00

:atlin Engineers & Scientist
220 Old Dairy Road
?.O. Box 10279
Vilmington, NC 28405

Pace Project Number: 9211361
Client Project ID: Koch North Terminal

\ttn: Mr. Steve Tyler
?hone: (910)452-5861

)C Batch ID: 21690
\nalysis Method: EPA 602
\ssociated Pace Samples: 92802727 92802735 92802743 92802750

QC Batch Method: EPA 602
Analysis Description: Purgeable Aromatics

!ETHOD BLANK: 92804301
\ssociated Pace Samples:
92802727 92802735 92802743 92802750

'arameter	Units	92802735 Method Blank Result	PRL	Footnotes
lethyl-tert-butyl Ether	ug/l	ND	1	
3enzene	ug/l	ND	1	
'oluene	ug/l	ND	1	
.thylbenzene	ug/l	ND	1	
&p-Xylene	ug/l	ND	1	
-Xylene (1,2-Dimethylbenzene)	ug/l	ND	1	
-Chloro-3-fluorobenzene (S)	%	110		

ABORATORY CONTROL SAMPLE: 92804319

arameter	Units	Spike Conc.	LCS Result	Spike % Rec	Footnotes
ethyl-tert-butyl Ether	ug/l	20	16.96	84.8	
enzene	ug/l	20	19.44	97.2	
oluene	ug/l	20	21.34	107	
thylbenzene	ug/l	20	23.85	119	
p-Xylene	ug/l	40	49.21	123	
Xylene (1,2-Dimethylbenzene)	ug/l	20	24.44	122	
Chloro-3-fluorobenzene (S)				113	

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Huntersville, NC 28078

Tel: 704-875-9092
Fax: 704-875-9091

Pace Project Number: 9211361
Client Project ID: Koch North Terminal

UALITY CONTROL DATA PARAMETER FOOTNOTES

onsistent with EPA guidelines unrounded concentrations are displayed and have been used to calculate % Rec and RPD values.

D	Not Detected
C	Not Calculable
RL	Pace Reporting Limit
PD	Relative Percent Difference
S)	Surrogate

The Right Chemistry, The Right Solution®

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

511873

Page: 1 of 1

Required Client Information: **Section A**

Company: KOCH INDUSTRIES
Address: P. O. BOX 29055
CHARL. NC 28406
ATTN: JIM STRICKLAND
Phone: 910-799-0180
Fax:

Required Client Information: **Section B**

Report To: FRANK VAN RYN (REISS) STEVE TYLER (CATLIN)
Invoice To: FRANK VAN RYN (REISS KEM.)
P.O.: 22256
Project Name: KOCH NORTH TERM.
Project Number: 95033

Client Information (Check quote/contract):
Requested Due Date: 1-21-00
*TAT:

* Turn around times less than 14 days subject to laboratory and contractual obligations and may result in a Rush Turnaround Surcharge.
Turn Around Time (TAT) in calendar days.

To Be Completed by Pace Analytical and Client **Section C**

Quote Reference:
Project Manager: MS. FELICIA GIRGIAN
Project #:
Profile #:

Section D **Required** Client Information:

SAMPLE ID
One character per box.
(A–Z, 0–9 / .–)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
WATER	WT
SOIL	SL
OIL	OL
WIPE	WP
AIR	AR
TISSUE	TS
OTHER	OT

Requested Analysis: BTEX & MTBE; PCBs EPA 602

ITEM #	SAMPLE ID	MATRIX CODE	DATE COLLECTED mm / dd / yy	TIME COLLECTED hh:mm a/p	# Containers	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	BTEX & MTBE	PCBs EPA 602	Remarks / Lab ID
1	KOCH-14	WT	01/11/00	1300		✓			✓			✓		92802127
2	KOCH-2	WT	01/11/00	1330		✓			✓			✓		92802750
3	KOCH-20	WT	01/11/00	1400		✓			✓			✓		92802743
4	KOCH-1	WT	01/11/00	1430		✓			✓			✓		92802750
5														
6														
7														
8														
9														
10														
11														
12														

Sample Condition		Sample Notes	Item No.	Relinquished By / Company	Date	Time	Accepted By / Company	Date	Time
Temp in °C:	10.1			Ben Ashba / CATLIN	01/11/00	1500	[illegible]	1/11/00	10:20
Received on ICE:	(Y) / N								
Sealed Cooler:	(Y) / N								
Samples Intact:	(Y) / N								

Additional Comments:

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: BEN ASHBA
SIGNATURE of SAMPLER: Ben Ashba
DATE Signed: (MM / DD / YY) 01/11/00

SEE REVERSE SIDE FOR INSTRUCTIONS

Pace Analytical Services, Inc. Form COC01.XLS 12/99

Pace Analytical™

Pace Analytical Services, Inc.
9800 Kincey Avenue, Suite 100
Huntersville, NC 28078
Phone: 704.875.9092
Fax: 704.875.9091

RECEIVED
BY HG DATE 4-18-00

April 13, 2000

Mr. Steve Tyler
Catlin Engineers & Scientist
220 Old Dairy Road
P.O. Box 10279
Wilmington, NC 28405

RE: Pace Project Number: 9212328
Client Project ID: Koch North

Dear Mr. Tyler:

Enclosed are the results of analyses for sample(s) received by the laboratory on March 2, 2000. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Felicia Grogan

Felicia Grogan
Project Manager

Enclosures

Pace Analytical Services, Inc.
9800 Kincey Avenue, Suite 100
Huntersville, NC 28078
Phone: 704.875.9092
Fax: 704.875.9091

DATE: 04/13/00
PAGE: 1

Catlin Engineers & Scientist
220 Old Dairy Road
P.O. Box 10279
Wilmington, NC 28405

Pace Project Number: 9212328
Client Project ID: Koch North

Attn: Mr. Steve Tyler
Phone: (910)452-5861

Solid results are reported on a dry weight basis

Pace Sample No: 92874676 Date Collected: 02/24/00 Matrix: Soil
Client Sample ID: S-1 Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Wet Chemistry								
Percent Moisture		Method: % Moisture			Prep Method:			
Percent Moisture	10.3	%		0.90	03/03/00	TYM		
GC/MS Volatiles								
GC/MS VOCs by 8260, low level		Method: EPA 8260			Prep Method: EPA 8260			
m&p-Xylene	ND	ug/kg	11	1.00	03/03/00	JSS	7816-60-0	
Dibromofluoromethane (S)	101	%		0.90	03/03/00	JSS	1868-53-7	
1,2-Dichloroethane-d4 (S)	102	%		0.90	03/03/00	JSS	17060-07-0	
Toluene-d8 (S)	100	%		0.90	03/03/00	JSS	2037-26-5	
4-Bromofluorobenzene (S)	97	%		0.90	03/03/00	JSS	460-00-4	

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92874692 Date Collected: 02/24/00 Matrix: Soil
Client Sample ID: S-2 Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Wet Chemistry								
Percent Moisture	Method: % Moisture				Prep Method:			
Percent Moisture	10.4	%		0.90	03/03/00	TYM		
GC/MS Volatiles								
GC/MS VOCs by 8260, low level	Method: EPA 8260				Prep Method: EPA 8260			
m&p-Xylene	ND	ug/kg	11	1.00	03/03/00	JSS	7816-60-0	
Dibromofluoromethane (S)	101	%		0.90	03/03/00	JSS	1868-53-7	
1,2-Dichloroethane-d4 (S)	102	%		0.90	03/03/00	JSS	17060-07-0	
Toluene-d8 (S)	100	%		0.90	03/03/00	JSS	2037-26-5	
4-Bromofluorobenzene (S)	98	%		0.90	03/03/00	JSS	460-00-4	

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92874700 Date Collected: 02/24/00 Matrix: Soil
Client Sample ID: S-3 Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Wet Chemistry								
Percent Moisture		Method: % Moisture			Prep Method:			
Percent Moisture	9.9	%		0.90	03/03/00	TYM		
GC/MS Volatiles								
GC/MS VOCs by 8260, low level		Method: EPA 8260			Prep Method: EPA 8260			
m&p-Xylene	11	ug/kg	11	1.00	03/03/00	JSS	7816-60-0	
Dibromofluoromethane (S)	103	%		0.90	03/03/00	JSS	1868-53-7	
1,2-Dichloroethane-d4 (S)	103	%		0.90	03/03/00	JSS	17060-07-0	
Toluene-d8 (S)	101	%		0.90	03/03/00	JSS	2037-26-5	
4-Bromofluorobenzene (S)	98	%		0.90	03/03/00	JSS	460-00-4	

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92874718 Date Collected: 02/24/00 Matrix: Soil
Client Sample ID: S-4 Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Wet Chemistry								
Percent Moisture	Method: % Moisture				Prep Method:			
Percent Moisture	15.4	%		0.85	03/03/00	TYM		
GC/MS Volatiles								
GC/MS VOCs by 8260, low level	Method: EPA 8260				Prep Method: EPA 8260			
m&p-Xylene	230	ug/kg	12	1.00	03/04/00	JSS	7816-60-0	
Dibromofluoromethane (S)	101	%		0.85	03/04/00	JSS	1868-53-7	
1,2-Dichloroethane-d4 (S)	100	%		0.85	03/04/00	JSS	17060-07-0	
Toluene-d8 (S)	101	%		0.85	03/04/00	JSS	2037-26-5	
4-Bromofluorobenzene (S)	92	%		0.85	03/04/00	JSS	460-00-4	

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Phone: 704.875.9092
Fax: 704.875.9091

Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92874726 Date Collected: 02/24/00 Matrix: Soil
Client Sample ID: S-5 Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Wet Chemistry								
Percent Moisture	Method: % Moisture				Prep Method:			
Percent Moisture	6.7	%		0.93	03/03/00	TYM		
GC/MS Volatiles								
GC/MS VOCs by 8260	Method: EPA 8260				Prep Method: EPA 8260			
m&p-Xylene	110,000,000	ug/kg	540000	1000	03/08/00	JRS	7816-60-0	1
Dibromofluoromethane (S)	0	%		0.93	03/08/00	JRS	1868-53-7	
1,2-Dichloroethane-d4 (S)	0	%		0.93	03/08/00	JRS	17060-07-0	2
Toluene-d8 (S)	0	%		0.93	03/08/00	JRS	2037-26-5	
4-Bromofluorobenzene (S)	0	%		0.93	03/08/00	JRS	460-00-4	

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Phone: 704.875.9092
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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92874734 | Date Collected: 02/24/00 | Matrix: Soil
Client Sample ID: S-6 | Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Wet Chemistry								
Percent Moisture		Method: % Moisture			Prep Method:			
Percent Moisture	5.8	%		0.94	03/03/00	TYM		
GC/MS Volatiles								
GC/MS VOCs by 8260, low level		Method: EPA 8260			Prep Method: EPA 8260			
m&p-Xylene	24	ug/kg	11	1.00	03/04/00	JSS	7816-60-0	
Dibromofluoromethane (S)	102	%		0.94	03/04/00	JSS	1868-53-7	
1,2-Dichloroethane-d4 (S)	102	%		0.94	03/04/00	JSS	17060-07-0	
Toluene-d8 (S)	101	%		0.94	03/04/00	JSS	2037-26-5	
4-Bromofluorobenzene (S)	96	%		0.94	03/04/00	JSS	460-00-4	

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Fax: 704.875.9091

Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92874742 Date Collected: 02/24/00 Matrix: Soil
Client Sample ID: S-7 Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Wet Chemistry								
Percent Moisture		Method: % Moisture			Prep Method:			
Percent Moisture	6.5	%		0.94	03/03/00	TYM		
GC/MS Volatiles								
GC/MS VOCs by 8260, low level		Method: EPA 8260			Prep Method: EPA 8260			
m&p-Xylene	90	ug/kg	11	1.00	03/04/00	JSS	7816-60-0	
Dibromofluoromethane (S)	102	%		0.94	03/04/00	JSS	1868-53-7	
1,2-Dichloroethane-d4 (S)	100	%		0.94	03/04/00	JSS	17060-07-0	
Toluene-d8 (S)	100	%		0.94	03/04/00	JSS	2037-26-5	
4-Bromofluorobenzene (S)	99	%		0.94	03/04/00	JSS	460-00-4	

Pace Analytical Services, Inc.
9800 Kincey Avenue, Suite 100
Huntersville, NC 28078
Phone: 704.875.9092
Fax: 704.875.9091

Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92874759 | Date Collected: 02/24/00 | Matrix: Soil
Client Sample ID: S-8 | Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Wet Chemistry								
Percent Moisture		Method: % Moisture			Prep Method:			
Percent Moisture	7.4	%		0.93	03/03/00	TYM		
GC/MS Volatiles								
GC/MS VOCs by 8260		Method: EPA 8260			Prep Method: EPA 8260			
Dichlorodifluoromethane	ND	ug/kg	540000	1000	03/08/00	JRS	75-71-8	
Chloromethane	ND	ug/kg	540000	1000	03/08/00	JRS	74-87-3	
Vinyl Chloride	ND	ug/kg	540000	1000	03/08/00	JRS	75-01-4	
Bromomethane	ND	ug/kg	540000	1000	03/08/00	JRS	74-83-9	
Chloroethane	ND	ug/kg	540000	1000	03/08/00	JRS	75-00-3	
Trichlorofluoromethane	ND	ug/kg	270000	1000	03/08/00	JRS	75-69-4	
1,1-Dichloroethene	ND	ug/kg	270000	1000	03/08/00	JRS	75-35-4	
Methylene Chloride	1000000	ug/kg	270000	1000	03/08/00	JRS	75-09-2	3
trans-1,2-Dichloroethene	ND	ug/kg	270000	1000	03/08/00	JRS	156-60-5	
1,1-Dichloroethane	ND	ug/kg	270000	1000	03/08/00	JRS	75-34-3	
cis-1,2-Dichloroethene	ND	ug/kg	270000	1000	03/08/00	JRS	156-59-2	
2,2-Dichloropropane	ND	ug/kg	270000	1000	03/08/00	JRS	594-20-7	
Chloroform	ND	ug/kg	270000	1000	03/08/00	JRS	67-66-3	
Bromochloromethane	ND	ug/kg	270000	1000	03/08/00	JRS	74-97-5	
1,1,1-Trichloroethane	ND	ug/kg	270000	1000	03/08/00	JRS	71-55-6	
1,1-Dichloropropene	ND	ug/kg	270000	1000	03/08/00	JRS	563-58-6	
1,2-Dichloroethane	ND	ug/kg	270000	1000	03/08/00	JRS	107-06-2	
Carbon Tetrachloride	ND	ug/kg	270000	1000	03/08/00	JRS	56-23-5	
Benzene	ND	ug/kg	270000	1000	03/08/00	JRS	71-43-2	
Trichloroethene	ND	ug/kg	270000	1000	03/08/00	JRS	79-01-6	
1,2-Dichloropropane	ND	ug/kg	270000	1000	03/08/00	JRS	78-87-5	
Dibromomethane	ND	ug/kg	270000	1000	03/08/00	JRS	74-95-3	
Bromodichloromethane	ND	ug/kg	270000	1000	03/08/00	JRS	75-27-4	
Toluene	ND	ug/kg	270000	1000	03/08/00	JRS	108-88-3	
1,1,2-Trichloroethane	ND	ug/kg	270000	1000	03/08/00	JRS	79-00-5	
1,3-Dichloropropane	ND	ug/kg	270000	1000	03/08/00	JRS	142-28-9	
Dibromochloromethane	ND	ug/kg	270000	1000	03/08/00	JRS	124-48-1	
Tetrachloroethene	ND	ug/kg	270000	1000	03/08/00	JRS	127-18-4	
1,2-Dibromoethane	ND	ug/kg	270000	1000	03/08/00	JRS	106-93-4	
Chlorobenzene	ND	ug/kg	270000	1000	03/08/00	JRS	108-90-7	
1,1,1,2-Tetrachloroethane	ND	ug/kg	270000	1000	03/08/00	JRS	630-20-6	

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92874759 | Date Collected: 02/24/00 | Matrix: Soil
Client Sample ID: S-8 | Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Ethylbenzene	ND	ug/kg	270000	1000	03/08/00	JRS	100-41-4	
m&p-Xylene	100000000	ug/kg	540000	1000	03/08/00	JRS	7816-60-0	1
Styrene	ND	ug/kg	270000	1000	03/08/00	JRS	100-42-5	
o-Xylene (1,2-Dimethylbenzene)	ND	ug/kg	270000	1000	03/08/00	JRS	95-47-6	
Bromoform	ND	ug/kg	270000	1000	03/08/00	JRS	75-25-2	
1,1,2,2-Tetrachloroethane	ND	ug/kg	270000	1000	03/08/00	JRS	79-34-5	
Isopropylbenzene (Cumene)	ND	ug/kg	270000	1000	03/08/00	JRS	98-82-8	
1,2,3-Trichloropropane	ND	ug/kg	270000	1000	03/08/00	JRS	96-18-4	
Bromobenzene	ND	ug/kg	270000	1000	03/08/00	JRS	108-86-1	
n-Propylbenzene	ND	ug/kg	270000	1000	03/08/00	JRS	103-65-1	
2-Chlorotoluene	ND	ug/kg	270000	1000	03/08/00	JRS	95-49-8	
4-Chlorotoluene	ND	ug/kg	270000	1000	03/08/00	JRS	106-43-4	
1,3,5-Trimethylbenzene	ND	ug/kg	270000	1000	03/08/00	JRS	108-67-8	
tert-Butylbenzene	ND	ug/kg	270000	1000	03/08/00	JRS	98-06-6	
1,2,4-Trimethylbenzene	ND	ug/kg	270000	1000	03/08/00	JRS	95-63-6	
sec-Butylbenzene	ND	ug/kg	270000	1000	03/08/00	JRS	135-98-8	
1,3-Dichlorobenzene	ND	ug/kg	270000	1000	03/08/00	JRS	541-73-1	
p-Isopropyltoluene	ND	ug/kg	270000	1000	03/08/00	JRS	99-87-6	
1,4-Dichlorobenzene	ND	ug/kg	270000	1000	03/08/00	JRS	106-46-7	
1,2-Dichlorobenzene	ND	ug/kg	270000	1000	03/08/00	JRS	95-50-1	
n-Butylbenzene	ND	ug/kg	270000	1000	03/08/00	JRS	104-51-8	
1,2-Dibromo-3-Chloropropane	ND	ug/kg	270000	1000	03/08/00	JRS	96-12-8	
1,2,4-Trichlorobenzene	ND	ug/kg	270000	1000	03/08/00	JRS	120-82-1	
Naphthalene	ND	ug/kg	270000	1000	03/08/00	JRS	91-20-3	
Hexachlorobutadiene	ND	ug/kg	270000	1000	03/08/00	JRS	87-68-3	
1,2,3-Trichlorobenzene	ND	ug/kg	270000	1000	03/08/00	JRS	87-61-6	
Dibromofluoromethane (S)	0	%		0.93	03/08/00	JRS	1868-53-7	2
1,2-Dichloroethane-d4 (S)	0	%		0.93	03/08/00	JRS	17060-07-0	
Toluene-d8 (S)	0	%		0.93	03/08/00	JRS	2037-26-5	
4-Bromofluorobenzene (S)	0	%		0.93	03/08/00	JRS	460-00-4	

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92874767 | Date Collected: 02/24/00 | Matrix: Soil
Client Sample ID: S-9 | Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Wet Chemistry								
Percent Moisture		Method: % Moisture			Prep Method:			
Percent Moisture	9.5	%		0.90	03/03/00	TYM		
GC/MS Volatiles								
GC/MS VOCs by 8260		Method: EPA 8260			Prep Method: EPA 8260			
m&p-Xylene	670000	ug/kg	55000	100	03/08/00	JRS	7816-60-0	
Dibromofluoromethane (S)	0	%		0.90	03/08/00	JRS	1868-53-7	
1,2-Dichloroethane-d4 (S)	0	%		0.90	03/08/00	JRS	17060-07-0	2
Toluene-d8 (S)	0	%		0.90	03/08/00	JRS	2037-26-5	
4-Bromofluorobenzene (S)	0	%		0.90	03/08/00	JRS	460-00-4	

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92874775 Date Collected: 02/24/00 Matrix: Soil
Client Sample ID: S-10 Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Wet Chemistry								
Percent Moisture		Method: % Moisture			Prep Method:			
Percent Moisture	6.0	%		0.94	03/03/00	TYM		
GC/MS Volatiles								
GC/MS VOCs by 8260, low level		Method: EPA 8260			Prep Method: EPA 8260			
m&p-Xylene	13	ug/kg	11	1.00	03/04/00	JSS	7816-60-0	
Dibromofluoromethane (S)	99	%		0.94	03/04/00	JSS	1868-53-7	
1,2-Dichloroethane-d4 (S)	102	%		0.94	03/04/00	JSS	17060-07-0	
Toluene-d8 (S)	100	%		0.94	03/04/00	JSS	2037-26-5	
4-Bromofluorobenzene (S)	97	%		0.94	03/04/00	JSS	460-00-4	

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92874783 | Date Collected: 02/24/00 | Matrix: Soil
Client Sample ID: S-11 | Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Wet Chemistry								
Percent Moisture		Method: % Moisture			Prep Method:			
Percent Moisture	5.0	%		0.95	03/03/00	TYM		
GC/MS Volatiles								
GC/MS VOCs by 8260, low level		Method: EPA 8260			Prep Method: EPA 8260			
m&p-Xylene	ND	ug/kg	11	1.00	03/04/00	JSS	7816-60-0	
Dibromofluoromethane (S)	103	%		0.95	03/04/00	JSS	1868-53-7	
1,2-Dichloroethane-d4 (S)	103	%		0.95	03/04/00	JSS	17060-07-0	
Toluene-d8 (S)	101	%		0.95	03/04/00	JSS	2037-26-5	
4-Bromofluorobenzene (S)	99	%		0.95	03/04/00	JSS	460-00-4	

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92874791 Date Collected: 02/24/00 Matrix: Soil
Client Sample ID: S-12 Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Wet Chemistry								
Percent Moisture		Method: % Moisture			Prep Method:			
Percent Moisture	3.5	%		0.96	03/03/00	TYM		
GC/MS Volatiles								
GC/MS VOCs by 8260, low level		Method: EPA 8260			Prep Method: EPA 8260			
m&p-Xylene	ND	ug/kg	10	1.00	03/07/00	JRS	7816-60-0	
Dibromofluoromethane (S)	100	%		0.96	03/07/00	JRS	1868-53-7	
1,2-Dichloroethane-d4 (S)	100	%		0.96	03/07/00	JRS	17060-07-0	
Toluene-d8 (S)	99	%		0.96	03/07/00	JRS	2037-26-5	
4-Bromofluorobenzene (S)	98	%		0.96	03/07/00	JRS	460-00-4	

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92874825 Date Collected: 02/24/00 Matrix: Soil
Client Sample ID: S-13 Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Wet Chemistry								
Percent Moisture	Method: % Moisture				Prep Method:			
Percent Moisture	11.4	%		0.89	03/03/00	TYM		
GC/MS Volatiles								
GC/MS VOCs by 8260	Method: EPA 8260				Prep Method: EPA 8260			
m&p-Xylene	150000000	ug/kg	560000	1000	03/08/00	JRS	7816-60-0	1
Dibromofluoromethane (S)	4	%		0.89	03/08/00	JRS	1868-53-7	
1,2-Dichloroethane-d4 (S)	3	%		0.89	03/08/00	JRS	17060-07-0	2
Toluene-d8 (S)	4	%		0.89	03/08/00	JRS	2037-26-5	
4-Bromofluorobenzene (S)	5	%		0.89	03/08/00	JRS	460-00-4	

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92874833 Date Collected: 02/24/00 Matrix: Soil
Client Sample ID: S-14 Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Wet Chemistry								
Percent Moisture	Method: % Moisture				Prep Method:			
Percent Moisture	10.5	%		0.90	03/03/00	TYM		
GC/MS Volatiles								
GC/MS VOCs by 8260, low level	Method: EPA 8260				Prep Method: EPA 8260			
m&p-Xylene	ND	ug/kg	11	1.00	03/07/00	JSS	7816-60-0	
Dibromofluoromethane (S)	97	%		0.90	03/07/00	JSS	1868-53-7	
1,2-Dichloroethane-d4 (S)	99	%		0.90	03/07/00	JSS	17060-07-0	
Toluene-d8 (S)	98	%		0.90	03/07/00	JSS	2037-26-5	
4-Bromofluorobenzene (S)	98	%		0.90	03/07/00	JSS	460-00-4	

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92874841 Date Collected: 02/24/00 Matrix: Soil
Client Sample ID: S-15 Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Wet Chemistry								
Percent Moisture		Method: % Moisture			Prep Method:			
Percent Moisture	6.5	%		0.94	03/03/00	TYM		
GC/MS Volatiles								
GC/MS VOCs by 8260, low level		Method: EPA 8260			Prep Method: EPA 8260			
m&p-Xylene	ND	ug/kg	11	1.00	03/07/00	JSS	7816-60-0	
Dibromofluoromethane (S)	98	%		0.94	03/07/00	JSS	1868-53-7	
1,2-Dichloroethane-d4 (S)	100	%		0.94	03/07/00	JSS	17060-07-0	
Toluene-d8 (S)	98	%		0.94	03/07/00	JSS	2037-26-5	
4-Bromofluorobenzene (S)	99	%		0.94	03/07/00	JSS	460-00-4	

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92874858 Date Collected: 02/29/00 Matrix: Water
Client Sample ID: MW-1 Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
GC Volatiles								
Purgeable Aromatics		Method: EPA 602			Prep Method: EPA 602			
m&p-Xylene	ND	ug/l	1	1.00	03/04/00	KST	7816-60-0	
1-Chloro-3-fluorobenzene (S)	76	%		1.00	03/04/00	KST	625-98-9	

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92874866 Date Collected: 02/29/00 Matrix: Water
Client Sample ID: MW-3 Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
GC Volatiles								
Purgeable Aromatics	Method: EPA 602				Prep Method: EPA 602			
m&p-Xylene	37000	ug/l	1000	1000	03/04/00	KST	7816-60-0	
1-Chloro-3-fluorobenzene (S)	78	%		1.00	03/04/00	KST	625-98-9	

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92874940 Date Collected: 02/29/00 Matrix: Water
Client Sample ID: MW-4 Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
GC Volatiles								
Purgeable Aromatics	Method: EPA 602				Prep Method: EPA 602			
m&p-Xylene	100000	ug/l	5000	5000	03/07/00	KST	7816-60-0	
1-Chloro-3-fluorobenzene (S)	80	%		1.00	03/07/00	KST	625-98-9	

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92874957 Date Collected: 02/29/00 Matrix: Water
Client Sample ID: MW-5 Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
GC Volatiles								
Purgeable Aromatics	Method: EPA 602				Prep Method: EPA 602			
m&p-Xylene	2100	ug/l	50	50.0	03/06/00	KST	7816-60-0	
1-Chloro-3-fluorobenzene (S)	77	%		1.00	03/06/00	KST	625-98-9	

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92874965 Date Collected: 02/29/00 Matrix: Water
Client Sample ID: MW-7 Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
GC Volatiles								
Purgeable Aromatics	Method: EPA 602				Prep Method: EPA 602			
m&p-Xylene	130000	ug/l	1000	1000	03/06/00	KST	7816-60-0	
1-Chloro-3-fluorobenzene (S)	85	%		1.00	03/06/00	KST	625-98-9	

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92875004 Date Collected: 02/29/00 Matrix: Water
Client Sample ID: MW-8 Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
GC Volatiles								
Purgeable Aromatics	Method: EPA 602				Prep Method: EPA 602			
m&p-Xylene	12000	ug/l	500	500	03/06/00	KST	7816-60-0	
1-Chloro-3-fluorobenzene (S)	85	%		1.00	03/06/00	KST	625-98-9	

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92875012 Date Collected: 02/29/00 Matrix: Water
Client Sample ID: MW-9 Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
GC Volatiles								
Purgeable Aromatics	Method: EPA 602				Prep Method: EPA 602			
m&p-Xylene	ND	ug/l	1	1.00	03/08/00	KST	7816-60-0	
1-Chloro-3-fluorobenzene (S)	101	%		1.00	03/08/00	KST	625-98-9	

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NC Drinking Water 37706
SC 99006

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TN UST List
VA Drinking Water 213

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92875020 | Date Collected: 02/29/00 | Matrix: Water
Client Sample ID: MW-10 | Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
GC Volatiles								
Purgeable Aromatics	Method: EPA 602				Prep Method: EPA 602			
m&p-Xylene	96000	ug/l	1000	1000	03/07/00	KST	7816-60-0	
1-Chloro-3-fluorobenzene (S)	76	%		1.00	03/07/00	KST	625-98-9	

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92875038 Date Collected: 02/29/00 Matrix: Water
Client Sample ID: MW-11 Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
GC Volatiles								
Purgeable Aromatics	Method: EPA 602				Prep Method: EPA 602			
m&p-Xylene	110000	ug/l	1000	1000	03/07/00	KST	7816-60-0	
1-Chloro-3-fluorobenzene (S)	89	%		1.00	03/07/00	KST	625-98-9	

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92875046 | Date Collected: 02/29/00 | Matrix: Water
Client Sample ID: MW-12 | Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
GC Volatiles								
Purgeable Aromatics	Method: EPA 602				Prep Method: EPA 602			
m&p-Xylene	56000	ug/l	1000	1000	03/07/00	KST	7816-60-0	
1-Chloro-3-fluorobenzene (S)	79	%		1.00	03/07/00	KST	625-98-9	

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NC Drinking Water 37706
SC 99006

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92875053 Date Collected: 02/29/00 Matrix: Water
Client Sample ID: MW-13 Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
GC Volatiles								
Purgeable Aromatics	Method: EPA 602				Prep Method: EPA 602			
m&p-Xylene	85000	ug/l	1000	1000	03/07/00	KST	7816-60-0	
1-Chloro-3-fluorobenzene (S)	84	%		1.00	03/07/00	KST	625-98-9	

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92875061 | Date Collected: 02/29/00 | Matrix: Water
Client Sample ID: MW-14 | Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
GC Volatiles								
Purgeable Aromatics	Method: EPA 602				Prep Method: EPA 602			
m&p-Xylene	270000	ug/l	5000	5000	03/08/00	KST	7816-60-0	
1-Chloro-3-fluorobenzene (S)	95	%		1.00	03/08/00	KST	625-98-9	

Laboratory Certification IDs
NC Wastewater 12
NC Drinking Water 37706
SC 99006

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92875079 Date Collected: 02/29/00 Matrix: Water
Client Sample ID: MW-15 Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
GC Volatiles								
Purgeable Aromatics	Method: EPA 602				Prep Method: EPA 602			
m&p-Xylene	49000	ug/l	1000	1000	03/07/00	KST	7816-60-0	
1-Chloro-3-fluorobenzene (S)	84	%		1.00	03/07/00	KST	625-98-9	

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92875087 Date Collected: 02/29/00 Matrix: Water
Client Sample ID: MW-16 Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
GC Volatiles								
Purgeable Aromatics	Method: EPA 602				Prep Method: EPA 602			
m&p-Xylene	79000	ug/l	1000	1000	03/07/00	KST	7816-60-0	
1-Chloro-3-fluorobenzene (S)	91	%		1.00	03/07/00	KST	625-98-9	

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92875095 Date Collected: 02/29/00 Matrix: Water
Client Sample ID: MW-17 Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
GC Volatiles								
Purgeable Aromatics	Method: EPA 602				Prep Method: EPA 602			
m&p-Xylene	24000	ug/l	200	200	03/07/00	KST	7816-60-0	
1-Chloro-3-fluorobenzene (S)	89	%		1.00	03/07/00	KST	625-98-9	

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92875103 | Date Collected: 02/29/00 | Matrix: Water
Client Sample ID: MW-18 | Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
GC Volatiles								
Purgeable Aromatics	Method: EPA 602				Prep Method: EPA 602			
m&p-Xylene	13000	ug/l	200	200	03/07/00	KST	7816-60-0	
1-Chloro-3-fluorobenzene (S)	78	%		1.00	03/07/00	KST	625-98-9	

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92875111 Date Collected: 02/29/00 Matrix: Water
Client Sample ID: MW-19 Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
GC Volatiles								
Purgeable Aromatics	Method: EPA 602				Prep Method: EPA 602			
m&p-Xylene	1400	ug/l	20	20.0	03/08/00	KST	7816-60-0	
1-Chloro-3-fluorobenzene (S)	80	%		1.00	03/08/00	KST	625-98-9	

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92875129 | Date Collected: 03/01/00 | Matrix: Water
Client Sample ID: MW-20 | Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
GC Volatiles								
Purgeable Aromatics	Method: EPA 602				Prep Method: EPA 602			
m&p-Xylene	7900	ug/l	100	100	03/09/00	KST	7816-60-0	
1-Chloro-3-fluorobenzene (S)	89	%		1.00	03/09/00	KST	625-98-9	

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92875137 Date Collected: 03/01/00 Matrix: Water
Client Sample ID: MW-28 Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
GC Volatiles								
Purgeable Aromatics		Method: EPA 602			Prep Method: EPA 602			
m&p-Xylene	ND	ug/l	1	1.00	03/08/00	KST	7816-60-0	
1-Chloro-3-fluorobenzene (S)	89	%		1.00	03/08/00	KST	625-98-9	

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92875145 | Date Collected: 03/01/00 | Matrix: Water
Client Sample ID: MW-30 | Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
GC Volatiles								
Purgeable Aromatics		Method: EPA 602			Prep Method: EPA 602			
m&p-Xylene	ND	ug/l	1	1.00	03/08/00	KST	7816-60-0	
1-Chloro-3-fluorobenzene (S)	90	%		1.00	03/08/00	KST	625-98-9	

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92875152 Date Collected: 02/25/00 Matrix: Water
Client Sample ID: MW-31 Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
GC Volatiles								
Purgeable Aromatics	Method: EPA 602				Prep Method: EPA 602			
m&p-Xylene	44000	ug/l	1000	1000	03/08/00	KST	7816-60-0	
1-Chloro-3-fluorobenzene (S)	85	%		1.00	03/08/00	KST	625-98-9	

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92875160 | Date Collected: 02/25/00 | Matrix: Water
Client Sample ID: MW-32 | Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
GC Volatiles								
Purgeable Aromatics	Method: EPA 602				Prep Method: EPA 602			
m&p-Xylene	91000	ug/l	1000	1000	03/04/00	KST	7816-60-0	
1-Chloro-3-fluorobenzene (S)	78	%		1.00	03/04/00	KST	625-98-9	

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92875178 | Date Collected: 02/25/00 | Matrix: Water
Client Sample ID: MW-33 | Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
GC Volatiles								
Purgeable Aromatics	Method: EPA 602				Prep Method: EPA 602			
m&p-Xylene	69000	ug/l	1000	1000	03/04/00	KST	7816-60-0	
1-Chloro-3-fluorobenzene (S)	78	%		1.00	03/04/00	KST	625-98-9	

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92875186 Date Collected: 02/29/00 Matrix: Water
Client Sample ID: 102 Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
GC Volatiles								
Purgeable Aromatics	Method: EPA 602				Prep Method: EPA 602			
m&p-Xylene	1300	ug/l	50	50.0	03/07/00	KST	7816-60-0	
1-Chloro-3-fluorobenzene (S)	79	%		1.00	03/07/00	KST	625-98-9	

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92875194 Date Collected: 03/01/00 Matrix: Water
Client Sample ID: 106 Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
GC Volatiles								
Purgeable Aromatics	Method: EPA 602				Prep Method: EPA 602			
m&p-Xylene	130000	ug/l	1000	1000	03/08/00	KST	7816-60-0	
1-Chloro-3-fluorobenzene (S)	101	%		1.00	03/08/00	KST	625-98-9	

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92875202 Date Collected: 02/29/00 Matrix: Water
Client Sample ID: 113 Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
GC Volatiles								
Purgeable Aromatics	Method: EPA 602				Prep Method: EPA 602			
m&p-Xylene	370	ug/l	10	10.0	03/07/00	KST	7816-60-0	
1-Chloro-3-fluorobenzene (S)	79	%		1.00	03/07/00	KST	625-98-9	

Laboratory Certification IDs
NC Wastewater 12
NC Drinking Water 37706
SC 99006

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92875210 Date Collected: 02/29/00 Matrix: Water
Client Sample ID: 117 Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
GC Volatiles								
Purgeable Aromatics	Method: EPA 602				Prep Method: EPA 602			
m&p-Xylene	78000	ug/l	5000	5000	03/07/00	KST	7816-60-0	
1-Chloro-3-fluorobenzene (S)	79	%		1.00	03/07/00	KST	625-98-9	

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92875228 Date Collected: 02/29/00 Matrix: Water
Client Sample ID: 119 Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
GC Volatiles								
Purgeable Aromatics	Method: EPA 602				Prep Method: EPA 602			
m&p-Xylene	4900	ug/l	100	100	03/07/00	KST	7816-60-0	
1-Chloro-3-fluorobenzene (S)	96	%		1.00	03/07/00	KST	625-98-9	

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92875236 Date Collected: 03/01/00 Matrix: Water
Client Sample ID: 121 Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
GC Volatiles								
Purgeable Aromatics	Method: EPA 602				Prep Method: EPA 602			
m&p-Xylene	180000	ug/l	5000	5000	03/08/00	KST	7816-60-0	
1-Chloro-3-fluorobenzene (S)	91	%		1.00	03/08/00	KST	625-98-9	

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92875244 | Date Collected: 02/29/00 | Matrix: Water
Client Sample ID: TMW-1 | Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
GC Volatiles								
Purgeable Aromatics		Method: EPA 602			Prep Method: EPA 602			
m&p-Xylene	300	ug/l	10	10.0	03/09/00	KST	7816-60-0	
1-Chloro-3-fluorobenzene (S)	78	%		1.00	03/09/00	KST	625-98-9	

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92875251 | Date Collected: 02/29/00 | Matrix: Water
Client Sample ID: TMW-2 | Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
GC Volatiles								
Purgeable Aromatics	Method: EPA 602				Prep Method: EPA 602			
m&p-Xylene	4.2	ug/l	1	1.00	03/08/00	KST	7816-60-0	
1-Chloro-3-fluorobenzene (S)	77	%		1.00	03/08/00	KST	625-98-9	

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92875269 Date Collected: 03/01/00 Matrix: Water
Client Sample ID: RW-2 Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
GC Volatiles								
Purgeable Aromatics	Method: EPA 602				Prep Method: EPA 602			
m&p-Xylene	26000	ug/l	200	200	03/08/00	KST	7816-60-0	
1-Chloro-3-fluorobenzene (S)	84	%		1.00	03/08/00	KST	625-98-9	

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92875277 Date Collected: 02/29/00 Matrix: Water
Client Sample ID: KRW-3 Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
GC Volatiles								
Purgeable Aromatics	Method: EPA 602				Prep Method: EPA 602			
m&p-Xylene	17000	ug/l	1000	1000	03/08/00	KST	7816-60-0	
1-Chloro-3-fluorobenzene (S)	77	%		1.00	03/08/00	KST	625-98-9	

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92875285 Date Collected: 02/29/00 Matrix: Water
Client Sample ID: KRW-4 Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
GC Volatiles								
Purgeable Aromatics	Method: EPA 602				Prep Method: EPA 602			
m&p-Xylene	61000	ug/l	500	500	03/08/00	KST	7816-60-0	
1-Chloro-3-fluorobenzene (S)	78	%		1.00	03/08/00	KST	625-98-9	

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NC Drinking Water 37706
SC 99006

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Pace Project Number: 9212328
Client Project ID: Koch North

Pace Sample No: 92875293 Date Collected: 02/29/00 Matrix: Water
Client Sample ID: KRW-5 Date Received: 03/02/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
GC Volatiles								
Purgeable Aromatics	Method: EPA 602				Prep Method: EPA 602			
m&p-Xylene	150000	ug/l	5000	5000	03/08/00	KST	7816-60-0	
1-Chloro-3-fluorobenzene (S)	78	%		1.00	03/08/00	KST	625-98-9	

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Pace Project Number: 9212328
Client Project ID: Koch North

PARAMETER FOOTNOTES

ND	Not Detected
NC	Not Calculable
PRL	Pace Reporting Limit
(S)	Surrogate
App. DF	Applied Dilution Factor
[1]	Compound concentration exceeds the calibration range of the instrument (CLP E-Flag).
[2]	Spike and/or surrogate recoveries could not be calculated due to sample dilution.
[3]	Common laboratory contaminant.

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QUALITY CONTROL DATA

DATE: 04/13/00

Catlin Engineers & Scientist
220 Old Dairy Road
P.O. Box 10279
Wilmington, NC 28405

Pace Project Number: 9212328
Client Project ID: Koch North

Attn: Mr. Steve Tyler
Phone: (910)452-5861

QC Batch ID: 23002
QC Batch Method: EPA 8260
Analysis Method: EPA 8260
Analysis Description: GC/MS VOCs by 8260
Associated Pace Samples: 92874726 92874759 92874767 92874825

METHOD BLANK: 92889039
Associated Pace Samples:
92874726 92874759 92874767 92874825

Parameter	Units	Method Blank Result	PRL	Footnotes
Dichlorodifluoromethane	ug/kg	ND	500	
Chloromethane	ug/kg	ND	500	
Vinyl Chloride	ug/kg	ND	500	
Bromomethane	ug/kg	ND	500	
Chloroethane	ug/kg	ND	500	
Trichlorofluoromethane	ug/kg	ND	250	
1,1-Dichloroethene	ug/kg	ND	250	
Methylene Chloride	ug/kg	ND	250	
trans-1,2-Dichloroethene	ug/kg	ND	250	
1,1-Dichloroethane	ug/kg	ND	250	
cis-1,2-Dichloroethene	ug/kg	ND	250	
2,2-Dichloropropane	ug/kg	ND	250	
Chloroform	ug/kg	ND	250	
Bromochloromethane	ug/kg	ND	250	
1,1,1-Trichloroethane	ug/kg	ND	250	
1,1-Dichloropropene	ug/kg	ND	250	
1,2-Dichloroethane	ug/kg	ND	250	
Carbon Tetrachloride	ug/kg	ND	250	
Benzene	ug/kg	ND	250	
Trichloroethene	ug/kg	ND	250	
1,2-Dichloropropane	ug/kg	ND	250	
Dibromomethane	ug/kg	ND	250	
Bromodichloromethane	ug/kg	ND	250	
Toluene	ug/kg	ND	250	
1,1,2-Trichloroethane	ug/kg	ND	250	

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QUALITY CONTROL DATA

Pace Project Number: 9212328
Client Project ID: Koch North

METHOD BLANK: 92889039
Associated Pace Samples:

	92874726	92874759	92874767	92874825
Parameter	Units	Method Blank Result	PRL	Footnotes
1,3-Dichloropropane	ug/kg	ND	250	
Dibromochloromethane	ug/kg	ND	250	
Tetrachloroethene	ug/kg	ND	250	
1,2-Dibromoethane	ug/kg	ND	250	
Chlorobenzene	ug/kg	ND	250	
1,1,1,2-Tetrachloroethane	ug/kg	ND	250	
Ethylbenzene	ug/kg	ND	250	
m&p-Xylene	ug/kg	ND	500	
Styrene	ug/kg	ND	250	
o-Xylene (1,2-Dimethylbenzene)	ug/kg	ND	250	
Bromoform	ug/kg	ND	250	
1,1,2,2-Tetrachloroethane	ug/kg	ND	250	
Isopropylbenzene (Cumene)	ug/kg	ND	250	
1,2,3-Trichloropropane	ug/kg	ND	250	
Bromobenzene	ug/kg	ND	250	
n-Propylbenzene	ug/kg	ND	250	
2-Chlorotoluene	ug/kg	ND	250	
4-Chlorotoluene	ug/kg	ND	250	
1,3,5-Trimethylbenzene	ug/kg	ND	250	
tert-Butylbenzene	ug/kg	ND	250	
1,2,4-Trimethylbenzene	ug/kg	ND	250	
sec-Butylbenzene	ug/kg	ND	250	
1,3-Dichlorobenzene	ug/kg	ND	250	
p-Isopropyltoluene	ug/kg	ND	250	
1,4-Dichlorobenzene	ug/kg	ND	250	
1,2-Dichlorobenzene	ug/kg	ND	250	
n-Butylbenzene	ug/kg	ND	250	
1,2-Dibromo-3-Chloropropane	ug/kg	ND	250	
1,2,4-Trichlorobenzene	ug/kg	ND	250	
Naphthalene	ug/kg	ND	250	
Hexachlorobutadiene	ug/kg	ND	250	
1,2,3-Trichlorobenzene	ug/kg	ND	250	
Dibromofluoromethane (S)	%	95		
1,2-Dichloroethane-d4 (S)	%	93		
Toluene-d8 (S)	%	101		
4-Bromofluorobenzene (S)	%	98		

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QUALITY CONTROL DATA

Pace Project Number: 9212328
Client Project ID: Koch North

MATRIX SPIKE: 92880897

Parameter	Units	92860352	Spike Conc.	Matrix Spike Result	Spike % Rec	Footnotes
1,1-Dichloroethene	ug/kg	0	2672	2858	107	
Benzene	ug/kg	0	2672	3060	114	
Trichloroethene	ug/kg	0	2672	3003	112	
Toluene	ug/kg	0	2672	2914	109	
Chlorobenzene	ug/kg	0	2672	2899	108	
Dibromofluoromethane (S)					85	
1,2-Dichloroethane-d4 (S)					84	
Toluene-d8 (S)					86	
4-Bromofluorobenzene (S)					80	

LABORATORY CONTROL SAMPLE: 92880376

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	Footnotes
Dichlorodifluoromethane	ug/kg	2500	1308	52.3	
Chloromethane	ug/kg	2500	1667	66.7	
Vinyl Chloride	ug/kg	2500	2133	85.3	
Bromomethane	ug/kg	2500	260.1	10.4	1
Chloroethane	ug/kg	2500	902.2	36.1	1
Trichlorofluoromethane	ug/kg	2500	2266	90.6	
1,1-Dichloroethene	ug/kg	2500	2828	113	
Methylene Chloride	ug/kg	2500	3004	120	
trans-1,2-Dichloroethene	ug/kg	2500	2821	113	
1,1-Dichloroethane	ug/kg	2500	2947	118	
cis-1,2-Dichloroethene	ug/kg	2500	2958	118	
2,2-Dichloropropane	ug/kg	2500	2886	115	
Chloroform	ug/kg	2500	2931	117	
Bromochloromethane	ug/kg	2500	2791	112	
1,1,1-Trichloroethane	ug/kg	2500	2848	114	
1,1-Dichloropropene	ug/kg	2500	2837	113	
1,2-Dichloroethane	ug/kg	2500	2693	108	
Carbon Tetrachloride	ug/kg	2500	2974	119	
Benzene	ug/kg	2500	3028	121	
Trichloroethene	ug/kg	2500	2951	118	
1,2-Dichloropropane	ug/kg	2500	2854	114	
Dibromomethane	ug/kg	2500	2759	110	
Bromodichloromethane	ug/kg	2500	2881	115	
Toluene	ug/kg	2500	2847	114	
1,1,2-Trichloroethane	ug/kg	2500	2457	98.3	
1,3-Dichloropropane	ug/kg	2500	2741	110	

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QUALITY CONTROL DATA

Pace Project Number: 9212328
Client Project ID: Koch North

LABORATORY CONTROL SAMPLE: 92880376

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	Footnotes
Dibromochloromethane	ug/kg	2500	2842	114	
Tetrachloroethene	ug/kg	2500	4938	198	1
1,2-Dibromoethane	ug/kg	2500	2645	106	
Chlorobenzene	ug/kg	2500	2899	116	
1,1,1,2-Tetrachloroethane	ug/kg	2500	2841	114	
Ethylbenzene	ug/kg	2500	2901	116	
m&p-Xylene	ug/kg	5000	5601	112	
Styrene	ug/kg	2500	2848	114	
o-Xylene (1,2-Dimethylbenzene)	ug/kg	2500	2846	114	
Bromoform	ug/kg	2500	2730	109	
1,1,2,2-Tetrachloroethane	ug/kg	2500	2364	94.5	
Isopropylbenzene (Cumene)	ug/kg	2500	2658	106	
1,2,3-Trichloropropane	ug/kg	2500	2495	99.8	
Bromobenzene	ug/kg	2500	3329	133	1
n-Propylbenzene	ug/kg	2500	2891	116	
2-Chlorotoluene	ug/kg	2500	2979	119	
4-Chlorotoluene	ug/kg	2500	2981	119	
1,3,5-Trimethylbenzene	ug/kg	2500	2903	116	
tert-Butylbenzene	ug/kg	2500	2884	115	1
1,2,4-Trimethylbenzene	ug/kg	2500	2787	111	
sec-Butylbenzene	ug/kg	2500	2698	108	
1,3-Dichlorobenzene	ug/kg	2500	2963	119	
p-Isopropyltoluene	ug/kg	2500	2546	102	
1,4-Dichlorobenzene	ug/kg	2500	2931	117	
1,2-Dichlorobenzene	ug/kg	2500	2973	119	
n-Butylbenzene	ug/kg	2500	2326	93.1	
1,2-Dibromo-3-Chloropropane	ug/kg	2500	2611	104	
1,2,4-Trichlorobenzene	ug/kg	2500	2856	114	
Naphthalene	ug/kg	2500	3736	149	1
Hexachlorobutadiene	ug/kg	2500	1931	77.2	
1,2,3-Trichlorobenzene	ug/kg	2500	2975	119	
Dibromofluoromethane (S)				98	
1,2-Dichloroethane-d4 (S)				96	
Toluene-d8 (S)				93	
4-Bromofluorobenzene (S)				92	

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QUALITY CONTROL DATA

Pace Project Number: 9212328
Client Project ID: Koch North

SAMPLE DUPLICATE: 92881416

Parameter	Units	92860311	Dup. Result	RPD	Footnotes
Dichlorodifluoromethane	ug/kg	ND	ND	NC	
Chloromethane	ug/kg	ND	ND	NC	
Vinyl Chloride	ug/kg	ND	ND	NC	
Bromomethane	ug/kg	ND	ND	NC	
Chloroethane	ug/kg	ND	ND	NC	
Trichlorofluoromethane	ug/kg	ND	ND	NC	
1,1-Dichloroethene	ug/kg	ND	ND	NC	
Methylene Chloride	ug/kg	ND	ND	NC	
trans-1,2-Dichloroethene	ug/kg	ND	ND	NC	
1,1-Dichloroethane	ug/kg	ND	ND	NC	
cis-1,2-Dichloroethene	ug/kg	ND	ND	NC	
2,2-Dichloropropane	ug/kg	ND	ND	NC	
Chloroform	ug/kg	ND	ND	NC	
Bromochloromethane	ug/kg	ND	ND	NC	
1,1,1-Trichloroethane	ug/kg	ND	ND	NC	
1,1-Dichloropropene	ug/kg	ND	ND	NC	
1,2-Dichloroethane	ug/kg	ND	ND	NC	
Carbon Tetrachloride	ug/kg	ND	ND	NC	
Benzene	ug/kg	ND	ND	NC	
Trichloroethene	ug/kg	ND	ND	NC	
1,2-Dichloropropane	ug/kg	ND	ND	NC	
Dibromomethane	ug/kg	ND	ND	NC	
Bromodichloromethane	ug/kg	ND	ND	NC	
Toluene	ug/kg	1400	1500	7	
1,1,2-Trichloroethane	ug/kg	ND	ND	NC	
1,3-Dichloropropane	ug/kg	ND	ND	NC	
Dibromochloromethane	ug/kg	ND	ND	NC	
Tetrachloroethene	ug/kg	ND	ND	NC	
1,2-Dibromoethane	ug/kg	ND	ND	NC	
Chlorobenzene	ug/kg	ND	ND	NC	
1,1,1,2-Tetrachloroethane	ug/kg	ND	ND	NC	
Ethylbenzene	ug/kg	5100	5500	9	
m&p-Xylene	ug/kg	21000	23000	8	
Styrene	ug/kg	ND	ND	NC	
o-Xylene (1,2-Dimethylbenzene)	ug/kg	11000	12000	8	
Bromoform	ug/kg	ND	ND	NC	
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND	NC	
Isopropylbenzene (Cumene)	ug/kg	980.0	1100	7	
1,2,3-Trichloropropane	ug/kg	ND	ND	NC	
Bromobenzene	ug/kg	ND	ND	NC	
n-Propylbenzene	ug/kg	4600	5300	15	

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QUALITY CONTROL DATA

Pace Project Number: 9212328
Client Project ID: Koch North

SAMPLE DUPLICATE: 92881416

Parameter	Units	92860311	Dup. Result	RPD	Footnotes
2-Chlorotoluene	ug/kg	ND	ND	NC	
4-Chlorotoluene	ug/kg	ND	ND	NC	
1,3,5-Trimethylbenzene	ug/kg	8900	9900	11	
tert-Butylbenzene	ug/kg	ND	ND	NC	
1,2,4-Trimethylbenzene	ug/kg	37000	30000	19	2
sec-Butylbenzene	ug/kg	530.0	590.0	11	
1,3-Dichlorobenzene	ug/kg	ND	ND	NC	
p-Isopropyltoluene	ug/kg	300.0	350.0	15	
1,4-Dichlorobenzene	ug/kg	ND	ND	NC	
1,2-Dichlorobenzene	ug/kg	ND	ND	NC	
n-Butylbenzene	ug/kg	1200	1200	4	
1,2-Dibromo-3-Chloropropane	ug/kg	ND	ND	NC	
1,2,4-Trichlorobenzene	ug/kg	ND	ND	NC	
Naphthalene	ug/kg	4500	4600	3	
Hexachlorobutadiene	ug/kg	ND	ND	NC	
1,2,3-Trichlorobenzene	ug/kg	ND	ND	NC	
Dibromofluoromethane (S)	%	83	84	0	
1,2-Dichloroethane-d4 (S)	%	80	82	0	
Toluene-d8 (S)	%	80	80	0	3
4-Bromofluorobenzene (S)	%	78	76	0	

SAMPLE DUPLICATE: 92881424

Parameter	Units	92860295	Dup. Result	RPD	Footnotes
Dichlorodifluoromethane	ug/kg	ND	ND	NC	
Chloromethane	ug/kg	ND	ND	NC	
Vinyl Chloride	ug/kg	ND	ND	NC	
Bromomethane	ug/kg	ND	ND	NC	
Chloroethane	ug/kg	ND	ND	NC	
Trichlorofluoromethane	ug/kg	ND	ND	NC	
1,1-Dichloroethene	ug/kg	ND	ND	NC	
Methylene Chloride	ug/kg	ND	ND	NC	
trans-1,2-Dichloroethene	ug/kg	ND	ND	NC	
1,1-Dichloroethane	ug/kg	ND	ND	NC	
cis-1,2-Dichloroethene	ug/kg	ND	ND	NC	
2,2-Dichloropropane	ug/kg	ND	ND	NC	
Chloroform	ug/kg	ND	ND	NC	
Bromochloromethane	ug/kg	ND	ND	NC	
1,1,1-Trichloroethane	ug/kg	ND	ND	NC	

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QUALITY CONTROL DATA

Pace Project Number: 9212328
Client Project ID: Koch North

SAMPLE DUPLICATE: 92881424

Parameter	Units	92860295	Dup. Result	RPD	Footnotes
1,1-Dichloropropene	ug/kg	ND	ND	NC	
1,2-Dichloroethane	ug/kg	ND	ND	NC	
Carbon Tetrachloride	ug/kg	ND	ND	NC	
Benzene	ug/kg	ND	ND	NC	
Trichloroethene	ug/kg	ND	ND	NC	
1,2-Dichloropropane	ug/kg	ND	ND	NC	
Dibromomethane	ug/kg	ND	ND	NC	
Bromodichloromethane	ug/kg	ND	ND	NC	
Toluene	ug/kg	11000	12000	3	
1,1,2-Trichloroethane	ug/kg	ND	ND	NC	
1,3-Dichloropropane	ug/kg	ND	ND	NC	
Dibromochloromethane	ug/kg	ND	ND	NC	
Tetrachloroethene	ug/kg	ND	ND	NC	
1,2-Dibromoethane	ug/kg	ND	ND	NC	
Chlorobenzene	ug/kg	ND	ND	NC	
1,1,1,2-Tetrachloroethane	ug/kg	ND	ND	NC	
Ethylbenzene	ug/kg	18000	14000	27	2,4
m&p-Xylene	ug/kg	79000	54000	38	2,4
Styrene	ug/kg	ND	ND	NC	
o-Xylene (1,2-Dimethylbenzene)	ug/kg	38000	28000	30	2,4
Bromoform	ug/kg	ND	ND	NC	
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND	NC	
Isopropylbenzene (Cumene)	ug/kg	1900	2200	13	
1,2,3-Trichloropropane	ug/kg	ND	ND	NC	
Bromobenzene	ug/kg	ND	ND	NC	
n-Propylbenzene	ug/kg	9100	10000	10	
2-Chlorotoluene	ug/kg	ND	ND	NC	
4-Chlorotoluene	ug/kg	ND	ND	NC	
1,3,5-Trimethylbenzene	ug/kg	33000	24000	33	2,4
tert-Butylbenzene	ug/kg	ND	ND	NC	
1,2,4-Trimethylbenzene	ug/kg	91000	69000	28	2,4
sec-Butylbenzene	ug/kg	1200	1400	16	
1,3-Dichlorobenzene	ug/kg	ND	ND	NC	
p-Isopropyltoluene	ug/kg	770.0	900.0	16	
1,4-Dichlorobenzene	ug/kg	ND	ND	NC	
1,2-Dichlorobenzene	ug/kg	ND	ND	NC	
n-Butylbenzene	ug/kg	3200	4100	27	4
1,2-Dibromo-3-Chloropropane	ug/kg	ND	ND	NC	
1,2,4-Trichlorobenzene	ug/kg	ND	ND	NC	
Naphthalene	ug/kg	16000	17000	5	2
Hexachlorobutadiene	ug/kg	ND	ND	NC	

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QUALITY CONTROL DATA

Pace Project Number: 9212328
Client Project ID: Koch North

SAMPLE DUPLICATE: 92881424

Parameter	Units	92860295	Dup. Result	RPD	Footnotes
1,2,3-Trichlorobenzene	ug/kg	ND	ND	NC	
Dibromofluoromethane (S)	%	87	80	0	1
1,2-Dichloroethane-d4 (S)	%	87	78	0	1
Toluene-d8 (S)	%	86	85	0	
4-Bromofluorobenzene (S)	%	85	82	0	

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QUALITY CONTROL DATA

DATE: 04/13/00

Catlin Engineers & Scientist
220 Old Dairy Road
P.O. Box 10279
Wilmington, NC 28405

Pace Project Number: 9212328
Client Project ID: Koch North

Attn: Mr. Steve Tyler
Phone: (910)452-5861

QC Batch ID: 23069
Analysis Method: EPA 8260
Associated Pace Samples: 92874833 92874841

QC Batch Method: EPA 8260
Analysis Description: GC/MS VOCs by 8260, low level

METHOD BLANK: 92885276
Associated Pace Samples:
92874833 92874841

Parameter	Units	Method Blank Result	PRL	Footnotes
m&p-Xylene	ug/kg	ND	10	
Dibromofluoromethane (S)	%	96		
1,2-Dichloroethane-d4 (S)	%	92		
Toluene-d8 (S)	%	99		
4-Bromofluorobenzene (S)	%	97		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 92885284 92885292

Parameter	Units	92876697	Spike Conc.	Matrix Spike Result	Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Footnotes
Dibromofluoromethane (S)					99		99		
1,2-Dichloroethane-d4 (S)					100		99		
Toluene-d8 (S)					99		100		
4-Bromofluorobenzene (S)					98		97		

LABORATORY CONTROL SAMPLE: 92859479

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	Footnotes
m&p-Xylene	ug/kg	100	98.98	99.0	
Dibromofluoromethane (S)				94	
1,2-Dichloroethane-d4 (S)				94	
Toluene-d8 (S)				101	

Laboratory Certification IDs
NC Wastewater 12
NC Drinking Water 37706
SC 99006

REPORT OF LABORATORY ANALYSIS

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Laboratory Certification IDs
KY Drinking Water 90090
TN UST List
VA Drinking Water 213

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QUALITY CONTROL DATA

Pace Project Number: 9212328
Client Project ID: Koch North

LABORATORY CONTROL SAMPLE: 92859479

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	Footnotes
4-Bromofluorobenzene (S)				101	

LABORATORY CONTROL SAMPLE: 92882992

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	Footnotes
m&p-Xylene	ug/kg	100	120.8	121	
Dibromofluoromethane (S)				95	
1,2-Dichloroethane-d4 (S)				92	
Toluene-d8 (S)				100	
4-Bromofluorobenzene (S)				97	

SAMPLE DUPLICATE: 92860873

Parameter	Units	92839935	Dup. Result	RPD	Footnotes
m&p-Xylene	ug/kg	ND	ND	NC	
Dibromofluoromethane (S)	%	84	78	0	1
1,2-Dichloroethane-d4 (S)	%	77	71	0	1
Toluene-d8 (S)	%	100	98	0	
4-Bromofluorobenzene (S)	%	95	94	0	

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QUALITY CONTROL DATA

DATE: 04/13/00

Catlin Engineers & Scientist
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Wilmington, NC 28405

Pace Project Number: 9212328
Client Project ID: Koch North

Attn: Mr. Steve Tyler
Phone: (910)452-5861

QC Batch ID: 23518
Analysis Method: EPA 602
Associated Pace Samples: 92875160 92875178

QC Batch Method: EPA 602
Analysis Description: Purgeable Aromatics

METHOD BLANK: 92876150
Associated Pace Samples:
92875160 92875178

Parameter	Units	Method Blank Result	PRL	Footnotes
m&p-Xylene	ug/l	ND	1	
1-Chloro-3-fluorobenzene (S)	%	92		

LABORATORY CONTROL SAMPLE: 92876168

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	Footnotes
m&p-Xylene	ug/l	40	37.53	93.8	
1-Chloro-3-fluorobenzene (S)				86	

Laboratory Certification IDs
NC Wastewater 12
NC Drinking Water 37706
SC 99006

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Laboratory Certification IDs
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TN UST List
VA Drinking Water 213

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QUALITY CONTROL DATA

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Pace Project Number: 9212328
Client Project ID: Koch North

Attn: Mr. Steve Tyler
Phone: (910)452-5861

QC Batch ID: 23535
Analysis Method: % Moisture
Associated Pace Samples:

QC Batch Method:
Analysis Description: Percent Moisture

	92874676	92874692	92874700	92874718	92874726
	92874734	92874742	92874759	92874767	92874775
	92874783	92874791	92874825	92874833	92874841

SAMPLE DUPLICATE: 92876580

Parameter	Units	92874676	Dup. Result	RPD	Footnotes
Percent Moisture	%	10.30	10.30	0	

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QUALITY CONTROL DATA

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Pace Project Number: 9212328
Client Project ID: Koch North

Attn: Mr. Steve Tyler
Phone: (910)452-5861

QC Batch ID: 23543
Analysis Method: EPA 8260
Associated Pace Samples: 92874676 92874692 92874700 92874718 92874734 92874742 92874775 92874783

QC Batch Method: EPA 8260
Analysis Description: GC/MS VOCs by 8260, low level

METHOD BLANK: 92880343
Associated Pace Samples: 92874676 92874692 92874700

Parameter	Units	Method Blank Result	PRL	Footnotes
m&p-Xylene	ug/kg	ND	10	
Dibromofluoromethane (S)	%	100		
1,2-Dichloroethane-d4 (S)	%	102		
Toluene-d8 (S)	%	99		
4-Bromofluorobenzene (S)	%	101		

METHOD BLANK: 92880350
Associated Pace Samples: 92874718 92874734 92874742 92874775 92874783

Parameter	Units	Method Blank Result	PRL	Footnotes
m&p-Xylene	ug/kg	ND	10	
Dibromofluoromethane (S)	%	101		
1,2-Dichloroethane-d4 (S)	%	104		
Toluene-d8 (S)	%	100		
4-Bromofluorobenzene (S)	%	101		

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QUALITY CONTROL DATA

Pace Project Number: 9212328
Client Project ID: Koch North

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 92885664 92885672

Parameter	Units	92876705	Spike Conc.	Matrix Spike Result	Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Footnotes
Dibromofluoromethane (S)					100		99		
1,2-Dichloroethane-d4 (S)					100		98		
Toluene-d8 (S)					98		99		
4-Bromofluorobenzene (S)					96		98		

LABORATORY CONTROL SAMPLE: 92877364

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	Footnotes
m&p-Xylene	ug/kg	100	111.0	111	
Dibromofluoromethane (S)				101	
1,2-Dichloroethane-d4 (S)				101	
Toluene-d8 (S)				100	
4-Bromofluorobenzene (S)				99	

SAMPLE DUPLICATE: 92877372

Parameter	Units	92860303	Dup. Result	RPD	Footnotes
m&p-Xylene	ug/kg	46.00	40.00	14	
Dibromofluoromethane (S)	%	111	116	0	
1,2-Dichloroethane-d4 (S)	%	114	118	0	
Toluene-d8 (S)	%	82	80	0	1
4-Bromofluorobenzene (S)	%	74	72	0	1

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QUALITY CONTROL DATA

Catlin Engineers & Scientist
220 Old Dairy Road
P.O. Box 10279
Wilmington, NC 28405

Pace Project Number: 9212328
Client Project ID: Koch North

Attn: Mr. Steve Tyler
Phone: (910)452-5861

QC Batch ID: 23557
Analysis Method: EPA 602
Associated Pace Samples: 92874858 92874866

QC Batch Method: EPA 602
Analysis Description: Purgeable Aromatics

METHOD BLANK: 92878727
Associated Pace Samples:
92874858 92874866

Parameter	Units	Method Blank Result	PRL	Footnotes
m&p-Xylene	ug/l	ND	1	
1-Chloro-3-fluorobenzene (S)	%	92		

LABORATORY CONTROL SAMPLE: 92878735

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	Footnotes
m&p-Xylene	ug/l	40	33.05	82.6	
1-Chloro-3-fluorobenzene (S)				77	

SAMPLE DUPLICATE: 92878743

Parameter	Units	92872746	Dup. Result	RPD	Footnotes
m&p-Xylene	ug/l	ND	ND	NC	
1-Chloro-3-fluorobenzene (S)	%	85	93	0	

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QUALITY CONTROL DATA

Catlin Engineers & Scientist
220 Old Dairy Road
P.O. Box 10279
Wilmington, NC 28405

Pace Project Number: 9212328
Client Project ID: Koch North

Attn: Mr. Steve Tyler
Phone: (910)452-5861

QC Batch ID: 23615
Analysis Method: EPA 602
Associated Pace Samples: 92874940, 92874957, 92874965, 92875004, 92875012, 92875020, 92875038, 92875046, 92875053, 92875061, 92875079, 92875087, 92875095, 92875103, 92875111, 92875186, 92875202, 92875210, 92875228

QC Batch Method: EPA 602
Analysis Description: Purgeable Aromatics

METHOD BLANK: 92881671
Associated Pace Samples:
92874940, 92874957, 92874965, 92875004, 92875012, 92875020, 92875038, 92875046, 92875053, 92875061, 92875079, 92875087, 92875095, 92875103, 92875111, 92875186, 92875202, 92875210, 92875228

Parameter	Units	Method Blank Result	PRL	Footnotes
m&p-Xylene	ug/l	ND	1	
1-Chloro-3-fluorobenzene (S)	%	98		

LABORATORY CONTROL SAMPLE: 92881689

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	Footnotes
m&p-Xylene	ug/l	40	40.41	101	
1-Chloro-3-fluorobenzene (S)				86	

SAMPLE DUPLICATE: 92881762

Parameter	Units	92875228	Dup. Result	RPD	Footnotes
m&p-Xylene	ug/l	4900	4900	0	
1-Chloro-3-fluorobenzene (S)	%	96	94	0	

Laboratory Certification IDs
NC Wastewater 12
NC Drinking Water 37706
SC 99006

REPORT OF LABORATORY ANALYSIS

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Laboratory Certification IDs
KY Drinking Water 90090
TN UST List
VA Drinking Water 213

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QUALITY CONTROL DATA

DATE: 04/13/00

Catlin Engineers & Scientist
220 Old Dairy Road
P.O. Box 10279
Wilmington, NC 28405

Pace Project Number: 9212328
Client Project ID: Koch North

Attn: Mr. Steve Tyler
Phone: (910)452-5861

QC Batch ID: 23666
QC Batch Method: EPA 602
Analysis Method: EPA 602
Analysis Description: Purgeable Aromatics
Associated Pace Samples: 92875129 92875137 92875145 92875152 92875244 92875251 92875277 92875285 92875293

METHOD BLANK: 92883651
Associated Pace Samples:
92875129 92875137 92875145 92875152 92875244 92875251 92875277 92875285 92875293

Parameter	Units	Method Blank Result	PRL	Footnotes
m&p-Xylene	ug/l	ND	1	
1-Chloro-3-fluorobenzene (S)	%	80		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 92883701 92883719

Parameter	Units	92875145	Spike Conc.	Matrix Spike Result	Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Footnotes
m&p-Xylene	ug/l	0	40	40.15	100	41.32	103	3	
1-Chloro-3-fluorobenzene (S)					91		87		

LABORATORY CONTROL SAMPLE: 92883669

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	Footnotes
m&p-Xylene	ug/l	40	45.57	114	
1-Chloro-3-fluorobenzene (S)				91	

REPORT OF LABORATORY ANALYSIS

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220 Old Dairy Road
P.O. Box 10279
Wilmington, NC 28405

Pace Project Number: 9212328
Client Project ID: Koch North

Attn: Mr. Steve Tyler
Phone: (910)452-5861

QC Batch ID: 23739
Analysis Method: EPA 8260
Associated Pace Samples: 92874791

QC Batch Method: EPA 8260
Analysis Description: GC/MS VOCs by 8260, low level

METHOD BLANK: 92886035
Associated Pace Samples:
92874791

Parameter	Units	Method Blank Result	PRL	Footnotes
m&p-Xylene	ug/kg	ND	10	
Dibromofluoromethane (S)	%	96		
1,2-Dichloroethane-d4 (S)	%	92		
Toluene-d8 (S)	%	99		
4-Bromofluorobenzene (S)	%	97		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 92890284 92890292

Parameter	Units	92873421	Spike Conc.	Matrix Spike Result	Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Footnotes
Dibromofluoromethane (S)					104		105		
1,2-Dichloroethane-d4 (S)					102		105		
Toluene-d8 (S)					92		89		
4-Bromofluorobenzene (S)					82		79		

LABORATORY CONTROL SAMPLE: 92886027

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	Footnotes
m&p-Xylene	ug/kg	100	106.3	106	
Dibromofluoromethane (S)				100	
1,2-Dichloroethane-d4 (S)				101	
Toluene-d8 (S)				99	

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QUALITY CONTROL DATA

Pace Project Number: 9212328
Client Project ID: Koch North

LABORATORY CONTROL SAMPLE: 92886027

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	Footnotes
4-Bromofluorobenzene (S)				98	

SAMPLE DUPLICATE: 92890276

Parameter	Units	92873413	Dup. Result	RPD	Footnotes
m&p-Xylene	ug/kg	ND	ND	NC	
Dibromofluoromethane (S)	%	100	100	0	
1,2-Dichloroethane-d4 (S)	%	97	101	0	
Toluene-d8 (S)	%	98	97	0	
4-Bromofluorobenzene (S)	%	90	97	0	

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QUALITY CONTROL DATA

Catlin Engineers & Scientist
220 Old Dairy Road
P.O. Box 10279
Wilmington, NC 28405

Pace Project Number: 9212328
Client Project ID: Koch North

Attn: Mr. Steve Tyler
Phone: (910)452-5861

QC Batch ID: 23749
QC Batch Method: EPA 602
Analysis Method: EPA 602
Analysis Description: Purgeable Aromatics
Associated Pace Samples: 92875194 92875236 92875269

METHOD BLANK: 92886951
Associated Pace Samples:
92875194 92875236 92875269

Parameter	Units	Method Blank Result	PRL	Footnotes
m&p-Xylene	ug/l	ND	1	
1-Chloro-3-fluorobenzene (S)	%	84		

LABORATORY CONTROL SAMPLE: 92886969

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	Footnotes
m&p-Xylene	ug/l	40	47.56	119	
1-Chloro-3-fluorobenzene (S)				90	

SAMPLE DUPLICATE: 92886977

Parameter	Units	92878297	Dup. Result	RPD	Footnotes
m&p-Xylene	ug/l	ND	ND	NC	
1-Chloro-3-fluorobenzene (S)	%	84	82	0	

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Pace Project Number: 9212328
Client Project ID: Koch North

QUALITY CONTROL DATA PARAMETER FOOTNOTES

Consistent with EPA guidelines unrounded concentrations are displayed and have been used to calculate % Rec and RPD values.

ND	Not Detected
NC	Not Calculable
PRL	Pace Reporting Limit
RPD	Relative Percent Difference
(S)	Surrogate
[1]	The surrogate and/or spike recovery was outside acceptance limits.
[2]	Compound concentration exceeds the calibration range of the instrument (CLP E-Flag).
[3]	Low surrogate recovery was confirmed as a matrix effect by a second analysis.
[4]	The calculated RPD was outside QC acceptance limits.

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FILE

June 12, 2000

Mr. Steve Tyler
Catlin Engineers & Scientist
220 Old Dairy Road
P.O. Box 10279
Wilmington, NC 28405

RE: Pace Project Number: 9214408
Client Project ID: Koch North

Dear Mr. Tyler:

Enclosed are the results of analyses for sample(s) received by the laboratory on June 1, 2000. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Felicia Grogan

Felicia Grogan
Project Manager

Enclosures

Pace Analytical Services, Inc.
9800 Kincey Avenue, Suite 100
Huntersville, NC 28078
Phone: 704.875.9092
Fax: 704.875.9091

DATE: 06/12/00
PAGE: 1

Catlin Engineers & Scientist
220 Old Dairy Road
P.O. Box 10279
Wilmington, NC 28405

Pace Project Number: 9214408
Client Project ID: Koch North

Attn: Mr. Steve Tyler
Phone: (910)452-5861

Solid results are reported on a dry weight basis

Pace Sample No: 921019931 Date Collected: 05/26/00 Matrix: Soil
Client Sample ID: 601-7 (7-7.5') Date Received: 06/01/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Wet Chemistry								
Percent Moisture		Method: % Moisture			Prep Method:			
Percent Moisture	16.2	%		0.84	06/02/00	YMH		
GC/MS Volatiles								
GC/MS VOCs by 8260		Method: EPA 8260			Prep Method: EPA 8260			
Dichlorodifluoromethane	ND	ug/kg	600000	1000	06/06/00	JRS	75-71-8	
Chloromethane	ND	ug/kg	600000	1000	06/06/00	JRS	74-87-3	
Vinyl Chloride	ND	ug/kg	600000	1000	06/06/00	JRS	75-01-4	
Bromomethane	ND	ug/kg	600000	1000	06/06/00	JRS	74-83-9	
Chloroethane	ND	ug/kg	600000	1000	06/06/00	JRS	75-00-3	
Trichlorofluoromethane	ND	ug/kg	300000	1000	06/06/00	JRS	75-69-4	
1,1-Dichloroethene	ND	ug/kg	300000	1000	06/06/00	JRS	75-35-4	
Methylene Chloride	ND	ug/kg	300000	1000	06/06/00	JRS	75-09-2	
trans-1,2-Dichloroethene	ND	ug/kg	300000	1000	06/06/00	JRS	156-60-5	
1,1-Dichloroethane	ND	ug/kg	300000	1000	06/06/00	JRS	75-34-3	
cis-1,2-Dichloroethene	ND	ug/kg	300000	1000	06/06/00	JRS	156-59-2	
2,2-Dichloropropane	ND	ug/kg	300000	1000	06/06/00	JRS	594-20-7	
Chloroform	ND	ug/kg	300000	1000	06/06/00	JRS	67-66-3	
Bromochloromethane	ND	ug/kg	300000	1000	06/06/00	JRS	74-97-5	
1,1,1-Trichloroethane	ND	ug/kg	300000	1000	06/06/00	JRS	71-55-6	
1,1-Dichloropropene	ND	ug/kg	300000	1000	06/06/00	JRS	563-58-6	
1,2-Dichloroethane	ND	ug/kg	300000	1000	06/06/00	JRS	107-06-2	
Carbon Tetrachloride	ND	ug/kg	300000	1000	06/06/00	JRS	56-23-5	
Benzene	ND	ug/kg	300000	1000	06/06/00	JRS	71-43-2	
Trichloroethene	ND	ug/kg	300000	1000	06/06/00	JRS	79-01-6	
1,2-Dichloropropane	ND	ug/kg	300000	1000	06/06/00	JRS	78-87-5	

Laboratory Certification IDs
NC Wastewater 12
NC Drinking Water 37706
SC 99006

REPORT OF LABORATORY ANALYSIS

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KY Drinking Water 90090
TN UST List
VA Drinking Water 213

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Huntersville, NC 28078
Phone: 704.875.9092
Fax: 704.875.9091

Pace Project Number: 9214408
Client Project ID: Koch North

Pace Sample No: 921019931 | Date Collected: 05/26/00 | Matrix: Soil
Client Sample ID: 601-7 (7-7.5') | Date Received: 06/01/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Dibromomethane	ND	ug/kg	300000	1000	06/06/00	JRS	74-95-3	
Bromodichloromethane	ND	ug/kg	300000	1000	06/06/00	JRS	75-27-4	
Toluene	ND	ug/kg	300000	1000	06/06/00	JRS	108-88-3	
1,1,2-Trichloroethane	ND	ug/kg	300000	1000	06/06/00	JRS	79-00-5	
1,3-Dichloropropane	ND	ug/kg	300000	1000	06/06/00	JRS	142-28-9	
Dibromochloromethane	ND	ug/kg	300000	1000	06/06/00	JRS	124-48-1	
Tetrachloroethene	ND	ug/kg	300000	1000	06/06/00	JRS	127-18-4	
1,2-Dibromoethane	ND	ug/kg	300000	1000	06/06/00	JRS	106-93-4	
Chlorobenzene	ND	ug/kg	300000	1000	06/06/00	JRS	108-90-7	
1,1,1,2-Tetrachloroethane	ND	ug/kg	300000	1000	06/06/00	JRS	630-20-6	
Ethylbenzene	ND	ug/kg	300000	1000	06/06/00	JRS	100-41-4	
m&p-Xylene	10000000	ug/kg	600000	1000	06/06/00	JRS	7816-60-0	
Styrene	ND	ug/kg	300000	1000	06/06/00	JRS	100-42-5	
o-Xylene (1,2-Dimethylbenzene)	ND	ug/kg	300000	1000	06/06/00	JRS	95-47-6	
Bromoform	ND	ug/kg	300000	1000	06/06/00	JRS	75-25-2	
1,1,2,2-Tetrachloroethane	ND	ug/kg	300000	1000	06/06/00	JRS	79-34-5	
Isopropylbenzene (Cumene)	ND	ug/kg	300000	1000	06/06/00	JRS	98-82-8	
1,2,3-Trichloropropane	ND	ug/kg	300000	1000	06/06/00	JRS	96-18-4	
Bromobenzene	ND	ug/kg	300000	1000	06/06/00	JRS	108-86-1	
n-Propylbenzene	ND	ug/kg	300000	1000	06/06/00	JRS	103-65-1	
2-Chlorotoluene	ND	ug/kg	300000	1000	06/06/00	JRS	95-49-8	
4-Chlorotoluene	ND	ug/kg	300000	1000	06/06/00	JRS	106-43-4	
1,3,5-Trimethylbenzene	ND	ug/kg	300000	1000	06/06/00	JRS	108-67-8	
tert-Butylbenzene	ND	ug/kg	300000	1000	06/06/00	JRS	98-06-6	
1,2,4-Trimethylbenzene	ND	ug/kg	300000	1000	06/06/00	JRS	95-63-6	
sec-Butylbenzene	ND	ug/kg	300000	1000	06/06/00	JRS	135-98-8	
1,3-Dichlorobenzene	ND	ug/kg	300000	1000	06/06/00	JRS	541-73-1	
p-Isopropyltoluene	ND	ug/kg	300000	1000	06/06/00	JRS	99-87-6	
1,4-Dichlorobenzene	ND	ug/kg	300000	1000	06/06/00	JRS	106-46-7	
1,2-Dichlorobenzene	ND	ug/kg	300000	1000	06/06/00	JRS	95-50-1	
n-Butylbenzene	ND	ug/kg	300000	1000	06/06/00	JRS	104-51-8	
1,2-Dibromo-3-Chloropropane	ND	ug/kg	300000	1000	06/06/00	JRS	96-12-8	
1,2,4-Trichlorobenzene	ND	ug/kg	300000	1000	06/06/00	JRS	120-82-1	
Naphthalene	ND	ug/kg	300000	1000	06/06/00	JRS	91-20-3	
Hexachlorobutadiene	ND	ug/kg	300000	1000	06/06/00	JRS	87-68-3	
1,2,3-Trichlorobenzene	ND	ug/kg	300000	1000	06/06/00	JRS	87-61-6	
Dibromofluoromethane (S)	0	%		0.84	06/06/00	JRS	1868-53-7	1
1,2-Dichloroethane-d4 (S)	0	%		0.84	06/06/00	JRS	17060-07-0	
Toluene-d8 (S)	0	%		0.84	06/06/00	JRS	2037-26-5	
4-Bromofluorobenzene (S)	0	%		0.84	06/06/00	JRS	460-00-4	

GC/MS Semivolatiles

Laboratory Certification IDs

NC Wastewater	12
NC Drinking Water	37706
SC	99006

REPORT OF LABORATORY ANALYSIS

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KY Drinking Water	90090
TN UST List	
VA Drinking Water	213

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Phone: 704.875.9092
Fax: 704.875.9091

Pace Project Number: 9214408
Client Project ID: Koch North

Pace Sample No: 921019931
Client Sample ID: 601-7 (7-7.5')
Date Collected: 05/26/00
Date Received: 06/01/00
Matrix: Soil

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Semivolatile Organics	Method: EPA 8270				Prep Method: EPA 3550			
bis(2-Chloroethyl)ether	ND	ug/kg	390	1.00	06/08/00	DHJ	111-44-4	
Phenol	ND	ug/kg	390	1.00	06/08/00	DHJ	108-95-2	
2-Chlorophenol	ND	ug/kg	390	1.00	06/08/00	DHJ	95-57-8	
1,3-Dichlorobenzene	ND	ug/kg	390	1.00	06/08/00	DHJ	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	390	1.00	06/08/00	DHJ	106-46-7	
1,2-Dichlorobenzene	ND	ug/kg	390	1.00	06/08/00	DHJ	95-50-1	
Benzyl Alcohol	ND	ug/kg	790	1.00	06/08/00	DHJ	100-51-6	
bis(2-Chloroisopropyl)ether	ND	ug/kg	390	1.00	06/08/00	DHJ	39638-32-9	
2-Methylphenol	ND	ug/kg	390	1.00	06/08/00	DHJ	95-48-7	
Hexachloroethane	ND	ug/kg	390	1.00	06/08/00	DHJ	67-72-1	
N-Nitroso-di-n-propylamine	ND	ug/kg	390	1.00	06/08/00	DHJ	621-64-7	
3&4-Methylphenol	ND	ug/kg	390	1.00	06/08/00	DHJ		
Nitrobenzene	ND	ug/kg	390	1.00	06/08/00	DHJ	98-95-3	
Isophorone	ND	ug/kg	390	1.00	06/08/00	DHJ	78-59-1	
2-Nitrophenol	ND	ug/kg	390	1.00	06/08/00	DHJ	88-75-5	
2,4-Dimethylphenol	ND	ug/kg	390	1.00	06/08/00	DHJ	105-67-9	
bis(2-Chloroethoxy)methane	ND	ug/kg	390	1.00	06/08/00	DHJ	111-91-1	
Benzoic Acid	ND	ug/kg	2000	1.00	06/08/00	DHJ	65-85-0	
2,4-Dichlorophenol	ND	ug/kg	390	1.00	06/08/00	DHJ	120-83-2	
1,2,4-Trichlorobenzene	ND	ug/kg	390	1.00	06/08/00	DHJ	120-82-1	
Naphthalene	ND	ug/kg	390	1.00	06/08/00	DHJ	91-20-3	
4-Chloroaniline	ND	ug/kg	790	1.00	06/08/00	DHJ	106-47-8	
Hexachlorobutadiene	ND	ug/kg	390	1.00	06/08/00	DHJ	87-68-3	
4-Chloro-3-methylphenol	ND	ug/kg	790	1.00	06/08/00	DHJ	59-50-7	
2-Methylnaphthalene	ND	ug/kg	390	1.00	06/08/00	DHJ	91-57-6	
Hexachlorocyclopentadiene	ND	ug/kg	390	1.00	06/08/00	DHJ	77-47-4	
2,4,6-Trichlorophenol	ND	ug/kg	390	1.00	06/08/00	DHJ	88-06-2	
2,4,5-Trichlorophenol	ND	ug/kg	390	1.00	06/08/00	DHJ	95-95-4	
2-Chloronaphthalene	ND	ug/kg	390	1.00	06/08/00	DHJ	91-58-7	
2-Nitroaniline	ND	ug/kg	2000	1.00	06/08/00	DHJ	88-74-4	
Acenaphthylene	ND	ug/kg	390	1.00	06/08/00	DHJ	208-96-8	
Dimethylphthalate	ND	ug/kg	390	1.00	06/08/00	DHJ	131-11-3	
2,6-Dinitrotoluene	ND	ug/kg	390	1.00	06/08/00	DHJ	606-20-2	
Acenaphthene	ND	ug/kg	390	1.00	06/08/00	DHJ	83-32-9	
3-Nitroaniline	ND	ug/kg	2000	1.00	06/08/00	DHJ	99-09-2	
2,4-Dinitrophenol	ND	ug/kg	2000	1.00	06/08/00	DHJ	51-28-5	
Dibenzofuran	ND	ug/kg	390	1.00	06/08/00	DHJ	132-64-9	
2,4-Dinitrotoluene	ND	ug/kg	390	1.00	06/08/00	DHJ	121-14-2	
4-Nitrophenol	ND	ug/kg	2000	1.00	06/08/00	DHJ	100-02-7	

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Pace Project Number: 9214408
Client Project ID: Koch North

Pace Sample No: 921019931
Client Sample ID: 601-7 (7-7.5')
Date Collected: 05/26/00
Date Received: 06/01/00
Matrix: Soil

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Fluorene	ND	ug/kg	390	1.00	06/08/00	DHJ	86-73-7	
4-Chlorophenyl-phenylether	ND	ug/kg	390	1.00	06/08/00	DHJ	7005-72-3	
Diethylphthalate	ND	ug/kg	390	1.00	06/08/00	DHJ	84-66-2	
4-Nitroaniline	ND	ug/kg	2000	1.00	06/08/00	DHJ	100-01-6	
1,2-Diphenylhydrazine	ND	ug/kg	390	1.00	06/08/00	DHJ	122-66-7	
4,6-Dinitro-2-methylphenol	ND	ug/kg	390	1.00	06/08/00	DHJ	534-52-1	
N-Nitrosodiphenylamine	ND	ug/kg	390	1.00	06/08/00	DHJ	86-30-6	
4-Bromophenyl-phenylether	ND	ug/kg	390	1.00	06/08/00	DHJ	101-55-3	
Hexachlorobenzene	ND	ug/kg	390	1.00	06/08/00	DHJ	118-74-1	
Pentachlorophenol	ND	ug/kg	2000	1.00	06/08/00	DHJ	87-86-5	
Phenanthrene	ND	ug/kg	390	1.00	06/08/00	DHJ	85-01-8	
Anthracene	ND	ug/kg	390	1.00	06/08/00	DHJ	120-12-7	
Di-n-butylphthalate	ND	ug/kg	390	1.00	06/08/00	DHJ	84-74-2	
Fluoranthene	ND	ug/kg	390	1.00	06/08/00	DHJ	206-44-0	
Pyrene	ND	ug/kg	390	1.00	06/08/00	DHJ	129-00-0	
Butylbenzylphthalate	910	ug/kg	390	1.00	06/08/00	DHJ	85-68-7	
3,3'-Dichlorobenzidine	ND	ug/kg	790	1.00	06/08/00	DHJ	91-94-1	
Benzo(a)anthracene	ND	ug/kg	390	1.00	06/08/00	DHJ	56-55-3	
Chrysene	ND	ug/kg	390	1.00	06/08/00	DHJ	218-01-9	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	790	1.00	06/08/00	DHJ	117-81-7	
Di-n-octylphthalate	ND	ug/kg	390	1.00	06/08/00	DHJ	117-84-0	
Benzo(b)fluoranthene	ND	ug/kg	390	1.00	06/08/00	DHJ	205-99-2	
Benzo(k)fluoranthene	ND	ug/kg	390	1.00	06/08/00	DHJ	207-08-9	
Benzo(a)pyrene	ND	ug/kg	390	1.00	06/08/00	DHJ	50-32-8	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	390	1.00	06/08/00	DHJ	193-39-5	
Dibenz(a,h)anthracene	ND	ug/kg	390	1.00	06/08/00	DHJ	53-70-3	
Benzo(g,h,i)perylene	ND	ug/kg	390	1.00	06/08/00	DHJ	191-24-2	
2-Fluorophenol (S)	5	%		0.84	06/08/00	DHJ	367-12-4	2
Phenol-d6 (S)	76	%		0.84	06/08/00	DHJ	13127-88-3	
Nitrobenzene-d5 (S)	93	%		0.84	06/08/00	DHJ	4165-60-0	
2-Fluorobiphenyl (S)	79	%		0.84	06/08/00	DHJ	321-60-8	
2,4,6-Tribromophenol (S)	85	%		0.84	06/08/00	DHJ	118-79-6	
Terphenyl-d14 (S)	70	%		0.84	06/08/00	DHJ	1718-51-0	
Date Extracted					06/06/00			

Laboratory Certification IDs
NC Wastewater 12
NC Drinking Water 37706
SC 99006

REPORT OF LABORATORY ANALYSIS

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Laboratory Certification IDs
KY Drinking Water 90090
TN UST List
VA Drinking Water 213

Pace Analytical™

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Pace Project Number: 9214408
Client Project ID: Koch North

Pace Sample No: 921019949 | Date Collected: 05/26/00 | Matrix: Soil
Client Sample ID: BH-15 (6.5-7') | Date Received: 06/01/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Wet Chemistry								
Percent Moisture		Method: % Moisture			Prep Method:			
Percent Moisture	17.8	%		0.82	06/02/00	YMH		
GC/MS Volatiles								
GC/MS VOCs by 8260		Method: EPA 8260			Prep Method: EPA 8260			
Dichlorodifluoromethane	ND	ug/kg	610000	1000	06/06/00	CBD	75-71-8	
Chloromethane	ND	ug/kg	610000	1000	06/06/00	CBD	74-87-3	
Vinyl Chloride	ND	ug/kg	610000	1000	06/06/00	CBD	75-01-4	
Bromomethane	ND	ug/kg	610000	1000	06/06/00	CBD	74-83-9	
Chloroethane	ND	ug/kg	610000	1000	06/06/00	CBD	75-00-3	
Trichlorofluoromethane	ND	ug/kg	300000	1000	06/06/00	CBD	75-69-4	
1,1-Dichloroethene	ND	ug/kg	300000	1000	06/06/00	CBD	75-35-4	
Methylene Chloride	ND	ug/kg	300000	1000	06/06/00	CBD	75-09-2	
trans-1,2-Dichloroethene	ND	ug/kg	300000	1000	06/06/00	CBD	156-60-5	
1,1-Dichloroethane	ND	ug/kg	300000	1000	06/06/00	CBD	75-34-3	
cis-1,2-Dichloroethene	ND	ug/kg	300000	1000	06/06/00	CBD	156-59-2	
2,2-Dichloropropane	ND	ug/kg	300000	1000	06/06/00	CBD	594-20-7	
Chloroform	ND	ug/kg	300000	1000	06/06/00	CBD	67-66-3	
Bromochloromethane	ND	ug/kg	300000	1000	06/06/00	CBD	74-97-5	
1,1,1-Trichloroethane	ND	ug/kg	300000	1000	06/06/00	CBD	71-55-6	
1,1-Dichloropropene	ND	ug/kg	300000	1000	06/06/00	CBD	563-58-6	
1,2-Dichloroethane	ND	ug/kg	300000	1000	06/06/00	CBD	107-06-2	
Carbon Tetrachloride	ND	ug/kg	300000	1000	06/06/00	CBD	56-23-5	
Benzene	ND	ug/kg	300000	1000	06/06/00	CBD	71-43-2	
Trichloroethene	ND	ug/kg	300000	1000	06/06/00	CBD	79-01-6	
1,2-Dichloropropane	ND	ug/kg	300000	1000	06/06/00	CBD	78-87-5	
Dibromomethane	ND	ug/kg	300000	1000	06/06/00	CBD	74-95-3	
Bromodichloromethane	ND	ug/kg	300000	1000	06/06/00	CBD	75-27-4	
Toluene	ND	ug/kg	300000	1000	06/06/00	CBD	108-88-3	
1,1,2-Trichloroethane	ND	ug/kg	300000	1000	06/06/00	CBD	79-00-5	
1,3-Dichloropropane	ND	ug/kg	300000	1000	06/06/00	CBD	142-28-9	
Dibromochloromethane	ND	ug/kg	300000	1000	06/06/00	CBD	124-48-1	
Tetrachloroethene	ND	ug/kg	300000	1000	06/06/00	CBD	127-18-4	
1,2-Dibromoethane	ND	ug/kg	300000	1000	06/06/00	CBD	106-93-4	
Chlorobenzene	ND	ug/kg	300000	1000	06/06/00	CBD	108-90-7	
1,1,1,2-Tetrachloroethane	ND	ug/kg	300000	1000	06/06/00	CBD	630-20-6	

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Pace Project Number: 9214408
Client Project ID: Koch North

Pace Sample No: 921019931 | Date Collected: 05/26/00 | Matrix: Soil
Client Sample ID: 601-7 (7-7.5') | Date Received: 06/01/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Fluorene	ND	ug/kg	390	1.00	06/08/00	DHJ	86-73-7	
4-Chlorophenyl-phenylether	ND	ug/kg	390	1.00	06/08/00	DHJ	7005-72-3	
Diethylphthalate	ND	ug/kg	390	1.00	06/08/00	DHJ	84-66-2	
4-Nitroaniline	ND	ug/kg	2000	1.00	06/08/00	DHJ	100-01-6	
1,2-Diphenylhydrazine	ND	ug/kg	390	1.00	06/08/00	DHJ	122-66-7	
4,6-Dinitro-2-methylphenol	ND	ug/kg	390	1.00	06/08/00	DHJ	534-52-1	
N-Nitrosodiphenylamine	ND	ug/kg	390	1.00	06/08/00	DHJ	86-30-6	
4-Bromophenyl-phenylether	ND	ug/kg	390	1.00	06/08/00	DHJ	101-55-3	
Hexachlorobenzene	ND	ug/kg	390	1.00	06/08/00	DHJ	118-74-1	
Pentachlorophenol	ND	ug/kg	2000	1.00	06/08/00	DHJ	87-86-5	
Phenanthrene	ND	ug/kg	390	1.00	06/08/00	DHJ	85-01-8	
Anthracene	ND	ug/kg	390	1.00	06/08/00	DHJ	120-12-7	
Di-n-butylphthalate	ND	ug/kg	390	1.00	06/08/00	DHJ	84-74-2	
Fluoranthene	ND	ug/kg	390	1.00	06/08/00	DHJ	206-44-0	
Pyrene	ND	ug/kg	390	1.00	06/08/00	DHJ	129-00-0	
Butylbenzylphthalate	910	ug/kg	390	1.00	06/08/00	DHJ	85-68-7	
3,3'-Dichlorobenzidine	ND	ug/kg	790	1.00	06/08/00	DHJ	91-94-1	
Benzo(a)anthracene	ND	ug/kg	390	1.00	06/08/00	DHJ	56-55-3	
Chrysene	ND	ug/kg	390	1.00	06/08/00	DHJ	218-01-9	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	790	1.00	06/08/00	DHJ	117-81-7	
Di-n-octylphthalate	ND	ug/kg	390	1.00	06/08/00	DHJ	117-84-0	
Benzo(b)fluoranthene	ND	ug/kg	390	1.00	06/08/00	DHJ	205-99-2	
Benzo(k)fluoranthene	ND	ug/kg	390	1.00	06/08/00	DHJ	207-08-9	
Benzo(a)pyrene	ND	ug/kg	390	1.00	06/08/00	DHJ	50-32-8	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	390	1.00	06/08/00	DHJ	193-39-5	
Dibenz(a,h)anthracene	ND	ug/kg	390	1.00	06/08/00	DHJ	53-70-3	
Benzo(g,h,i)perylene	ND	ug/kg	390	1.00	06/08/00	DHJ	191-24-2	
2-Fluorophenol (S)	5	%		0.84	06/08/00	DHJ	367-12-4	2
Phenol-d6 (S)	76	%		0.84	06/08/00	DHJ	13127-88-3	
Nitrobenzene-d5 (S)	93	%		0.84	06/08/00	DHJ	4165-60-0	
2-Fluorobiphenyl (S)	79	%		0.84	06/08/00	DHJ	321-60-8	
2,4,6-Tribromophenol (S)	85	%		0.84	06/08/00	DHJ	118-79-6	
Terphenyl-d14 (S)	70	%		0.84	06/08/00	DHJ	1718-51-0	
Date Extracted					06/06/00			

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Pace Project Number: 9214408
Client Project ID: Koch North

Pace Sample No: 921019949 | Date Collected: 05/26/00 | Matrix: Soil
Client Sample ID: BH-15 (6.5-7') | Date Received: 06/01/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Wet Chemistry								
Percent Moisture		Method: % Moisture			Prep Method:			
Percent Moisture	17.8	%		0.82	06/02/00	YMH		
GC/MS Volatiles								
GC/MS VOCs by 8260		Method: EPA 8260			Prep Method: EPA 8260			
Dichlorodifluoromethane	ND	ug/kg	610000	1000	06/06/00	CBD	75-71-8	
Chloromethane	ND	ug/kg	610000	1000	06/06/00	CBD	74-87-3	
Vinyl Chloride	ND	ug/kg	610000	1000	06/06/00	CBD	75-01-4	
Bromomethane	ND	ug/kg	610000	1000	06/06/00	CBD	74-83-9	
Chloroethane	ND	ug/kg	610000	1000	06/06/00	CBD	75-00-3	
Trichlorofluoromethane	ND	ug/kg	300000	1000	06/06/00	CBD	75-69-4	
1,1-Dichloroethene	ND	ug/kg	300000	1000	06/06/00	CBD	75-35-4	
Methylene Chloride	ND	ug/kg	300000	1000	06/06/00	CBD	75-09-2	
trans-1,2-Dichloroethene	ND	ug/kg	300000	1000	06/06/00	CBD	156-60-5	
1,1-Dichloroethane	ND	ug/kg	300000	1000	06/06/00	CBD	75-34-3	
cis-1,2-Dichloroethene	ND	ug/kg	300000	1000	06/06/00	CBD	156-59-2	
2,2-Dichloropropane	ND	ug/kg	300000	1000	06/06/00	CBD	594-20-7	
Chloroform	ND	ug/kg	300000	1000	06/06/00	CBD	67-66-3	
Bromochloromethane	ND	ug/kg	300000	1000	06/06/00	CBD	74-97-5	
1,1,1-Trichloroethane	ND	ug/kg	300000	1000	06/06/00	CBD	71-55-6	
1,1-Dichloropropene	ND	ug/kg	300000	1000	06/06/00	CBD	563-58-6	
1,2-Dichloroethane	ND	ug/kg	300000	1000	06/06/00	CBD	107-06-2	
Carbon Tetrachloride	ND	ug/kg	300000	1000	06/06/00	CBD	56-23-5	
Benzene	ND	ug/kg	300000	1000	06/06/00	CBD	71-43-2	
Trichloroethene	ND	ug/kg	300000	1000	06/06/00	CBD	79-01-6	
1,2-Dichloropropane	ND	ug/kg	300000	1000	06/06/00	CBD	78-87-5	
Dibromomethane	ND	ug/kg	300000	1000	06/06/00	CBD	74-95-3	
Bromodichloromethane	ND	ug/kg	300000	1000	06/06/00	CBD	75-27-4	
Toluene	ND	ug/kg	300000	1000	06/06/00	CBD	108-88-3	
1,1,2-Trichloroethane	ND	ug/kg	300000	1000	06/06/00	CBD	79-00-5	
1,3-Dichloropropane	ND	ug/kg	300000	1000	06/06/00	CBD	142-28-9	
Dibromochloromethane	ND	ug/kg	300000	1000	06/06/00	CBD	124-48-1	
Tetrachloroethene	ND	ug/kg	300000	1000	06/06/00	CBD	127-18-4	
1,2-Dibromoethane	ND	ug/kg	300000	1000	06/06/00	CBD	106-93-4	
Chlorobenzene	ND	ug/kg	300000	1000	06/06/00	CBD	108-90-7	
1,1,1,2-Tetrachloroethane	ND	ug/kg	300000	1000	06/06/00	CBD	630-20-6	

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Pace Project Number: 9214408
Client Project ID: Koch North

Pace Sample No: 921019949 | Date Collected: 05/26/00 | Matrix: Soil
Client Sample ID: BH-15 (6.5-7') | Date Received: 06/01/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Ethylbenzene	ND	ug/kg	300000	1000	06/06/00	CBD	100-41-4	
m&p-Xylene	240000000	ug/kg	6100000	10000	06/06/00	CBD	7816-60-0	
Styrene	ND	ug/kg	300000	1000	06/06/00	CBD	100-42-5	
o-Xylene (1,2-Dimethylbenzene)	310000	ug/kg	300000	1000	06/06/00	CBD	95-47-6	
Bromoform	ND	ug/kg	300000	1000	06/06/00	CBD	75-25-2	
1,1,2,2-Tetrachloroethane	ND	ug/kg	300000	1000	06/06/00	CBD	79-34-5	
Isopropylbenzene (Cumene)	ND	ug/kg	300000	1000	06/06/00	CBD	98-82-8	
1,2,3-Trichloropropane	ND	ug/kg	300000	1000	06/06/00	CBD	96-18-4	
Bromobenzene	ND	ug/kg	300000	1000	06/06/00	CBD	108-86-1	
n-Propylbenzene	ND	ug/kg	300000	1000	06/06/00	CBD	103-65-1	
2-Chlorotoluene	ND	ug/kg	300000	1000	06/06/00	CBD	95-49-8	
4-Chlorotoluene	ND	ug/kg	300000	1000	06/06/00	CBD	106-43-4	
1,3,5-Trimethylbenzene	ND	ug/kg	300000	1000	06/06/00	CBD	108-67-8	
tert-Butylbenzene	ND	ug/kg	300000	1000	06/06/00	CBD	98-06-6	
1,2,4-Trimethylbenzene	390000	ug/kg	300000	1000	06/06/00	CBD	95-63-6	
sec-Butylbenzene	ND	ug/kg	300000	1000	06/06/00	CBD	135-98-8	
1,3-Dichlorobenzene	ND	ug/kg	300000	1000	06/06/00	CBD	541-73-1	
p-Isopropyltoluene	ND	ug/kg	300000	1000	06/06/00	CBD	99-87-6	
1,4-Dichlorobenzene	ND	ug/kg	300000	1000	06/06/00	CBD	106-46-7	
1,2-Dichlorobenzene	ND	ug/kg	300000	1000	06/06/00	CBD	95-50-1	
n-Butylbenzene	ND	ug/kg	300000	1000	06/06/00	CBD	104-51-8	
1,2-Dibromo-3-Chloropropane	ND	ug/kg	300000	1000	06/06/00	CBD	96-12-8	
1,2,4-Trichlorobenzene	ND	ug/kg	300000	1000	06/06/00	CBD	120-82-1	
Naphthalene	ND	ug/kg	300000	1000	06/06/00	CBD	91-20-3	
Hexachlorobutadiene	ND	ug/kg	300000	1000	06/06/00	CBD	87-68-3	
1,2,3-Trichlorobenzene	ND	ug/kg	300000	1000	06/06/00	CBD	87-61-6	
Dibromofluoromethane (S)	0	%		0.82	06/06/00	CBD	1868-53-7	1
1,2-Dichloroethane-d4 (S)	0	%		0.82	06/06/00	CBD	17060-07-0	
Toluene-d8 (S)	0	%		0.82	06/06/00	CBD	2037-26-5	
4-Bromofluorobenzene (S)	0	%		0.82	06/06/00	CBD	460-00-4	

GC/MS Semivolatiles

Semivolatile Organics	Method: EPA 8270				Prep Method: EPA 3550		
bis(2-Chloroethyl)ether	ND	ug/kg	400	1.00	06/08/00	DHJ	111-44-4
Phenol	ND	ug/kg	400	1.00	06/08/00	DHJ	108-95-2
2-Chlorophenol	ND	ug/kg	400	1.00	06/08/00	DHJ	95-57-8
1,3-Dichlorobenzene	ND	ug/kg	400	1.00	06/08/00	DHJ	541-73-1
1,4-Dichlorobenzene	ND	ug/kg	400	1.00	06/08/00	DHJ	106-46-7
1,2-Dichlorobenzene	ND	ug/kg	400	1.00	06/08/00	DHJ	95-50-1

Laboratory Certification IDs
NC Wastewater 12
NC Drinking Water 37706
SC 99006

REPORT OF LABORATORY ANALYSIS

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Laboratory Certification IDs
KY Drinking Water 90090
TN UST List
VA Drinking Water 213

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Pace Project Number: 9214408
Client Project ID: Koch North

Pace Sample No: 921019949
Client Sample ID: BH-15 (6.5-7')
Date Collected: 05/26/00
Date Received: 06/01/00
Matrix: Soil

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Benzyl Alcohol	ND	ug/kg	800	1.00	06/08/00	DHJ	100-51-6	
bis(2-Chloroisopropyl)ether	ND	ug/kg	400	1.00	06/08/00	DHJ	39638-32-9	
2-Methylphenol	ND	ug/kg	400	1.00	06/08/00	DHJ	95-48-7	
Hexachloroethane	ND	ug/kg	400	1.00	06/08/00	DHJ	67-72-1	
N-Nitroso-di-n-propylamine	ND	ug/kg	400	1.00	06/08/00	DHJ	621-64-7	
3&4-Methylphenol	1300	ug/kg	400	1.00	06/08/00	DHJ		
Nitrobenzene	ND	ug/kg	400	1.00	06/08/00	DHJ	98-95-3	
Isophorone	ND	ug/kg	400	1.00	06/08/00	DHJ	78-59-1	
2-Nitrophenol	ND	ug/kg	400	1.00	06/08/00	DHJ	88-75-5	
2,4-Dimethylphenol	2700	ug/kg	400	1.00	06/08/00	DHJ	105-67-9	
bis(2-Chloroethoxy)methane	ND	ug/kg	400	1.00	06/08/00	DHJ	111-91-1	
Benzoic Acid	ND	ug/kg	2000	1.00	06/08/00	DHJ	65-85-0	
2,4-Dichlorophenol	ND	ug/kg	400	1.00	06/08/00	DHJ	120-83-2	
1,2,4-Trichlorobenzene	ND	ug/kg	400	1.00	06/08/00	DHJ	120-82-1	
Naphthalene	1700	ug/kg	400	1.00	06/08/00	DHJ	91-20-3	
4-Chloroaniline	ND	ug/kg	800	1.00	06/08/00	DHJ	106-47-8	
Hexachlorobutadiene	ND	ug/kg	400	1.00	06/08/00	DHJ	87-68-3	
4-Chloro-3-methylphenol	ND	ug/kg	800	1.00	06/08/00	DHJ	59-50-7	
2-Methylnaphthalene	3700	ug/kg	400	1.00	06/08/00	DHJ	91-57-6	
Hexachlorocyclopentadiene	ND	ug/kg	400	1.00	06/08/00	DHJ	77-47-4	
2,4,6-Trichlorophenol	ND	ug/kg	400	1.00	06/08/00	DHJ	88-06-2	
2,4,5-Trichlorophenol	ND	ug/kg	400	1.00	06/08/00	DHJ	95-95-4	
2-Chloronaphthalene	ND	ug/kg	400	1.00	06/08/00	DHJ	91-58-7	
2-Nitroaniline	ND	ug/kg	2000	1.00	06/08/00	DHJ	88-74-4	
Acenaphthylene	ND	ug/kg	400	1.00	06/08/00	DHJ	208-96-8	
Dimethylphthalate	ND	ug/kg	400	1.00	06/08/00	DHJ	131-11-3	
2,6-Dinitrotoluene	ND	ug/kg	400	1.00	06/08/00	DHJ	606-20-2	
Acenaphthene	ND	ug/kg	400	1.00	06/08/00	DHJ	83-32-9	
3-Nitroaniline	ND	ug/kg	2000	1.00	06/08/00	DHJ	99-09-2	
2,4-Dinitrophenol	ND	ug/kg	2000	1.00	06/08/00	DHJ	51-28-5	
Dibenzofuran	ND	ug/kg	400	1.00	06/08/00	DHJ	132-64-9	
2,4-Dinitrotoluene	ND	ug/kg	400	1.00	06/08/00	DHJ	121-14-2	
4-Nitrophenol	ND	ug/kg	2000	1.00	06/08/00	DHJ	100-02-7	
Fluorene	ND	ug/kg	400	1.00	06/08/00	DHJ	86-73-7	
4-Chlorophenyl-phenylether	ND	ug/kg	400	1.00	06/08/00	DHJ	7005-72-3	
Diethylphthalate	ND	ug/kg	400	1.00	06/08/00	DHJ	84-66-2	
4-Nitroaniline	ND	ug/kg	2000	1.00	06/08/00	DHJ	100-01-6	
1,2-Diphenylhydrazine	ND	ug/kg	400	1.00	06/08/00	DHJ	122-66-7	
4,6-Dinitro-2-methylphenol	ND	ug/kg	400	1.00	06/08/00	DHJ	534-52-1	
N-Nitrosodiphenylamine	ND	ug/kg	400	1.00	06/08/00	DHJ	86-30-6	

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VA Drinking Water 213

Pace Analytical Services, Inc.
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Pace Project Number: 9214408
Client Project ID: Koch North

Pace Sample No: 921019949 Date Collected: 05/26/00 Matrix: Soil
Client Sample ID: BH-15 (6.5-7') Date Received: 06/01/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
4-Bromophenyl-phenylether	ND	ug/kg	400	1.00	06/08/00	DHJ	101-55-3	
Hexachlorobenzene	ND	ug/kg	400	1.00	06/08/00	DHJ	118-74-1	
Pentachlorophenol	ND	ug/kg	2000	1.00	06/08/00	DHJ	87-86-5	
Phenanthrene	ND	ug/kg	400	1.00	06/08/00	DHJ	85-01-8	
Anthracene	ND	ug/kg	400	1.00	06/08/00	DHJ	120-12-7	
Di-n-butylphthalate	ND	ug/kg	400	1.00	06/08/00	DHJ	84-74-2	
Fluoranthene	ND	ug/kg	400	1.00	06/08/00	DHJ	206-44-0	
Pyrene	ND	ug/kg	400	1.00	06/08/00	DHJ	129-00-0	
Butylbenzylphthalate	2300	ug/kg	400	1.00	06/08/00	DHJ	85-68-7	
3,3'-Dichlorobenzidine	ND	ug/kg	800	1.00	06/08/00	DHJ	91-94-1	
Benzo(a)anthracene	ND	ug/kg	400	1.00	06/08/00	DHJ	56-55-3	
Chrysene	ND	ug/kg	400	1.00	06/08/00	DHJ	218-01-9	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	800	1.00	06/08/00	DHJ	117-81-7	
Di-n-octylphthalate	ND	ug/kg	400	1.00	06/08/00	DHJ	117-84-0	
Benzo(b)fluoranthene	ND	ug/kg	400	1.00	06/08/00	DHJ	205-99-2	
Benzo(k)fluoranthene	ND	ug/kg	400	1.00	06/08/00	DHJ	207-08-9	
Benzo(a)pyrene	ND	ug/kg	400	1.00	06/08/00	DHJ	50-32-8	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	400	1.00	06/08/00	DHJ	193-39-5	
Dibenz(a,h)anthracene	ND	ug/kg	400	1.00	06/08/00	DHJ	53-70-3	
Benzo(g,h,i)perylene	ND	ug/kg	400	1.00	06/08/00	DHJ	191-24-2	
2-Fluorophenol (S)	3	%		0.82	06/08/00	DHJ	367-12-4	2
Phenol-d6 (S)	61	%		0.82	06/08/00	DHJ	13127-88-3	
Nitrobenzene-d5 (S)	109	%		0.82	06/08/00	DHJ	4165-60-0	
2-Fluorobiphenyl (S)	53	%		0.82	06/08/00	DHJ	321-60-8	
2,4,6-Tribromophenol (S)	64	%		0.82	06/08/00	DHJ	118-79-6	
Terphenyl-d14 (S)	54	%		0.82	06/08/00	DHJ	1718-51-0	
Date Extracted					06/06/00			

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Pace Project Number: 9214408
Client Project ID: Koch North

Pace Sample No: 921019956 | Date Collected: 05/26/00 | Matrix: Soil
Client Sample ID: 401-13 (5-5.5') | Date Received: 06/01/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Wet Chemistry								
Percent Moisture		Method: % Moisture			Prep Method:			
Percent Moisture	5.7	%		0.94	06/02/00	YMH		
GC/MS Volatiles								
GC/MS VOCs by 8260		Method: EPA 8260			Prep Method: EPA 8260			
Dichlorodifluoromethane	ND	ug/kg	530000	1000	06/06/00	CBD	75-71-8	
Chloromethane	ND	ug/kg	530000	1000	06/06/00	CBD	74-87-3	
Vinyl Chloride	ND	ug/kg	530000	1000	06/06/00	CBD	75-01-4	
Bromomethane	ND	ug/kg	530000	1000	06/06/00	CBD	74-83-9	
Chloroethane	ND	ug/kg	530000	1000	06/06/00	CBD	75-00-3	
Trichlorofluoromethane	ND	ug/kg	260000	1000	06/06/00	CBD	75-69-4	
1,1-Dichloroethene	ND	ug/kg	260000	1000	06/06/00	CBD	75-35-4	
Methylene Chloride	ND	ug/kg	260000	1000	06/06/00	CBD	75-09-2	
trans-1,2-Dichloroethene	ND	ug/kg	260000	1000	06/06/00	CBD	156-60-5	
1,1-Dichloroethane	ND	ug/kg	260000	1000	06/06/00	CBD	75-34-3	
cis-1,2-Dichloroethene	ND	ug/kg	260000	1000	06/06/00	CBD	156-59-2	
2,2-Dichloropropane	ND	ug/kg	260000	1000	06/06/00	CBD	594-20-7	
Chloroform	ND	ug/kg	260000	1000	06/06/00	CBD	67-66-3	
Bromochloromethane	ND	ug/kg	260000	1000	06/06/00	CBD	74-97-5	
1,1,1-Trichloroethane	ND	ug/kg	260000	1000	06/06/00	CBD	71-55-6	
1,1-Dichloropropene	ND	ug/kg	260000	1000	06/06/00	CBD	563-58-6	
1,2-Dichloroethane	ND	ug/kg	260000	1000	06/06/00	CBD	107-06-2	
Carbon Tetrachloride	ND	ug/kg	260000	1000	06/06/00	CBD	56-23-5	
Benzene	ND	ug/kg	260000	1000	06/06/00	CBD	71-43-2	
Trichloroethene	ND	ug/kg	260000	1000	06/06/00	CBD	79-01-6	
1,2-Dichloropropane	ND	ug/kg	260000	1000	06/06/00	CBD	78-87-5	
Dibromomethane	ND	ug/kg	260000	1000	06/06/00	CBD	74-95-3	
Bromodichloromethane	ND	ug/kg	260000	1000	06/06/00	CBD	75-27-4	
Toluene	ND	ug/kg	260000	1000	06/06/00	CBD	108-88-3	
1,1,2-Trichloroethane	ND	ug/kg	260000	1000	06/06/00	CBD	79-00-5	
1,3-Dichloropropane	ND	ug/kg	260000	1000	06/06/00	CBD	142-28-9	
Dibromochloromethane	ND	ug/kg	260000	1000	06/06/00	CBD	124-48-1	
Tetrachloroethene	ND	ug/kg	260000	1000	06/06/00	CBD	127-18-4	
1,2-Dibromoethane	ND	ug/kg	260000	1000	06/06/00	CBD	106-93-4	
Chlorobenzene	ND	ug/kg	260000	1000	06/06/00	CBD	108-90-7	
1,1,1,2-Tetrachloroethane	ND	ug/kg	260000	1000	06/06/00	CBD	630-20-6	

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Pace Project Number: 9214408
Client Project ID: Koch North

Pace Sample No: 921019956 | Date Collected: 05/26/00 | Matrix: Soil
Client Sample ID: 401-13 (5-5.5') | Date Received: 06/01/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Ethylbenzene	550000	ug/kg	260000	1000	06/06/00	CBD	100-41-4	
m&p-Xylene	660000000	ug/kg	26000000	50000	06/06/00	CBD	7816-60-0	
Styrene	ND	ug/kg	260000	1000	06/06/00	CBD	100-42-5	
o-Xylene (1,2-Dimethylbenzene)	360000	ug/kg	260000	1000	06/06/00	CBD	95-47-6	
Bromoform	ND	ug/kg	260000	1000	06/06/00	CBD	75-25-2	
1,1,2,2-Tetrachloroethane	ND	ug/kg	260000	1000	06/06/00	CBD	79-34-5	
Isopropylbenzene (Cumene)	ND	ug/kg	260000	1000	06/06/00	CBD	98-82-8	
1,2,3-Trichloropropane	ND	ug/kg	260000	1000	06/06/00	CBD	96-18-4	
Bromobenzene	ND	ug/kg	260000	1000	06/06/00	CBD	108-86-1	
n-Propylbenzene	ND	ug/kg	260000	1000	06/06/00	CBD	103-65-1	
2-Chlorotoluene	ND	ug/kg	260000	1000	06/06/00	CBD	95-49-8	
4-Chlorotoluene	ND	ug/kg	260000	1000	06/06/00	CBD	106-43-4	
1,3,5-Trimethylbenzene	ND	ug/kg	260000	1000	06/06/00	CBD	108-67-8	
tert-Butylbenzene	ND	ug/kg	260000	1000	06/06/00	CBD	98-06-6	
1,2,4-Trimethylbenzene	ND	ug/kg	260000	1000	06/06/00	CBD	95-63-6	
sec-Butylbenzene	ND	ug/kg	260000	1000	06/06/00	CBD	135-98-8	
1,3-Dichlorobenzene	ND	ug/kg	260000	1000	06/06/00	CBD	541-73-1	
p-Isopropyltoluene	ND	ug/kg	260000	1000	06/06/00	CBD	99-87-6	
1,4-Dichlorobenzene	ND	ug/kg	260000	1000	06/06/00	CBD	106-46-7	
1,2-Dichlorobenzene	ND	ug/kg	260000	1000	06/06/00	CBD	95-50-1	
n-Butylbenzene	ND	ug/kg	260000	1000	06/06/00	CBD	104-51-8	
1,2-Dibromo-3-Chloropropane	ND	ug/kg	260000	1000	06/06/00	CBD	96-12-8	
1,2,4-Trichlorobenzene	ND	ug/kg	260000	1000	06/06/00	CBD	120-82-1	
Naphthalene	ND	ug/kg	260000	1000	06/06/00	CBD	91-20-3	
Hexachlorobutadiene	ND	ug/kg	260000	1000	06/06/00	CBD	87-68-3	
1,2,3-Trichlorobenzene	ND	ug/kg	260000	1000	06/06/00	CBD	87-61-6	
Dibromofluoromethane (S)	0	%		0.94	06/06/00	CBD	1868-53-7	1
1,2-Dichloroethane-d4 (S)	0	%		0.94	06/06/00	CBD	17060-07-0	
Toluene-d8 (S)	0	%		0.94	06/06/00	CBD	2037-26-5	
4-Bromofluorobenzene (S)	0	%		0.94	06/06/00	CBD	460-00-4	

GC/MS Semivolatiles

Semivolatile Organics	Method: EPA 8270				Prep Method: EPA 3550			
bis(2-Chloroethyl)ether	ND	ug/kg	350	1.00	06/08/00	DHJ	111-44-4	
Phenol	ND	ug/kg	350	1.00	06/08/00	DHJ	108-95-2	
2-Chlorophenol	ND	ug/kg	350	1.00	06/08/00	DHJ	95-57-8	
1,3-Dichlorobenzene	ND	ug/kg	350	1.00	06/08/00	DHJ	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	350	1.00	06/08/00	DHJ	106-46-7	
1,2-Dichlorobenzene	ND	ug/kg	350	1.00	06/08/00	DHJ	95-50-1	

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Pace Project Number: 9214408
Client Project ID: Koch North

Pace Sample No: 921019956 | Date Collected: 05/26/00 | Matrix: Soil
Client Sample ID: 401-13 (5-5.5') | Date Received: 06/01/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Benzyl Alcohol	ND	ug/kg	700	1.00	06/08/00	DHJ	100-51-6	
bis(2-Chloroisopropyl)ether	ND	ug/kg	350	1.00	06/08/00	DHJ	39638-32-9	
2-Methylphenol	ND	ug/kg	350	1.00	06/08/00	DHJ	95-48-7	
Hexachloroethane	ND	ug/kg	350	1.00	06/08/00	DHJ	67-72-1	
N-Nitroso-di-n-propylamine	ND	ug/kg	350	1.00	06/08/00	DHJ	621-64-7	
3&4-Methylphenol	ND	ug/kg	350	1.00	06/08/00	DHJ		
Nitrobenzene	ND	ug/kg	350	1.00	06/08/00	DHJ	98-95-3	
Isophorone	ND	ug/kg	350	1.00	06/08/00	DHJ	78-59-1	
2-Nitrophenol	ND	ug/kg	350	1.00	06/08/00	DHJ	88-75-5	
2,4-Dimethylphenol	ND	ug/kg	350	1.00	06/08/00	DHJ	105-67-9	
bis(2-Chloroethoxy)methane	ND	ug/kg	350	1.00	06/08/00	DHJ	111-91-1	
Benzoic Acid	ND	ug/kg	1700	1.00	06/08/00	DHJ	65-85-0	
2,4-Dichlorophenol	ND	ug/kg	350	1.00	06/08/00	DHJ	120-83-2	
1,2,4-Trichlorobenzene	ND	ug/kg	350	1.00	06/08/00	DHJ	120-82-1	
Naphthalene	530	ug/kg	350	1.00	06/08/00	DHJ	91-20-3	
4-Chloroaniline	ND	ug/kg	700	1.00	06/08/00	DHJ	106-47-8	
Hexachlorobutadiene	ND	ug/kg	350	1.00	06/08/00	DHJ	87-68-3	
4-Chloro-3-methylphenol	ND	ug/kg	700	1.00	06/08/00	DHJ	59-50-7	
2-Methylnaphthalene	1700	ug/kg	350	1.00	06/08/00	DHJ	91-57-6	
Hexachlorocyclopentadiene	ND	ug/kg	350	1.00	06/08/00	DHJ	77-47-4	
2,4,6-Trichlorophenol	ND	ug/kg	350	1.00	06/08/00	DHJ	88-06-2	
2,4,5-Trichlorophenol	ND	ug/kg	350	1.00	06/08/00	DHJ	95-95-4	
2-Chloronaphthalene	ND	ug/kg	350	1.00	06/08/00	DHJ	91-58-7	
2-Nitroaniline	ND	ug/kg	1700	1.00	06/08/00	DHJ	88-74-4	
Acenaphthylene	ND	ug/kg	350	1.00	06/08/00	DHJ	208-96-8	
Dimethylphthalate	ND	ug/kg	350	1.00	06/08/00	DHJ	131-11-3	
2,6-Dinitrotoluene	ND	ug/kg	350	1.00	06/08/00	DHJ	606-20-2	
Acenaphthene	ND	ug/kg	350	1.00	06/08/00	DHJ	83-32-9	
3-Nitroaniline	ND	ug/kg	1700	1.00	06/08/00	DHJ	99-09-2	
2,4-Dinitrophenol	ND	ug/kg	1700	1.00	06/08/00	DHJ	51-28-5	
Dibenzofuran	ND	ug/kg	350	1.00	06/08/00	DHJ	132-64-9	
2,4-Dinitrotoluene	ND	ug/kg	350	1.00	06/08/00	DHJ	121-14-2	
4-Nitrophenol	ND	ug/kg	1700	1.00	06/08/00	DHJ	100-02-7	
Fluorene	ND	ug/kg	350	1.00	06/08/00	DHJ	86-73-7	
4-Chlorophenyl-phenylether	ND	ug/kg	350	1.00	06/08/00	DHJ	7005-72-3	
Diethylphthalate	ND	ug/kg	350	1.00	06/08/00	DHJ	84-66-2	
4-Nitroaniline	ND	ug/kg	1700	1.00	06/08/00	DHJ	100-01-6	
1,2-Diphenylhydrazine	ND	ug/kg	350	1.00	06/08/00	DHJ	122-66-7	
4,6-Dinitro-2-methylphenol	ND	ug/kg	350	1.00	06/08/00	DHJ	534-52-1	
N-Nitrosodiphenylamine	ND	ug/kg	350	1.00	06/08/00	DHJ	86-30-6	

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Pace Project Number: 9214408
Client Project ID: Koch North

Pace Sample No: 921019956 | Date Collected: 05/26/00 | Matrix: Soil
Client Sample ID: 401-13 (5-5.5') | Date Received: 06/01/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
4-Bromophenyl-phenylether	ND	ug/kg	350	1.00	06/08/00	DHJ	101-55-3	
Hexachlorobenzene	ND	ug/kg	350	1.00	06/08/00	DHJ	118-74-1	
Pentachlorophenol	ND	ug/kg	1700	1.00	06/08/00	DHJ	87-86-5	
Phenanthrene	ND	ug/kg	350	1.00	06/08/00	DHJ	85-01-8	
Anthracene	ND	ug/kg	350	1.00	06/08/00	DHJ	120-12-7	
Di-n-butylphthalate	ND	ug/kg	350	1.00	06/08/00	DHJ	84-74-2	
Fluoranthene	ND	ug/kg	350	1.00	06/08/00	DHJ	206-44-0	
Pyrene	ND	ug/kg	350	1.00	06/08/00	DHJ	129-00-0	
Butylbenzylphthalate	350	ug/kg	350	1.00	06/08/00	DHJ	85-68-7	
3,3'-Dichlorobenzidine	ND	ug/kg	700	1.00	06/08/00	DHJ	91-94-1	
Benzo(a)anthracene	ND	ug/kg	350	1.00	06/08/00	DHJ	56-55-3	
Chrysene	ND	ug/kg	350	1.00	06/08/00	DHJ	218-01-9	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	700	1.00	06/08/00	DHJ	117-81-7	
Di-n-octylphthalate	ND	ug/kg	350	1.00	06/08/00	DHJ	117-84-0	
Benzo(b)fluoranthene	ND	ug/kg	350	1.00	06/08/00	DHJ	205-99-2	
Benzo(k)fluoranthene	ND	ug/kg	350	1.00	06/08/00	DHJ	207-08-9	
Benzo(a)pyrene	ND	ug/kg	350	1.00	06/08/00	DHJ	50-32-8	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	350	1.00	06/08/00	DHJ	193-39-5	
Dibenz(a,h)anthracene	ND	ug/kg	350	1.00	06/08/00	DHJ	53-70-3	
Benzo(g,h,i)perylene	ND	ug/kg	350	1.00	06/08/00	DHJ	191-24-2	
2-Fluorophenol (S)	0	%		0.94	06/08/00	DHJ	367-12-4	3
Phenol-d6 (S)	74	%		0.94	06/08/00	DHJ	13127-88-3	
Nitrobenzene-d5 (S)	132	%		0.94	06/08/00	DHJ	4165-60-0	4
2-Fluorobiphenyl (S)	80	%		0.94	06/08/00	DHJ	321-60-8	
2,4,6-Tribromophenol (S)	85	%		0.94	06/08/00	DHJ	118-79-6	
Terphenyl-d14 (S)	58	%		0.94	06/08/00	DHJ	1718-51-0	
Date Extracted					06/06/00			

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Pace Project Number: 9214408
Client Project ID: Koch North

Pace Sample No: 921019964 | Date Collected: 05/29/00 | Matrix: Soil
Client Sample ID: BH-17 (7-7.5') | Date Received: 06/01/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Wet Chemistry								
Percent Moisture		Method: % Moisture			Prep Method:			
Percent Moisture	18.5	%		0.82	06/02/00	YMH		
GC/MS Volatiles								
GC/MS VOCs by 8260		Method: EPA 8260			Prep Method: EPA 8260			
Dichlorodifluoromethane	ND	ug/kg	610000	1000	06/06/00	CBD	75-71-8	
Chloromethane	ND	ug/kg	610000	1000	06/06/00	CBD	74-87-3	
Vinyl Chloride	ND	ug/kg	610000	1000	06/06/00	CBD	75-01-4	
Bromomethane	ND	ug/kg	610000	1000	06/06/00	CBD	74-83-9	
Chloroethane	ND	ug/kg	610000	1000	06/06/00	CBD	75-00-3	
Trichlorofluoromethane	ND	ug/kg	310000	1000	06/06/00	CBD	75-69-4	
1,1-Dichloroethene	ND	ug/kg	310000	1000	06/06/00	CBD	75-35-4	
Methylene Chloride	ND	ug/kg	310000	1000	06/06/00	CBD	75-09-2	
trans-1,2-Dichloroethene	ND	ug/kg	310000	1000	06/06/00	CBD	156-60-5	
1,1-Dichloroethane	ND	ug/kg	310000	1000	06/06/00	CBD	75-34-3	
cis-1,2-Dichloroethene	ND	ug/kg	310000	1000	06/06/00	CBD	156-59-2	
2,2-Dichloropropane	ND	ug/kg	310000	1000	06/06/00	CBD	594-20-7	
Chloroform	ND	ug/kg	310000	1000	06/06/00	CBD	67-66-3	
Bromochloromethane	ND	ug/kg	310000	1000	06/06/00	CBD	74-97-5	
1,1,1-Trichloroethane	ND	ug/kg	310000	1000	06/06/00	CBD	71-55-6	
1,1-Dichloropropene	ND	ug/kg	310000	1000	06/06/00	CBD	563-58-6	
1,2-Dichloroethane	ND	ug/kg	310000	1000	06/06/00	CBD	107-06-2	
Carbon Tetrachloride	ND	ug/kg	310000	1000	06/06/00	CBD	56-23-5	
Benzene	ND	ug/kg	310000	1000	06/06/00	CBD	71-43-2	
Trichloroethene	ND	ug/kg	310000	1000	06/06/00	CBD	79-01-6	
1,2-Dichloropropane	ND	ug/kg	310000	1000	06/06/00	CBD	78-87-5	
Dibromomethane	ND	ug/kg	310000	1000	06/06/00	CBD	74-95-3	
Bromodichloromethane	ND	ug/kg	310000	1000	06/06/00	CBD	75-27-4	
Toluene	ND	ug/kg	310000	1000	06/06/00	CBD	108-88-3	
1,1,2-Trichloroethane	ND	ug/kg	310000	1000	06/06/00	CBD	79-00-5	
1,3-Dichloropropane	ND	ug/kg	310000	1000	06/06/00	CBD	142-28-9	
Dibromochloromethane	ND	ug/kg	310000	1000	06/06/00	CBD	124-48-1	
Tetrachloroethene	ND	ug/kg	310000	1000	06/06/00	CBD	127-18-4	
1,2-Dibromoethane	ND	ug/kg	310000	1000	06/06/00	CBD	106-93-4	
Chlorobenzene	ND	ug/kg	310000	1000	06/06/00	CBD	108-90-7	
1,1,1,2-Tetrachloroethane	ND	ug/kg	310000	1000	06/06/00	CBD	630-20-6	

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Pace Project Number: 9214408
Client Project ID: Koch North

Pace Sample No: 921019964 | Date Collected: 05/29/00 | Matrix: Soil
Client Sample ID: BH-17 (7-7.5') | Date Received: 06/01/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Ethylbenzene	ND	ug/kg	310000	1000	06/06/00	CBD	100-41-4	
m&p-Xylene	29000000	ug/kg	1200000	2000	06/06/00	CBD	7816-60-0	
Styrene	ND	ug/kg	310000	1000	06/06/00	CBD	100-42-5	
o-Xylene (1,2-Dimethylbenzene)	ND	ug/kg	310000	1000	06/06/00	CBD	95-47-6	
Bromoform	ND	ug/kg	310000	1000	06/06/00	CBD	75-25-2	
1,1,2,2-Tetrachloroethane	ND	ug/kg	310000	1000	06/06/00	CBD	79-34-5	
Isopropylbenzene (Cumene)	ND	ug/kg	310000	1000	06/06/00	CBD	98-82-8	
1,2,3-Trichloropropane	ND	ug/kg	310000	1000	06/06/00	CBD	96-18-4	
Bromobenzene	ND	ug/kg	310000	1000	06/06/00	CBD	108-86-1	
n-Propylbenzene	ND	ug/kg	310000	1000	06/06/00	CBD	103-65-1	
2-Chlorotoluene	ND	ug/kg	310000	1000	06/06/00	CBD	95-49-8	
4-Chlorotoluene	ND	ug/kg	310000	1000	06/06/00	CBD	106-43-4	
1,3,5-Trimethylbenzene	3000000	ug/kg	310000	1000	06/06/00	CBD	108-67-8	
tert-Butylbenzene	ND	ug/kg	310000	1000	06/06/00	CBD	98-06-6	
1,2,4-Trimethylbenzene	4600000	ug/kg	310000	1000	06/06/00	CBD	95-63-6	
sec-Butylbenzene	430000	ug/kg	310000	1000	06/06/00	CBD	135-98-8	
1,3-Dichlorobenzene	ND	ug/kg	310000	1000	06/06/00	CBD	541-73-1	
p-Isopropyltoluene	790000	ug/kg	310000	1000	06/06/00	CBD	99-87-6	
1,4-Dichlorobenzene	ND	ug/kg	310000	1000	06/06/00	CBD	106-46-7	
1,2-Dichlorobenzene	ND	ug/kg	310000	1000	06/06/00	CBD	95-50-1	
n-Butylbenzene	330000	ug/kg	310000	1000	06/06/00	CBD	104-51-8	
1,2-Dibromo-3-Chloropropane	ND	ug/kg	310000	1000	06/06/00	CBD	96-12-8	
1,2,4-Trichlorobenzene	ND	ug/kg	310000	1000	06/06/00	CBD	120-82-1	
Naphthalene	980000	ug/kg	310000	1000	06/06/00	CBD	91-20-3	
Hexachlorobutadiene	ND	ug/kg	310000	1000	06/06/00	CBD	87-68-3	
1,2,3-Trichlorobenzene	ND	ug/kg	310000	1000	06/06/00	CBD	87-61-6	
Dibromofluoromethane (S)	0	%		0.82	06/06/00	CBD	1868-53-7	1
1,2-Dichloroethane-d4 (S)	0	%		0.82	06/06/00	CBD	17060-07-0	
Toluene-d8 (S)	0	%		0.82	06/06/00	CBD	2037-26-5	
4-Bromofluorobenzene (S)	0	%		0.82	06/06/00	CBD	460-00-4	

GC/MS Semivolatiles

Semivolatile Organics	Method: EPA 8270				Prep Method: EPA 3550		
bis(2-Chloroethyl)ether	ND	ug/kg	410	1.00	06/08/00	DHJ	111-44-4
Phenol	ND	ug/kg	410	1.00	06/08/00	DHJ	108-95-2
2-Chlorophenol	ND	ug/kg	410	1.00	06/08/00	DHJ	95-57-8
1,3-Dichlorobenzene	ND	ug/kg	410	1.00	06/08/00	DHJ	541-73-1
1,4-Dichlorobenzene	ND	ug/kg	410	1.00	06/08/00	DHJ	106-46-7
1,2-Dichlorobenzene	ND	ug/kg	410	1.00	06/08/00	DHJ	95-50-1

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NC Wastewater 12
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KY Drinking Water 90090
TN UST List
VA Drinking Water 213

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Pace Project Number: 9214408
Client Project ID: Koch North

Pace Sample No: 921019964
Client Sample ID: BH-17 (7-7.5')
Date Collected: 05/29/00
Date Received: 06/01/00
Matrix: Soil

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Benzyl Alcohol	ND	ug/kg	810	1.00	06/08/00	DHJ	100-51-6	
bis(2-Chloroisopropyl)ether	ND	ug/kg	410	1.00	06/08/00	DHJ	39638-32-9	
2-Methylphenol	ND	ug/kg	410	1.00	06/08/00	DHJ	95-48-7	
Hexachloroethane	ND	ug/kg	410	1.00	06/08/00	DHJ	67-72-1	
N-Nitroso-di-n-propylamine	ND	ug/kg	410	1.00	06/08/00	DHJ	621-64-7	
3&4-Methylphenol	ND	ug/kg	410	1.00	06/08/00	DHJ		
Nitrobenzene	ND	ug/kg	410	1.00	06/08/00	DHJ	98-95-3	
Isophorone	ND	ug/kg	410	1.00	06/08/00	DHJ	78-59-1	
2-Nitrophenol	ND	ug/kg	410	1.00	06/08/00	DHJ	88-75-5	
2,4-Dimethylphenol	ND	ug/kg	410	1.00	06/08/00	DHJ	105-67-9	
bis(2-Chloroethoxy)methane	ND	ug/kg	410	1.00	06/08/00	DHJ	111-91-1	
Benzoic Acid	ND	ug/kg	2000	1.00	06/08/00	DHJ	65-85-0	
2,4-Dichlorophenol	ND	ug/kg	410	1.00	06/08/00	DHJ	120-83-2	
1,2,4-Trichlorobenzene	ND	ug/kg	410	1.00	06/08/00	DHJ	120-82-1	
Naphthalene	17000	ug/kg	4100	10.0	06/08/00	DHJ	91-20-3	
4-Chloroaniline	ND	ug/kg	810	1.00	06/08/00	DHJ	106-47-8	
Hexachlorobutadiene	ND	ug/kg	410	1.00	06/08/00	DHJ	87-68-3	
4-Chloro-3-methylphenol	ND	ug/kg	810	1.00	06/08/00	DHJ	59-50-7	
2-Methylnaphthalene	35000	ug/kg	4100	10.0	06/08/00	DHJ	91-57-6	
Hexachlorocyclopentadiene	ND	ug/kg	410	1.00	06/08/00	DHJ	77-47-4	
2,4,6-Trichlorophenol	ND	ug/kg	410	1.00	06/08/00	DHJ	88-06-2	
2,4,5-Trichlorophenol	ND	ug/kg	410	1.00	06/08/00	DHJ	95-95-4	
2-Chloronaphthalene	ND	ug/kg	410	1.00	06/08/00	DHJ	91-58-7	
2-Nitroaniline	ND	ug/kg	2000	1.00	06/08/00	DHJ	88-74-4	
Acenaphthylene	ND	ug/kg	410	1.00	06/08/00	DHJ	208-96-8	
Dimethylphthalate	ND	ug/kg	410	1.00	06/08/00	DHJ	131-11-3	
2,6-Dinitrotoluene	ND	ug/kg	410	1.00	06/08/00	DHJ	606-20-2	
Acenaphthene	ND	ug/kg	410	1.00	06/08/00	DHJ	83-32-9	
3-Nitroaniline	ND	ug/kg	2000	1.00	06/08/00	DHJ	99-09-2	
2,4-Dinitrophenol	ND	ug/kg	2000	1.00	06/08/00	DHJ	51-28-5	
Dibenzofuran	770	ug/kg	410	1.00	06/08/00	DHJ	132-64-9	
2,4-Dinitrotoluene	ND	ug/kg	410	1.00	06/08/00	DHJ	121-14-2	
4-Nitrophenol	ND	ug/kg	2000	1.00	06/08/00	DHJ	100-02-7	
Fluorene	640	ug/kg	410	1.00	06/08/00	DHJ	86-73-7	
4-Chlorophenyl-phenylether	ND	ug/kg	410	1.00	06/08/00	DHJ	7005-72-3	
Diethylphthalate	ND	ug/kg	410	1.00	06/08/00	DHJ	84-66-2	
4-Nitroaniline	ND	ug/kg	2000	1.00	06/08/00	DHJ	100-01-6	
1,2-Diphenylhydrazine	ND	ug/kg	410	1.00	06/08/00	DHJ	122-66-7	
4,6-Dinitro-2-methylphenol	ND	ug/kg	410	1.00	06/08/00	DHJ	534-52-1	
N-Nitrosodiphenylamine	ND	ug/kg	410	1.00	06/08/00	DHJ	86-30-6	

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Laboratory Certification IDs
KY Drinking Water 90090
TN UST List
VA Drinking Water 213

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Pace Project Number: 9214408
Client Project ID: Koch North

Pace Sample No: 921019964
Client Sample ID: BH-17 (7-7.5')
Date Collected: 05/29/00
Date Received: 06/01/00
Matrix: Soil

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
4-Bromophenyl-phenylether	ND	ug/kg	410	1.00	06/08/00	DHJ	101-55-3	
Hexachlorobenzene	ND	ug/kg	410	1.00	06/08/00	DHJ	118-74-1	
Pentachlorophenol	ND	ug/kg	2000	1.00	06/08/00	DHJ	87-86-5	
Phenanthrene	ND	ug/kg	410	1.00	06/08/00	DHJ	85-01-8	
Anthracene	ND	ug/kg	410	1.00	06/08/00	DHJ	120-12-7	
Di-n-butylphthalate	ND	ug/kg	410	1.00	06/08/00	DHJ	84-74-2	
Fluoranthene	ND	ug/kg	410	1.00	06/08/00	DHJ	206-44-0	
Pyrene	ND	ug/kg	410	1.00	06/08/00	DHJ	129-00-0	
Butylbenzylphthalate	680	ug/kg	410	1.00	06/08/00	DHJ	85-68-7	
3,3'-Dichlorobenzidine	ND	ug/kg	810	1.00	06/08/00	DHJ	91-94-1	
Benzo(a)anthracene	ND	ug/kg	410	1.00	06/08/00	DHJ	56-55-3	
Chrysene	ND	ug/kg	410	1.00	06/08/00	DHJ	218-01-9	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	810	1.00	06/08/00	DHJ	117-81-7	
Di-n-octylphthalate	ND	ug/kg	410	1.00	06/08/00	DHJ	117-84-0	
Benzo(b)fluoranthene	ND	ug/kg	410	1.00	06/08/00	DHJ	205-99-2	
Benzo(k)fluoranthene	ND	ug/kg	410	1.00	06/08/00	DHJ	207-08-9	
Benzo(a)pyrene	ND	ug/kg	410	1.00	06/08/00	DHJ	50-32-8	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	410	1.00	06/08/00	DHJ	193-39-5	
Dibenz(a,h)anthracene	ND	ug/kg	410	1.00	06/08/00	DHJ	53-70-3	
Benzo(g,h,i)perylene	ND	ug/kg	410	1.00	06/08/00	DHJ	191-24-2	
2-Fluorophenol (S)	94	%		0.82	06/08/00	DHJ	367-12-4	
Phenol-d6 (S)	104	%		0.82	06/08/00	DHJ	13127-88-3	
Nitrobenzene-d5 (S)	184	%		0.82	06/08/00	DHJ	4165-60-0	4
2-Fluorobiphenyl (S)	66	%		0.82	06/08/00	DHJ	321-60-8	
2,4,6-Tribromophenol (S)	90	%		0.82	06/08/00	DHJ	118-79-6	
Terphenyl-d14 (S)	59	%		0.82	06/08/00	DHJ	1718-51-0	
Date Extracted					06/06/00			

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Pace Project Number: 9214408
Client Project ID: Koch North

Pace Sample No: 921019972 | Date Collected: 05/29/00 | Matrix: Soil
Client Sample ID: BH-19 (6-6.5') | Date Received: 06/01/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Wet Chemistry								
Percent Moisture		Method: % Moisture			Prep Method:			
Percent Moisture	10.2	%		0.90	06/02/00	YMH		
GC/MS Volatiles								
GC/MS VOCs by 8260		Method: EPA 8260			Prep Method: EPA 8260			
Dichlorodifluoromethane	ND	ug/kg	560000	1000	06/06/00	CBD	75-71-8	
Chloromethane	ND	ug/kg	560000	1000	06/06/00	CBD	74-87-3	
Vinyl Chloride	ND	ug/kg	560000	1000	06/06/00	CBD	75-01-4	
Bromomethane	ND	ug/kg	560000	1000	06/06/00	CBD	74-83-9	
Chloroethane	ND	ug/kg	560000	1000	06/06/00	CBD	75-00-3	
Trichlorofluoromethane	ND	ug/kg	280000	1000	06/06/00	CBD	75-69-4	
1,1-Dichloroethene	ND	ug/kg	280000	1000	06/06/00	CBD	75-35-4	
Methylene Chloride	ND	ug/kg	280000	1000	06/06/00	CBD	75-09-2	
trans-1,2-Dichloroethene	ND	ug/kg	280000	1000	06/06/00	CBD	156-60-5	
1,1-Dichloroethane	ND	ug/kg	280000	1000	06/06/00	CBD	75-34-3	
cis-1,2-Dichloroethene	ND	ug/kg	280000	1000	06/06/00	CBD	156-59-2	
2,2-Dichloropropane	ND	ug/kg	280000	1000	06/06/00	CBD	594-20-7	
Chloroform	ND	ug/kg	280000	1000	06/06/00	CBD	67-66-3	
Bromochloromethane	ND	ug/kg	280000	1000	06/06/00	CBD	74-97-5	
1,1,1-Trichloroethane	ND	ug/kg	280000	1000	06/06/00	CBD	71-55-6	
1,1-Dichloropropene	ND	ug/kg	280000	1000	06/06/00	CBD	563-58-6	
1,2-Dichloroethane	ND	ug/kg	280000	1000	06/06/00	CBD	107-06-2	
Carbon Tetrachloride	ND	ug/kg	280000	1000	06/06/00	CBD	56-23-5	
Benzene	ND	ug/kg	280000	1000	06/06/00	CBD	71-43-2	
Trichloroethene	ND	ug/kg	280000	1000	06/06/00	CBD	79-01-6	
1,2-Dichloropropane	ND	ug/kg	280000	1000	06/06/00	CBD	78-87-5	
Dibromomethane	ND	ug/kg	280000	1000	06/06/00	CBD	74-95-3	
Bromodichloromethane	ND	ug/kg	280000	1000	06/06/00	CBD	75-27-4	
Toluene	ND	ug/kg	280000	1000	06/06/00	CBD	108-88-3	
1,1,2-Trichloroethane	ND	ug/kg	280000	1000	06/06/00	CBD	79-00-5	
1,3-Dichloropropane	ND	ug/kg	280000	1000	06/06/00	CBD	142-28-9	
Dibromochloromethane	ND	ug/kg	280000	1000	06/06/00	CBD	124-48-1	
Tetrachloroethene	ND	ug/kg	280000	1000	06/06/00	CBD	127-18-4	
1,2-Dibromoethane	ND	ug/kg	280000	1000	06/06/00	CBD	106-93-4	
Chlorobenzene	ND	ug/kg	280000	1000	06/06/00	CBD	108-90-7	
1,1,1,2-Tetrachloroethane	ND	ug/kg	280000	1000	06/06/00	CBD	630-20-6	

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Pace Project Number: 9214408
Client Project ID: Koch North

Pace Sample No: 921019972 Date Collected: 05/29/00 Matrix: Soil
Client Sample ID: BH-19 (6-6.5') Date Received: 06/01/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Ethylbenzene	ND	ug/kg	280000	1000	06/06/00	CBD	100-41-4	
m&p-Xylene	21000000	ug/kg	1100000	2000	06/06/00	CBD	7816-60-0	
Styrene	ND	ug/kg	280000	1000	06/06/00	CBD	100-42-5	
o-Xylene (1,2-Dimethylbenzene)	ND	ug/kg	280000	1000	06/06/00	CBD	95-47-6	
Bromoform	ND	ug/kg	280000	1000	06/06/00	CBD	75-25-2	
1,1,2,2-Tetrachloroethane	ND	ug/kg	280000	1000	06/06/00	CBD	79-34-5	
Isopropylbenzene (Cumene)	ND	ug/kg	280000	1000	06/06/00	CBD	98-82-8	
1,2,3-Trichloropropane	ND	ug/kg	280000	1000	06/06/00	CBD	96-18-4	
Bromobenzene	ND	ug/kg	280000	1000	06/06/00	CBD	108-86-1	
n-Propylbenzene	ND	ug/kg	280000	1000	06/06/00	CBD	103-65-1	
2-Chlorotoluene	ND	ug/kg	280000	1000	06/06/00	CBD	95-49-8	
4-Chlorotoluene	ND	ug/kg	280000	1000	06/06/00	CBD	106-43-4	
1,3,5-Trimethylbenzene	ND	ug/kg	280000	1000	06/06/00	CBD	108-67-8	
tert-Butylbenzene	ND	ug/kg	280000	1000	06/06/00	CBD	98-06-6	
1,2,4-Trimethylbenzene	ND	ug/kg	280000	1000	06/06/00	CBD	95-63-6	
sec-Butylbenzene	ND	ug/kg	280000	1000	06/06/00	CBD	135-98-8	
1,3-Dichlorobenzene	ND	ug/kg	280000	1000	06/06/00	CBD	541-73-1	
p-Isopropyltoluene	ND	ug/kg	280000	1000	06/06/00	CBD	99-87-6	
1,4-Dichlorobenzene	ND	ug/kg	280000	1000	06/06/00	CBD	106-46-7	
1,2-Dichlorobenzene	ND	ug/kg	280000	1000	06/06/00	CBD	95-50-1	
n-Butylbenzene	ND	ug/kg	280000	1000	06/06/00	CBD	104-51-8	
1,2-Dibromo-3-Chloropropane	ND	ug/kg	280000	1000	06/06/00	CBD	96-12-8	
1,2,4-Trichlorobenzene	ND	ug/kg	280000	1000	06/06/00	CBD	120-82-1	
Naphthalene	ND	ug/kg	280000	1000	06/06/00	CBD	91-20-3	
Hexachlorobutadiene	ND	ug/kg	280000	1000	06/06/00	CBD	87-68-3	
1,2,3-Trichlorobenzene	ND	ug/kg	280000	1000	06/06/00	CBD	87-61-6	
Dibromofluoromethane (S)	0	%		0.90	06/06/00	CBD	1868-53-7	1
1,2-Dichloroethane-d4 (S)	0	%		0.90	06/06/00	CBD	17060-07-0	
Toluene-d8 (S)	0	%		0.90	06/06/00	CBD	2037-26-5	
4-Bromofluorobenzene (S)	0	%		0.90	06/06/00	CBD	460-00-4	

GC/MS Semivolatiles

Semivolatile Organics	Method: EPA 8270				Prep Method: EPA 3550		
bis(2-Chloroethyl)ether	ND	ug/kg	370	1.00	06/08/00	DHJ	111-44-4
Phenol	ND	ug/kg	370	1.00	06/08/00	DHJ	108-95-2
2-Chlorophenol	ND	ug/kg	370	1.00	06/08/00	DHJ	95-57-8
1,3-Dichlorobenzene	ND	ug/kg	370	1.00	06/08/00	DHJ	541-73-1
1,4-Dichlorobenzene	ND	ug/kg	370	1.00	06/08/00	DHJ	106-46-7
1,2-Dichlorobenzene	ND	ug/kg	370	1.00	06/08/00	DHJ	95-50-1

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Pace Project Number: 9214408
Client Project ID: Koch North

Pace Sample No: 921019972
Client Sample ID: BH-19 (6-6.5')
Date Collected: 05/29/00
Date Received: 06/01/00
Matrix: Soil

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Benzyl Alcohol	ND	ug/kg	740	1.00	06/08/00	DHJ	100-51-6	
bis(2-Chloroisopropyl)ether	ND	ug/kg	370	1.00	06/08/00	DHJ	39638-32-9	
2-Methylphenol	ND	ug/kg	370	1.00	06/08/00	DHJ	95-48-7	
Hexachloroethane	ND	ug/kg	370	1.00	06/08/00	DHJ	67-72-1	
N-Nitroso-di-n-propylamine	ND	ug/kg	370	1.00	06/08/00	DHJ	621-64-7	
3&4-Methylphenol	ND	ug/kg	370	1.00	06/08/00	DHJ		
Nitrobenzene	ND	ug/kg	370	1.00	06/08/00	DHJ	98-95-3	
Isophorone	ND	ug/kg	370	1.00	06/08/00	DHJ	78-59-1	
2-Nitrophenol	ND	ug/kg	370	1.00	06/08/00	DHJ	88-75-5	
2,4-Dimethylphenol	3700	ug/kg	370	1.00	06/08/00	DHJ	105-67-9	
bis(2-Chloroethoxy)methane	ND	ug/kg	370	1.00	06/08/00	DHJ	111-91-1	
Benzoic Acid	ND	ug/kg	1800	1.00	06/08/00	DHJ	65-85-0	
2,4-Dichlorophenol	ND	ug/kg	370	1.00	06/08/00	DHJ	120-83-2	
1,2,4-Trichlorobenzene	ND	ug/kg	370	1.00	06/08/00	DHJ	120-82-1	
Naphthalene	1100	ug/kg	370	1.00	06/08/00	DHJ	91-20-3	
4-Chloroaniline	ND	ug/kg	740	1.00	06/08/00	DHJ	106-47-8	
Hexachlorobutadiene	ND	ug/kg	370	1.00	06/08/00	DHJ	87-68-3	
4-Chloro-3-methylphenol	ND	ug/kg	740	1.00	06/08/00	DHJ	59-50-7	
2-Methylnaphthalene	5700	ug/kg	740	2.00	06/08/00	DHJ	91-57-6	
Hexachlorocyclopentadiene	ND	ug/kg	370	1.00	06/08/00	DHJ	77-47-4	
2,4,6-Trichlorophenol	ND	ug/kg	370	1.00	06/08/00	DHJ	88-06-2	
2,4,5-Trichlorophenol	ND	ug/kg	370	1.00	06/08/00	DHJ	95-95-4	
2-Chloronaphthalene	ND	ug/kg	370	1.00	06/08/00	DHJ	91-58-7	
2-Nitroaniline	ND	ug/kg	1800	1.00	06/08/00	DHJ	88-74-4	
Acenaphthylene	ND	ug/kg	370	1.00	06/08/00	DHJ	208-96-8	
Dimethylphthalate	ND	ug/kg	370	1.00	06/08/00	DHJ	131-11-3	
2,6-Dinitrotoluene	ND	ug/kg	370	1.00	06/08/00	DHJ	606-20-2	
Acenaphthene	ND	ug/kg	370	1.00	06/08/00	DHJ	83-32-9	
3-Nitroaniline	ND	ug/kg	1800	1.00	06/08/00	DHJ	99-09-2	
2,4-Dinitrophenol	ND	ug/kg	1800	1.00	06/08/00	DHJ	51-28-5	
Dibenzofuran	ND	ug/kg	370	1.00	06/08/00	DHJ	132-64-9	
2,4-Dinitrotoluene	ND	ug/kg	370	1.00	06/08/00	DHJ	121-14-2	
4-Nitrophenol	ND	ug/kg	1800	1.00	06/08/00	DHJ	100-02-7	
Fluorene	ND	ug/kg	370	1.00	06/08/00	DHJ	86-73-7	
4-Chlorophenyl-phenylether	ND	ug/kg	370	1.00	06/08/00	DHJ	7005-72-3	
Diethylphthalate	ND	ug/kg	370	1.00	06/08/00	DHJ	84-66-2	
4-Nitroaniline	ND	ug/kg	1800	1.00	06/08/00	DHJ	100-01-6	
1,2-Diphenylhydrazine	ND	ug/kg	370	1.00	06/08/00	DHJ	122-66-7	
4,6-Dinitro-2-methylphenol	ND	ug/kg	370	1.00	06/08/00	DHJ	534-52-1	
N-Nitrosodiphenylamine	ND	ug/kg	370	1.00	06/08/00	DHJ	86-30-6	

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Pace Project Number: 9214408
Client Project ID: Koch North

Pace Sample No: 921019972 | Date Collected: 05/29/00 | Matrix: Soil
Client Sample ID: BH-19 (6-6.5') | Date Received: 06/01/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
4-Bromophenyl-phenylether	ND	ug/kg	370	1.00	06/08/00	DHJ	101-55-3	
Hexachlorobenzene	ND	ug/kg	370	1.00	06/08/00	DHJ	118-74-1	
Pentachlorophenol	ND	ug/kg	1800	1.00	06/08/00	DHJ	87-86-5	
Phenanthrene	ND	ug/kg	370	1.00	06/08/00	DHJ	85-01-8	
Anthracene	ND	ug/kg	370	1.00	06/08/00	DHJ	120-12-7	
Di-n-butylphthalate	ND	ug/kg	370	1.00	06/08/00	DHJ	84-74-2	
Fluoranthene	ND	ug/kg	370	1.00	06/08/00	DHJ	206-44-0	
Pyrene	ND	ug/kg	370	1.00	06/08/00	DHJ	129-00-0	
Butylbenzylphthalate	ND	ug/kg	370	1.00	06/08/00	DHJ	85-68-7	
3,3'-Dichlorobenzidine	ND	ug/kg	740	1.00	06/08/00	DHJ	91-94-1	
Benzo(a)anthracene	ND	ug/kg	370	1.00	06/08/00	DHJ	56-55-3	
Chrysene	ND	ug/kg	370	1.00	06/08/00	DHJ	218-01-9	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	740	1.00	06/08/00	DHJ	117-81-7	
Di-n-octylphthalate	ND	ug/kg	370	1.00	06/08/00	DHJ	117-84-0	
Benzo(b)fluoranthene	ND	ug/kg	370	1.00	06/08/00	DHJ	205-99-2	
Benzo(k)fluoranthene	ND	ug/kg	370	1.00	06/08/00	DHJ	207-08-9	
Benzo(a)pyrene	ND	ug/kg	370	1.00	06/08/00	DHJ	50-32-8	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	370	1.00	06/08/00	DHJ	193-39-5	
Dibenz(a,h)anthracene	ND	ug/kg	370	1.00	06/08/00	DHJ	53-70-3	
Benzo(g,h,i)perylene	ND	ug/kg	370	1.00	06/08/00	DHJ	191-24-2	
2-Fluorophenol (S)	81	%		0.90	06/08/00	DHJ	367-12-4	
Phenol-d6 (S)	82	%		0.90	06/08/00	DHJ	13127-88-3	
Nitrobenzene-d5 (S)	47	%		0.90	06/08/00	DHJ	4165-60-0	
2-Fluorobiphenyl (S)	62	%		0.90	06/08/00	DHJ	321-60-8	
2,4,6-Tribromophenol (S)	67	%		0.90	06/08/00	DHJ	118-79-6	
Terphenyl-d14 (S)	58	%		0.90	06/08/00	DHJ	1718-51-0	
Date Extracted					06/06/00			

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Pace Project Number: 9214408
Client Project ID: Koch North

Pace Sample No: 921019998 Date Collected: 05/26/00 Matrix: Soil
Client Sample ID: 801-~~B4~~(7-7.5') Date Received: 06/01/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Wet Chemistry								
Percent Moisture		Method: % Moisture			Prep Method:			
Percent Moisture	16.9	%		0.83	06/02/00	YMH		
GC/MS Volatiles								
GC/MS VOCs by 8260		Method: EPA 8260			Prep Method: EPA 8260			
Dichlorodifluoromethane	ND	ug/kg	600000	1000	06/06/00	CBD	75-71-8	
Chloromethane	ND	ug/kg	600000	1000	06/06/00	CBD	74-87-3	
Vinyl Chloride	ND	ug/kg	600000	1000	06/06/00	CBD	75-01-4	
Bromomethane	ND	ug/kg	600000	1000	06/06/00	CBD	74-83-9	
Chloroethane	ND	ug/kg	600000	1000	06/06/00	CBD	75-00-3	
Trichlorofluoromethane	ND	ug/kg	300000	1000	06/06/00	CBD	75-69-4	
1,1-Dichloroethene	ND	ug/kg	300000	1000	06/06/00	CBD	75-35-4	
Methylene Chloride	ND	ug/kg	300000	1000	06/06/00	CBD	75-09-2	
trans-1,2-Dichloroethene	ND	ug/kg	300000	1000	06/06/00	CBD	156-60-5	
1,1-Dichloroethane	ND	ug/kg	300000	1000	06/06/00	CBD	75-34-3	
cis-1,2-Dichloroethene	ND	ug/kg	300000	1000	06/06/00	CBD	156-59-2	
2,2-Dichloropropane	ND	ug/kg	300000	1000	06/06/00	CBD	594-20-7	
Chloroform	ND	ug/kg	300000	1000	06/06/00	CBD	67-66-3	
Bromochloromethane	ND	ug/kg	300000	1000	06/06/00	CBD	74-97-5	
1,1,1-Trichloroethane	ND	ug/kg	300000	1000	06/06/00	CBD	71-55-6	
1,1-Dichloropropene	ND	ug/kg	300000	1000	06/06/00	CBD	563-58-6	
1,2-Dichloroethane	ND	ug/kg	300000	1000	06/06/00	CBD	107-06-2	
Carbon Tetrachloride	ND	ug/kg	300000	1000	06/06/00	CBD	56-23-5	
Benzene	ND	ug/kg	300000	1000	06/06/00	CBD	71-43-2	
Trichloroethene	ND	ug/kg	300000	1000	06/06/00	CBD	79-01-6	
1,2-Dichloropropane	ND	ug/kg	300000	1000	06/06/00	CBD	78-87-5	
Dibromomethane	ND	ug/kg	300000	1000	06/06/00	CBD	74-95-3	
Bromodichloromethane	ND	ug/kg	300000	1000	06/06/00	CBD	75-27-4	
Toluene	ND	ug/kg	300000	1000	06/06/00	CBD	108-88-3	
1,1,2-Trichloroethane	ND	ug/kg	300000	1000	06/06/00	CBD	79-00-5	
1,3-Dichloropropane	ND	ug/kg	300000	1000	06/06/00	CBD	142-28-9	
Dibromochloromethane	ND	ug/kg	300000	1000	06/06/00	CBD	124-48-1	
Tetrachloroethene	ND	ug/kg	300000	1000	06/06/00	CBD	127-18-4	
1,2-Dibromoethane	ND	ug/kg	300000	1000	06/06/00	CBD	106-93-4	
Chlorobenzene	ND	ug/kg	300000	1000	06/06/00	CBD	108-90-7	
1,1,1,2-Tetrachloroethane	ND	ug/kg	300000	1000	06/06/00	CBD	630-20-6	

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Pace Project Number: 9214408
Client Project ID: Koch North

Pace Sample No: 921019998 | Date Collected: 05/26/00 | Matrix: Soil
Client Sample ID: 801-[redacted](7-7.5') | Date Received: 06/01/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Ethylbenzene	ND	ug/kg	300000	1000	06/06/00	CBD	100-41-4	
m&p-Xylene	58000000	ug/kg	3000000	5000	06/06/00	CBD	7816-60-0	
Styrene	ND	ug/kg	300000	1000	06/06/00	CBD	100-42-5	
o-Xylene (1,2-Dimethylbenzene)	ND	ug/kg	300000	1000	06/06/00	CBD	95-47-6	
Bromoform	ND	ug/kg	300000	1000	06/06/00	CBD	75-25-2	
1,1,2,2-Tetrachloroethane	ND	ug/kg	300000	1000	06/06/00	CBD	79-34-5	
Isopropylbenzene (Cumene)	ND	ug/kg	300000	1000	06/06/00	CBD	98-82-8	
1,2,3-Trichloropropane	ND	ug/kg	300000	1000	06/06/00	CBD	96-18-4	
Bromobenzene	ND	ug/kg	300000	1000	06/06/00	CBD	108-86-1	
n-Propylbenzene	ND	ug/kg	300000	1000	06/06/00	CBD	103-65-1	
2-Chlorotoluene	ND	ug/kg	300000	1000	06/06/00	CBD	95-49-8	
4-Chlorotoluene	ND	ug/kg	300000	1000	06/06/00	CBD	106-43-4	
1,3,5-Trimethylbenzene	ND	ug/kg	300000	1000	06/06/00	CBD	108-67-8	
tert-Butylbenzene	ND	ug/kg	300000	1000	06/06/00	CBD	98-06-6	
1,2,4-Trimethylbenzene	ND	ug/kg	300000	1000	06/06/00	CBD	95-63-6	
sec-Butylbenzene	ND	ug/kg	300000	1000	06/06/00	CBD	135-98-8	
1,3-Dichlorobenzene	ND	ug/kg	300000	1000	06/06/00	CBD	541-73-1	
p-Isopropyltoluene	ND	ug/kg	300000	1000	06/06/00	CBD	99-87-6	
1,4-Dichlorobenzene	ND	ug/kg	300000	1000	06/06/00	CBD	106-46-7	
1,2-Dichlorobenzene	ND	ug/kg	300000	1000	06/06/00	CBD	95-50-1	
n-Butylbenzene	ND	ug/kg	300000	1000	06/06/00	CBD	104-51-8	
1,2-Dibromo-3-Chloropropane	ND	ug/kg	300000	1000	06/06/00	CBD	96-12-8	
1,2,4-Trichlorobenzene	ND	ug/kg	300000	1000	06/06/00	CBD	120-82-1	
Naphthalene	ND	ug/kg	300000	1000	06/06/00	CBD	91-20-3	
Hexachlorobutadiene	ND	ug/kg	300000	1000	06/06/00	CBD	87-68-3	
1,2,3-Trichlorobenzene	ND	ug/kg	300000	1000	06/06/00	CBD	87-61-6	
Dibromofluoromethane (S)	0	%		0.83	06/06/00	CBD	1868-53-7	1
1,2-Dichloroethane-d4 (S)	0	%		0.83	06/06/00	CBD	17060-07-0	
Toluene-d8 (S)	0	%		0.83	06/06/00	CBD	2037-26-5	
4-Bromofluorobenzene (S)	0	%		0.83	06/06/00	CBD	460-00-4	

GC/MS Semivolatiles

Semivolatile Organics	Method: EPA 8270				Prep Method: EPA 3550		
bis(2-Chloroethyl)ether	ND	ug/kg	400	1.00	06/08/00	DHJ	111-44-4
Phenol	ND	ug/kg	400	1.00	06/08/00	DHJ	108-95-2
2-Chlorophenol	ND	ug/kg	400	1.00	06/08/00	DHJ	95-57-8
1,3-Dichlorobenzene	ND	ug/kg	400	1.00	06/08/00	DHJ	541-73-1
1,4-Dichlorobenzene	ND	ug/kg	400	1.00	06/08/00	DHJ	106-46-7
1,2-Dichlorobenzene	ND	ug/kg	400	1.00	06/08/00	DHJ	95-50-1

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Pace Project Number: 9214408
Client Project ID: Koch North

Pace Sample No: 921019998 Date Collected: 05/26/00 Matrix: Soil
Client Sample ID: 801-B4(7-7.5') Date Received: 06/01/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Benzyl Alcohol	ND	ug/kg	790	1.00	06/08/00	DHJ	100-51-6	
bis(2-Chloroisopropyl)ether	ND	ug/kg	400	1.00	06/08/00	DHJ	39638-32-9	
2-Methylphenol	ND	ug/kg	400	1.00	06/08/00	DHJ	95-48-7	
Hexachloroethane	ND	ug/kg	400	1.00	06/08/00	DHJ	67-72-1	
N-Nitroso-di-n-propylamine	ND	ug/kg	400	1.00	06/08/00	DHJ	621-64-7	
3&4-Methylphenol	ND	ug/kg	400	1.00	06/08/00	DHJ		
Nitrobenzene	ND	ug/kg	400	1.00	06/08/00	DHJ	98-95-3	
Isophorone	ND	ug/kg	400	1.00	06/08/00	DHJ	78-59-1	
2-Nitrophenol	ND	ug/kg	400	1.00	06/08/00	DHJ	88-75-5	
2,4-Dimethylphenol	ND	ug/kg	400	1.00	06/08/00	DHJ	105-67-9	
bis(2-Chloroethoxy)methane	ND	ug/kg	400	1.00	06/08/00	DHJ	111-91-1	
Benzoic Acid	ND	ug/kg	2000	1.00	06/08/00	DHJ	65-85-0	
2,4-Dichlorophenol	ND	ug/kg	400	1.00	06/08/00	DHJ	120-83-2	
1,2,4-Trichlorobenzene	ND	ug/kg	400	1.00	06/08/00	DHJ	120-82-1	
Naphthalene	ND	ug/kg	400	1.00	06/08/00	DHJ	91-20-3	
4-Chloroaniline	ND	ug/kg	790	1.00	06/08/00	DHJ	106-47-8	
Hexachlorobutadiene	ND	ug/kg	400	1.00	06/08/00	DHJ	87-68-3	
4-Chloro-3-methylphenol	ND	ug/kg	790	1.00	06/08/00	DHJ	59-50-7	
2-Methylnaphthalene	ND	ug/kg	400	1.00	06/08/00	DHJ	91-57-6	
Hexachlorocyclopentadiene	ND	ug/kg	400	1.00	06/08/00	DHJ	77-47-4	
2,4,6-Trichlorophenol	ND	ug/kg	400	1.00	06/08/00	DHJ	88-06-2	
2,4,5-Trichlorophenol	ND	ug/kg	400	1.00	06/08/00	DHJ	95-95-4	
2-Chloronaphthalene	ND	ug/kg	400	1.00	06/08/00	DHJ	91-58-7	
2-Nitroaniline	ND	ug/kg	2000	1.00	06/08/00	DHJ	88-74-4	
Acenaphthylene	ND	ug/kg	400	1.00	06/08/00	DHJ	208-96-8	
Dimethylphthalate	ND	ug/kg	400	1.00	06/08/00	DHJ	131-11-3	
2,6-Dinitrotoluene	ND	ug/kg	400	1.00	06/08/00	DHJ	606-20-2	
Acenaphthene	ND	ug/kg	400	1.00	06/08/00	DHJ	83-32-9	
3-Nitroaniline	ND	ug/kg	2000	1.00	06/08/00	DHJ	99-09-2	
2,4-Dinitrophenol	ND	ug/kg	2000	1.00	06/08/00	DHJ	51-28-5	
Dibenzofuran	ND	ug/kg	400	1.00	06/08/00	DHJ	132-64-9	
2,4-Dinitrotoluene	ND	ug/kg	400	1.00	06/08/00	DHJ	121-14-2	
4-Nitrophenol	ND	ug/kg	2000	1.00	06/08/00	DHJ	100-02-7	
Fluorene	ND	ug/kg	400	1.00	06/08/00	DHJ	86-73-7	
4-Chlorophenyl-phenylether	ND	ug/kg	400	1.00	06/08/00	DHJ	7005-72-3	
Diethylphthalate	ND	ug/kg	400	1.00	06/08/00	DHJ	84-66-2	
4-Nitroaniline	ND	ug/kg	2000	1.00	06/08/00	DHJ	100-01-6	
1,2-Diphenylhydrazine	ND	ug/kg	400	1.00	06/08/00	DHJ	122-66-7	
4,6-Dinitro-2-methylphenol	ND	ug/kg	400	1.00	06/08/00	DHJ	534-52-1	
N-Nitrosodiphenylamine	ND	ug/kg	400	1.00	06/08/00	DHJ	86-30-6	

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Pace Project Number: 9214408
Client Project ID: Koch North

Pace Sample No: 921019998 | Date Collected: 05/26/00 | Matrix: Soil
Client Sample ID: 801-04(7-7.5') | Date Received: 06/01/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
4-Bromophenyl-phenylether	ND	ug/kg	400	1.00	06/08/00	DHJ	101-55-3	
Hexachlorobenzene	ND	ug/kg	400	1.00	06/08/00	DHJ	118-74-1	
Pentachlorophenol	ND	ug/kg	2000	1.00	06/08/00	DHJ	87-86-5	
Phenanthrene	ND	ug/kg	400	1.00	06/08/00	DHJ	85-01-8	
Anthracene	ND	ug/kg	400	1.00	06/08/00	DHJ	120-12-7	
Di-n-butylphthalate	ND	ug/kg	400	1.00	06/08/00	DHJ	84-74-2	
Fluoranthene	ND	ug/kg	400	1.00	06/08/00	DHJ	206-44-0	
Pyrene	ND	ug/kg	400	1.00	06/08/00	DHJ	129-00-0	
Butylbenzylphthalate	ND	ug/kg	400	1.00	06/08/00	DHJ	85-68-7	
3,3'-Dichlorobenzidine	ND	ug/kg	790	1.00	06/08/00	DHJ	91-94-1	
Benzo(a)anthracene	ND	ug/kg	400	1.00	06/08/00	DHJ	56-55-3	
Chrysene	ND	ug/kg	400	1.00	06/08/00	DHJ	218-01-9	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	790	1.00	06/08/00	DHJ	117-81-7	
Di-n-octylphthalate	ND	ug/kg	400	1.00	06/08/00	DHJ	117-84-0	
Benzo(b)fluoranthene	ND	ug/kg	400	1.00	06/08/00	DHJ	205-99-2	
Benzo(k)fluoranthene	ND	ug/kg	400	1.00	06/08/00	DHJ	207-08-9	
Benzo(a)pyrene	ND	ug/kg	400	1.00	06/08/00	DHJ	50-32-8	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	400	1.00	06/08/00	DHJ	193-39-5	
Dibenz(a,h)anthracene	ND	ug/kg	400	1.00	06/08/00	DHJ	53-70-3	
Benzo(g,h,i)perylene	ND	ug/kg	400	1.00	06/08/00	DHJ	191-24-2	
2-Fluorophenol (S)	6	%		0.83	06/08/00	DHJ	367-12-4	2
Phenol-d6 (S)	81	%		0.83	06/08/00	DHJ	13127-88-3	
Nitrobenzene-d5 (S)	91	%		0.83	06/08/00	DHJ	4165-60-0	
2-Fluorobiphenyl (S)	81	%		0.83	06/08/00	DHJ	321-60-8	
2,4,6-Tribromophenol (S)	93	%		0.83	06/08/00	DHJ	118-79-6	
Terphenyl-d14 (S)	82	%		0.83	06/08/00	DHJ	1718-51-0	
Date Extracted					06/06/00			

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Pace Project Number: 9214408
Client Project ID: Koch North

Pace Sample No: 921020004 | Date Collected: 05/26/00 | Matrix: Soil
Client Sample ID: 401-13 (7-7.5') | Date Received: 06/01/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Wet Chemistry								
Percent Moisture		Method: % Moisture			Prep Method:			
Percent Moisture	16.3	%		0.84	06/02/00	YMH		
GC/MS Volatiles								
GC/MS VOCs by 8260		Method: EPA 8260			Prep Method: EPA 8260			
Dichlorodifluoromethane	ND	ug/kg	600000	1000	06/06/00	CBD	75-71-8	
Chloromethane	ND	ug/kg	600000	1000	06/06/00	CBD	74-87-3	
Vinyl Chloride	ND	ug/kg	600000	1000	06/06/00	CBD	75-01-4	
Bromomethane	ND	ug/kg	600000	1000	06/06/00	CBD	74-83-9	
Chloroethane	ND	ug/kg	600000	1000	06/06/00	CBD	75-00-3	
Trichlorofluoromethane	ND	ug/kg	300000	1000	06/06/00	CBD	75-69-4	
1,1-Dichloroethene	ND	ug/kg	300000	1000	06/06/00	CBD	75-35-4	
Methylene Chloride	ND	ug/kg	300000	1000	06/06/00	CBD	75-09-2	
trans-1,2-Dichloroethene	ND	ug/kg	300000	1000	06/06/00	CBD	156-60-5	
1,1-Dichloroethane	ND	ug/kg	300000	1000	06/06/00	CBD	75-34-3	
cis-1,2-Dichloroethene	ND	ug/kg	300000	1000	06/06/00	CBD	156-59-2	
2,2-Dichloropropane	ND	ug/kg	300000	1000	06/06/00	CBD	594-20-7	
Chloroform	ND	ug/kg	300000	1000	06/06/00	CBD	67-66-3	
Bromochloromethane	ND	ug/kg	300000	1000	06/06/00	CBD	74-97-5	
1,1,1-Trichloroethane	ND	ug/kg	300000	1000	06/06/00	CBD	71-55-6	
1,1-Dichloropropene	ND	ug/kg	300000	1000	06/06/00	CBD	563-58-6	
1,2-Dichloroethane	ND	ug/kg	300000	1000	06/06/00	CBD	107-06-2	
Carbon Tetrachloride	ND	ug/kg	300000	1000	06/06/00	CBD	56-23-5	
Benzene	ND	ug/kg	300000	1000	06/06/00	CBD	71-43-2	
Trichloroethene	ND	ug/kg	300000	1000	06/06/00	CBD	79-01-6	
1,2-Dichloropropane	ND	ug/kg	300000	1000	06/06/00	CBD	78-87-5	
Dibromomethane	ND	ug/kg	300000	1000	06/06/00	CBD	74-95-3	
Bromodichloromethane	ND	ug/kg	300000	1000	06/06/00	CBD	75-27-4	
Toluene	ND	ug/kg	300000	1000	06/06/00	CBD	108-88-3	
1,1,2-Trichloroethane	ND	ug/kg	300000	1000	06/06/00	CBD	79-00-5	
1,3-Dichloropropane	ND	ug/kg	300000	1000	06/06/00	CBD	142-28-9	
Dibromochloromethane	ND	ug/kg	300000	1000	06/06/00	CBD	124-48-1	
Tetrachloroethene	ND	ug/kg	300000	1000	06/06/00	CBD	127-18-4	
1,2-Dibromoethane	ND	ug/kg	300000	1000	06/06/00	CBD	106-93-4	
Chlorobenzene	ND	ug/kg	300000	1000	06/06/00	CBD	108-90-7	
1,1,1,2-Tetrachloroethane	ND	ug/kg	300000	1000	06/06/00	CBD	630-20-6	

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Pace Project Number: 9214408
Client Project ID: Koch North

Pace Sample No: 921020004 Date Collected: 05/26/00 Matrix: Soil
Client Sample ID: 401-13 (7-7.5') Date Received: 06/01/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Ethylbenzene	ND	ug/kg	300000	1000	06/06/00	CBD	100-41-4	
m&p-Xylene	120000000	ug/kg	3000000	5000	06/06/00	CBD	7816-60-0	
Styrene	ND	ug/kg	300000	1000	06/06/00	CBD	100-42-5	
o-Xylene (1,2-Dimethylbenzene)	ND	ug/kg	300000	1000	06/06/00	CBD	95-47-6	
Bromoform	ND	ug/kg	300000	1000	06/06/00	CBD	75-25-2	
1,1,2,2-Tetrachloroethane	ND	ug/kg	300000	1000	06/06/00	CBD	79-34-5	
Isopropylbenzene (Cumene)	ND	ug/kg	300000	1000	06/06/00	CBD	98-82-8	
1,2,3-Trichloropropane	ND	ug/kg	300000	1000	06/06/00	CBD	96-18-4	
Bromobenzene	ND	ug/kg	300000	1000	06/06/00	CBD	108-86-1	
n-Propylbenzene	ND	ug/kg	300000	1000	06/06/00	CBD	103-65-1	
2-Chlorotoluene	ND	ug/kg	300000	1000	06/06/00	CBD	95-49-8	
4-Chlorotoluene	ND	ug/kg	300000	1000	06/06/00	CBD	106-43-4	
1,3,5-Trimethylbenzene	890000	ug/kg	300000	1000	06/06/00	CBD	108-67-8	
tert-Butylbenzene	ND	ug/kg	300000	1000	06/06/00	CBD	98-06-6	
1,2,4-Trimethylbenzene	1900000	ug/kg	300000	1000	06/06/00	CBD	95-63-6	
sec-Butylbenzene	ND	ug/kg	300000	1000	06/06/00	CBD	135-98-8	
1,3-Dichlorobenzene	ND	ug/kg	300000	1000	06/06/00	CBD	541-73-1	
p-Isopropyltoluene	350000	ug/kg	300000	1000	06/06/00	CBD	99-87-6	
1,4-Dichlorobenzene	ND	ug/kg	300000	1000	06/06/00	CBD	106-46-7	
1,2-Dichlorobenzene	ND	ug/kg	300000	1000	06/06/00	CBD	95-50-1	
n-Butylbenzene	350000	ug/kg	300000	1000	06/06/00	CBD	104-51-8	
1,2-Dibromo-3-Chloropropane	ND	ug/kg	300000	1000	06/06/00	CBD	96-12-8	
1,2,4-Trichlorobenzene	ND	ug/kg	300000	1000	06/06/00	CBD	120-82-1	
Naphthalene	500000	ug/kg	300000	1000	06/06/00	CBD	91-20-3	
Hexachlorobutadiene	ND	ug/kg	300000	1000	06/06/00	CBD	87-68-3	
1,2,3-Trichlorobenzene	ND	ug/kg	300000	1000	06/06/00	CBD	87-61-6	
Dibromofluoromethane (S)	0	%		0.84	06/06/00	CBD	1868-53-7	1
1,2-Dichloroethane-d4 (S)	0	%		0.84	06/06/00	CBD	17060-07-0	
Toluene-d8 (S)	0	%		0.84	06/06/00	CBD	2037-26-5	
4-Bromofluorobenzene (S)	0	%		0.84	06/06/00	CBD	460-00-4	

GC/MS Semivolatiles

Semivolatile Organics	Method: EPA 8270				Prep Method: EPA 3550		
bis(2-Chloroethyl)ether	ND	ug/kg	20000	50.0	06/09/00	DHJ	111-44-4
Phenol	ND	ug/kg	20000	50.0	06/09/00	DHJ	108-95-2
2-Chlorophenol	ND	ug/kg	20000	50.0	06/09/00	DHJ	95-57-8
1,3-Dichlorobenzene	ND	ug/kg	20000	50.0	06/09/00	DHJ	541-73-1
1,4-Dichlorobenzene	ND	ug/kg	20000	50.0	06/09/00	DHJ	106-46-7
1,2-Dichlorobenzene	ND	ug/kg	20000	50.0	06/09/00	DHJ	95-50-1

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Pace Project Number: 9214408
Client Project ID: Koch North

Pace Sample No: 921020004 | Date Collected: 05/26/00 | Matrix: Soil
Client Sample ID: 401-13 (7-7.5') | Date Received: 06/01/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Benzyl Alcohol	ND	ug/kg	39000	50.0	06/09/00	DHJ	100-51-6	
bis(2-Chloroisopropyl)ether	ND	ug/kg	20000	50.0	06/09/00	DHJ	39638-32-9	
2-Methylphenol	ND	ug/kg	20000	50.0	06/09/00	DHJ	95-48-7	
Hexachloroethane	ND	ug/kg	20000	50.0	06/09/00	DHJ	67-72-1	
N-Nitroso-di-n-propylamine	ND	ug/kg	20000	50.0	06/09/00	DHJ	621-64-7	
3&4-Methylphenol	ND	ug/kg	20000	50.0	06/09/00	DHJ		
Nitrobenzene	ND	ug/kg	20000	50.0	06/09/00	DHJ	98-95-3	
Isophorone	ND	ug/kg	20000	50.0	06/09/00	DHJ	78-59-1	
2-Nitrophenol	ND	ug/kg	20000	50.0	06/09/00	DHJ	88-75-5	
2,4-Dimethylphenol	ND	ug/kg	20000	50.0	06/09/00	DHJ	105-67-9	
bis(2-Chloroethoxy)methane	ND	ug/kg	20000	50.0	06/09/00	DHJ	111-91-1	
Benzoic Acid	ND	ug/kg	99000	50.0	06/09/00	DHJ	65-85-0	
2,4-Dichlorophenol	ND	ug/kg	20000	50.0	06/09/00	DHJ	120-83-2	
1,2,4-Trichlorobenzene	ND	ug/kg	20000	50.0	06/09/00	DHJ	120-82-1	
Naphthalene	ND	ug/kg	20000	50.0	06/09/00	DHJ	91-20-3	
4-Chloroaniline	ND	ug/kg	39000	50.0	06/09/00	DHJ	106-47-8	
Hexachlorobutadiene	ND	ug/kg	20000	50.0	06/09/00	DHJ	87-68-3	
4-Chloro-3-methylphenol	ND	ug/kg	39000	50.0	06/09/00	DHJ	59-50-7	
2-Methylnaphthalene	41000	ug/kg	20000	50.0	06/09/00	DHJ	91-57-6	
Hexachlorocyclopentadiene	ND	ug/kg	20000	50.0	06/09/00	DHJ	77-47-4	
2,4,6-Trichlorophenol	ND	ug/kg	20000	50.0	06/09/00	DHJ	88-06-2	
2,4,5-Trichlorophenol	ND	ug/kg	20000	50.0	06/09/00	DHJ	95-95-4	
2-Chloronaphthalene	ND	ug/kg	20000	50.0	06/09/00	DHJ	91-58-7	
2-Nitroaniline	ND	ug/kg	99000	50.0	06/09/00	DHJ	88-74-4	
Acenaphthylene	ND	ug/kg	20000	50.0	06/09/00	DHJ	208-96-8	
Dimethylphthalate	ND	ug/kg	20000	50.0	06/09/00	DHJ	131-11-3	
2,6-Dinitrotoluene	ND	ug/kg	20000	50.0	06/09/00	DHJ	606-20-2	
Acenaphthene	ND	ug/kg	20000	50.0	06/09/00	DHJ	83-32-9	
3-Nitroaniline	ND	ug/kg	99000	50.0	06/09/00	DHJ	99-09-2	
2,4-Dinitrophenol	ND	ug/kg	99000	50.0	06/09/00	DHJ	51-28-5	
Dibenzofuran	ND	ug/kg	20000	50.0	06/09/00	DHJ	132-64-9	
2,4-Dinitrotoluene	ND	ug/kg	20000	50.0	06/09/00	DHJ	121-14-2	
4-Nitrophenol	ND	ug/kg	99000	50.0	06/09/00	DHJ	100-02-7	
Fluorene	ND	ug/kg	20000	50.0	06/09/00	DHJ	86-73-7	
4-Chlorophenyl-phenylether	ND	ug/kg	20000	50.0	06/09/00	DHJ	7005-72-3	
Diethylphthalate	ND	ug/kg	20000	50.0	06/09/00	DHJ	84-66-2	
4-Nitroaniline	ND	ug/kg	99000	50.0	06/09/00	DHJ	100-01-6	
1,2-Diphenylhydrazine	ND	ug/kg	20000	50.0	06/09/00	DHJ	122-66-7	
4,6-Dinitro-2-methylphenol	ND	ug/kg	20000	50.0	06/09/00	DHJ	534-52-1	
N-Nitrosodiphenylamine	ND	ug/kg	20000	50.0	06/09/00	DHJ	86-30-6	

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Pace Project Number: 9214408
Client Project ID: Koch North

Pace Sample No: 921020004 | Date Collected: 05/26/00 | Matrix: Soil
Client Sample ID: 401-13 (7-7.5') | Date Received: 06/01/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
4-Bromophenyl-phenylether	ND	ug/kg	20000	50.0	06/09/00	DHJ	101-55-3	
Hexachlorobenzene	ND	ug/kg	20000	50.0	06/09/00	DHJ	118-74-1	
Pentachlorophenol	ND	ug/kg	99000	50.0	06/09/00	DHJ	87-86-5	
Phenanthrene	ND	ug/kg	20000	50.0	06/09/00	DHJ	85-01-8	
Anthracene	ND	ug/kg	20000	50.0	06/09/00	DHJ	120-12-7	
Di-n-butylphthalate	ND	ug/kg	20000	50.0	06/09/00	DHJ	84-74-2	
Fluoranthene	ND	ug/kg	20000	50.0	06/09/00	DHJ	206-44-0	
Pyrene	ND	ug/kg	20000	50.0	06/09/00	DHJ	129-00-0	
Butylbenzylphthalate	ND	ug/kg	20000	50.0	06/09/00	DHJ	85-68-7	
3,3'-Dichlorobenzidine	ND	ug/kg	39000	50.0	06/09/00	DHJ	91-94-1	
Benzo(a)anthracene	ND	ug/kg	20000	50.0	06/09/00	DHJ	56-55-3	
Chrysene	ND	ug/kg	20000	50.0	06/09/00	DHJ	218-01-9	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	39000	50.0	06/09/00	DHJ	117-81-7	
Di-n-octylphthalate	ND	ug/kg	20000	50.0	06/09/00	DHJ	117-84-0	
Benzo(b)fluoranthene	ND	ug/kg	20000	50.0	06/09/00	DHJ	205-99-2	
Benzo(k)fluoranthene	ND	ug/kg	20000	50.0	06/09/00	DHJ	207-08-9	
Benzo(a)pyrene	ND	ug/kg	20000	50.0	06/09/00	DHJ	50-32-8	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	20000	50.0	06/09/00	DHJ	193-39-5	
Dibenz(a,h)anthracene	ND	ug/kg	20000	50.0	06/09/00	DHJ	53-70-3	
Benzo(g,h,i)perylene	ND	ug/kg	20000	50.0	06/09/00	DHJ	191-24-2	
2-Fluorophenol (S)	0	%		0.84	06/09/00	DHJ	367-12-4	
Phenol-d6 (S)	0	%		0.84	06/09/00	DHJ	13127-88-3	
Nitrobenzene-d5 (S)	0	%		0.84	06/09/00	DHJ	4165-60-0	
2-Fluorobiphenyl (S)	0	%		0.84	06/09/00	DHJ	321-60-8	
2,4,6-Tribromophenol (S)	0	%		0.84	06/09/00	DHJ	118-79-6	1
Terphenyl-d14 (S)	0	%		0.84	06/09/00	DHJ	1718-51-0	
Date Extracted					06/06/00			

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Pace Project Number: 9214408
Client Project ID: Koch North

Pace Sample No: 921020020 | Date Collected: 05/26/00 | Matrix: Soil
Client Sample ID: BH-X6 (5.5-6') | Date Received: 06/01/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Wet Chemistry								
Percent Moisture		Method: % Moisture			Prep Method:			
Percent Moisture	16.9	%		0.83	06/02/00	YMH		
GC/MS Volatiles								
GC/MS VOCs by 8260		Method: EPA 8260			Prep Method: EPA 8260			
Dichlorodifluoromethane	ND	ug/kg	600000	1000	06/06/00	CBD	75-71-8	
Chloromethane	ND	ug/kg	600000	1000	06/06/00	CBD	74-87-3	
Vinyl Chloride	ND	ug/kg	600000	1000	06/06/00	CBD	75-01-4	
Bromomethane	ND	ug/kg	600000	1000	06/06/00	CBD	74-83-9	
Chloroethane	ND	ug/kg	600000	1000	06/06/00	CBD	75-00-3	
Trichlorofluoromethane	ND	ug/kg	300000	1000	06/06/00	CBD	75-69-4	
1,1-Dichloroethene	ND	ug/kg	300000	1000	06/06/00	CBD	75-35-4	
Methylene Chloride	ND	ug/kg	300000	1000	06/06/00	CBD	75-09-2	
trans-1,2-Dichloroethene	ND	ug/kg	300000	1000	06/06/00	CBD	156-60-5	
1,1-Dichloroethane	ND	ug/kg	300000	1000	06/06/00	CBD	75-34-3	
cis-1,2-Dichloroethene	ND	ug/kg	300000	1000	06/06/00	CBD	156-59-2	
2,2-Dichloropropane	ND	ug/kg	300000	1000	06/06/00	CBD	594-20-7	
Chloroform	ND	ug/kg	300000	1000	06/06/00	CBD	67-66-3	
Bromochloromethane	ND	ug/kg	300000	1000	06/06/00	CBD	74-97-5	
1,1,1-Trichloroethane	ND	ug/kg	300000	1000	06/06/00	CBD	71-55-6	
1,1-Dichloropropene	ND	ug/kg	300000	1000	06/06/00	CBD	563-58-6	
1,2-Dichloroethane	ND	ug/kg	300000	1000	06/06/00	CBD	107-06-2	
Carbon Tetrachloride	ND	ug/kg	300000	1000	06/06/00	CBD	56-23-5	
Benzene	ND	ug/kg	300000	1000	06/06/00	CBD	71-43-2	
Trichloroethene	ND	ug/kg	300000	1000	06/06/00	CBD	79-01-6	
1,2-Dichloropropane	ND	ug/kg	300000	1000	06/06/00	CBD	78-87-5	
Dibromomethane	ND	ug/kg	300000	1000	06/06/00	CBD	74-95-3	
Bromodichloromethane	ND	ug/kg	300000	1000	06/06/00	CBD	75-27-4	
Toluene	ND	ug/kg	300000	1000	06/06/00	CBD	108-88-3	
1,1,2-Trichloroethane	ND	ug/kg	300000	1000	06/06/00	CBD	79-00-5	
1,3-Dichloropropane	ND	ug/kg	300000	1000	06/06/00	CBD	142-28-9	
Dibromochloromethane	ND	ug/kg	300000	1000	06/06/00	CBD	124-48-1	
Tetrachloroethene	ND	ug/kg	300000	1000	06/06/00	CBD	127-18-4	
1,2-Dibromoethane	ND	ug/kg	300000	1000	06/06/00	CBD	106-93-4	
Chlorobenzene	ND	ug/kg	300000	1000	06/06/00	CBD	108-90-7	
1,1,1,2-Tetrachloroethane	ND	ug/kg	300000	1000	06/06/00	CBD	630-20-6	

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Pace Project Number: 9214408
Client Project ID: Koch North

Pace Sample No: 921020020 Date Collected: 05/26/00 Matrix: Soil
Client Sample ID: BH-X6 (5.5-6') Date Received: 06/01/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Ethylbenzene	1200000	ug/kg	300000	1000	06/06/00	CBD	100-41-4	
m&p-Xylene	510000000	ug/kg	30000000	50000	06/06/00	CBD	7816-60-0	
Styrene	ND	ug/kg	300000	1000	06/06/00	CBD	100-42-5	
o-Xylene (1,2-Dimethylbenzene)	1900000	ug/kg	300000	1000	06/06/00	CBD	95-47-6	
Bromoform	ND	ug/kg	300000	1000	06/06/00	CBD	75-25-2	
1,1,2,2-Tetrachloroethane	ND	ug/kg	300000	1000	06/06/00	CBD	79-34-5	
Isopropylbenzene (Cumene)	ND	ug/kg	300000	1000	06/06/00	CBD	98-82-8	
1,2,3-Trichloropropane	ND	ug/kg	300000	1000	06/06/00	CBD	96-18-4	
Bromobenzene	ND	ug/kg	300000	1000	06/06/00	CBD	108-86-1	
n-Propylbenzene	490000	ug/kg	300000	1000	06/06/00	CBD	103-65-1	
2-Chlorotoluene	ND	ug/kg	300000	1000	06/06/00	CBD	95-49-8	
4-Chlorotoluene	ND	ug/kg	300000	1000	06/06/00	CBD	106-43-4	
1,3,5-Trimethylbenzene	2500000	ug/kg	300000	1000	06/06/00	CBD	108-67-8	
tert-Butylbenzene	ND	ug/kg	300000	1000	06/06/00	CBD	98-06-6	
1,2,4-Trimethylbenzene	5400000	ug/kg	300000	1000	06/06/00	CBD	95-63-6	
sec-Butylbenzene	360000	ug/kg	300000	1000	06/06/00	CBD	135-98-8	
1,3-Dichlorobenzene	ND	ug/kg	300000	1000	06/06/00	CBD	541-73-1	
p-Isopropyltoluene	530000	ug/kg	300000	1000	06/06/00	CBD	99-87-6	
1,4-Dichlorobenzene	ND	ug/kg	300000	1000	06/06/00	CBD	106-46-7	
1,2-Dichlorobenzene	ND	ug/kg	300000	1000	06/06/00	CBD	95-50-1	
n-Butylbenzene	330000	ug/kg	300000	1000	06/06/00	CBD	104-51-8	
1,2-Dibromo-3-Chloropropane	ND	ug/kg	300000	1000	06/06/00	CBD	96-12-8	
1,2,4-Trichlorobenzene	ND	ug/kg	300000	1000	06/06/00	CBD	120-82-1	
Naphthalene	820000	ug/kg	300000	1000	06/06/00	CBD	91-20-3	
Hexachlorobutadiene	ND	ug/kg	300000	1000	06/06/00	CBD	87-68-3	
1,2,3-Trichlorobenzene	ND	ug/kg	300000	1000	06/06/00	CBD	87-61-6	
Dibromofluoromethane (S)	0	%		0.83	06/06/00	CBD	1868-53-7	1
1,2-Dichloroethane-d4 (S)	0	%		0.83	06/06/00	CBD	17060-07-0	
Toluene-d8 (S)	0	%		0.83	06/06/00	CBD	2037-26-5	
4-Bromofluorobenzene (S)	0	%		0.83	06/06/00	CBD	460-00-4	

GC/MS Semivolatiles

Semivolatile Organics	Method: EPA 8270				Prep Method: EPA 3550		
bis(2-Chloroethyl)ether	ND	ug/kg	20000	50.0	06/09/00	DHJ	111-44-4
Phenol	ND	ug/kg	20000	50.0	06/09/00	DHJ	108-95-2
2-Chlorophenol	ND	ug/kg	20000	50.0	06/09/00	DHJ	95-57-8
1,3-Dichlorobenzene	ND	ug/kg	20000	50.0	06/09/00	DHJ	541-73-1
1,4-Dichlorobenzene	ND	ug/kg	20000	50.0	06/09/00	DHJ	106-46-7
1,2-Dichlorobenzene	ND	ug/kg	20000	50.0	06/09/00	DHJ	95-50-1

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Pace Project Number: 9214408
Client Project ID: Koch North

Pace Sample No: 921020020 | Date Collected: 05/26/00 | Matrix: Soil
Client Sample ID: BH-~~X~~6 (5.5-6') | Date Received: 06/01/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
Benzyl Alcohol	ND	ug/kg	40000	50.0	06/09/00	DHJ	100-51-6	
bis(2-Chloroisopropyl)ether	ND	ug/kg	20000	50.0	06/09/00	DHJ	39638-32-9	
2-Methylphenol	ND	ug/kg	20000	50.0	06/09/00	DHJ	95-48-7	
Hexachloroethane	ND	ug/kg	20000	50.0	06/09/00	DHJ	67-72-1	
N-Nitroso-di-n-propylamine	ND	ug/kg	20000	50.0	06/09/00	DHJ	621-64-7	
3&4-Methylphenol	ND	ug/kg	20000	50.0	06/09/00	DHJ		
Nitrobenzene	ND	ug/kg	20000	50.0	06/09/00	DHJ	98-95-3	
Isophorone	ND	ug/kg	20000	50.0	06/09/00	DHJ	78-59-1	
2-Nitrophenol	ND	ug/kg	20000	50.0	06/09/00	DHJ	88-75-5	
2,4-Dimethylphenol	ND	ug/kg	20000	50.0	06/09/00	DHJ	105-67-9	
bis(2-Chloroethoxy)methane	ND	ug/kg	20000	50.0	06/09/00	DHJ	111-91-1	
Benzoic Acid	ND	ug/kg	99000	50.0	06/09/00	DHJ	65-85-0	
2,4-Dichlorophenol	ND	ug/kg	20000	50.0	06/09/00	DHJ	120-83-2	
1,2,4-Trichlorobenzene	ND	ug/kg	20000	50.0	06/09/00	DHJ	120-82-1	
Naphthalene	ND	ug/kg	20000	50.0	06/09/00	DHJ	91-20-3	
4-Chloroaniline	ND	ug/kg	40000	50.0	06/09/00	DHJ	106-47-8	
Hexachlorobutadiene	ND	ug/kg	20000	50.0	06/09/00	DHJ	87-68-3	
4-Chloro-3-methylphenol	ND	ug/kg	40000	50.0	06/09/00	DHJ	59-50-7	
2-Methylnaphthalene	35000	ug/kg	20000	50.0	06/09/00	DHJ	91-57-6	
Hexachlorocyclopentadiene	ND	ug/kg	20000	50.0	06/09/00	DHJ	77-47-4	
2,4,6-Trichlorophenol	ND	ug/kg	20000	50.0	06/09/00	DHJ	88-06-2	
2,4,5-Trichlorophenol	ND	ug/kg	20000	50.0	06/09/00	DHJ	95-95-4	
2-Chloronaphthalene	ND	ug/kg	20000	50.0	06/09/00	DHJ	91-58-7	
2-Nitroaniline	ND	ug/kg	99000	50.0	06/09/00	DHJ	88-74-4	
Acenaphthylene	ND	ug/kg	20000	50.0	06/09/00	DHJ	208-96-8	
Dimethylphthalate	ND	ug/kg	20000	50.0	06/09/00	DHJ	131-11-3	
2,6-Dinitrotoluene	ND	ug/kg	20000	50.0	06/09/00	DHJ	606-20-2	
Acenaphthene	ND	ug/kg	20000	50.0	06/09/00	DHJ	83-32-9	
3-Nitroaniline	ND	ug/kg	99000	50.0	06/09/00	DHJ	99-09-2	
2,4-Dinitrophenol	ND	ug/kg	99000	50.0	06/09/00	DHJ	51-28-5	
Dibenzofuran	ND	ug/kg	20000	50.0	06/09/00	DHJ	132-64-9	
2,4-Dinitrotoluene	ND	ug/kg	20000	50.0	06/09/00	DHJ	121-14-2	
4-Nitrophenol	ND	ug/kg	99000	50.0	06/09/00	DHJ	100-02-7	
Fluorene	ND	ug/kg	20000	50.0	06/09/00	DHJ	86-73-7	
4-Chlorophenyl-phenylether	ND	ug/kg	20000	50.0	06/09/00	DHJ	7005-72-3	
Diethylphthalate	ND	ug/kg	20000	50.0	06/09/00	DHJ	84-66-2	
4-Nitroaniline	ND	ug/kg	99000	50.0	06/09/00	DHJ	100-01-6	
1,2-Diphenylhydrazine	ND	ug/kg	20000	50.0	06/09/00	DHJ	122-66-7	
4,6-Dinitro-2-methylphenol	ND	ug/kg	20000	50.0	06/09/00	DHJ	534-52-1	
N-Nitrosodiphenylamine	ND	ug/kg	20000	50.0	06/09/00	DHJ	86-30-6	

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Pace Project Number: 9214408
Client Project ID: Koch North

Pace Sample No: 921020020 | Date Collected: 05/26/00 | Matrix: Soil
Client Sample ID: BH-X6 (5.5-6') | Date Received: 06/01/00

Parameters	Results	Units	PRL	App. DF	Analyzed	Analyst	CAS#	Footnotes
4-Bromophenyl-phenylether	ND	ug/kg	20000	50.0	06/09/00	DHJ	101-55-3	
Hexachlorobenzene	ND	ug/kg	20000	50.0	06/09/00	DHJ	118-74-1	
Pentachlorophenol	ND	ug/kg	99000	50.0	06/09/00	DHJ	87-86-5	
Phenanthrene	ND	ug/kg	20000	50.0	06/09/00	DHJ	85-01-8	
Anthracene	ND	ug/kg	20000	50.0	06/09/00	DHJ	120-12-7	
Di-n-butylphthalate	ND	ug/kg	20000	50.0	06/09/00	DHJ	84-74-2	
Fluoranthene	ND	ug/kg	20000	50.0	06/09/00	DHJ	206-44-0	
Pyrene	ND	ug/kg	20000	50.0	06/09/00	DHJ	129-00-0	
Butylbenzylphthalate	ND	ug/kg	20000	50.0	06/09/00	DHJ	85-68-7	
3,3'-Dichlorobenzidine	ND	ug/kg	40000	50.0	06/09/00	DHJ	91-94-1	
Benzo(a)anthracene	ND	ug/kg	20000	50.0	06/09/00	DHJ	56-55-3	
Chrysene	ND	ug/kg	20000	50.0	06/09/00	DHJ	218-01-9	
bis(2-Ethylhexyl)phthalate	ND	ug/kg	40000	50.0	06/09/00	DHJ	117-81-7	
Di-n-octylphthalate	ND	ug/kg	20000	50.0	06/09/00	DHJ	117-84-0	
Benzo(b)fluoranthene	ND	ug/kg	20000	50.0	06/09/00	DHJ	205-99-2	
Benzo(k)fluoranthene	ND	ug/kg	20000	50.0	06/09/00	DHJ	207-08-9	
Benzo(a)pyrene	ND	ug/kg	20000	50.0	06/09/00	DHJ	50-32-8	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	20000	50.0	06/09/00	DHJ	193-39-5	
Dibenz(a,h)anthracene	ND	ug/kg	20000	50.0	06/09/00	DHJ	53-70-3	
Benzo(g,h,i)perylene	ND	ug/kg	20000	50.0	06/09/00	DHJ	191-24-2	
2-Fluorophenol (S)	0	%		0.83	06/09/00	DHJ	367-12-4	
Phenol-d6 (S)	0	%		0.83	06/09/00	DHJ	13127-88-3	
Nitrobenzene-d5 (S)	0	%		0.83	06/09/00	DHJ	4165-60-0	
2-Fluorobiphenyl (S)	0	%		0.83	06/09/00	DHJ	321-60-8	
2,4,6-Tribromophenol (S)	0	%		0.83	06/09/00	DHJ	118-79-6	1
Terphenyl-d14 (S)	0	%		0.83	06/09/00	DHJ	1718-51-0	
Date Extracted					06/06/00			

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Pace Project Number: 9214408
Client Project ID: Koch North

PARAMETER FOOTNOTES

ND	Not Detected
NC	Not Calculable
PRL	Pace Reporting Limit
(S)	Surrogate
App. DF	Applied Dilution Factor
[1]	Surrogate standards were not recovered due to sample dilution.
[2]	Acid surrogate recovery outside of control limits. The data was accepted based on valid recovery of remaining two acid's surrogate.
[3]	Spike and/or surrogate recoveries could not be calculated due to matrix interference.
[4]	Base/neutral surrogate recovery outside of control limits. The data was accepted based on valid recovery of remaining two base/neutral surrogates.

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QUALITY CONTROL DATA

Catlin Engineers & Scientist
220 Old Dairy Road
P.O. Box 10279
Wilmington, NC 28405

Pace Project Number: 9214408
Client Project ID: Koch North

Attn: Mr. Steve Tyler
Phone: (910)452-5861

QC Batch ID: 26642
Analysis Method: EPA 8260
Associated Pace Samples: 921019931 921019949 921019956 921019964 921019972 921019998 921020004 921020020

QC Batch Method: EPA 8260
Analysis Description: GC/MS VOCs by 8260

METHOD BLANK: 921026738
Associated Pace Samples:
921019931 921019949 921019956 921019964 921019972 921019998 921020004 921020020

Parameter	Units	Method Blank Result	PRL	Footnotes
Dichlorodifluoromethane	ug/kg	ND	500	
Chloromethane	ug/kg	ND	500	
Vinyl Chloride	ug/kg	ND	500	
Bromomethane	ug/kg	ND	500	
Chloroethane	ug/kg	ND	500	
Trichlorofluoromethane	ug/kg	ND	250	
1,1-Dichloroethene	ug/kg	ND	250	
Methylene Chloride	ug/kg	ND	250	
trans-1,2-Dichloroethene	ug/kg	ND	250	
1,1-Dichloroethane	ug/kg	ND	250	
cis-1,2-Dichloroethene	ug/kg	ND	250	
2,2-Dichloropropane	ug/kg	ND	250	
Chloroform	ug/kg	ND	250	
Bromochloromethane	ug/kg	ND	250	
1,1,1-Trichloroethane	ug/kg	ND	250	
1,1-Dichloropropene	ug/kg	ND	250	
1,2-Dichloroethane	ug/kg	ND	250	
Carbon Tetrachloride	ug/kg	ND	250	
Benzene	ug/kg	ND	250	
Trichloroethene	ug/kg	ND	250	
1,2-Dichloropropane	ug/kg	ND	250	
Dibromomethane	ug/kg	ND	250	
Bromodichloromethane	ug/kg	ND	250	

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QUALITY CONTROL DATA

Pace Project Number: 9214408
Client Project ID: Koch North

METHOD BLANK: 921026738
Associated Pace Samples:
921019931 921019949 921019956 921019964 921019972 921019998 921020004
921020020

Parameter	Units	Method Blank Result	PRL	Footnotes
Toluene	ug/kg	ND	250	
1,1,2-Trichloroethane	ug/kg	ND	250	
1,3-Dichloropropane	ug/kg	ND	250	
Dibromochloromethane	ug/kg	ND	250	
Tetrachloroethene	ug/kg	ND	250	
1,2-Dibromoethane	ug/kg	ND	250	
Chlorobenzene	ug/kg	ND	250	
1,1,1,2-Tetrachloroethane	ug/kg	ND	250	
Ethylbenzene	ug/kg	ND	250	
m&p-Xylene	ug/kg	ND	500	
Styrene	ug/kg	ND	250	
o-Xylene (1,2-Dimethylbenzene)	ug/kg	ND	250	
Bromoform	ug/kg	ND	250	
1,1,2,2-Tetrachloroethane	ug/kg	ND	250	
Isopropylbenzene (Cumene)	ug/kg	ND	250	
1,2,3-Trichloropropane	ug/kg	ND	250	
Bromobenzene	ug/kg	ND	250	
n-Propylbenzene	ug/kg	ND	250	
2-Chlorotoluene	ug/kg	ND	250	
4-Chlorotoluene	ug/kg	ND	250	
1,3,5-Trimethylbenzene	ug/kg	ND	250	
tert-Butylbenzene	ug/kg	ND	250	
1,2,4-Trimethylbenzene	ug/kg	ND	250	
sec-Butylbenzene	ug/kg	ND	250	
1,3-Dichlorobenzene	ug/kg	ND	250	
p-Isopropyltoluene	ug/kg	ND	250	
1,4-Dichlorobenzene	ug/kg	ND	250	
1,2-Dichlorobenzene	ug/kg	ND	250	
n-Butylbenzene	ug/kg	ND	250	
1,2-Dibromo-3-Chloropropane	ug/kg	ND	250	
1,2,4-Trichlorobenzene	ug/kg	ND	250	
Naphthalene	ug/kg	ND	250	
Hexachlorobutadiene	ug/kg	ND	250	
1,2,3-Trichlorobenzene	ug/kg	ND	250	
Dibromofluoromethane (S)	%	113		
1,2-Dichloroethane-d4 (S)	%	113		
Toluene-d8 (S)	%	120		

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QUALITY CONTROL DATA

Pace Project Number: 9214408
Client Project ID: Koch North

METHOD BLANK: 921026738
Associated Pace Samples:
921019931 921019949 921019956 921019964 921019972 921019998 921020004
921020020

Parameter	Units	Method Blank Result	PRL	Footnotes
4-Bromofluorobenzene (S)	%	122		

LABORATORY CONTROL SAMPLE: 921005658

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	Footnotes
Dichlorodifluoromethane	ug/kg	2500	1166	46.6	1
Chloromethane	ug/kg	2500	1656	66.2	1
Vinyl Chloride	ug/kg	2500	2233	89.3	
Bromomethane	ug/kg	2500	573.0	22.9	1
Chloroethane	ug/kg	2500	816.5	32.7	
Trichlorofluoromethane	ug/kg	2500	2797	112	
1,1-Dichloroethene	ug/kg	2500	4244	170	1
Methylene Chloride	ug/kg	2500	1477	59.1	1
trans-1,2-Dichloroethene	ug/kg	2500	2521	101	
1,1-Dichloroethane	ug/kg	2500	3523	141	1
cis-1,2-Dichloroethene	ug/kg	2500	2450	98.0	
2,2-Dichloropropane	ug/kg	2500	2689	108	
Chloroform	ug/kg	2500	2417	96.7	
Bromochloromethane	ug/kg	2500	2715	109	
1,1,1-Trichloroethane	ug/kg	2500	2630	105	
1,1-Dichloropropene	ug/kg	2500	2635	105	
1,2-Dichloroethane	ug/kg	2500	2253	90.1	
Carbon Tetrachloride	ug/kg	2500	2867	115	
Benzene	ug/kg	2500	2450	98.0	
Trichloroethene	ug/kg	2500	2650	106	
1,2-Dichloropropane	ug/kg	2500	2314	92.5	
Dibromomethane	ug/kg	2500	2182	87.3	
Bromodichloromethane	ug/kg	2500	2417	96.7	
Toluene	ug/kg	2500	2493	99.7	
1,1,2-Trichloroethane	ug/kg	2500	2079	83.2	
1,3-Dichloropropane	ug/kg	2500	2250	90.0	
Dibromochloromethane	ug/kg	2500	2317	92.7	
Tetrachloroethene	ug/kg	2500	3514	141	1
1,2-Dibromoethane	ug/kg	2500	2122	84.9	

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QUALITY CONTROL DATA

Pace Project Number: 9214408
Client Project ID: Koch North

LABORATORY CONTROL SAMPLE: 921005658

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	Footnotes
Chlorobenzene	ug/kg	2500	2585	103	
1,1,1,2-Tetrachloroethane	ug/kg	2500	2492	99.7	
Ethylbenzene	ug/kg	2500	2772	111	
m&p-Xylene	ug/kg	5000	5678	114	
Styrene	ug/kg	2500	2467	98.7	
o-Xylene (1,2-Dimethylbenzene)	ug/kg	2500	2667	107	
Bromoform	ug/kg	2500	2192	87.7	
1,1,2,2-Tetrachloroethane	ug/kg	2500	1970	78.8	
Isopropylbenzene (Cumene)	ug/kg	2500	2804	112	
1,2,3-Trichloropropane	ug/kg	2500	2144	85.7	
Bromobenzene	ug/kg	2500	2555	102	
n-Propylbenzene	ug/kg	2500	3256	130	1
2-Chlorotoluene	ug/kg	2500	2888	116	
4-Chlorotoluene	ug/kg	2500	2923	117	
1,3,5-Trimethylbenzene	ug/kg	2500	2977	119	
tert-Butylbenzene	ug/kg	2500	2868	115	
1,2,4-Trimethylbenzene	ug/kg	2500	2914	117	
sec-Butylbenzene	ug/kg	2500	3019	121	
1,3-Dichlorobenzene	ug/kg	2500	2823	113	
p-Isopropyltoluene	ug/kg	2500	3062	122	
1,4-Dichlorobenzene	ug/kg	2500	2746	110	
1,2-Dichlorobenzene	ug/kg	2500	2600	104	
n-Butylbenzene	ug/kg	2500	3232	129	
1,2-Dibromo-3-Chloropropane	ug/kg	2500	2048	81.9	
1,2,4-Trichlorobenzene	ug/kg	2500	2767	111	
Naphthalene	ug/kg	2500	2007	80.3	
Hexachlorobutadiene	ug/kg	2500	3067	123	
1,2,3-Trichlorobenzene	ug/kg	2500	2485	99.4	
Dibromofluoromethane (S)				92	
1,2-Dichloroethane-d4 (S)				89	
Toluene-d8 (S)				95	
4-Bromofluorobenzene (S)				95	

SAMPLE DUPLICATE: 921020400

Parameter	Units	92996198	Dup. Result	RPD	Footnotes
Dichlorodifluoromethane	ug/kg	ND	ND	NC	
Chloromethane	ug/kg	ND	ND	NC	
Vinyl Chloride .	ug/kg	ND	ND	NC	

Laboratory Certification IDs
NC Wastewater 12
NC Drinking Water 37706
SC 99006

REPORT OF LABORATORY ANALYSIS

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TN UST List
VA Drinking Water 213

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QUALITY CONTROL DATA

Pace Project Number: 9214408
Client Project ID: Koch North

SAMPLE DUPLICATE: 921020400

Parameter	Units	92996198	Dup. Result	RPD	Footnotes
Bromomethane	ug/kg	ND	ND	NC	
Chloroethane	ug/kg	ND	ND	NC	
Trichlorofluoromethane	ug/kg	ND	ND	NC	
1,1-Dichloroethene	ug/kg	5200	4700	10	
Methylene Chloride	ug/kg	1600	1300	16	
trans-1,2-Dichloroethene	ug/kg	ND	ND	NC	
1,1-Dichloroethane	ug/kg	ND	ND	NC	
cis-1,2-Dichloroethene	ug/kg	ND	ND	NC	
2,2-Dichloropropane	ug/kg	ND	ND	NC	
Chloroform	ug/kg	4300	3800	13	
Bromochloromethane	ug/kg	ND	ND	NC	
1,1,1-Trichloroethane	ug/kg	1100	930.0	14	
1,1-Dichloropropene	ug/kg	ND	ND	NC	
1,2-Dichloroethane	ug/kg	7900	6800	15	
Carbon Tetrachloride	ug/kg	1300	1200	11	
Benzene	ug/kg	9900	8900	11	
Trichloroethene	ug/kg	5800	5200	11	
1,2-Dichloropropane	ug/kg	ND	ND	NC	
Dibromomethane	ug/kg	ND	ND	NC	
Bromodichloromethane	ug/kg	5400	4800	12	
Toluene	ug/kg	8100	7300	11	
1,1,2-Trichloroethane	ug/kg	ND	ND	NC	
1,3-Dichloropropane	ug/kg	ND	ND	NC	
Dibromochloromethane	ug/kg	7600	6900	9	
Tetrachloroethene	ug/kg	1400	1300	6	
1,2-Dibromoethane	ug/kg	ND	ND	NC	
Chlorobenzene	ug/kg	2900	2800	7	
1,1,1,2-Tetrachloroethane	ug/kg	3200	2900	8	
Ethylbenzene	ug/kg	2800	2600	6	
m&p-Xylene	ug/kg	5100	4800	7	
Styrene	ug/kg	ND	ND	NC	
o-Xylene (1,2-Dimethylbenzene)	ug/kg	2600	2400	7	
Bromoform	ug/kg	1200	1100	12	
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND	NC	
Isopropylbenzene (Cumene)	ug/kg	ND	ND	NC	
1,2,3-Trichloropropane	ug/kg	ND	ND	NC	
Bromobenzene	ug/kg	ND	ND	NC	
n-Propylbenzene	ug/kg	ND	ND	NC	
2-Chlorotoluene	ug/kg	ND	ND	NC	
4-Chlorotoluene	ug/kg	ND	ND	NC	
1,3,5-Trimethylbenzene	ug/kg	ND	ND	NC	

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QUALITY CONTROL DATA

Pace Project Number: 9214408
Client Project ID: Koch North

SAMPLE DUPLICATE: 921020400

Parameter	Units	92996198	Dup. Result	RPD	Footnotes
tert-Butylbenzene	ug/kg	ND	ND	NC	
1,2,4-Trimethylbenzene	ug/kg	ND	ND	NC	
sec-Butylbenzene	ug/kg	ND	ND	NC	
1,3-Dichlorobenzene	ug/kg	4300	4000	7	
p-Isopropyltoluene	ug/kg	ND	ND	NC	
1,4-Dichlorobenzene	ug/kg	2000	1800	8	
1,2-Dichlorobenzene	ug/kg	4200	3900	8	
n-Butylbenzene	ug/kg	ND	ND	NC	
1,2-Dibromo-3-Chloropropane	ug/kg	ND	ND	NC	
1,2,4-Trichlorobenzene	ug/kg	ND	ND	NC	
Naphthalene	ug/kg	ND	ND	NC	
Hexachlorobutadiene	ug/kg	ND	ND	NC	
1,2,3-Trichlorobenzene	ug/kg	ND	ND	NC	
Dibromofluoromethane (S)	%	86	79	0	
1,2-Dichloroethane-d4 (S)	%	82	74	0	
Toluene-d8 (S)	%	99	97	0	
4-Bromofluorobenzene (S)	%	98	97	0	

SAMPLE DUPLICATE: 921026746

Parameter	Units	921019931	Dup. Result	RPD	Footnotes
Dichlorodifluoromethane	ug/kg	ND	ND	NC	
Chloromethane	ug/kg	ND	ND	NC	
Vinyl Chloride	ug/kg	ND	ND	NC	
Bromomethane	ug/kg	ND	ND	NC	
Chloroethane	ug/kg	ND	ND	NC	
Trichlorofluoromethane	ug/kg	ND	ND	NC	
1,1-Dichloroethene	ug/kg	ND	ND	NC	
Methylene Chloride	ug/kg	ND	ND	NC	
trans-1,2-Dichloroethene	ug/kg	ND	ND	NC	
1,1-Dichloroethane	ug/kg	ND	ND	NC	
cis-1,2-Dichloroethene	ug/kg	ND	ND	NC	
2,2-Dichloropropane	ug/kg	ND	ND	NC	
Chloroform	ug/kg	ND	ND	NC	
Bromochloromethane	ug/kg	ND	ND	NC	
1,1,1-Trichloroethane	ug/kg	ND	ND	NC	
1,1-Dichloropropene	ug/kg	ND	ND	NC	
1,2-Dichloroethane	ug/kg	ND	ND	NC	
Carbon Tetrachloride	ug/kg	ND	ND	NC	

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QUALITY CONTROL DATA

Pace Project Number: 9214408
Client Project ID: Koch North

SAMPLE DUPLICATE: 921026746

Parameter	Units	921019931	Dup. Result	RPD	Footnotes
Benzene	ug/kg	ND	ND	NC	
Trichloroethene	ug/kg	ND	ND	NC	
1,2-Dichloropropane	ug/kg	ND	ND	NC	
Dibromomethane	ug/kg	ND	ND	NC	
Bromodichloromethane	ug/kg	ND	ND	NC	
Toluene	ug/kg	ND	ND	NC	
1,1,2-Trichloroethane	ug/kg	ND	ND	NC	
1,3-Dichloropropane	ug/kg	ND	ND	NC	
Dibromochloromethane	ug/kg	ND	ND	NC	
Tetrachloroethene	ug/kg	ND	ND	NC	
1,2-Dibromoethane	ug/kg	ND	ND	NC	
Chlorobenzene	ug/kg	ND	ND	NC	
1,1,1,2-Tetrachloroethane	ug/kg	ND	ND	NC	
Ethylbenzene	ug/kg	ND	ND	NC	
m&p-Xylene	ug/kg	10000000	16000000	46	2
Styrene	ug/kg	ND	ND	NC	
o-Xylene (1,2-Dimethylbenzene)	ug/kg	ND	ND	NC	
Bromoform	ug/kg	ND	ND	NC	
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND	NC	
Isopropylbenzene (Cumene)	ug/kg	ND	ND	NC	
1,2,3-Trichloropropane	ug/kg	ND	ND	NC	
Bromobenzene	ug/kg	ND	ND	NC	
n-Propylbenzene	ug/kg	ND	ND	NC	
2-Chlorotoluene	ug/kg	ND	ND	NC	
4-Chlorotoluene	ug/kg	ND	ND	NC	
1,3,5-Trimethylbenzene	ug/kg	ND	ND	NC	
tert-Butylbenzene	ug/kg	ND	ND	NC	
1,2,4-Trimethylbenzene	ug/kg	ND	ND	NC	
sec-Butylbenzene	ug/kg	ND	ND	NC	
1,3-Dichlorobenzene	ug/kg	ND	ND	NC	
p-Isopropyltoluene	ug/kg	ND	ND	NC	
1,4-Dichlorobenzene	ug/kg	ND	ND	NC	
1,2-Dichlorobenzene	ug/kg	ND	ND	NC	
n-Butylbenzene	ug/kg	ND	ND	NC	
1,2-Dibromo-3-Chloropropane	ug/kg	ND	ND	NC	
1,2,4-Trichlorobenzene	ug/kg	ND	ND	NC	
Naphthalene	ug/kg	ND	ND	NC	
Hexachlorobutadiene	ug/kg	ND	ND	NC	
1,2,3-Trichlorobenzene	ug/kg	ND	ND	NC	
Dibromofluoromethane (S)	%	0	0	0	3
1,2-Dichloroethane-d4 (S)	%	0	0	0	

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QUALITY CONTROL DATA

Pace Project Number: 9214408
Client Project ID: Koch North

SAMPLE DUPLICATE: 921026746

Parameter	Units	921019931	Dup. Result	RPD	Footnotes
Toluene-d8 (S)	%	0	0	0	
4-Bromofluorobenzene (S)	%	0	0	0	

SAMPLE DUPLICATE: 921035093

Parameter	Units	921021960	Dup. Result	RPD	Footnotes
Dichlorodifluoromethane	ug/kg	ND	ND	NC	
Chloromethane	ug/kg	ND	ND	NC	
Vinyl Chloride	ug/kg	ND	ND	NC	
Bromomethane	ug/kg	ND	ND	NC	
Chloroethane	ug/kg	ND	ND	NC	
Trichlorofluoromethane	ug/kg	ND	ND	NC	
1,1-Dichloroethene	ug/kg	ND	ND	NC	
Methylene Chloride	ug/kg	ND	ND	NC	
trans-1,2-Dichloroethene	ug/kg	ND	ND	NC	
1,1-Dichloroethane	ug/kg	ND	ND	NC	
cis-1,2-Dichloroethene	ug/kg	ND	ND	NC	
2,2-Dichloropropane	ug/kg	ND	ND	NC	
Chloroform	ug/kg	ND	ND	NC	
Bromochloromethane	ug/kg	ND	ND	NC	
1,1,1-Trichloroethane	ug/kg	ND	ND	NC	
1,1-Dichloropropene	ug/kg	ND	ND	NC	
1,2-Dichloroethane	ug/kg	ND	ND	NC	
Carbon Tetrachloride	ug/kg	ND	ND	NC	
Benzene	ug/kg	ND	ND	NC	
Trichloroethene	ug/kg	ND	ND	NC	
1,2-Dichloropropane	ug/kg	ND	ND	NC	
Dibromomethane	ug/kg	ND	ND	NC	
Bromodichloromethane	ug/kg	ND	ND	NC	
Toluene	ug/kg	ND	ND	NC	
1,1,2-Trichloroethane	ug/kg	ND	ND	NC	
1,3-Dichloropropane	ug/kg	ND	ND	NC	
Dibromochloromethane	ug/kg	ND	ND	NC	
Tetrachloroethene	ug/kg	ND	ND	NC	
1,2-Dibromoethane	ug/kg	ND	ND	NC	
Chlorobenzene	ug/kg	ND	ND	NC	
1,1,1,2-Tetrachloroethane	ug/kg	ND	ND	NC	
Ethylbenzene	ug/kg	ND	ND	NC	
m&p-Xylene	ug/kg	ND	ND	NC	

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QUALITY CONTROL DATA

Pace Project Number: 9214408
Client Project ID: Koch North

SAMPLE DUPLICATE: 921035093

Parameter	Units	921021960	Dup. Result	RPD	Footnotes
Styrene	ug/kg	ND	ND	NC	
o-Xylene (1,2-Dimethylbenzene)	ug/kg	ND	ND	NC	
Bromoform	ug/kg	ND	ND	NC	
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND	NC	
Isopropylbenzene (Cumene)	ug/kg	ND	ND	NC	
1,2,3-Trichloropropane	ug/kg	ND	ND	NC	
Bromobenzene	ug/kg	ND	ND	NC	
n-Propylbenzene	ug/kg	ND	ND	NC	
2-Chlorotoluene	ug/kg	ND	ND	NC	
4-Chlorotoluene	ug/kg	ND	ND	NC	
1,3,5-Trimethylbenzene	ug/kg	ND	ND	NC	
tert-Butylbenzene	ug/kg	ND	ND	NC	
1,2,4-Trimethylbenzene	ug/kg	ND	ND	NC	
sec-Butylbenzene	ug/kg	ND	ND	NC	
1,3-Dichlorobenzene	ug/kg	ND	ND	NC	
p-Isopropyltoluene	ug/kg	ND	ND	NC	
1,4-Dichlorobenzene	ug/kg	ND	ND	NC	
1,2-Dichlorobenzene	ug/kg	ND	ND	NC	
n-Butylbenzene	ug/kg	ND	ND	NC	
1,2-Dibromo-3-Chloropropane	ug/kg	ND	ND	NC	
1,2,4-Trichlorobenzene	ug/kg	ND	ND	NC	
Naphthalene	ug/kg	ND	ND	NC	
Hexachlorobutadiene	ug/kg	ND	ND	NC	
1,2,3-Trichlorobenzene	ug/kg	ND	ND	NC	
Dibromofluoromethane (S)	%	75	79	0	
1,2-Dichloroethane-d4 (S)	%	75	80	0	
Toluene-d8 (S)	%	96	98	0	
4-Bromofluorobenzene (S)	%	90	92	0	

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QUALITY CONTROL DATA

Catlin Engineers & Scientist
220 Old Dairy Road
P.O. Box 10279
Wilmington, NC 28405

Pace Project Number: 9214408
Client Project ID: Koch North

Attn: Mr. Steve Tyler
Phone: (910)452-5861

QC Batch ID: 27083
Analysis Method: % Moisture
Associated Pace Samples: 921019931 921019949 921019956 921019964 921019972 921019998 921020004 921020020

QC Batch Method:
Analysis Description: Percent Moisture

SAMPLE DUPLICATE: 921020863

Parameter	Units	921019931	Dup. Result	RPD	Footnotes
Percent Moisture	%	16.20	17.00	4	

SAMPLE DUPLICATE: 921020962

Parameter	Units	921019485	Dup. Result	RPD	Footnotes
Percent Moisture	%	10.30	10.40	1	

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QUALITY CONTROL DATA

Catlin Engineers & Scientist
220 Old Dairy Road
P.O. Box 10279
Wilmington, NC 28405

Pace Project Number: 9214408
Client Project ID: Koch North

Attn: Mr. Steve Tyler
Phone: (910)452-5861

QC Batch ID: 27227
Analysis Method: EPA 8270
Associated Pace Samples: 921019931 921019949 921019956 921019964 921019972 921019998 921020004 921020020

QC Batch Method: EPA 3550
Analysis Description: Semivolatile Organics

METHOD BLANK: 921026530
Associated Pace Samples:
921019931 921019949 921019956 921019964 921019972 921019998 921020004 921020020

Parameter	Units	Method Blank Result	PRL	Footnotes
bis(2-Chloroethyl)ether	ug/kg	ND	330	
Phenol	ug/kg	ND	330	
2-Chlorophenol	ug/kg	ND	330	
1,3-Dichlorobenzene	ug/kg	ND	330	
1,4-Dichlorobenzene	ug/kg	ND	330	
1,2-Dichlorobenzene	ug/kg	ND	330	
Benzyl Alcohol	ug/kg	ND	660	
bis(2-Chloroisopropyl)ether	ug/kg	ND	330	
2-Methylphenol	ug/kg	ND	330	
Hexachloroethane	ug/kg	ND	330	
N-Nitroso-di-n-propylamine	ug/kg	ND	330	
3&4-Methylphenol	ug/kg	ND	330	
Nitrobenzene	ug/kg	ND	330	
Isophorone	ug/kg	ND	330	
2-Nitrophenol	ug/kg	ND	330	
2,4-Dimethylphenol	ug/kg	ND	330	
bis(2-Chloroethoxy)methane	ug/kg	ND	330	
Benzoic Acid	ug/kg	ND	1600	
2,4-Dichlorophenol	ug/kg	ND	330	
1,2,4-Trichlorobenzene	ug/kg	ND	330	
Naphthalene	ug/kg	ND	330	
4-Chloroaniline	ug/kg	ND	660	
Hexachlorobutadiene	ug/kg	ND	330	

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QUALITY CONTROL DATA

Pace Project Number: 9214408
Client Project ID: Koch North

METHOD BLANK: 921026530
Associated Pace Samples:
921019931 921019949 921019956 921019964 921019972 921019998 921020004
921020020

Parameter	Units	Method Blank Result	PRL	Footnotes
4-Chloro-3-methylphenol	ug/kg	ND	660	
2-Methylnaphthalene	ug/kg	ND	330	
Hexachlorocyclopentadiene	ug/kg	ND	330	
2,4,6-Trichlorophenol	ug/kg	ND	330	
2,4,5-Trichlorophenol	ug/kg	ND	330	
2-Chloronaphthalene	ug/kg	ND	330	
2-Nitroaniline	ug/kg	ND	1600	
Acenaphthylene	ug/kg	ND	330	
Dimethylphthalate	ug/kg	ND	330	
2,6-Dinitrotoluene	ug/kg	ND	330	
Acenaphthene	ug/kg	ND	330	
3-Nitroaniline	ug/kg	ND	1600	
2,4-Dinitrophenol	ug/kg	ND	1600	
Dibenzofuran	ug/kg	ND	330	
2,4-Dinitrotoluene	ug/kg	ND	330	
4-Nitrophenol	ug/kg	ND	1600	
Fluorene	ug/kg	ND	330	
4-Chlorophenyl-phenylether	ug/kg	ND	330	
Diethylphthalate	ug/kg	ND	330	
4-Nitroaniline	ug/kg	ND	1600	
1,2-Diphenylhydrazine	ug/kg	ND	330	
4,6-Dinitro-2-methylphenol	ug/kg	ND	330	
N-Nitrosodiphenylamine	ug/kg	ND	330	
4-Bromophenyl-phenylether	ug/kg	ND	330	
Hexachlorobenzene	ug/kg	ND	330	
Pentachlorophenol	ug/kg	ND	1600	
Phenanthrene	ug/kg	ND	330	
Anthracene	ug/kg	ND	330	
Di-n-butylphthalate	ug/kg	ND	330	
Fluoranthene	ug/kg	ND	330	
Pyrene	ug/kg	ND	330	
Butylbenzylphthalate	ug/kg	ND	330	
3,3'-Dichlorobenzidine	ug/kg	ND	660	
Benzo(a)anthracene	ug/kg	ND	330	
Chrysene	ug/kg	ND	330	
bis(2-Ethylhexyl)phthalate	ug/kg	ND	660	
Di-n-octylphthalate	ug/kg	ND	330	

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QUALITY CONTROL DATA

Pace Project Number: 9214408
Client Project ID: Koch North

METHOD BLANK: 921026530
Associated Pace Samples:
921019931 921019949 921019956 921019964 921019972 921019998 921020004
921020020

Parameter	Units	Method Blank Result	PRL	Footnotes
Benzo(b)fluoranthene	ug/kg	ND	330	
Benzo(k)fluoranthene	ug/kg	ND	330	
Benzo(a)pyrene	ug/kg	ND	330	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	330	
Dibenz(a,h)anthracene	ug/kg	ND	330	
Benzo(g,h,i)perylene	ug/kg	ND	330	
2-Fluorophenol (S)	%	51		
Phenol-d6 (S)	%	54		
Nitrobenzene-d5 (S)	%	58		
2-Fluorobiphenyl (S)	%	52		
2,4,6-Tribromophenol (S)	%	62		
Terphenyl-d14 (S)	%	72		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 921026563 921026571

Parameter	Units	921014742	Spike Conc.	Matrix Spike Result	Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Footnotes
Phenol	ug/kg	0	1879	1176	62.6	1345	71.6	13	
2-Chlorophenol	ug/kg	0	1879	1187	63.2	1961	104	49	4
1,4-Dichlorobenzene	ug/kg	0	1879	756.5	40.3	866.5	46.1	13	
N-Nitroso-di-n-propylamine	ug/kg	0	1879	1185	63.1	1857	98.8	44	4
1,2,4-Trichlorobenzene	ug/kg	0	1879	934.4	49.7	997.1	53.1	7	
Naphthalene	ug/kg	0	1879	1047	55.7	1161	61.8	10	
4-Chloro-3-methylphenol	ug/kg	0	1879	1386	73.8	1949	104	34	4
Acenaphthylene	ug/kg	0	1879	1245	66.3	1359	72.3	9	
Acenaphthene	ug/kg	0	1879	1197	63.7	1313	69.9	9	
2,4-Dinitrotoluene	ug/kg	0	1879	1319	70.2	1722	91.6	26	
4-Nitrophenol	ug/kg	0	1879	687.8	36.6	1090	58.0	45	4
Fluorene	ug/kg	0	1879	1222	65.0	1430	76.1	16	
Pentachlorophenol	ug/kg	0	1879	855.8	45.5	1250	66.5	38	4
Phenanthrene	ug/kg	45.09	1879	1280	65.7	1309	67.3	2	
Anthracene	ug/kg	0	1879	1362	72.5	1413	75.2	4	
Fluoranthene	ug/kg	44.83	1879	1067	54.4	1270	65.2	18	
Pyrene	ug/kg	44.11	1879	1434	74.0	1212	62.1	17	
Benzo(a)anthracene	ug/kg	0	1879	1286	68.5	1239	65.9	4	
Chrysene	ug/kg	0	1879	1235	65.7	1193	63.5	3	

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QUALITY CONTROL DATA

Pace Project Number: 9214408
Client Project ID: Koch North

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 921026563 921026571

Parameter	Units	921014742	Spike Conc.	Matrix Spike Result	Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Footnotes
Benzo(b)fluoranthene	ug/kg	0	1879	946.5	50.4	956.1	50.9	1	
Benzo(k)fluoranthene	ug/kg	0	1879	992.2	52.8	866.1	46.1	14	
Benzo(a)pyrene	ug/kg	0	1879	1032	54.9	995.3	53.0	4	
Indeno(1,2,3-cd)pyrene	ug/kg	0	1879	896.2	47.7	944.2	50.2	5	
Dibenz(a,h)anthracene	ug/kg	0	1879	631.9	33.6	656.0	34.9	4	
Benzo(g,h,i)perylene	ug/kg	0	1879	934.3	49.7	990.3	52.7	6	
2-Fluorophenol (S)					57		93		
Phenol-d6 (S)					63		112		
Nitrobenzene-d5 (S)					64		76		
2-Fluorobiphenyl (S)					58		56		
2,4,6-Tribromophenol (S)					69		95		
Terphenyl-d14 (S)					88		63		

SAMPLE DUPLICATE: 921026555

Parameter	Units	921013116	Dup. Result	RPD	Footnotes
bis(2-Chloroethyl)ether	ug/kg	ND	ND	NC	
Phenol	ug/kg	ND	ND	NC	
2-Chlorophenol	ug/kg	ND	ND	NC	
1,3-Dichlorobenzene	ug/kg	ND	ND	NC	
1,4-Dichlorobenzene	ug/kg	ND	ND	NC	
1,2-Dichlorobenzene	ug/kg	ND	ND	NC	
Benzyl Alcohol	ug/kg	ND	ND	NC	
bis(2-Chloroisopropyl)ether	ug/kg	ND	ND	NC	
2-Methylphenol	ug/kg	ND	ND	NC	
Hexachloroethane	ug/kg	ND	ND	NC	
N-Nitroso-di-n-propylamine	ug/kg	ND	ND	NC	
3&4-Methylphenol	ug/kg	ND	ND	NC	
Nitrobenzene	ug/kg	ND	ND	NC	
Isophorone	ug/kg	ND	ND	NC	
2-Nitrophenol	ug/kg	ND	ND	NC	
2,4-Dimethylphenol	ug/kg	ND	ND	NC	
bis(2-Chloroethoxy)methane	ug/kg	ND	ND	NC	
Benzoic Acid	ug/kg	ND	ND	NC	
2,4-Dichlorophenol	ug/kg	ND	ND	NC	
1,2,4-Trichlorobenzene	ug/kg	ND	ND	NC	
Naphthalene	ug/kg	ND	ND	NC	
4-Chloroaniline	ug/kg	ND	ND	NC	
Hexachlorobutadiene	ug/kg	ND	ND	NC	

Pace Analytical Services, Inc.
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QUALITY CONTROL DATA

Pace Project Number: 9214408
Client Project ID: Koch North

SAMPLE DUPLICATE: 921026555

Parameter	Units	921013116	Dup. Result	RPD	Footnotes
4-Chloro-3-methylphenol	ug/kg	ND	ND	NC	
2-Methylnaphthalene	ug/kg	ND	ND	NC	
Hexachlorocyclopentadiene	ug/kg	ND	ND	NC	
2,4,6-Trichlorophenol	ug/kg	ND	ND	NC	
2,4,5-Trichlorophenol	ug/kg	ND	ND	NC	
2-Chloronaphthalene	ug/kg	ND	ND	NC	
2-Nitroaniline	ug/kg	ND	ND	NC	
Acenaphthylene	ug/kg	ND	ND	NC	
Dimethylphthalate	ug/kg	ND	ND	NC	
2,6-Dinitrotoluene	ug/kg	ND	ND	NC	
Acenaphthene	ug/kg	ND	ND	NC	
3-Nitroaniline	ug/kg	ND	ND	NC	
2,4-Dinitrophenol	ug/kg	ND	ND	NC	
Dibenzofuran	ug/kg	ND	ND	NC	
2,4-Dinitrotoluene	ug/kg	ND	ND	NC	
4-Nitrophenol	ug/kg	ND	ND	NC	
Fluorene	ug/kg	ND	ND	NC	
4-Chlorophenyl-phenylether	ug/kg	ND	ND	NC	
Diethylphthalate	ug/kg	ND	ND	NC	
4-Nitroaniline	ug/kg	ND	ND	NC	
1,2-Diphenylhydrazine	ug/kg	ND	ND	NC	
4,6-Dinitro-2-methylphenol	ug/kg	ND	ND	NC	
N-Nitrosodiphenylamine	ug/kg	ND	ND	NC	
4-Bromophenyl-phenylether	ug/kg	ND	ND	NC	
Hexachlorobenzene	ug/kg	ND	ND	NC	
Pentachlorophenol	ug/kg	ND	ND	NC	
Phenanthrene	ug/kg	ND	ND	NC	
Anthracene	ug/kg	ND	ND	NC	
Di-n-butylphthalate	ug/kg	ND	ND	NC	
Fluoranthene	ug/kg	ND	ND	NC	
Pyrene	ug/kg	ND	ND	NC	
Butylbenzylphthalate	ug/kg	ND	ND	NC	
3,3'-Dichlorobenzidine	ug/kg	ND	ND	NC	
Benzo(a)anthracene	ug/kg	ND	ND	NC	
Chrysene	ug/kg	ND	ND	NC	
bis(2-Ethylhexyl)phthalate	ug/kg	ND	ND	NC	
Di-n-octylphthalate	ug/kg	ND	ND	NC	
Benzo(b)fluoranthene	ug/kg	ND	ND	NC	
Benzo(k)fluoranthene	ug/kg	ND	ND	NC	
Benzo(a)pyrene	ug/kg	ND	ND	NC	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	ND	NC	

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QUALITY CONTROL DATA

Pace Project Number: 9214408
Client Project ID: Koch North

SAMPLE DUPLICATE: 921026555

Parameter	Units	921013116	Dup. Result	RPD	Footnotes
Dibenz(a,h)anthracene	ug/kg	ND	ND	NC	
Benzo(g,h,i)perylene	ug/kg	ND	ND	NC	
2-Fluorophenol (S)	%	50	33	0	
Phenol-d6 (S)	%	53	41	0	
Nitrobenzene-d5 (S)	%	57	38	0	
2-Fluorobiphenyl (S)	%	59	34	0	
2,4,6-Tribromophenol (S)	%	63	43	0	
Terphenyl-d14 (S)	%	88	42	0	

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Pace Project Number: 9214408
Client Project ID: Koch North

QUALITY CONTROL DATA PARAMETER FOOTNOTES

Consistent with EPA guidelines unrounded concentrations are displayed and have been used to calculate % Rec and RPD values.

ND	Not Detected
NC	Not Calculable
PRL	Pace Reporting Limit
RPD	Relative Percent Difference
(S)	Surrogate
[1]	The surrogate and/or spike recovery was outside acceptance limits.
[2]	The calculated RPD was outside QC acceptance limits.
[3]	Surrogate standards were not recovered due to sample dilution.
[4]	RPD value was outside of control limits, however % Recoveries were acceptable. Samples for QC batch accepted based on % recoveries and completeness of QC data.

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PARADIGM ANALYTICAL LABORATORIES, INC.
2627 Northchase Parkway SE, Wilmington, NC 28405
Phone: (910)-350-1903 FAX: (910)-350-1557

PACE

Chain-of Custody Record & Analytical Request

COC# 15627

Page 1 of 1

Client: Koch Petro Group
Address: 3334 River Rd.
Address: Wilmington, NC
Quote #:

Project ID: Koch North
P.O. Number:
Contact:
Phone:

Date: 5/31/00
Turnaround: STD
Job Number:

Report To: Frank [illegible]
Steve Tyler [illegible]
Invoice To: Frank [illegible]

Sample ID	Date	Time	Matrix	Preservatives: Ice				Analyses: Will Call									Comments: Please specify any special reporting requirements
3 BH-1(7'-7.5')	5/26/00	1500	SOIL	✓				✓									[illegible]
5 BH-15(6.5'-7')	5/26/00	1400	SOIL	↓				↓									[illegible]
6 401-13(5'-5.5')	5/26/00	1210	SOIL														[illegible]
7 BH-17(7'-7.5')	5/29/00	1100	SOIL														[illegible]
8 BH-17(6'-6.5')	5/29/00	1130	SOIL														[illegible]
4 801-5(7'-7.5')	5/26/00	1420	SOIL														[illegible]
9 401-13(7'-7.5')	5/26/00	1320	SOIL														[illegible]
5 BH-16(5.5'-6')	5/26/00	1200	SOIL	↓				↓									[illegible]

Relinquished By	Date	Time	Received By	Date	Time	Temperature	Sampled By	Airbill #
Ben [illegible]	5/31/00	1500	[illegible]	[illegible]	1015	[illegible]		

Data File: /chem/hpmsd6.i/060900.b/06090006.d
Report Date: 27-Jul-2000 09:56

BH-16 (5.5-6')

Pace Analytical Services - Charlotte

Semivolatile REPORT SW-846 Method 8270

Data file : /chem/hpmsd6.i/060900.b/06090006.d
Lab Smp Id: 921020020
Inj Date : 09-JUN-2000 15:09
Operator : DHJ Inst ID: hpmsd6.i
Smp Info : 060900.b,8270.m,DHJ,50
Misc Info : 921020020
Comment :
Method : /chem/hpmsd6.i/060900.b/8270.m
Meth Date : 14-Jun-2000 14:54 djones Quant Type: ISTD
Cal Date : 26-MAY-2000 16:14 Cal File: 05260003.d
Als bottle: 1
Dil Factor: 50.00000
Integrator: HP RTE Compound Sublist: 8270reg.sub
Target Version: 3.50

Concentration Formula: Amt * DF * Uf*Vt/Vi*Ws * CpndVariable

Name	Value	Description
DF	50.00000	Dilution Factor
Uf	0.00100	ng unit correction factor
Vt	1000.00000	Volume of final extract (uL)(1000 low, 2
Vi	1.00000	Volume injected (uL)
Ws	30.00000	Weigth of sample extracted (g)

Cpnd Variable Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/ml)	FINAL (ug/kg)	REVIEW CODE
* 10 1,4-dichlorobenzene d4 IS	152	5.511	5.573	(1.000)	314341	20.0000		
* 28 Naphthalene d8 IS	136	7.035	7.110	(1.000)	1149327	20.0000		
29 Naphthalene	128	7.062	7.144	(1.004)	462272	7.40538	11100	
34 2-Methylnaphthalene	142	8.082	8.164	(1.149)	657226	17.5347	26300	
* 45 Acenaphthene d8 IS	164	9.922	10.010	(1.000)	527234	20.0000		
62 Phenanthrene d10 IS	188	12.734	12.829	(1.000)	753398	20.0000		
74 bis(2-Ethylhexyl)phthalate	149	18.151	18.246	(1.004)	382590	13.1696	19700	
* 76 Chrysene d12 IS	240	18.077	18.179	(1.000)	415167	20.0000		
* 81 Perylene d12 IS	264	20.776	20.878	(1.000)	349617	20.0000		

Data File: /chem/hpmsd6.i/060900.b/06090006.d
Report Date: 27-Jul-2000 09:56

Pace Analytical Services - Charlotte

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: hpmsd6.i
Lab File ID: 06090006.d
Lab Smp Id: 921020020
Analysis Type: SV
Quant Type: ISTD
Operator: DHJ
Method File: /chem/hpmsd6.i/060900.b/8270.m
Misc Info: 921020020

Calibration Date: 26-MAY-2000
Calibration Time: 16:14

Level: LOW
Sample Type: SOIL

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
10 1,4-dichlorobenze	498317	249158	996634	314341	-36.92
28 Naphthalene d8 I	1964439	982220	3928878	1149327	-41.49
45 Acenaphthene d8	902937	451468	1805874	527234	-41.61
62 Phenanthrene d10	1269900	634950	2539800	753398	-40.67
75 Chrysene d12 IS	599346	299673	1198692	415167	-30.73
81 Perylene d12 IS	389408	194704	778816	349617	-10.22

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
10 1,4-dichlorobenze	5.57	5.07	6.07	5.51	-1.11
28 Naphthalene d8 I	7.11	6.61	7.61	7.04	-1.06
45 Acenaphthene d8	10.01	9.51	10.51	9.92	-0.88
62 Phenanthrene d10	12.83	12.33	13.33	12.73	-0.74
75 Chrysene d12 IS	18.18	17.68	18.68	18.08	-0.56
81 Perylene d12 IS	20.88	20.38	21.38	20.78	-0.49

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

Data File: /chem/hpmsd6.i/060900.b/06090006.d
Report Date: 27-Jul-2000 09:56

Pace Analytical Services - Charlotte

RECOVERY REPORT

Client Name:
Sample Matrix: SOLID
Lab Smp Id: 921020020
Level: LOW
Data Type: MS DATA
SpikeList File: WaterMsd.spk
Sublist File: 8270reg.sub
Method File: /chem/hpmsd6.i/060900.b/8270.m
Misc Info: 921020020

Client SDG: 060900
Fraction: SV

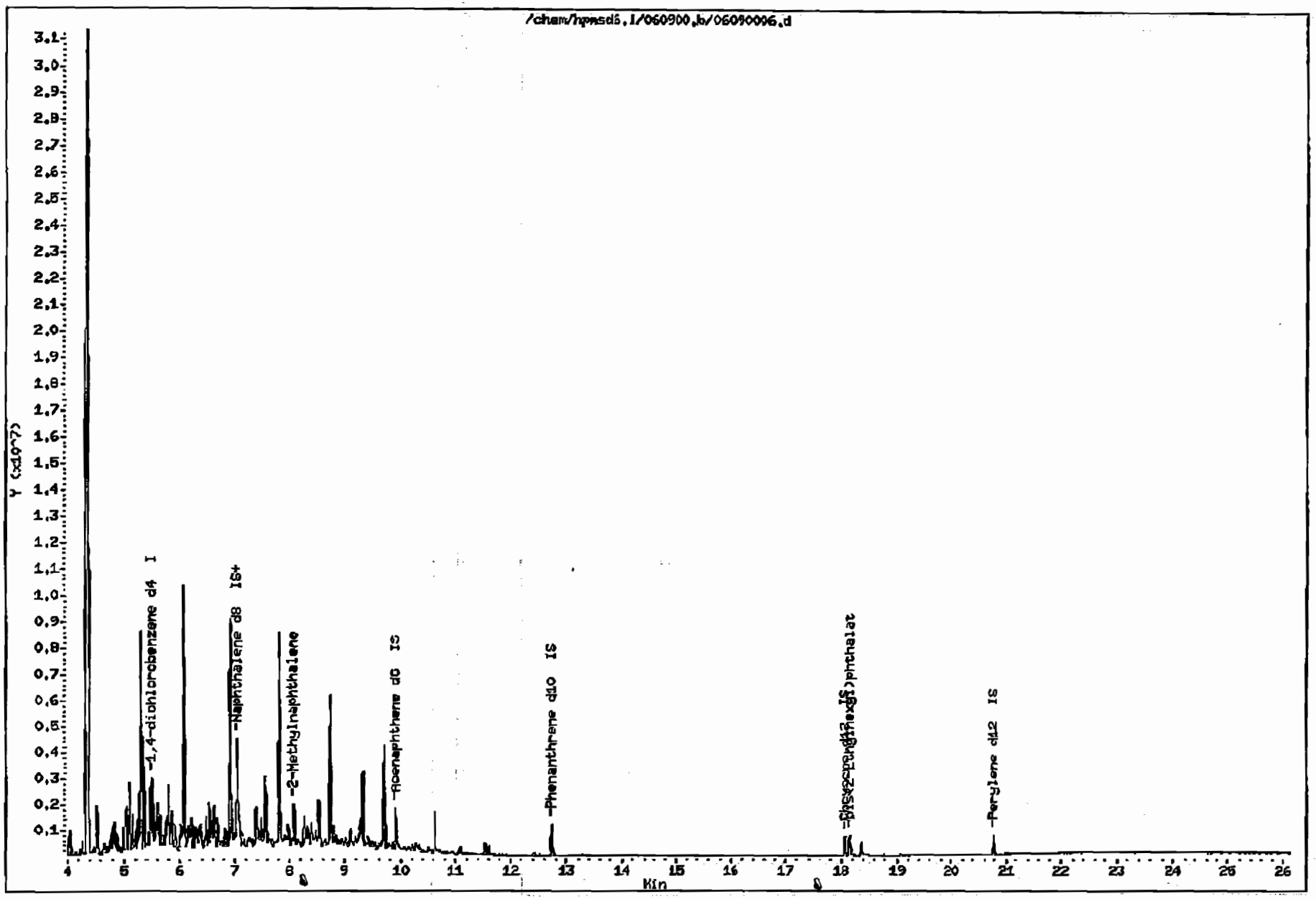
Operator: DHJ
SampleType: SAMPLE
Quant Type: ISTD

SURROGATE COMPOUND	AMOUNT ADDED ug/ml	AMOUNT RECOVERED ug/ml	% RECOVERED	LIMITS
$ 3 2-Fluorophenol (S)	3.33	0.00	*	30-115
$ 4 Phenol-d6 (S)	3.33	0.00	*	24-113
$ 19 Nitrobenzene-d5 (	1.67	0.00	*	23-120
$ 38 2-Fluorobiphenyl	1.67	0.00	*	30-115
$ 58 2,4,6-Tribromophe	3.33	0.00	*	19-122
$ 70 Terphenyl-d14 (S)	1.67	0.00	*	18-137

dil

Data File: /chem/hpmsd6.i/060900.b/06090006.d
Date : 09-JUN-2000 15:09
Client ID:
Sample Info: 060900.b,8270,n,BHJ,50
Volume Injected (uL): 1.0
Column phase:

Instrument: hpmsd6.i
Operator: BHJ
Column diameter: 2.00



8260

Data File: /chem/hpmsd4.i/060500P.b/06050034.d
Report Date: 06-Jun-2000 09:36

Pace Analytical Services - Charlotte

Data file : /chem/hpmsd4.i/060500P.b/06050034.d
Lab Smp Id: 921020020 Client Smp ID: BH-16 (5.5-6')
Inj Date : 06-JUN-2000 05:06
Operator : CBD Inst ID: hpmsd4.i
Smp Info : 060500P,8260,CBD,1000
Misc Info : 921020020
Comment :
Method : /chem/hpmsd4.i/060500P.b/8260.m
Meth Date : 06-Jun-2000 09:35 jsanford Quant Type: ISTD
Cal Date : 02-JUN-2000 14:59 Cal File: 06020009.d
Als bottle: 1
Dil Factor: 1000.00000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: 3.50
Processing Host: hpchemsv

Concentration Formula: Amt * DF * Uf/(Ws*(100-M)/100) * CpndVariable

Name	Value	Description
DF	1000.00000	Dilution Factor
Uf	5.00000	ng unit correction factor
Ws	5.00000	Weight of sample extracted (g)
M	0.00000	% Moisture (not decanted)
Va	100.00000	Volume of aliquot extract added (uL)

Cpnd Variable Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	CONCENTRATIONS FINAL (ug/kg)	REVIEW CODE
* 1 Pentafluorobenzene	168	9.318	9.312	(1.000)	167464	50.0000		
* 2 1,4-difluorobenzene	114	10.322	10.322	(1.000)	218393	50.0000		
* 3 Chlorobenzene-d5	82	14.348	14.348	(1.000)	112715	50.0000		
* 4 1,4-Dichlorobenzene-d4	152	17.749	17.743	(1.000)	83802	50.0000		
$ 5 Dibromofluoromethane (S)	111	9.300	9.294	(0.998)	3903	2.25391	2.25(aQR)	
$ 6 1,2-Dichloroethane-d4 (S)	65	9.763	9.757	(1.048)	4008	2.06938	2.07(aR)	
$ 7 Toluene-d8 (S)	98	12.329	12.329	(1.194)	14823	2.77018	2.77(aR)	
$ 8 4-Bromofluorobenzene (S)	95	16.006	16.019	(1.116)	11862	5.91404	5.91(aQR)	
9 Dichlorodifluoromethane	85	3.141	3.141	(0.337)	2584	1.64587	1640(a)	
56 Ethylbenzene	91	14.516	14.510	(1.012)	126034	20.6262	20600	
57 m&p-Xylene	91	14.720	14.673	(1.026)	15183937	3278.33	3280000(A)	
58 o-Xylene	91	15.261	15.256	(1.064)	151122	31.5156	31500	
61 Isopropylbenzene (Cumene)	105	15.778	15.778	(1.100)	21216	3.74499	3740(aO)	

Data File: /chem/hpmsd4.i/060500P.b/06050034.d Page 2
Report Date: 06-Jun-2000 09:36

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	CONCENTRATIONS FINAL (ug/kg)	REVIEW CODE
66 n-Propylbenzene	91	16.379	16.379	(0.923)	55071	8.13763	8140	
68 1,3,5-Trimethylbenzene	105	16.625	16.620	(0.937)	175853	41.3112	41300	
70 tert-Butylbenzene	119	17.124	17.124	(0.965)	6283	1.89248	1890(a)	
71 1,2,4-Trimethylbenzene	105	17.190	17.191	(0.968)	379818	89.2993	89300	
72 sec-Butylbenzene	105	17.449	17.449	(0.983)	31806	6.03088	6030	
73 p-Isopropyltoluene	119	17.647	17.647	(0.994)	34983	8.86377	8860	
76 n-Butylbenzene	91	18.266	18.266	(1.029)	24030	5.54792	5550(Q)	
81 Naphthalene	128	21.162	21.163	(1.192)	49853	13.6964	13700(Q)	

QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).
A - Target compound detected but, quantitated amount exceeded maximum amount.
Q - Qualifier signal failed the ratio test.
R - Spike/Surrogate failed recovery limits.

Data File: /chem/hpmsd4.i/060500P.b/06050034.d
Report Date: 06-Jun-2000 09:36

Pace Analytical Services - Charlotte

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: hpmsd4.i
Lab File ID: 06050034.d
Lab Smp Id: 921020020
Analysis Type: VOA
Quant Type: ISTD
Operator: CBD
Method File: /chem/hpmsd4.i/060500P.b/8260.m
Misc Info: 921020020

Calibration Date: 05-JUN-2000
Calibration Time: 23:15
Client Smp ID: BH-16 (5.5-6')
Level: LOW
Sample Type: SOIL

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
1 Pentafluorobenzen	239418	119709	478836	167464	-30.05
2 1,4-difluorobenze	345409	172704	690818	218393	-36.77
3 Chlorobenzene-d5	187301	93650	374602	112715	-39.82
4 1,4-Dichlorobenze	146491	73246	292982	83802	-42.79

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
1 Pentafluorobenzen	9.31	8.81	9.81	9.32	0.06
2 1,4-difluorobenze	10.32	9.82	10.82	10.32	0.00
3 Chlorobenzene-d5	14.35	13.85	14.85	14.35	0.00
4 1,4-Dichlorobenze	17.74	17.24	18.24	17.75	0.03

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

Data File: /chem/hpmsd4.i/060500P.b/06050034.d
Report Date: 06-Jun-2000 09:36

Pace Analytical Services - Charlotte

RECOVERY REPORT

Client Name: KOCH
Sample Matrix: SOLID
Lab Smp Id: 921020020
Level: LOW
Data Type: MS DATA
SpikeList File: LCS-W.spk
Sublist File: all.sub
Method File: /chem/hpmsd4.i/060500P.b/8260.m
Misc Info: 921020020

Client SDG: 060500P
Fraction: VOA
Client Smp ID: BH-16 (5.5-6')
Operator: CBD
SampleType: SAMPLE
Quant Type: ISTD

SURROGATE COMPOUND	CONC ADDED ug/kg	CONC RECOVERED ug/kg	% RECOVERED	LIMITS
$ 5 Dibromofluorometha	50.0	2.25	4.51*	80-120
$ 6 1,2-Dichloroethane	50.0	2.07	4.14*	80-120
$ 7 Toluene-d8 (S)	50.0	2.77	5.54*	81-117
$ 8 4-Bromofluorobenze	50.0	5.91	11.83*	74-121

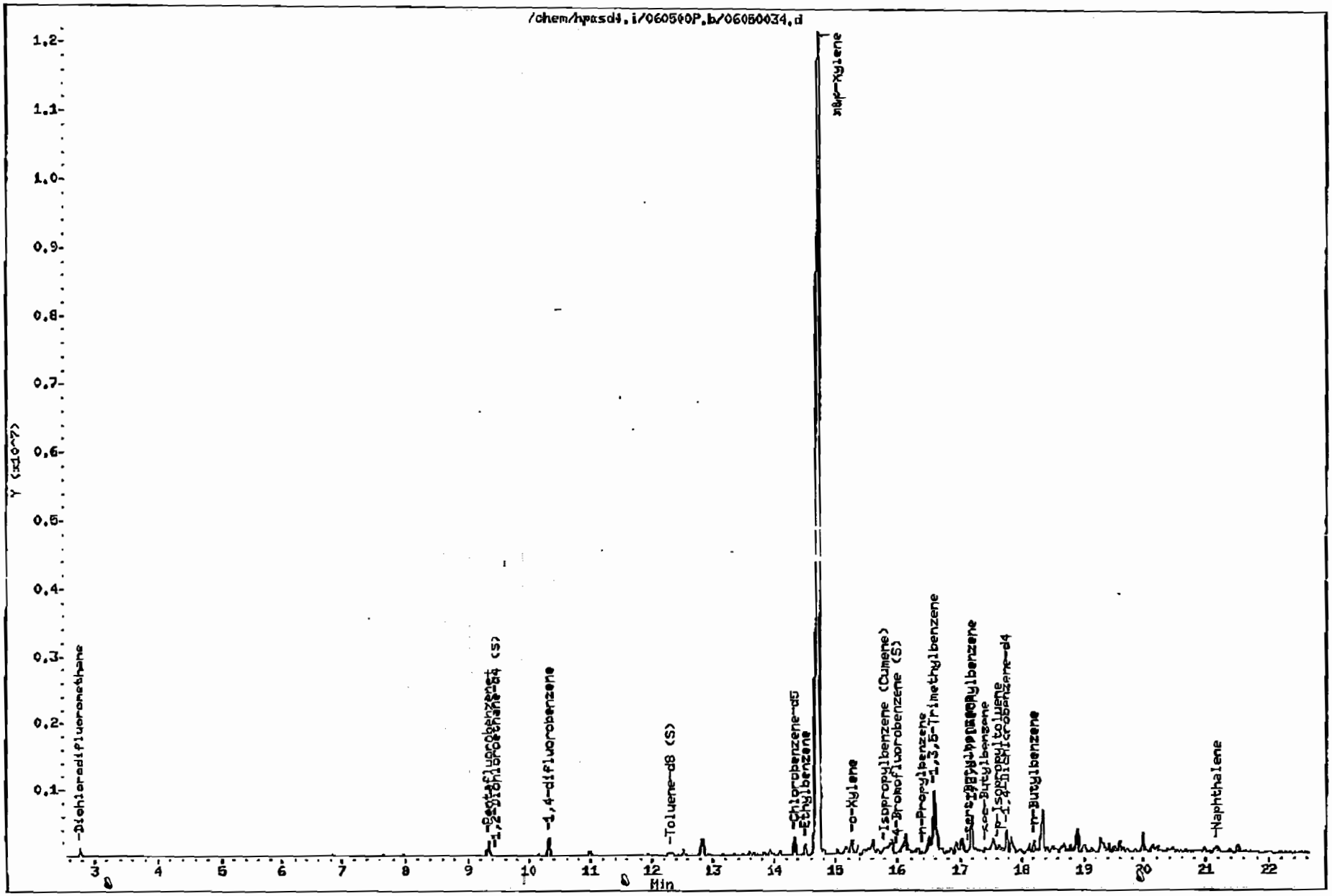
Data File: /chem/hpmsd4.i/060500P.b/06050034.d
Date : 06-JUN-2000 05:06
Client ID: BH-16 (5,5-6')
Sample Info: 050500P,8260,CBD,1000

Column phase: DB-624

Instrument: hpmsd4.i

Operator: CBD
Column diameter: 0.53

Page 5



Data File: /chem/hpmsd4.i/060600.b/06060013.d
Report Date: 06-Jun-2000 19:40

Pace Analytical Services - Charlotte

Data file : /chem/hpmsd4.i/060600.b/06060013.d
Lab Smp Id: 9210110020
Inj Date : 06-JUN-2000 17:26
Operator : JRS Inst ID: hpmsd4.i
Smp Info : 060600,8260,JRS,10000
Misc Info : 9210110020
Comment :
Method : /chem/hpmsd4.i/060600.b/8260.m
Meth Date : 06-Jun-2000 12:12 chemist Quant Type: ISTD
Cal Date : 02-JUN-2000 14:59 Cal File: 06020009.d
Als bottle: 1
Dil Factor: 10000.00000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: 3.50
Processing Host: hpchemsv

Concentration Formula: Amt * DF * Uf/Vo * CpndVariable

Name	Value	Description
DF	10000.00000	Dilution Factor
Uf	5.00000	ng unit correction factor
Vo	5.00000	Sample Volume purged (mL)

Cpnd Variable Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	FINAL (ug/L)	REVIEW CODE
*	1 Pentafluorobenzene	168	9.306	9.312	(1.000)	167997	50.0000		
*	2 1,4-difluorobenzene	114	10.315	10.316	(1.000)	225306	50.0000		
*	3 Chlorobenzene-d5	82	14.341	14.342	(1.000)	124571	50.0000		
*	4 1,4-Dichlorobenzene-d4	152	17.737	17.743	(1.000)	94577	50.0000		
S	5 Dibromofluoromethane (S)	111	9.287	9.288	(0.998)	82825	47.6782	47.7(a)	
$	6 1,2-Dichloroethane-d4 (S)	55	9.750	9.757	(1.048)	97635	50.2503	50.2(a)	
$	7 Toluene-d8 (S)	98	12.322	12.323	(1.195)	269456	48.8119	48.8(a)	
$	8 4-Bromofluorobenzene (S)	95	16.012	16.019	(1.116)	107470	48.4818	48.5(a)	
	9 Dichlorodifluoromethane	85	3.134	3.141	(0.337)	1981	1.25779	12600(aQ)	
	57 m&p-Xylene	91	14.678	14.667	(1.023)	3452964	674.566	6740000(A)	
	58 o-Xylene	91	15.249	15.249	(1.063)	15011	2.83252	28300(a)	
	68 1,3,5-Trimethylbenzene	105	16.613	16.620	(0.937)	16284	3.38960	33900(a)	
	71 1,2,4-Trimethylbenzene	105	17.184	17.184	(0.969)	37172	7.74385	77400	
	81 Naphthalene	128	21.162	21.157	(1.193)	4840	1.17822	11800(aQ)	

QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).
A - Target compound detected but, quantitated amount exceeded maximum amount.
Q - Qualifier signal failed the ratio test.

Data File: /chem/hpmsd4.i/060600.b/06060013.d
Report Date: 06-Jun-2000 19:40

Pace Analytical Services - Charlotte

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: hpmsd4.i
Lab File ID: 06060013.d
Lab Smp Id: 9210110020
Analysis Type: VOA
Quant Type: ISTD
Operator: JRS
Method File: /chem/hpmsd4.i/060600.b/8260.m
Misc Info: 9210110020

Calibration Date: 06-JUN-2000
Calibration Time: 11:40

Level: LOW
Sample Type: WATER

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
1 Pentafluorobenzen	249914	124957	499828	167997	-32.78
2 1,4-difluorobenze	357556	178778	715112	225306	-36.99
3 Chlorobenzene-d5	195535	97768	391070	124571	-36.29
4 1,4-Dichlorobenze	155276	77638	310552	94577	-39.09

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
1 Pentafluorobenzen	9.31	8.81	9.81	9.31	-0.07
2 1,4-difluorobenze	10.32	9.82	10.82	10.32	-0.01
3 Chlorobenzene-d5	14.34	13.84	14.84	14.34	-0.01
4 1,4-Dichlorobenze	17.74	17.24	18.24	17.74	-0.04

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

Data File: /chem/hpmsd4.i/060600.b/06060013.d
Report Date: 06-Jun-2000 19:40

Pace Analytical Services - Charlotte

RECOVERY REPORT

Client Name:
Sample Matrix: LIQUID
Lab Smp Id: 9210110020
Level: LOW
Data Type: MS DATA
SpikeList File: LCS-W.spk
Sublist File: all.sub
Method File: /chem/hpmsd4.i/060600.b/8260.m
Misc Info: 9210110020

Client SDG: 060600
Fraction: VOA

Operator: JRS
SampleType: SAMPLE
Quant Type: ISTD

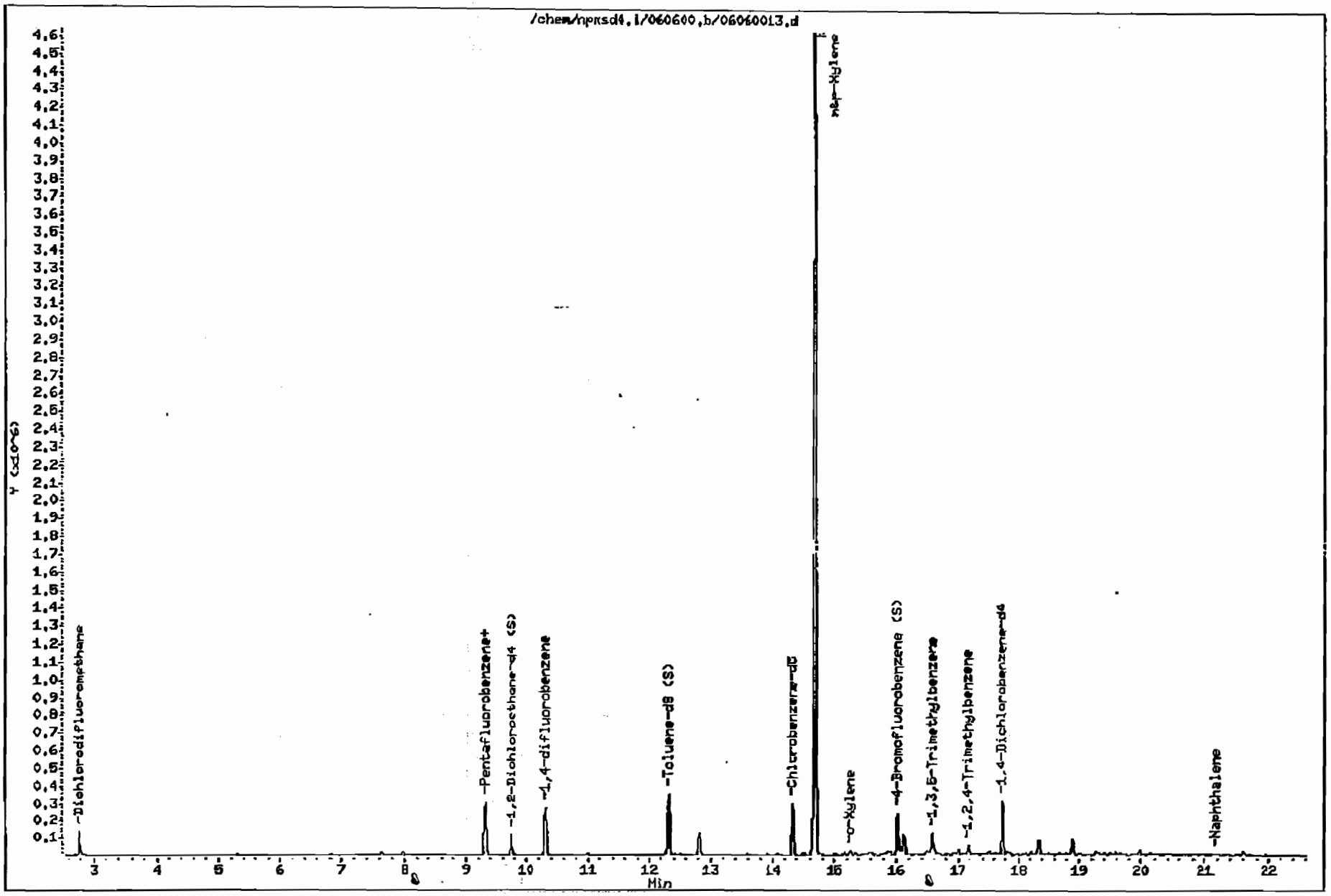
SURROGATE COMPOUND	CONC ADDED ug/L	CONC RECOVERED ug/L	% RECOVERED	LIMITS
$ 5 Dibromofluorometha	50.0	47.7	95.36	86-118
$ 6 1,2-Dichloroethane	50.0	50.2	100.50	80-120
$ 7 Toluene-d8 (S)	50.0	48.8	97.62	88-110
$ 8 4-Bromofluorobenze	50.0	48.5	96.96	86-115

Data File: /chem/hpmsd4.i/060600.b/06060013.d
Date : 06-JUN-2000 17:26
Client ID:
Sample Info: 060600,8260,JRS,10000
Purge Volume: 5.0
Column phase: DB-624

Instrument: hpmsd4.i

Operator: JRG
Column diameter: 0.53

Page 5



Data File: /chem/hpmsd4.i/060600P.b/06060035.d Page 1
Report Date: 07-Jun-2000 14:30

Pace Analytical Services - Charlotte

Data file : /chem/hpmsd4.i/060600P.b/06060035.d
Lab Smp Id: 921020020 Client Smp ID: BH-16 (5.5-6')
Inj Date : 07-JUN-2000 05:27
Operator : CBD Inst ID: hpmsd4.i
Smp Info : 060600P,8260,CBD,50000
Misc Info : 921020020
Comment :
Method : /chem/hpmsd4.i/060600P.b/8260.m
Meth Date : 07-Jun-2000 14:29 cdavidso Quant Type: ISTD
Cal Date : 02-JUN-2000 14:59 Cal File: 06020009.d
Als bottle: 1
Dil Factor: 50000.00000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: 3.50
Processing Host: hpchemsw

Concentration Formula: Amt * DF * Uf/(Ws*(100-M)/100) * CpndVariable

Name	Value	Description
DF	50000.00000	Dilution Factor
Uf	5.00000	ng unit correction factor
Ws	5.00000	Weight of sample extracted (g)
M	0.00000	% Moisture (not decanted)
Va	100.00000	Volume of aliquot extract added (uL)

Cpnd Variable Local Compound Variable

Compounds	QUANT SIC MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	FINAL (ug/kg)	REVIEW CODE
* 1 Pentafluorobenzene	168	9.294	9.301	(1.000)	153371	50.0000		
* 2 1,4-difluorobenzene	114	10.304	10.305	(1.000)	201706	50.0000		
* 3 Chlorobenzene-d5	82	14.330	14.331	(1.000)	114561	50.0000		
* 4 1,4-Dichlorobenzene-d4	152	17.731	17.732	(1.000)	83228	50.0000		
S 5 Dibromofluoromethane (S)	111	9.276	9.283	(0.998)	76211	48.0859	48.1(a)	
$ 6 1,2-Dichloroethane-d4 (S)	68	9.739	9.746	(1.040)	95290	53.7216	53.7(a)	
$ 7 Toluene-d8 (S)	98	12.311	12.312	(1.195)	243244	49.2192	49.2(a)	
$ 8 4-Bromofluorobenzene (S)	95	16.007	16.008	(1.117)	97027	47.5983	47.6(a)	
18 Acetone	43	6.127	6.128	(0.659)	10320	5.56465	278000	
57 m&p-Xylene	91	14.661	14.662	(1.023)	799244	169.702	8490000	
71 1,2,4-Trimethylbenzene	105	17.172	17.179	(0.968)	6712	1.58895	79400(a)	

Data File: /chem/hpmsd4.i/060600P.b/06060035.d
Report Date: 07-Jun-2000 14:30

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).

Data File: /chem/hpmsd4.i/060600P.b/06060035.d
Report Date: 07-Jun-2000 14:30

Pace Analytical Services - Charlotte

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: hpmsd4.i
Lab File ID: 06060035.d
Lab Smp Id: 921020020
Analysis Type: VOA
Quant Type: ISTD
Operator: CBD
Method File: /chem/hpmsd4.i/060600P.b/8260.m
Misc Info: 921020020

Calibration Date: 06-JUN-2000
Calibration Time: 21:23
Client Smp ID: BH-16 (5.5-6')
Level: LOW
Sample Type: SOIL

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
1 Pentafluorobenzen	232421	116210	464842	153271	-34.05
2 1,4-difluorobenze	333888	166944	667776	201706	-39.59
3 Chlorobenzene-d5	185719	92860	371438	114561	-38.31
4 1,4-Dichlorobenze	142522	71261	285044	83228	-41.60

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
1 Pentafluorobenzen	9.30	8.80	9.80	9.29	-0.08
2 1,4-difluorobenze	10.30	9.80	10.80	10.30	-0.01
3 Chlorobenzene-d5	14.33	13.83	14.83	14.33	-0.01
4 1,4-Dichlorobenze	17.73	17.23	18.23	17.73	-0.01

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

Data File: /chem/hpmsd4.i/060600P.b/06060035.d
Report Date: 07-Jun-2000 14:30

Pace Analytical Services - Charlotte

RECOVERY REPORT

Client Name: KOCH
Sample Matrix: SOLID
Lab Smp Id: 921020020
Level: LOW
Data Type: MS DATA
SpikeList File: LCS-W.spk
Sublist File: all.sub
Method File: /chem/hpmsd4.i/060600P.b/8260.m
Misc Info: 921020020

Client SDG: 060600P
Fraction: VOA
Client Smp ID: BH-16 (5.5-6')
Operator: CBD
SampleType: SAMPLE
Quant Type: ISTD

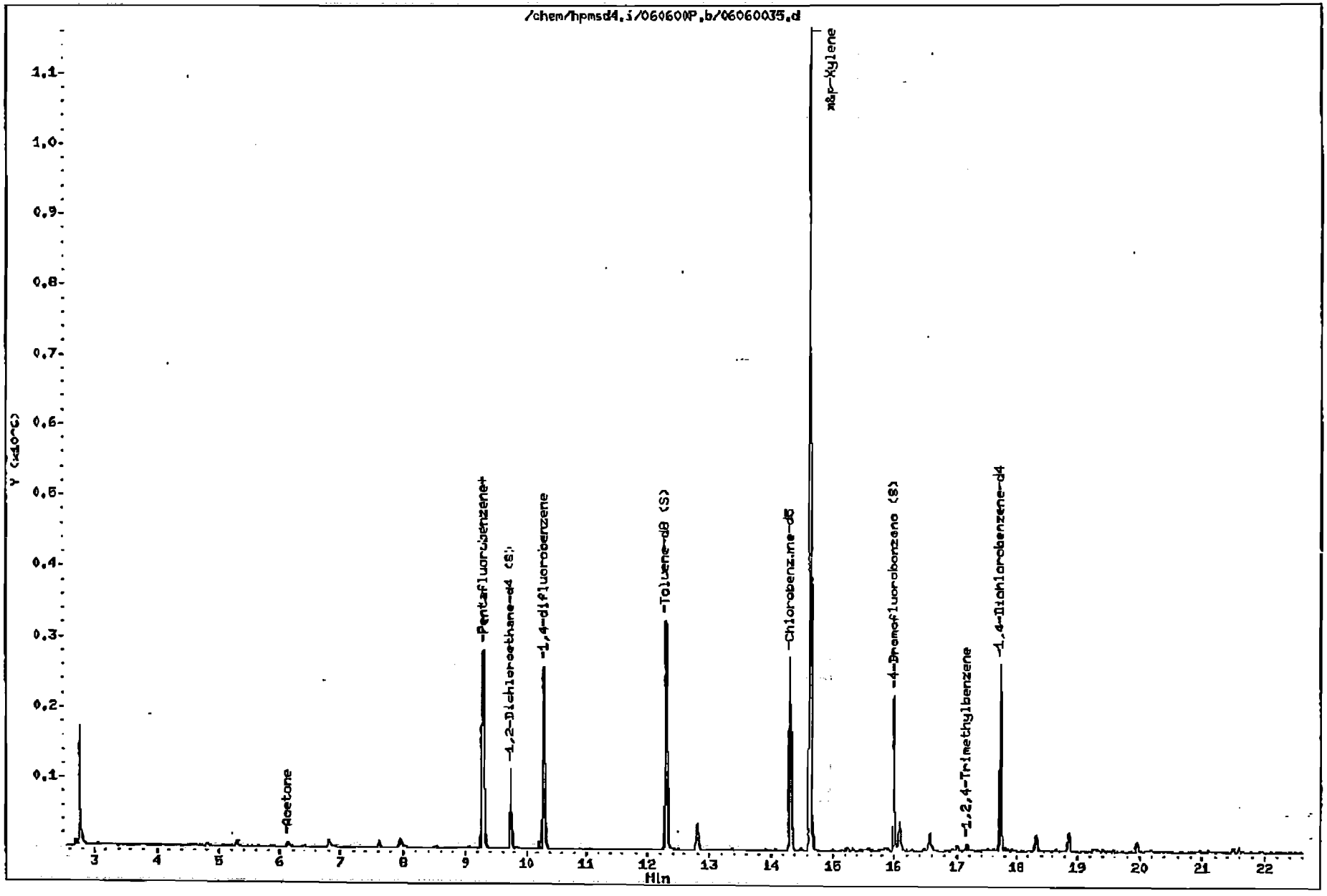
SURROGATE COMPOUND	CONC ADDED ug/kg	CONC RECOVERED ug/kg	% RECOVERED	LIMITS
$ 5 Dibromofluorometha	50.0	48.1	96.17	80-120
$ 6 1,2-Dichloroethane	50.0	53.7	107.44	80-120
$ 7 Toluene-d8 (S)	50.0	49.2	98.44	81-117
$ 8 4-Bromofluorobenze	50.0	47.6	95.19	74-121

Data File: /chem/hpmsd4.i/060600P.b/06060035.d
Date : 07-JUN-2000 05:27
Client ID: BH-16 (5.5-6')
Sample Info: 060600P,8260,CBD,50000

Column phase: DB-624

Instrument: hpmsd4.i

Operator: CBD
Column diameter: 0.53



Data File: /chem/hpmsd4 i/060500P.b/06050033.d Page 1
Report Date: 06-Jun-2000 09:36

Pace Analytical Services - Charlotte

Data file : /chem/hpmsd4.i/060500P.b/06050033.d
Lab Smp Id: 921020004 Client Smp ID: 401-13 (7-7.5')
Inj Date : 06-JUN-2000 04:34
Operator : CBD Inst ID: hpmsd4.i
Smp Info : 060500P,8260,CBD,1000
Misc Info : 921020004
Comment :
Method : /chem/hpmsd4.i/060500P.b/8260.m
Meth Date : 06-Jun-2000 09:35 jsanford Quant Type: ISTD
Cal Date : 02-JUN-2000 14:59 Cal File: 06020009.d
Als bottle: 1
Dil Factor: 1000.00000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: 3.50
Processing Host: hpchemsv

Concentration Formula: Amt * DF * Uf/(Ws*(100-M)/100) * CpndVariable

Name	Value	Description
DF	1000.00000	Dilution Factor
Uf	5.00000	ng unit correction factor
Ws	5.00000	Weight of sample extracted (g)
M	0.00000	% Moisture (not decanted)
Va	100.00000	Volume of aliquot extract added (uL)

Cpnd Variable Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	FINAL (ug/kg)	REVIEW CODE
* 1 Pentafluorobenzene	168	9.317	9.312	(1.000)	173146	50.0000		
* 2 1,4-difluorobenzene	114	10.326	10.322	(1.000)	228031	50.0000		
* 3 Chlorobenzene-d5	82	14.347	14.348	(1.000)	116035	50.0000		
* 4 1,4-Dichlorobenzene-d4	152	17.748	17.743	(1.000)	87608	50.0000		
$ 5 Dibromofluoromethane (S)	111	9.305	9.294	(0.999)	4106	2.29333	2.29(aQR)	
$ 6 1,2-Dichloroethane-d4 (S)	65	9.762	9.757	(1.048)	4031	2.01296	2.01(aR)	
$ 7 Toluene-d8 (S)	98	12.334	12.329	(1.194)	13320	2.38408	2.38(aR)	
$ 8 4-Bromofluorobenzene (S)	95	16.023	16.019	(1.117)	8463	4.09867	4.10(aQR)	
9 Dichlorodifluoromethane	95	3.145	3.141	(0.338)	2274	1.40088	1400(a)	
56 Ethylbenzene	91	14.515	14.510	(1.012)	14654	2.32959	2330(a)	
57 m&p-Xylene	91	14.695	14.673	(1.024)	8060441	1690.52	1690000(A)	
58 o-Xylene	91	15.260	15.256	(1.064)	6915	1.40082	1400(a)	
68 1,3,5-Trimethylbenzene	105	16.624	16.620	(0.937)	66666	14.9807	15000	

Data File: /chem/hpmsd4.i/060500P.b/06050033.d Page 2
Report Date: 06-Jun-2000 09:36

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	CONCENTRATIONS FINAL (ug/kg)	REVIEW CODE
71 1,2,4-Trimethylbenzene	105	17.195	17.191	(0.969)	140002	31.4860	31500	
72 sec-Butylbenzene	105	17.453	17.449	(0.983)	22814	4.13794	4140(a)	
73 p-Isopropyltoluene	119	17.652	17.647	(0.995)	23945	5.80346	5800	
76 n-Butylbenzene	91	18.271	18.266	(1.029)	26706	5.89788	5900(Q)	
81 Naphthalene	128	21.167	21.163	(1.193)	32087	8.43245	8430(Q)	

QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).
A - Target compound detected but, quantitated amount exceeded maximum amount.
Q - Qualifier signal failed the ratio test.
R - Spike/Surrogate failed recovery limits.

Data File: /chem/hpmsd4.i/060500P.b/06050033.d
Report Date: 06-Jun-2000 09:36

Pace Analytical Services - Charlotte

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: hpmsd4.i
Lab File ID: 06050033.d
Lab Smp Id: 921020004
Analysis Type: VOA
Quant Type: ISTD
Operator: CBD
Method File: /chem/hpmsd4.i/060500P.b/8260.m
Misc Info: 921020004

Calibration Date: 05-JUN-2000
Calibration Time: 23:15
Client Smp ID: 401-13 (7-7.5')
Level: LOW
Sample Type: SOIL

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
1 Pentafluorobenzen	239418	119709	478836	173146	-27.68
2 1,4-difluorobenze	345409	172704	690818	228031	-33.98
3 Chlorobenzene-d5	187301	93650	374602	116035	-38.05
4 1,4-Dichlorobenze	146491	73246	292982	87608	-40.20

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
1 Pentafluorobenzen	9.31	8.81	9.81	9.32	0.05
2 1,4-difluorobenze	10.32	9.82	10.82	10.33	0.04
3 Chlorobenzene-d5	14.35	13.85	14.85	14.35	-0.01
4 1,4-Dichlorobenze	17.74	17.24	18.24	17.75	0.03

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

Data File: /chem/hpmsd4.i/060500P.b/06050033.d
Report Date: 06-Jun-2000 09:36

Pace Analytical Services - Charlotte

RECOVERY REPORT

Client Name: KOCH
Sample Matrix: SOLID
Lab Smp Id: 921020004
Level: LOW
Data Type: MS DATA
SpikeList File: LCS-W.spk
Sublist File: all.sub
Method File: /chem/hpmsd4.i/060500P.b/8260.m
Misc Info: 921020004

Client SDG: 060500P
Fraction: VOA
Client Smp ID: 401-13 (7-7.5')
Operator: CBD
SampleType: SAMPLE
Quant Type: ISTD

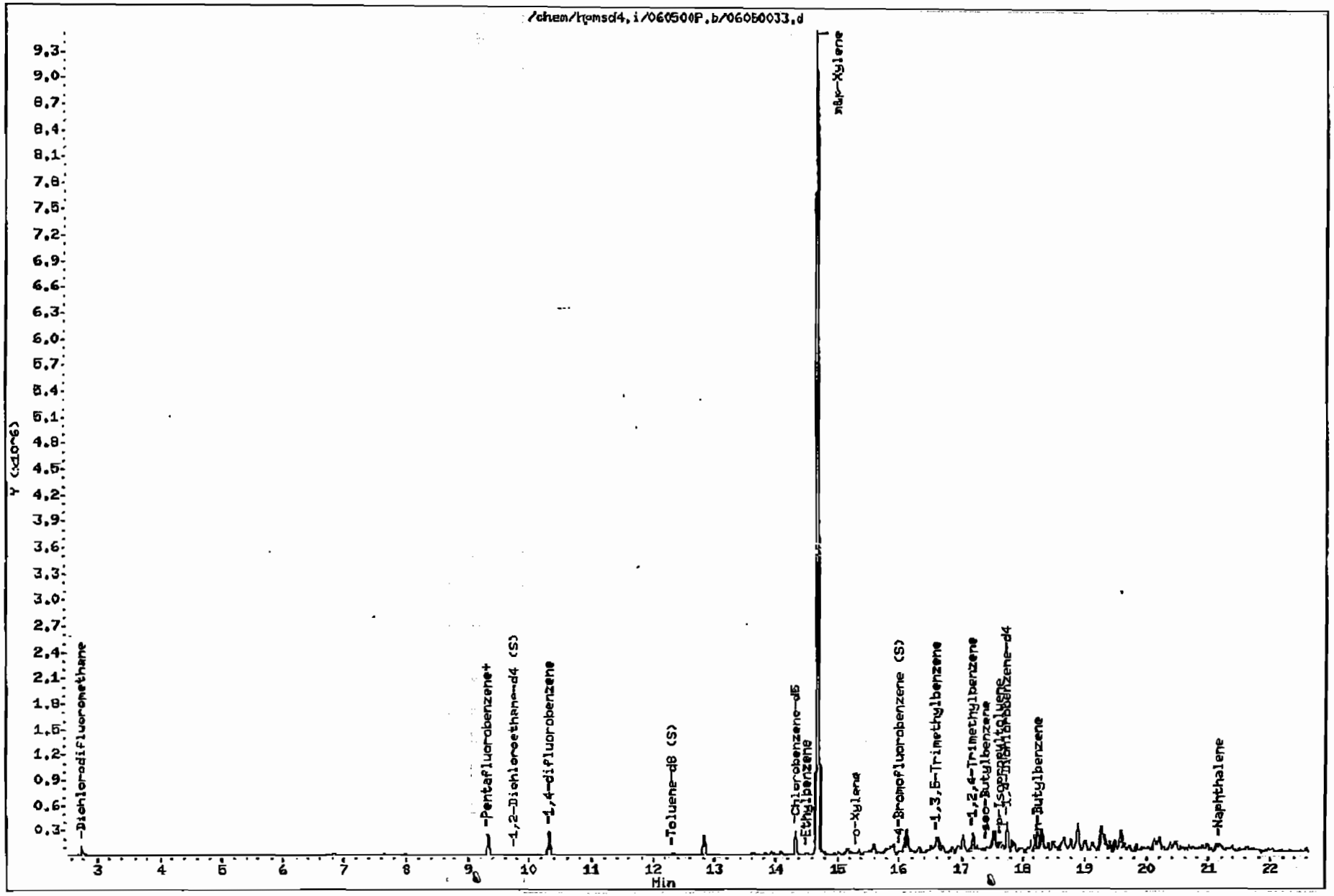
SURROGATE COMPOUND	CONC ADDED ug/kg	CONC RECOVERED ug/kg	% RECOVERED	LIMITS
$ 5 Dibromofluorometha	50.0	2.29	4.59*	80-120
$ 6 1,2-Dichloroethane	50.0	2.01	4.03*	80-120
$ 7 Toluene-d8 (S)	50.0	2.38	4.77*	81-117
$ 8 4-Bromofluorobenze	50.0	4.10	8.20*	74-121

Data File: /chem/hpmsd4.i/060500P.b/06050033.d
Date : 06-JUN-2000 04:36
Client ID: 401-13 (7-7.5')
Sample Info: 060500P,8260,CBD,1000

Column phase: DB-624

Instrument: hpmsd4.i

Operator: CBD
Column diameter: 0.53



Data File: /chem/hpmsd4.i/060600.b/06060012.d
Report Date: 06-Jun-2000 19:40

Pace Analytical Services - Charlotte

Data file : /chem/hpmsd4.i/060600.b/06060012.d
Lab Smp Id: 9210110004
Inj Date : 06-JUN-2000 16:54
Operator : JRS Inst ID: hpmsd4.i
Smp Info : 060600,8260,JRS,5000
Misc Info : 9210110004
Comment :
Method : /chem/hpmsd4.i/060600.b/8260.m
Meth Date : 06-Jun-2000 12:12 chemist Quant Type: ISTD
Cal Date : 02-JUN-2000 14:59 Cal File: 06020009.d
Als bottle: 1
Dil Factor: 5000.00000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: 3.50
Processing Host: hpchemsv

Concentration Formula: Amt * DF * Uf/Vo * CpndVariable

Name	Value	Description
DF	5000.00000	Dilution Factor
Uf	5.00000	ng unit correction factor
Vo	5.00000	Sample Volume purged (mL)

Cpnd Variable Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/L)	FINAL (ug/L)	REVIEW CODE
*	1 Pentafluorobenzene	168	9.306	9.312	(1.000)	181409	50.0000		
*	2 1,4-difluorobenzene	114	10.311	10.316	(1.000)	253455	50.0000		
*	3 Chlorobenzene-d5	82	14.337	14.342	(1.000)	139980	50.0000		
*	4 1,4-Dichlorobenzene-d4	152	17.739	17.743	(1.000)	109561	50.0000		
$	5 Dibromofluoromethane (S)	111	9.290	9.288	(0.998)	93490	49.8386	49.8(a)	
$	6 1,2-Dichloroethane-d4 (S)	65	9.752	9.757	(1.048)	108750	51.8329	51.8(a)	
$	7 Toluene-d8 (S)	98	12.318	12.323	(1.195)	307418	49.5039	49.5(a)	
$	8 4-Bromofluorobenzene (S)	95	16.014	16.019	(1.117)	120824	48.5060	48.5(a)	
	9 Dichlorodifluoromethane	85	3.136	3.141	(0.337)	2534	1.48995	7450(a)	
	57 m&p-Xylene	91	14.674	14.667	(1.023)	2285423	397.328	1990000	
	68 1,3,5-Trimethylbenzene	105	16.615	16.620	(0.937)	12498	2.24673	11200(a)	
	71 1,2,4-Trimethylbenzene	105	17.186	17.184	(0.969)	27347	4.91791	24600(a)	
	73 p-Isopropyltoluene	119	17.558	17.641	(0.990)	6673	1.29325	6470(a)	
	81 Naphthalene	128	21.158	21.157	(1.193)	6724	1.41299	7060(aQ)	

Data File: /chem/hpmsd4.i/060600.b/06060012.d
Report Date: 06-Jun-2000 19:40

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
Q - Qualifier signal failed the ratio test.

Data File: /chem/hpmsd4.i/060600.b/06060012.d
Report Date: 06-Jun-2000 19:40

Pace Analytical Services - Charlotte

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: hpmsd4.i
Lab File ID: 06060012.d
Lab Smp Id: 9210110004
Analysis Type: VOA
Quant Type: ISTD
Operator: JRS
Method File: /chem/hpmsd4.i/060600.b/8260.m
Misc Info: 9210110004

Calibration Date: 06-JUN-2000
Calibration Time: 11:40

Level: LOW
Sample Type: WATER

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
1 Pentafluorobenzen	249914	124957	499828	181409	-27.41
2 1,4-difluorobenze	357556	178778	715112	253455	-29.11
3 Chlorobenzene-d5	195535	97768	391070	139980	-28.41
4 1,4-Dichlorobenze	155276	77638	310552	109561	-29.44

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
1 Pentafluorobenzen	9.31	8.81	9.81	9.31	-0.05
2 1,4-difluorobenze	10.32	9.82	10.82	10.31	-0.05
3 Chlorobenzene-d5	14.34	13.84	14.84	14.34	-0.03
4 1,4-Dichlorobenze	17.74	17.24	18.24	17.74	-0.03

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

Data File: /chem/hpmsd4.i/060600.b/06060012.d
Report Date: 06-Jun-2000 19:40

Pace Analytical Services - Charlotte

RECOVERY REPORT

Client Name:
Sample Matrix: LIQUID
Lab Smp Id: 9210110004
Level: LOW
Data Type: MS DATA
SpikeList File: LCS-W.spk
Sublist File: all.sub
Method File: /chem/hpmsd4.i/060600.b/8260.m
Misc Info: 9210110004

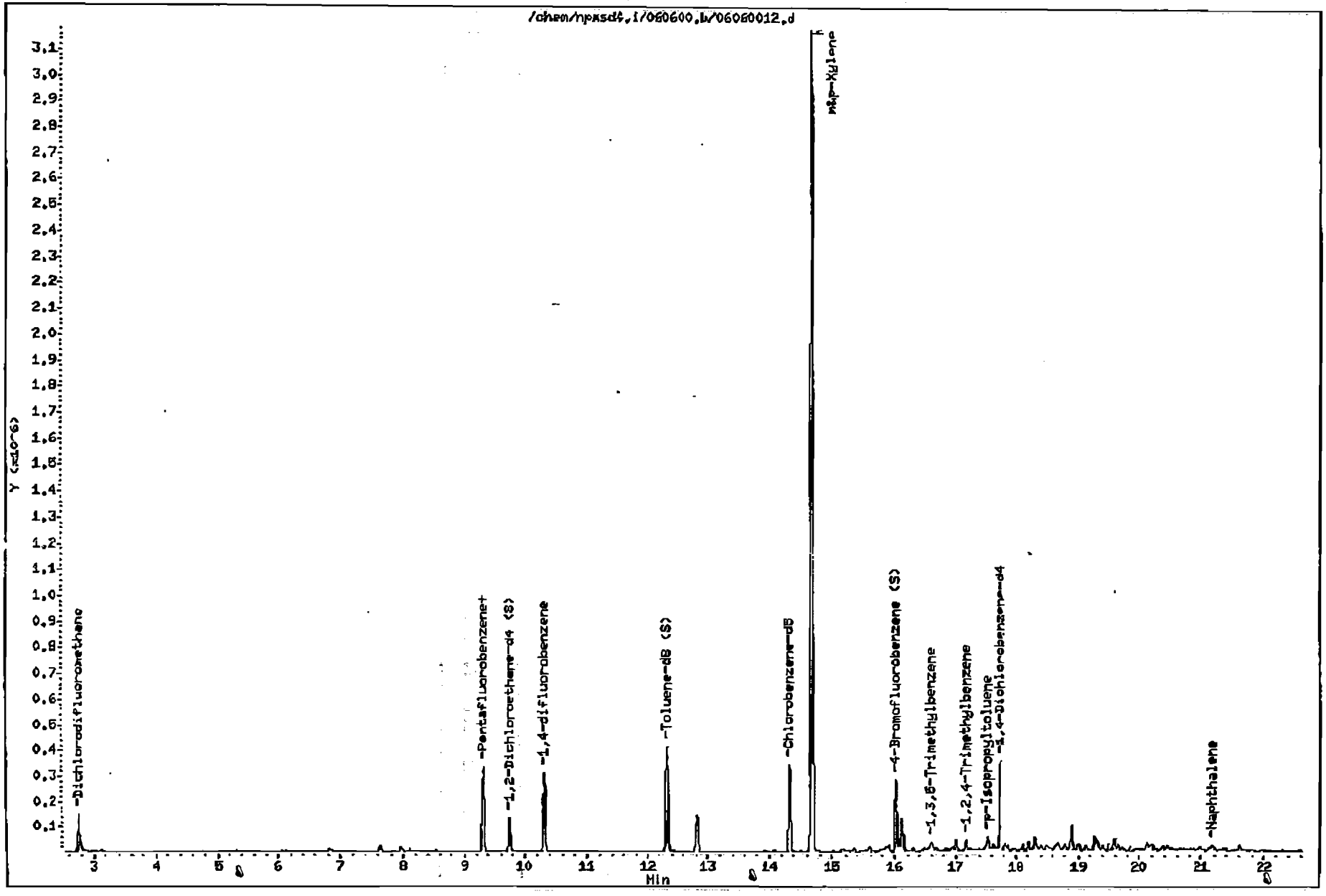
Client SDG: 060600
Fraction: VOA

Operator: JRS
SampleType: SAMPLE
Quant Type: ISTD

SURROGATE COMPOUND	CONC ADDED ug/L	CONC RECOVERED ug/L	% RECOVERED	LIMITS
$ 5 Dibromofluorometha	50.0	49.8	99.68	86-118
$ 6 1,2-Dichloroethane	50.0	51.8	103.67	80-120
$ 7 Toluene-d8 (S)	50.0	49.5	99.01	88-110
$ 8 4-Bromofluorobenze	50.0	48.5	97.01	86-115

Data File: /chem/hpmsd4.i/060600.b/06060012.d
Date : 06-JUN-2000 16:54
Client ID:
Sample Info: 060600,8260,JRS,5000
Purge Volume: 5.0
Column phase: IB-624

Instrument: hpmsd4.i
Operator: JRS
Column diameter: 0.53



Data File: /chem/hpmsd6.i/060900.b/06090005.d
Report Date: 27-Jul-2000 11:42

Pace Analytical Services - Charlotte

Semivolatile REPORT SW-846 Method 8270

Data file : /chem/hpmsd6.i/060900.b/06090005.d
Lab Smp Id: 921020004
Inj Date : 09-JUN-2000 14:29
Operator : DHJ Inst ID: hpmsd6.i
Smp Info : 060900.b,8270.m,DHJ,50
Misc Info : 921020004
Comment :
Method : /chem/hpmsd6.i/060900.b/8270.m
Meth Date : 14-Jun-2000 14:54 djones Quant Type: ISTD
Cal Date : 26-MAY-2000 16:14 Cal File: 05260003.d
Als bottle: 1
Dil Factor: 50.00000
Integrator: HP RTE Compound Sublist: 8270reg.sub
Target Version: 3.50

Concentration Formula: Amt * DF * Uf*Vt/Vi*Ws * CpndVariable

OK 225

Name	Value	Description
DF	50.00000	Dilution Factor
Uf	0.00100	ng unit correction factor
Vt	1000.00000	Volume of final extract (uL) (1000 low, 2
Vi	1.00000	Volume injected (uL)
Ws	30.00000	Weigth of sample extracted (g)

Cpnd Variable Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/ml)	CONCENTRATIONS FINAL (ug/kg)	REVIEW CODE
* 10 1,4-dichlorobenzene d4 IS	152	5.510	5.573	(1.000)	346091	20.0000		
* 28 Naphthalene d8 IS	136	7.033	7.110	(1.000)	1215674	20.0000		
29 Naphthalene	128	7.060	7.144	(1.004)	345027	5.22552 2.6	7840(Q)	
34 2-Methylnaphthalene	142	8.081	8.164	(1.149)	823709	20.7770	31200	
* 45 Acenaphthene d8 IS	164	9.920	10.010	(1.000)	551129	20.0000		
* 62 Phenanthrene d10 IS	188	12.732	12.829	(1.000)	794370	20.0000		
74 bis(2-Ethylhexyl)phthalate	149	18.149	18.246	(1.004)	485328	16.3239	24500	
* 75 Chrysene d12 IS	240	18.069	18.179	(1.000)	424249	20.0000		
* 81 Perylene d12 IS	264	20.774	20.878	(1.000)	336851	20.0000		

QC Flag Legend

Q - Qualifier signal failed the ratio test.

Data File: /chem/hpmsd6.i/060900.b/06090005.d
Report Date: 27-Jul-2000 11:42

Pace Analytical Services - Charlotte

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: hpmsd6.i
Lab File ID: 06090005.d
Lab Smp Id: 921020004
Analysis Type: SV
Quant Type: ISTD
Operator: DHJ
Method File: /chem/hpmsd6.i/060900.b/8270.m
Misc Info: 921020004

Calibration Date: 26-MAY-2000
Calibration Time: 16:14

Level: LOW
Sample Type: SOIL

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
10 1,4-dichlorobenze	498317	249158	996634	346091	-30.55
28 Naphthalene d8 I	1964439	982220	3928878	1215674	-38.12
45 Acenaphthene d8	902937	451468	1805874	551129	-38.96
62 Phenanthrene d10	1269900	634950	2539800	794370	-37.45
75 Chrysene d12 IS	599346	299673	1198692	424249	-29.21
81 Perylene d12 IS	389408	194704	778816	336851	-13.50

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
10 1,4-dichlorobenze	5.57	5.07	6.07	5.51	-1.14
28 Naphthalene d8 I	7.11	6.61	7.61	7.03	-1.08
45 Acenaphthene d8	10.01	9.51	10.51	9.92	-0.90
62 Phenanthrene d10	12.83	12.33	13.33	12.73	-0.76
75 Chrysene d12 IS	18.18	17.68	18.68	18.07	-0.61
81 Perylene d12 IS	20.88	20.38	21.38	20.77	-0.50

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

Data File: /chem/hpmsd6.i/060900.b/06090005.d
Report Date: 27-Jul-2000 11:42

Pace Analytical Services - Charlotte

RECOVERY REPORT

Client Name:
Sample Matrix: SOLID
Lab Smp Id: 921020004
Level: LOW
Data Type: MS DATA
SpikeList File: WaterMsd.spk
Sublist File: 8270reg.sub
Method File: /chem/hpmsd6.i/060900.b/8270.m
Misc Info: 921020004

Client SDG: 060900
Fraction: SV

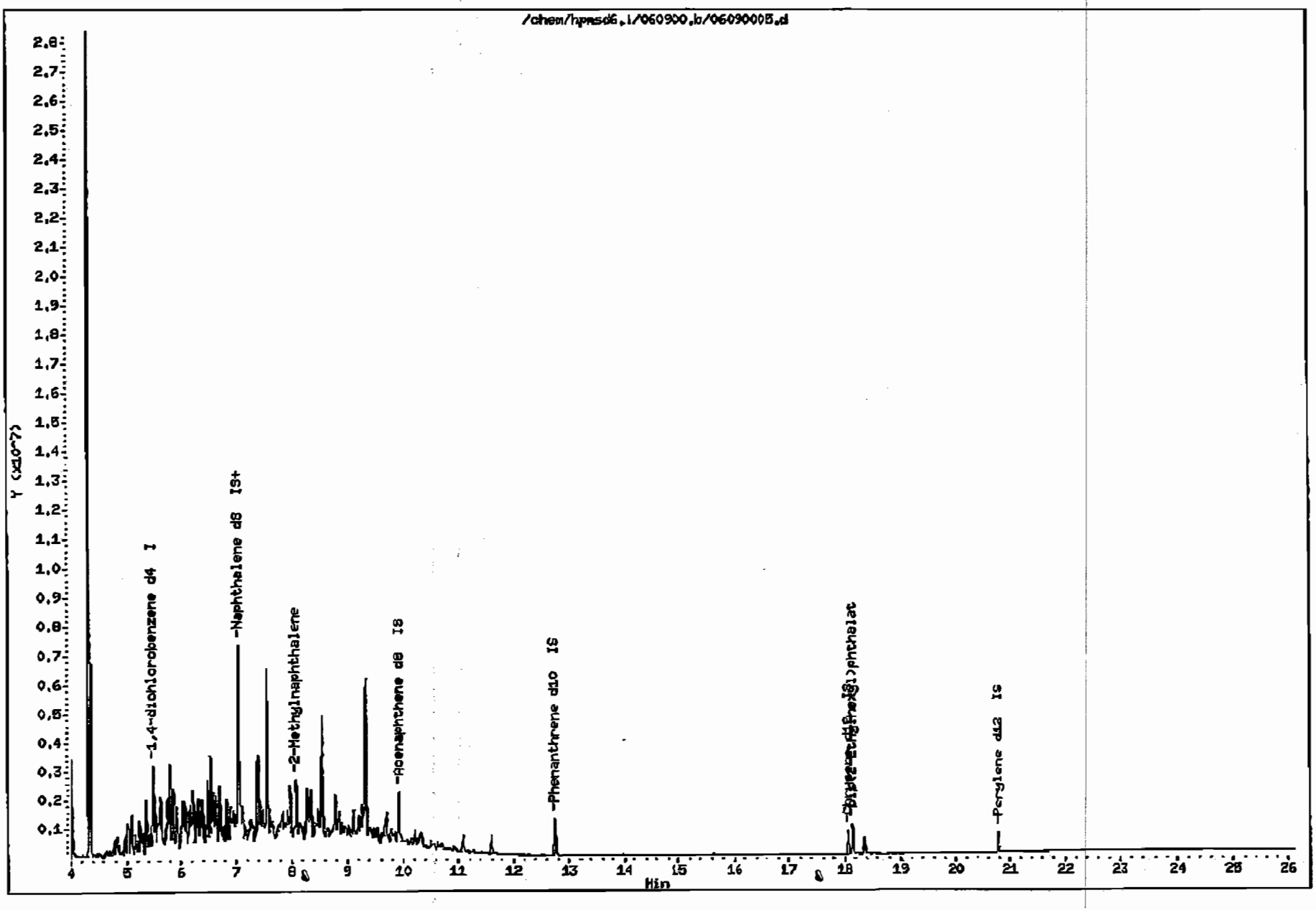
Operator: DHJ
SampleType: SAMPLE
Quant Type: ISTD

SURROGATE COMPOUND	AMOUNT ADDED ug/ml	AMOUNT RECOVERED ug/ml	% RECOVERED	LIMITS
$ 3 2-Fluorophenol (S)	3.33	0.00	*	30-115
$ 4 Phenol-d6 (S)	3.33	0.00	*	24-113
$ 19 Nitrobenzene-d5 (	1.67	0.00	*	23-120
$ 38 2-Fluorobiphenyl	1.67	0.00	*	30-115
$ 58 2,4,6-Tribromophe	3.33	0.00	*	19-122
$ 70 Terphenyl-d14 (S)	1.67	0.00	*	18-137

dil

Data File: /chem/hpmsd6.i/060900.b/06090005.d
Date : 09-JUN-2000 14:29
Client ID:
Sample Info: 060900.b,8270.n,DHJ,50
Volume Injected (uL): 1.0
Column phase:

Instrument: hpmsd6.i
Operator: DHJ
Column diameter: 2.00



3

APPENDIX C

BORING LOGS AND NORTH CAROLINA WELL CONSTRUCTION RECORDS

BORING LOG

BORING NUMBER MW-9
TOTAL DEPTH 12.0'

SITE LOCATION KOCH NORTH TERMINAL
WILMINGTON, NORTH CAROLINA

DRILLED BY B. FOWLER
LOGGED BY N. YOUNGREN

DRILLING DATE 2/07/00

SAMPLE DEPTH (FT.)		SAMPLE DESCRIPTION	USCS	WATER CONTENT	HC ODOR	PID/ FID PPM	BLOW COUNT
0	2.0	Tan/brown, fine to coarse grained SAND, poorly sorted.	SP	Dry	No	--	Grab
2.0	4.0	Dark brown, fine to coarse grained SAND, poorly sorted, few organic fines.	SP	Wet @ 3.5'	Slight	--	Grab
4.0	8.0	Tan/gray, fine to coarse grained SAND, poorly sorted, few fines.	SP	Wet	Slight	--	Grab
8.0	12.0	Dark brown, fine to coarse grained SAND, poorly sorted, few fines.	SP	Wet	No	--	Grab
		2/28/00 Depth to Ground Water Table = 3.24 Feet					

REMARKS Grab = Grab Sample

PAGE 1 OF 1

BORING LOG

BORING NUMBER MW-10
TOTAL DEPTH 12.0'

SITE LOCATION KOCH NORTH TERMINAL
WILMINGTON, NORTH CAROLINA

DRILLED BY B. FOWLER
LOGGED BY N. YOUNGREN

DRILLING DATE 2/10/00

SAMPLE DEPTH (FT.)		SAMPLE DESCRIPTION	USCS	WATER CONTENT	HC ODOR	PID/ FID PPM	BLOW COUNT
0	3.0	Tan, fine to coarse grained SAND, poorly sorted, some fill (gravel and shells).	SP	Dry	No	--	Grab
3.0	12.0	Dark brown to gray/black, fine to coarse grained sand, poorly sorted.	SP	Wet @ 4'	Strong @ 3'	--	Grab
		2/28/00 Depth to Surficial Water Table = 3.52 Feet					

REMARKS Grab = Grab Sample

PAGE 1 OF 1

BORING LOG

BORING NUMBER MW-11
TOTAL DEPTH 12.0'

SITE LOCATION KOCH NORTH TERMINAL
WILMINGTON, NORTH CAROLINA

DRILLED BY B. FOWLER
LOGGED BY N. YOUNGREN

DRILLING DATE 2/08/00

SAMPLE DEPTH (FT.)		SAMPLE DESCRIPTION	USCS	WATER CONTENT	HC ODOR	PID/ FID PPM	BLOW COUNT
0	12.0	Tan/brown, fine to coarse grained SAND, poorly sorted, well rounded grains.	SP	Wet @ 3.5'	Strong @ 3'	--	Grab
		2/28/00 Depth to Surficial Water Table = 3.91 Feet					

REMARKS Grab = Grab Sample

PAGE 1 OF 1

BORING LOG

BORING NUMBER MW-12
TOTAL DEPTH 14.0'

SITE LOCATION KOCH NORTH TERMINAL
WILMINGTON, NORTH CAROLINA

DRILLED BY B. FOWLER
LOGGED BY N. YOUNGREN

DRILLING DATE 2/07/00

SAMPLE DEPTH (FT.)		SAMPLE DESCRIPTION	USCS	WATER CONTENT	HC ODOR	PID/ FID PPM	BLOW COUNT
0	8.0	Tan/brown, fine to medium grained SAND, with some black phosphatic sands.	SP	Wet @ 6'	Strong @ 5'	--	Grab
8.0	14.5	Brown to dark gray, fine to coarse grained SAND.	SP	Wet	Slight	--	Grab
		2/28/00 Depth to Surficial Water Table = 6.09 Feet					

REMARKS Grab = Grab Sample

PAGE 1 OF 1

BORING LOG

BORING NUMBER MW-13
TOTAL DEPTH 18.0'

SITE LOCATION KOCH NORTH TERMINAL
WILMINGTON, NORTH CAROLINA

DRILLED BY B. FOWLER
LOGGED BY N. YOUNGREN

DRILLING DATE 2/07/00

SAMPLE DEPTH (FT.)		SAMPLE DESCRIPTION	USCS	WATER CONTENT	HC ODOR	PID/ FID PPM	BLOW COUNT
0	12.0	Tan/brown, fine to coarse grained SAND, poorly sorted.	SP	Wet @ 7'	Slight	--	Grab
12.0	18.0	Tan/brown to dark brown, fine to coarse grained SAND, poorly sorted, some phosphatic sands.	SP	Wet	No	--	Grab
		2/28/00 Depth to Surficial Water Table = 5.89 Feet					

REMARKS Grab = Grab Sample

PAGE 1 OF 1

BORING LOG

BORING NUMBER MW-14
TOTAL DEPTH 14.0'

SITE LOCATION KOCH NORTH TERMINAL
WILMINGTON, NORTH CAROLINA

DRILLED BY B. FOWLER
LOGGED BY N. YOUNGREN

DRILLING DATE 2/08/00

SAMPLE DEPTH (FT.)		SAMPLE DESCRIPTION	USCS	WATER CONTENT	HC ODOR	PID/ FID PPM	BLOW COUNT
0	4.0	Tan/brown, fine to coarse grained SAND, poorly sorted.	SP	Moist	No	--	Grab
4.0	14.0	Brown, fine to coarse grained SAND, moderate to poorly sorted.	SP	Wet @ 5.5'	Strong @ 4'	--	Grab
		2/28/00 Depth to Surficial Water Table = 4.98 Feet					

REMARKS Grab = Grab Sample

PAGE 1 OF 1

BORING LOG

BORING NUMBER MW-15
TOTAL DEPTH 14.0'

SITE LOCATION KOCH NORTH TERMINAL
WILMINGTON, NORTH CAROLINA

DRILLED BY B. FOWLER
LOGGED BY N. YOUNGREN

DRILLING DATE 2/08/00

SAMPLE DEPTH (FT.)		SAMPLE DESCRIPTION	USCS	WATER CONTENT	HC ODOR	PID/ FID PPM	BLOW COUNT
0	4.0	Brown/tan/orange, fine to coarse grained SAND, with some 3mm to 15mm gravel.	SP	Moist	No	--	Grab
4.0	7.0	Tan, fine to coarse grained SAND, moderately sorted, some 1mm to 8mm gravel.	SP	Wet @ 6'	Strong @ 5'	--	Grab
7.0	14.0	Dark brown/olive, fine to coarse grained SAND, poorly sorted, some gravel 1mm to 8mm.	SP	Wet	Slight	--	Grab
		2/28/00 Depth to Surficial Water Table = 5.86 Feet					

REMARKS Grab = Grab Sample

PAGE 1 OF 1

BORING LOG

BORING NUMBER MW-16
TOTAL DEPTH 14.0'

SITE LOCATION KOCH NORTH TERMINAL
WILMINGTON, NORTH CAROLINA

DRILLED BY B. FOWLER
LOGGED BY N. YOUNGREN

DRILLING DATE 2/08/00

SAMPLE DEPTH (FT.)		SAMPLE DESCRIPTION	USCS	WATER CONTENT	HC ODOR	PID/ FID PPM	BLOW COUNT
0	7.0	Tan/brown/orange, fine to coarse grained SAND, poorly sorted, some 1mm to 6mm gravel.	SP	Wet @ 6'	Strong @ 5'	--	Grab
7.0	14.0	Dark brown, fine to coarse grained SAND, poorly sorted, some 1mm to 6mm gravel, some black phosphatic sand.	SP	Wet	Slight	--	Grab
		2/28/00 Depth to Surficial Water Table = 5.82 Feet					

REMARKS Grab = Grab Sample

PAGE 1 OF 1

BORING LOG

BORING NUMBER MW-17
TOTAL DEPTH 12.0'

SITE LOCATION KOCH NORTH TERMINAL
WILMINGTON, NORTH CAROLINA

DRILLED BY B. FOWLER
LOGGED BY N. YOUNGREN

DRILLING DATE 2/09/00

SAMPLE DEPTH (FT.)		SAMPLE DESCRIPTION	USCS	WATER CONTENT	HC ODOR	PID/ FID PPM	BLOW COUNT
0	3.0	Dark brown, fine to medium grained SAND, some plant roots and rubble fill.	SP	Dry	No	--	Grab
3.0	12.0	Dark brown/tan, fine to coarse grained SAND, poorly sorted, some phosphatic sands.	SP	Wet @ 3'	Slight	--	Grab
		2/28/00 Depth to Surficial Water Table = 2.40 Feet					

REMARKS Grab = Grab Sample

PAGE 1 OF 1

BORING LOG

BORING NUMBER MW-18
TOTAL DEPTH 16.0'

SITE LOCATION KOCH NORTH TERMINAL
WILMINGTON, NORTH CAROLINA

DRILLED BY B. FOWLER
LOGGED BY N. YOUNGREN

DRILLING DATE 2/08/00

SAMPLE DEPTH (FT.)		SAMPLE DESCRIPTION	USCS	WATER CONTENT	HC ODOR	PID/ FID PPM	BLOW COUNT
0	5.0	Orange/tan, fine to coarse grained SAND, poorly sorted.	SP	Dry	No	--	Grab
5.0	10.0	Tan, fine to medium grained SAND, poorly sorted.	SP	Wet @ 10'	Slight	--	Grab
10.0	16.0	Light tan, fine to medium grained SAND, moderately sorted, some phosphatic sands, some 3mm to 14mm gravel.	SP	Wet	Slight	--	Grab
		2/28/00 Depth to Surficial Water Table = 9.44 Feet					

REMARKS Grab = Grab Sample

PAGE 1 OF 1

BORING LOG

BORING NUMBER MW-19
TOTAL DEPTH 16.0'

SITE LOCATION KOCH NORTH TERMINAL
WILMINGTON, NORTH CAROLINA

DRILLED BY B. FOWLER
LOGGED BY N. YOUNGREN

DRILLING DATE 2/09/00

SAMPLE DEPTH (FT.)		SAMPLE DESCRIPTION	USCS	WATER CONTENT	HC ODOR	PID/ FID PPM	BLOW COUNT
0	10.5	Tan/dark brown, fine to medium grained SAND, poorly sorted.	SP	Wet @ 9'	Strong @ 7'	--	Grab
10.5	16.0	Tan/dark brown, fine to medium grained SAND, poorly sorted, 1mm to 4mm gravel.	SP	Wet	Moderate	--	Grab
		2/28/00 Depth to Surficial Water Table = 9.82 Feet					

REMARKS Grab = Grab Sample

PAGE 1 OF 1

BORING LOG

BORING NUMBER MW-20
TOTAL DEPTH 16.0'

SITE LOCATION KOCH NORTH TERMINAL
WILMINGTON, NORTH CAROLINA

DRILLED BY B. FOWLER
LOGGED BY S. TYLER

DRILLING DATE 2/18/00

SAMPLE DEPTH (FT.)		SAMPLE DESCRIPTION	USCS	WATER CONTENT	HC ODOR	PID/ FID PPM	BLOW COUNT
0	8.0	Tan/olive, fine to medium grained SAND, poorly sorted, few silt fines.	SP	Dry	No	--	Grab
8.0	16.0	Tan/olive, fine to medium grained SILTY SAND.	SM	Wet @ 10'	Strong @ 8'	--	Grab
		2/28/00 Depth to Surficial Water Table = 10.12 Feet					

REMARKS Grab = Grab Sample

PAGE 1 OF 1

BORING LOG

BORING NUMBER TMW-2
TOTAL DEPTH 38.0'

SITE LOCATION KOCH NORTH TERMINAL
WILMINGTON, NORTH CAROLINA

DRILLED BY B. FOWLER
LOGGED BY N. YOUNGREN

DRILLING DATE 2/17/00

SAMPLE DEPTH (FT.)		SAMPLE DESCRIPTION	USCS	WATER CONTENT	HC ODOR	PID/ FID PPM	BLOW COUNT
0	3.0	Tan, fine to coarse grained SAND, poorly sorted, with shell fragments and gravel fill.	SP	Dry	No	--	Grab
3.0	15.0	Dark gray/brown, fine to coarse grained SAND, poorly sorted.	SP	Wet @ 6'	Strong @ 5'	--	Grab
15.0	20.0	Tan/white, fine to medium grained SAND, black phosphatic sands.	SP	Wet	Slight	--	Grab
20.0	28.0	Tan, fine to coarse grained SILTY SAND, poorly sorted, 1mm to 3mm well rounded gravel, some black phosphatic sand and shell fragments.	SP	Wet	Slight	--	Grab
28.0	31.0	Gray/olive, very fine to coarse grained SANDY CLAY, moderate plasticity.	SC	Moist	No	--	Grab
31.0	35.0	Tan, very fine to medium grained phosphatic SAND, some shell fragments.	SP	Wet	No	--	Grab
35.0	38.0	Limestone, hard.	LS	Wet	No	--	Grab
		2/28/00 Depth to Surficial Water Table = 5.66 Feet					

REMARKS Grab = Grab Sample

PAGE 1 OF 1

NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL MANAGEMENT - GROUNDWATER SECTION
P.O. BOX 27687 - RALEIGH, NC 27611-7687
PHONE: (910) 733-3221

FOR OFFICE USE ONLY

Quad No. _____ Serial No._____
Lat. _____ Long._____ Pc_____
Minor Basin_____
Basin Code_____
Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD FOR MW-14

DRILLING CONTRACTOR ___CATLIN ENGINEERS & SCIENTISTS_____

DRILLER REGISTRATION NUMBER ___1142_____ STATE WELL CONSTRUCTION PERMIT NUMBER: ___N/A_____

1. WELL LOCATION: (Show sketch of the location below) County: ___NEW HANOVER_____

   Nearest Town: ___Wilmington_____

   ___3325 RIVER ROAD, KOCH NORTH TERMINAL_____
   (Road, Community, or Subdivision and Lot No.)

2. OWNER ___KOCH REFINING COMPANY, LP_____

   ADDRESS ___3334 RIVER ROAD_____
   (Street or Route No.)
   ___WILMINGTON___ ___NC___ ___28412___
   City or Town State Zip Code

Depth From	Depth To	DRILLING LOG Formation Description
		SEE ATTACHED

3. DATE DRILLED ___2/08/00___ USE OF WELL ___MONITORING___

4. TOTAL DEPTH ___14.0'___ CUTTINGS COLLECTED ____YES ___X___ NO

5. DOES WELL REPLACE EXISTING WELL? _____ YES ___X___ NO

6. STATIC WATER LEVEL: ___±5.5___ FT. ____ ABOVE/BELOW TOP OF CASING.

7. YIELD (gpm): ___N/A___ METHOD OF TEST ___N/A___

8. WATER ZONES (depth): ___SURFICIAL AQUIFER_____

9. CHLORINATION: Type: ___N/A___ Amount ___N/A___

If additional space is needed use back of form.

10. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From	0	To 4.0 Ft.	2 in.	SCH 40	PVC
From		To Ft			

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points.)

11. GROUT:

	Depth		Material	Method
From	0	To 2.0 Ft.	CEMENT	TREMIE
From	2	To 3.0 Ft.	BENTONITE CHIPS	

12. SCREEN:

	Depth		Diameter	Slot Size	Material
From	4	To 14.0 Ft.	2 in.	.010 in.	PVC

SEE ATTACHED

13. GRAVEL PACK:

	Depth		Size	Material
From	3	To 14.0 Ft.	TORPEDO	SAND

14. REMARKS: _____

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

_____
SIGNATURE OF CONTRACTOR OR AGENT

DATE

Submit original to Division of Environmental Management and copy to well owner.

NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL MANAGEMENT - GROUNDWATER SECTION
P.O. BOX 27687 - RALEIGH, NC 27611-7687
PHONE: (910) 733-3221

FOR OFFICE USE ONLY

Quad No. _____ Serial No. _____
Lat. _____ Long. _____ Pc _____
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD FOR MW-9

DRILLING CONTRACTOR CATLIN ENGINEERS & SCIENTISTS

DRILLER REGISTRATION NUMBER 1142 STATE WELL CONSTRUCTION PERMIT NUMBER: N/A

1. WELL LOCATION: (Show sketch of the location below) County: NEW HANOVER

   Nearest Town: Wilmington

   3325 RIVER ROAD, KOCH NORTH TERMINAL
   (Road, Community, or Subdivision and Lot No.)

Depth From	Depth To	DRILLING LOG Formation Description

2. OWNER KOCH REFINING COMPANY, LP

   ADDRESS 3334 RIVER ROAD
   (Street or Route No.)
   WILMINGTON NC 28412
   City or Town State Zip Code

SEE ATTACHED

3. DATE DRILLED 2/07/00 USE OF WELL MONITORING

4. TOTAL DEPTH 12.0' CUTTINGS COLLECTED ____YES X NO

5. DOES WELL REPLACE EXISTING WELL? _____ YES X NO

6. STATIC WATER LEVEL: ±3.5 FT. ____ ABOVE/BELOW TOP OF CASING.

7. YIELD (gpm): N/A METHOD OF TEST N/A

8. WATER ZONES (depth): SURFICIAL AQUIFER

9. CHLORINATION: Type: N/A Amount N/A

If additional space is needed use back of form.

10. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From 0	To 5.0 Ft.		2 in.	SCH 40	PVC
From	To Ft				

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points.)

11. GROUT:

	Depth	Material	Method
From 0	To 2.5 Ft.	CEMENT	TREMIE
From 2.5	To 3.0 Ft.	BENTONITE CHIPS	

12. SCREEN:

	Depth	Diameter	Slot Size	Material
From 5	To 12.0 Ft.	2 in.	.010 in.	PVC

SEE ATTACHED

13. GRAVEL PACK:

	Depth	Size	Material
From 3	To 12.0 Ft.	TORPEDO	SAND

14. REMARKS: _____

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

_____
SIGNATURE OF CONTRACTOR OR AGENT
DATE

Submit original to Division of Environmental Management and copy to well

NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL MANAGEMENT - GROUNDWATER SECTION
P.O. BOX 27687 - RALEIGH, NC 27611-7687
PHONE: (910) 733-3221

FOR OFFICE USE ONLY

Quad No. _____ Serial No._____
Lat. _____ Long._____ Pc_____
Minor Basin_____
Basin Code_____
Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD FOR MW-10

DRILLING CONTRACTOR ___CATLIN ENGINEERS & SCIENTISTS_____

DRILLER REGISTRATION NUMBER ___1142_____ STATE WELL CONSTRUCTION PERMIT NUMBER: ___N/A_____

1. WELL LOCATION: (Show sketch of the location below) County: ___NEW HANOVER_____

   Nearest Town: ___Wilmington_____

   3325 RIVER ROAD, KOCH NORTH TERMINAL
   (Road, Community, or Subdivision and Lot No.)

2. OWNER ___KOCH REFINING COMPANY, LP_____

   ADDRESS ___3334 RIVER ROAD_____
   (Street or Route No.)
   WILMINGTON NC 28412
   City or Town State Zip Code

Depth From	Depth To	DRILLING LOG Formation Description
		SEE ATTACHED

3. DATE DRILLED ___2/10/00_____ USE OF WELL ___MONITORING_____

4. TOTAL DEPTH ___12.0'___ CUTTINGS COLLECTED ____YES ___X___ NO

5. DOES WELL REPLACE EXISTING WELL? _____ YES ___X___ NO

6. STATIC WATER LEVEL: ___±4.0___ FT. ___ ABOVE/BELOW TOP OF CASING.

7. YIELD (gpm): ___N/A_____ METHOD OF TEST ___N/A_____

8. WATER ZONES (depth): ___SURFICIAL AQUIFER_____

9. CHLORINATION: Type: ___N/A_____ Amount ___N/A_____

If additional space is needed use back of form.

10. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From 0	To 2.0 Ft.		2 in.	SCH 40	PVC
From	To Ft				

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points.)

11. GROUT:

	Depth	Material	Method
From 0	To 0.5 Ft.	CEMENT	TREMIE
From 0.5	To 1.0 Ft.	BENTONITE	CHIPS

12. SCREEN:

	Depth	Diameter	Slot Size	Material
From 2	To 12.0 Ft.	2 in.	.010 in.	PVC

SEE ATTACHED

13. GRAVEL PACK:

	Depth	Size	Material
From 1	To 12.0 Ft.	TORPEDO	SAND

4. REMARKS: _____

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

_____
SIGNATURE OF CONTRACTOR OR AGENT

DATE

GW-1 REVISED 2/90

Submit original to Division of Environmental Management and copy to well owner.

NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL MANAGEMENT - GROUNDWATER SECTION
P.O. BOX 27687 - RALEIGH, NC 27611-7687
PHONE: (910) 733-3221

FOR OFFICE USE ONLY

Quad No. _____ Serial No._____
Lat. _____Long._____ Pc_____
Minor Basin_____
Basin Code_____
Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD FOR MW-11

DRILLING CONTRACTOR ____CATLIN ENGINEERS & SCIENTISTS_____

DRILLER REGISTRATION NUMBER ____1142_____ STATE WELL CONSTRUCTION PERMIT NUMBER: ____N/A_____

1. WELL LOCATION: (Show sketch of the location below) County: ____NEW HANOVER_____

   Nearest Town: ____Wilmington_____

   _____3325 RIVER ROAD, KOCH NORTH TERMINAL_____
   (Road, Community, or Subdivision and Lot No.)

Depth From	Depth To	DRILLING LOG Formation Description

2. OWNER ____KOCH REFINING COMPANY, LP_____

   ADDRESS ____3334 RIVER ROAD_____
   (Street or Route No.)
   ____WILMINGTON_____ ____NC_____ ____28412_____
   City or Town State Zip Code

   SEE ATTACHED

3. DATE DRILLED ____2/08/00_____ USE OF WELL ____MONITORING_____

4. TOTAL DEPTH ____12.0'____ CUTTINGS COLLECTED _____YES ____X____ NO

5. DOES WELL REPLACE EXISTING WELL? _____ YES ____X____ NO

6. STATIC WATER LEVEL: ____±3.5____ FT. ____ ABOVE/BELOW TOP OF CASING.

7. YIELD (gpm): ____N/A_____ METHOD OF TEST _____N/A_____

8. WATER ZONES (depth): ____SURFICIAL AQUIFER_____

   _____

9. CHLORINATION: Type: ____N/A_____ Amount ____N/A_____

   If additional space is needed use back of form.

10. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From	0	To 2.0 Ft.	2 in.	SCH 40	PVC
From		To Ft			

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points.)

11. GROUT:

	Depth		Material	Method
From	0	To 0.5 Ft.	CEMENT	TREMIE
From	0.5	To 1.0 Ft.	BENTONITE	CHIPS

12. SCREEN:

	Depth		Diameter	Slot Size	Material
From	2	To 12.0 Ft.	2 in.	.010 in.	PVC

SEE ATTACHED

13. GRAVEL PACK:

	Depth		Size	Material
From	1	To 12.0 Ft.	TORPEDO	SAND_

14. REMARKS: _____

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

_____
SIGNATURE OF CONTRACTOR OR AGENT

DATE

GW-1 REVISED 2/90

Submit original to Division of Environmental Management and copy to well owner.

NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL MANAGEMENT - GROUNDWATER SECTION
P.O. BOX 27687 - RALEIGH, NC 27611-7687
PHONE: (910) 733-3221

FOR OFFICE USE ONLY

Quad No. _____ Serial No. _____
Lat. _____ Long. _____ Pc _____
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD FOR MW-12

DRILLING CONTRACTOR CATLIN ENGINEERS & SCIENTISTS

DRILLER REGISTRATION NUMBER 1142 STATE WELL CONSTRUCTION PERMIT NUMBER: N/A

1. WELL LOCATION: (Show sketch of the location below) County: NEW HANOVER

   Nearest Town: Wilmington

   3325 RIVER ROAD, KOCH NORTH TERMINAL
   (Road, Community, or Subdivision and Lot No.)

2. OWNER KOCH REFINING COMPANY, LP

   ADDRESS 3334 RIVER ROAD
   (Street or Route No.)
   WILMINGTON NC 28412
   City or Town State Zip Code

Depth From	Depth To	DRILLING LOG Formation Description
		SEE ATTACHED

3. DATE DRILLED 2/0700 USE OF WELL MONITORING

4. TOTAL DEPTH 14.5' CUTTINGS COLLECTED ____ YES X NO

5. DOES WELL REPLACE EXISTING WELL? _____ YES X NO

6. STATIC WATER LEVEL: ±6.0 FT. ____ ABOVE/BELOW TOP OF CASING.

7. YIELD (gpm): N/A METHOD OF TEST N/A

8. WATER ZONES (depth): SURFICIAL AQUIFER

9. CHLORINATION: Type: N/A Amount N/A

If additional space is needed use back of form.

10. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From 2.5	To 4.0 Ft.		2 in.	SCH 40	PVC
From	To Ft				

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points.)

11. GROUT:

	Depth	Material	Method
From 0	To 2.0 Ft.	CEMENT	TREMIE
From 2	To 3.0 Ft.	BENTONITE CHIPS	

12. SCREEN:

	Depth	Diameter	Slot Size	Material
From 4	To 14.0 Ft.	2 in.	.010 in.	PVC

SEE ATTACHED

13. GRAVEL PACK:

	Depth	Size	Material
From 3	To 14.5 Ft.	TORPEDO	SAND

14. REMARKS: _____

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

_____
SIGNATURE OF CONTRACTOR OR AGENT

DATE

GW-1 REVISED 2/90

Submit original to Division of Environmental Management and copy to well owner.

NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL MANAGEMENT - GROUNDWATER SECTION
P.O. BOX 27687 - RALEIGH, NC 27611-7687
PHONE: (910) 733-3221

FOR OFFICE USE ONLY

Quad No. _____ Serial No._____
Lat. _____ Long._____ Pc_____
Minor Basin_____
Basin Code_____
Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD FOR MW-13

DRILLING CONTRACTOR ___CATLIN ENGINEERS & SCIENTISTS_____

DRILLER REGISTRATION NUMBER ___1142_____ STATE WELL CONSTRUCTION PERMIT NUMBER: ___N/A_____

1. WELL LOCATION: (Show sketch of the location below) County: ___NEW HANOVER_____

   Nearest Town: ___Wilmington_____

   3325 RIVER ROAD, KOCH NORTH TERMINAL
   (Road, Community, or Subdivision and Lot No.)

2. OWNER ___KOCH REFINING COMPANY, LP_____

   ADDRESS ___3334 RIVER ROAD_____
   (Street or Route No.)
   WILMINGTON NC 28412
   City or Town State Zip Code

Depth From	Depth To	DRILLING LOG Formation Description
		SEE ATTACHED

3. DATE DRILLED ___2/07/00_____ USE OF WELL ___MONITORING_____

4. TOTAL DEPTH ___18.0'___ CUTTINGS COLLECTED ____YES ___X___ NO

5. DOES WELL REPLACE EXISTING WELL? _____ YES ___X___ NO

6. STATIC WATER LEVEL: ___±7.0___ FT. ____ ABOVE/BELOW TOP OF CASING.

7. YIELD (gpm): ___N/A_____ METHOD OF TEST ___N/A_____

8. WATER ZONES (depth): ___SURFICIAL AQUIFER_____

9. CHLORINATION: Type: ___N/A_____ Amount ___N/A_____

If additional space is needed use back of form.

10. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From 0	To 6.2 Ft.		2 in.	SCH 40	PVC
From	To Ft				

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points.)

11. GROUT:

	Depth	Material	Method
From 0	To 2.0 Ft.	CEMENT	TREMIE
From 2	To 3.0 Ft.	BENTONITE CHIPS	

12. SCREEN:

	Depth	Diameter	Slot Size	Material
From 6	To 16.2 Ft.	2 in.	.010 in.	PVC

SEE ATTACHED

13. GRAVEL PACK:

	Depth	Size	Material
From 3	To 18.0 Ft.	TORPEDO	SAND

14. REMARKS: _____

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

_____
SIGNATURE OF CONTRACTOR OR AGENT

DATE

GW-1 REVISED 2/90

Submit original to Division of Environmental Management and copy to well owner.

NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL MANAGEMENT - GROUNDWATER SECTION
P.O. BOX 27687 - RALEIGH, NC 27611-7687
PHONE: (910) 733-3221

FOR OFFICE USE ONLY

Quad No. _____ Serial No. _____
Lat. _____ Long. _____ Pc _____
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD FOR MW-15

DRILLING CONTRACTOR CATLIN ENGINEERS & SCIENTISTS

DRILLER REGISTRATION NUMBER 1142 STATE WELL CONSTRUCTION PERMIT NUMBER: N/A

1. WELL LOCATION: (Show sketch of the location below) County: NEW HANOVER

   Nearest Town: Wilmington

   3325 RIVER ROAD, KOCH NORTH TERMINAL
   (Road, Community, or Subdivision and Lot No.)

Depth From	Depth To	DRILLING LOG Formation Description

2. OWNER KOCH REFINING COMPANY, LP

   ADDRESS 3334 RIVER ROAD
   (Street or Route No.)
   WILMINGTON NC 28412
   City or Town State Zip Code

SEE ATTACHED

3. DATE DRILLED 2/08/00 USE OF WELL MONITORING

4. TOTAL DEPTH 14.0' CUTTINGS COLLECTED ____YES X NO

5. DOES WELL REPLACE EXISTING WELL? _____ YES X NO

6. STATIC WATER LEVEL: ±6.0 FT. ____ ABOVE/BELOW TOP OF CASING.

7. YIELD (gpm): N/A METHOD OF TEST N/A

8. WATER ZONES (depth): SURFICIAL AQUIFER

9. CHLORINATION: Type: N/A Amount N/A

If additional space is needed use back of form.

10. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From	0	To 4.0 Ft.	2 in.	SCH 40	PVC
From		To Ft			

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points.)

11. GROUT:

	Depth		Material	Method
From	0	To 1.0 Ft.	CEMENT	TREMIE
From	1	To 2.0 Ft.	BENTONITE CHIPS	

12. SCREEN:

	Depth		Diameter	Slot Size	Material
From	4	To 14.0 Ft.	2 in.	.010 in.	PVC

SEE ATTACHED

13. GRAVEL PACK:

	Depth		Size	Material
From	2	To 14.0 Ft.	TORPEDO	SAND

14. REMARKS: _____

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SIGNATURE OF CONTRACTOR OR AGENT DATE

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NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL MANAGEMENT - GROUNDWATER SECTION
P.O. BOX 27687 - RALEIGH, NC 27611-7687
PHONE: (910) 733-3221

FOR OFFICE USE ONLY

Quad No. _____ Serial No._____
Lat. _____Long._____ Pc_____
Minor Basin_____
Basin Code_____
Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD FOR MW-16

DRILLING CONTRACTOR ___CATLIN ENGINEERS & SCIENTISTS_____

DRILLER REGISTRATION NUMBER ___1142_____ STATE WELL CONSTRUCTION PERMIT NUMBER: ___N/A_____

1. WELL LOCATION: (Show sketch of the location below) County: ___NEW HANOVER_____

   Nearest Town: ___Wilmington_____

   3325 RIVER ROAD, KOCH NORTH TERMINAL
   (Road, Community, or Subdivision and Lot No.)

2. OWNER ___KOCH REFINING COMPANY, LP_____

   ADDRESS ___3334 RIVER ROAD_____
   (Street or Route No.)
   WILMINGTON NC 28412
   City or Town State Zip Code

Depth From	Depth To	DRILLING LOG Formation Description
		SEE ATTACHED

3. DATE DRILLED ___2/08/00_____ USE OF WELL ___MONITORING_____

4. TOTAL DEPTH ___14.0'___ CUTTINGS COLLECTED ____YES __X__ NO

5. DOES WELL REPLACE EXISTING WELL? _____ YES ___X___ NO

6. STATIC WATER LEVEL: ___±6.0___ FT. ____ ABOVE/BELOW TOP OF CASING.

7. YIELD (gpm): ___N/A_____ METHOD OF TEST _____N/A_____

8. WATER ZONES (depth): ___SURFICIAL AQUIFER_____

9. CHLORINATION: Type: ___N/A_____ Amount ___N/A_____

If additional space is needed use back of form.

10. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From 0	To 4.0 Ft.		2 in.	SCH 40	PVC
From	To Ft				

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points.)

11. GROUT:

	Depth	Material	Method
From 0	To 1.0 Ft.	CEMENT	TREMIE
From 1	To 2.0 Ft.	BENTONITE CHIPS	

12. SCREEN:

	Depth	Diameter	Slot Size	Material
From 4	To 14.0 Ft.	2 in.	.010 in.	PVC

SEE ATTACHED

13. GRAVEL PACK:

	Depth	Size	Material
From 2	To 14.0 Ft.	TORPEDO	SAND

14. REMARKS: _____

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

_____
SIGNATURE OF CONTRACTOR OR AGENT DATE

Submit original to Division of Environmental Management and copy to well owner.

GW-1 REVISED 2/90

NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL MANAGEMENT - GROUNDWATER SECTION
P.O. BOX 27687 - RALEIGH, NC 27611-7687
PHONE: (910) 733-3221

FOR OFFICE USE ONLY

Quad No. _____ Serial No._____
Lat. _____Long._____ Pc_____
Minor Basin_____
Basin Code_____
Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD FOR MW-17

DRILLING CONTRACTOR ___CATLIN ENGINEERS & SCIENTISTS_____

DRILLER REGISTRATION NUMBER ___1142_____ STATE WELL CONSTRUCTION PERMIT NUMBER: ___N/A_____

1. WELL LOCATION: (Show sketch of the location below) County: ___NEW HANOVER_____

Nearest Town: ___Wilmington_____

3325 RIVER ROAD, KOCH NORTH TERMINAL
(Road, Community, or Subdivision and Lot No.)

Depth — From — To — DRILLING LOG Formation Description

2. OWNER ___KOCH REFINING COMPANY, LP_____

ADDRESS ___3334 RIVER ROAD_____
(Street or Route No.)
WILMINGTON — NC — 28412
City or Town — State — Zip Code

SEE ATTACHED

3. DATE DRILLED ___2/09/00_____ USE OF WELL ___MONITORING_____

4. TOTAL DEPTH ___12.0'___ CUTTINGS COLLECTED ____YES ___X___ NO

5. DOES WELL REPLACE EXISTING WELL? _____ YES ___X___ NO

6. STATIC WATER LEVEL: ___±4.0___ FT. ____ ABOVE/BELOW TOP OF CASING.

7. YIELD (gpm): ___N/A_____ METHOD OF TEST _____N/A_____

8. WATER ZONES (depth): ___SURFICIAL AQUIFER_____

9. CHLORINATION: Type: ___N/A_____ Amount ___N/A_____

If additional space is needed use back of form.

10. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From 0	To 2.0 Ft.		2 in.	SCH 40	PVC
From	To Ft				

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points.)

11. GROUT:

	Depth	Material	Method
From 0	To 0.5 Ft.	CEMENT	TREMIE
From 0.5	To 1.0 Ft.	BENTONITE CHIPS	

12. SCREEN:

	Depth	Diameter	Slot Size	Material
From 2	To 12.0 Ft.	2 in.	.010 in.	PVC

SEE ATTACHED

13. GRAVEL PACK:

	Depth	Size	Material
From 1	To 12.0 Ft.	TORPEDO	SAND

14. REMARKS: _____

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

_____
SIGNATURE OF CONTRACTOR OR AGENT DATE

Submit original to Division of Environmental Management and copy to well owner.

GW-1 REVISED 2/90

NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL MANAGEMENT - GROUNDWATER SECTION
P.O. BOX 27687 - RALEIGH, NC 27611-7687
PHONE: (910) 733-3221

FOR OFFICE USE ONLY

Quad No. _____ Serial No._____
Lat. _____Long._____ Pc_____
Minor Basin_____
Basin Code_____
Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD FOR MW-18

DRILLING CONTRACTOR ___CATLIN ENGINEERS & SCIENTISTS_____

DRILLER REGISTRATION NUMBER ___1142_____ STATE WELL CONSTRUCTION PERMIT NUMBER: ___N/A_____

1. WELL LOCATION: (Show sketch of the location below) County: ___NEW HANOVER_____

Nearest Town: ___Wilmington_____

___3325 RIVER ROAD, KOCH NORTH TERMINAL_____
(Road, Community, or Subdivision and Lot No.)

Depth From	Depth To	DRILLING LOG Formation Description

2. OWNER ___KOCH REFINING COMPANY, LP_____

ADDRESS ___3334 RIVER ROAD_____
(Street or Route No.)
_WILMINGTON_____ NC_____ 28412_____
City or Town State Zip Code

SEE ATTACHED

3. DATE DRILLED ___2/08/00_____ USE OF WELL ___MONITORING_____

4. TOTAL DEPTH ___16.0'___ CUTTINGS COLLECTED ____YES ___X___ NO

5. DOES WELL REPLACE EXISTING WELL? _____ YES ___X___ NO

6. STATIC WATER LEVEL: ___±9.0___ FT. ____ ABOVE/BELOW TOP OF CASING.

7. YIELD (gpm): ___N/A_____ METHOD OF TEST _____N/A_____

8. WATER ZONES (depth): ___SURFICIAL AQUIFER_____

_____

9. CHLORINATION: Type: ___N/A_____ Amount ___N/A_____

If additional space is needed use back of form.

10. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From 0	To 6.0 Ft.		2 in.	SCH 40	PVC
From	To Ft				

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points.)

11. GROUT:

	Depth	Material	Method
From 0	To 2.0 Ft.	CEMENT	TREMIE
From 2	To 3.0 Ft.	BENTONITE CHIPS	

12. SCREEN:

	Depth	Diameter	Slot Size	Material
From 6	To 16.0 Ft.	2 in.	.010 in.	PVC

SEE ATTACHED

13. GRAVEL PACK:

	Depth	Size	Material
From 3	To 16.0 Ft.	TORPEDO	SAND

14. REMARKS: _____

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

_____
SIGNATURE OF CONTRACTOR OR AGENT DATE

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GW-1 REVISED 2/90

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DIVISION OF ENVIRONMENTAL MANAGEMENT - GROUNDWATER SECTION
P.O. BOX 27687 - RALEIGH, NC 27611-7687
PHONE: (910) 733-3221

FOR OFFICE USE ONLY

Quad No. _____ Serial No._____
Lat. _____ Long._____ Pc_____
Minor Basin_____
Basin Code_____
Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD FOR MW-19

DRILLING CONTRACTOR ____CATLIN ENGINEERS & SCIENTISTS_____

DRILLER REGISTRATION NUMBER ____1142_____ STATE WELL CONSTRUCTION PERMIT NUMBER: ____N/A_____

1. WELL LOCATION: (Show sketch of the location below) County: ____NEW HANOVER_____

   Nearest Town: ____Wilmington_____

   _____3325 RIVER ROAD, KOCH NORTH TERMINAL_____
   (Road, Community, or Subdivision and Lot No.)

2. OWNER ____KOCH REFINING COMPANY, LP_____

   ADDRESS ____3334 RIVER ROAD_____
   (Street or Route No.)
   ____WILMINGTON_____ ____NC_____ ____28412_____
   City or Town State Zip Code

3. DATE DRILLED ____2/09/00_____ USE OF WELL ____MONITORING_____

4. TOTAL DEPTH ____16.0'____ CUTTINGS COLLECTED _____YES ____X____ NO

5. DOES WELL REPLACE EXISTING WELL? _____ YES ____X____ NO

6. STATIC WATER LEVEL: ____±9.2____ FT. ____ ABOVE/BELOW TOP OF CASING.

7. YIELD (gpm): ____N/A_____ METHOD OF TEST _____N/A_____

8. WATER ZONES (depth): ____SURFICIAL AQUIFER_____

   _____

9. CHLORINATION: Type: ____N/A_____ Amount ____N/A_____

10. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From 0	To 6.0 Ft.		2 in.	SCH 40	PVC
From	To Ft				

11. GROUT:

	Depth	Material	Method
From 0	To 2.0 Ft.	CEMENT	TREMIE
From 2	To 3.0 Ft.	BENTONITE CHIPS	

12. SCREEN:

	Depth	Diameter	Slot Size	Material
From 6	To 16.0 Ft.	2 in.	.010 in.	PVC

13. GRAVEL PACK:

	Depth	Size	Material
From 3	To 16.0 Ft.	TORPEDO	SAND

14. REMARKS: _____

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

From	To	Formation Description

SEE ATTACHED

If additional space is needed use back of form.

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points.)

SEE ATTACHED

_____
SIGNATURE OF CONTRACTOR OR AGENT DATE

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GW-1 REVISED 2/90

NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
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Quad No. _____ Serial No._____
Lat. _____ Long._____ Pc_____
Minor Basin_____
Basin Code_____
Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD FOR MW-20

DRILLING CONTRACTOR CATLIN ENGINEERS & SCIENTISTS

DRILLER REGISTRATION NUMBER 1142 STATE WELL CONSTRUCTION PERMIT NUMBER: N/A

1. WELL LOCATION: (Show sketch of the location below) County: NEW HANOVER

Nearest Town: Wilmington

3325 RIVER ROAD, KOCH NORTH TERMINAL
(Road, Community, or Subdivision and Lot No.)

2. OWNER KOCH REFINING COMPANY, LP

ADDRESS 3334 RIVER ROAD
(Street or Route No.)
WILMINGTON NC 28412
City or Town State Zip Code

Depth From	Depth To	DRILLING LOG Formation Description
SEE ATTACHED		

3. DATE DRILLED 2/18/00 USE OF WELL MONITORING

4. TOTAL DEPTH 16.0' CUTTINGS COLLECTED ____YES X NO

5. DOES WELL REPLACE EXISTING WELL? _____ YES X NO

6. STATIC WATER LEVEL: ±10.0 FT. ____ ABOVE/BELOW TOP OF CASING.

7. YIELD (gpm): N/A METHOD OF TEST N/A

8. WATER ZONES (depth): SURFICIAL AQUIFER

9. CHLORINATION: Type: N/A Amount N/A

If additional space is needed use back of form.

10. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From 0	To 6.0 Ft.		2 in.	SCH 40	PVC
From	To Ft				

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points.)

11. GROUT:

	Depth	Material	Method
From 0	To 2.0 Ft.	CEMENT	TREMIE
From 2	To 3.0 Ft.	BENTONITE CHIPS	

12. SCREEN:

	Depth	Diameter	Slot Size	Material
From 6	To 16.0 Ft.	2 in.	.010 in.	PVC

SEE ATTACHED

13. GRAVEL PACK:

	Depth	Size	Material
From 3	To 16.0 Ft.	TORPEDO	SAND

14. REMARKS:

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT DATE

Submit original to Division of Environmental Management and copy to well owner.

GW-1 REVISED 2/90

NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL MANAGEMENT - GROUNDWATER SECTION
P.O. BOX 27687 - RALEIGH, NC 27611-7687
PHONE: (910) 733-3221

FOR OFFICE USE ONLY

Quad No. _____ Serial No. _____
Lat. _____ Long. _____ Pc _____
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD FOR TMW-2

DRILLING CONTRACTOR CATLIN ENGINEERS & SCIENTISTS

DRILLER REGISTRATION NUMBER 1142 STATE WELL CONSTRUCTION PERMIT NUMBER: N/A

1. WELL LOCATION: (Show sketch of the location below) County: NEW HANOVER

Nearest Town: Wilmington

3325 RIVER ROAD, KOCH NORTH TERMINAL
(Road, Community, or Subdivision and Lot No.)

Depth From	Depth To	DRILLING LOG Formation Description

2. OWNER KOCH REFINING COMPANY, LP

ADDRESS 3334 RIVER ROAD
(Street or Route No.)
WILMINGTON NC 28412
City or Town State Zip Code

SEE ATTACHED

3. DATE DRILLED 2/17/00 USE OF WELL MONITORING

4. TOTAL DEPTH 38.0' CUTTINGS COLLECTED ____ YES X NO

5. DOES WELL REPLACE EXISTING WELL? _____ YES X NO

6. STATIC WATER LEVEL: ±5.5 FT. ____ ABOVE/BELOW TOP OF CASING.

7. YIELD (gpm): N/A METHOD OF TEST N/A

8. WATER ZONES (depth): SURFICIAL AQUIFER

9. CHLORINATION: Type: N/A Amount N/A

If additional space is needed use back of form.

10. CASING:

	Depth		Diameter	Wall Thickness or Weight/Ft.	Material
From	0	To 36.0 Ft.	2 in.	SCH 40	PVC
From	0	To 30.0 Ft	6 in.		

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points.)

11. GROUT:

	Depth		Material	Method
From	0	To 29.0 Ft.	CEMENT	TREMIE
From	29	To 33.0 Ft.	BENTONITE CHIPS	

12. SCREEN:

	Depth		Diameter	Slot Size	Material
From	36	To 38.0 Ft.	2 in.	.010 in.	PVC

SEE ATTACHED

13. GRAVEL PACK:

	Depth		Size	Material
From	33	To 38.0 Ft.	TORPEDO	SAND

14. REMARKS: _____

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CONTRACTOR OR AGENT DATE

GW-1 REVISED 2/90

Submit original to Division of Environmental Management and copy to well owner.

APPENDIX D

RIGHT-TO-ENTER AGREEMENT

NORTH CAROLINA PORTS

JERREL J. FREEMAN, P.E.
Chief Engineer

February 22, 2000

Mr. Stephan A. Tyler, Project Manager
Catlin & Associates, Inc.
P.O. Box 10279
220 Old Dairy Road
Wilmington, N.C. 28405-3755

Re: Right to Enter Agreement
Koch Petroleum Group L.P., Additional Monitoring Well by CATLIN
North Carolina State Ports Authority, East Equipment Storage Yard
Port of Wilmington

Dear Mr. ~~Tyler~~ STEVE:

Please find attached the executed right of entry agreement for the subject site. Upon execution by Koch and delivery of a copy to the NCSPA, CATLIN may proceed with the installation of the additional groundwater monitoring well on the subject site. Please include in this delivery, a brief cover letter and map summarizing the proposed project.

Sincerely,
North Carolina State Ports Authority

H. Layton Bedsole Jr., R.E.M.
Environmental Manager

cc: Chief Engineer

NORTH CAROLINA STATE PORTS AUTHORITY
P.O. Box 9002 ▪ Wilmington, NC 28402 ▪ Tel: (910) 343-6227 ▪ Fax: (910) 343-6289

CATLIN
ENGINEERS and SCIENTISTS

220 Old Dairy Road • P.O. Box 10279
Wilmington, North Carolina 28405
Telephone: (910) 452-5861
Fax: (910) 452-7563

February 7, 2000

FEB 2000

North Carolina State Ports Authority
Attn: Mr. Eric Stromberg
Executive Director
2202 Burnett Boulevard
Wilmington, North Carolina 28402

Re: Right of Entry Agreement
Koch Petroleum Group L.P., Monitoring Well
North Carolina State Ports Authority East Equipment Storage Yard
Wilmington, North Carolina
CATLIN Project No. 95033-71

Dear Mr. Stromberg:

The purpose of this letter is to seek North Carolina State Ports Authority (NCSPA) personnel approval for installation of one Type II Monitoring Well within the NCSPA East Equipment Storage Yard. These wells are part of Koch Petroleum Group L.P. (Koch) plans to monitor their existing surficial ground water remediation system.

Figure 1 illustrates the proposed locations of the monitoring well. Figure 2 shows the planed construction detail of the monitoring well. Installation of the well should take no more than two days.

The executed Right-of-Entry Agreement is attached in Appendix II. If you need any additional information or would like for me to meet with you and your staff, please contact me at your convenience.

Sincerely,

Stephan A. Tyler
Project Manager

SAT/ss
Enclosure
cc: H. Layton Bedsole, NCSPA
Jim Strickland, Koch
Rich Hanna, Koch

9160ST04.ltr

RIGHT OF ENTRY

PERMISSION TO INSTALL AND MAINTAIN

AIR SPARGE WELLS

North Carolina State Ports Authority ("NCSPA") hereby grants Koch Petroleum Group L.P. ("Koch:) permission to install one (1) Type II Monitoring Well on the NCSPA East Equipment Storage Yard property in Wilmington, North Carolina, the exact location of which will be agreed to by the parties hereto. NCSPA also grants permission to maintain the monitoring well in the future. NCSPA understands that the monitoring well may remain on its property for the duration of the required monitoring period.

Koch agrees to pay reasonable compensation for any damage done to the above grounds or property by its employees or agents during construction or maintenance of the monitoring well. Koch will hold NCSPA harmless from any injury or damages to persons or property, or any action by reason thereof, as a result of Koch entry pursuant to this agreement, except as such injury or damages may be caused by the negligence of NCSPA. Koch also agrees to abandon the monitoring well in accordance with current State regulations at the conclusion of the monitoring period.

Dated: 2/22/00

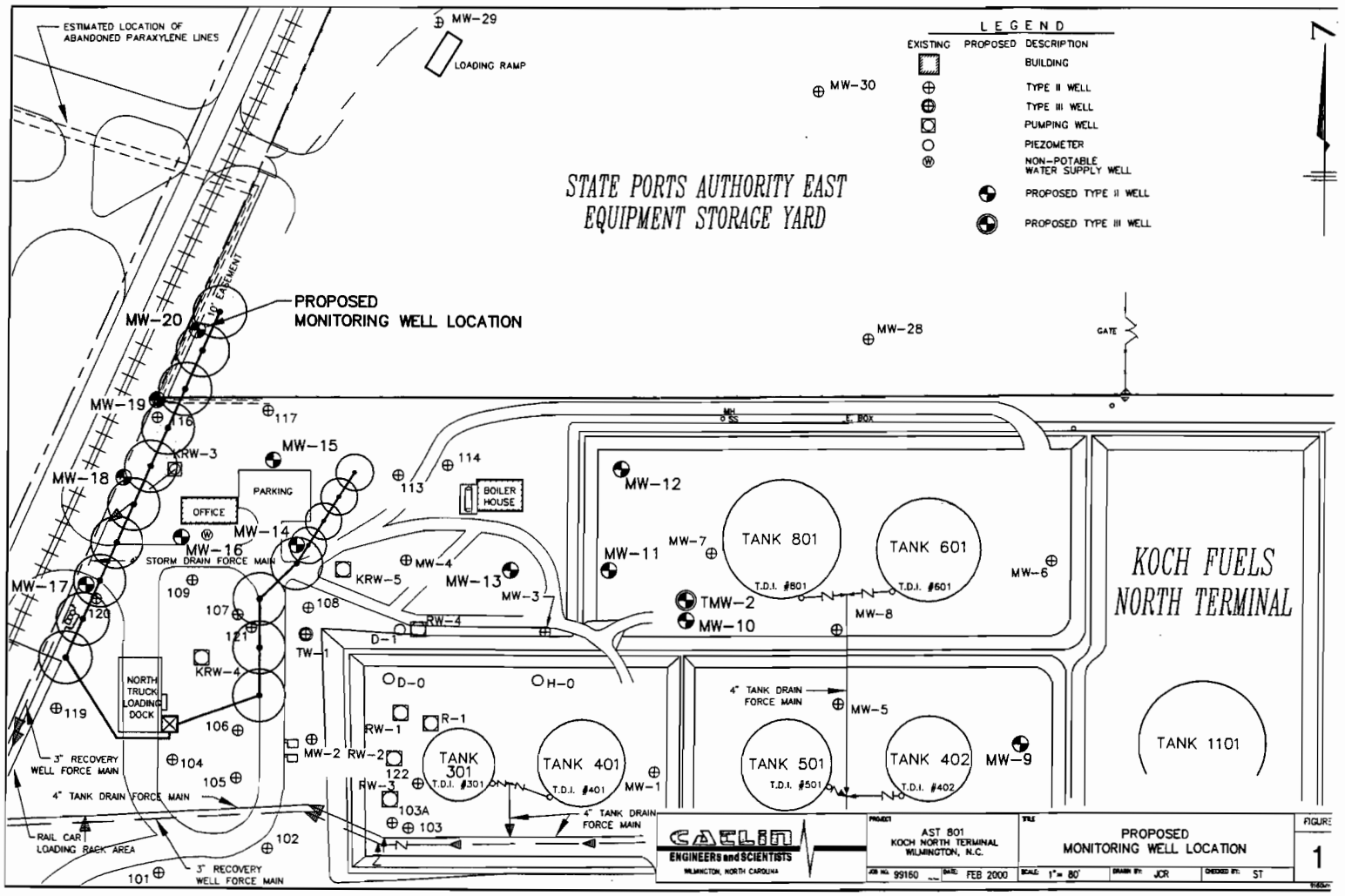
NORTH CAROLINA STATE PORTS AUTHORITY

By: _____
Property Owner or Agent

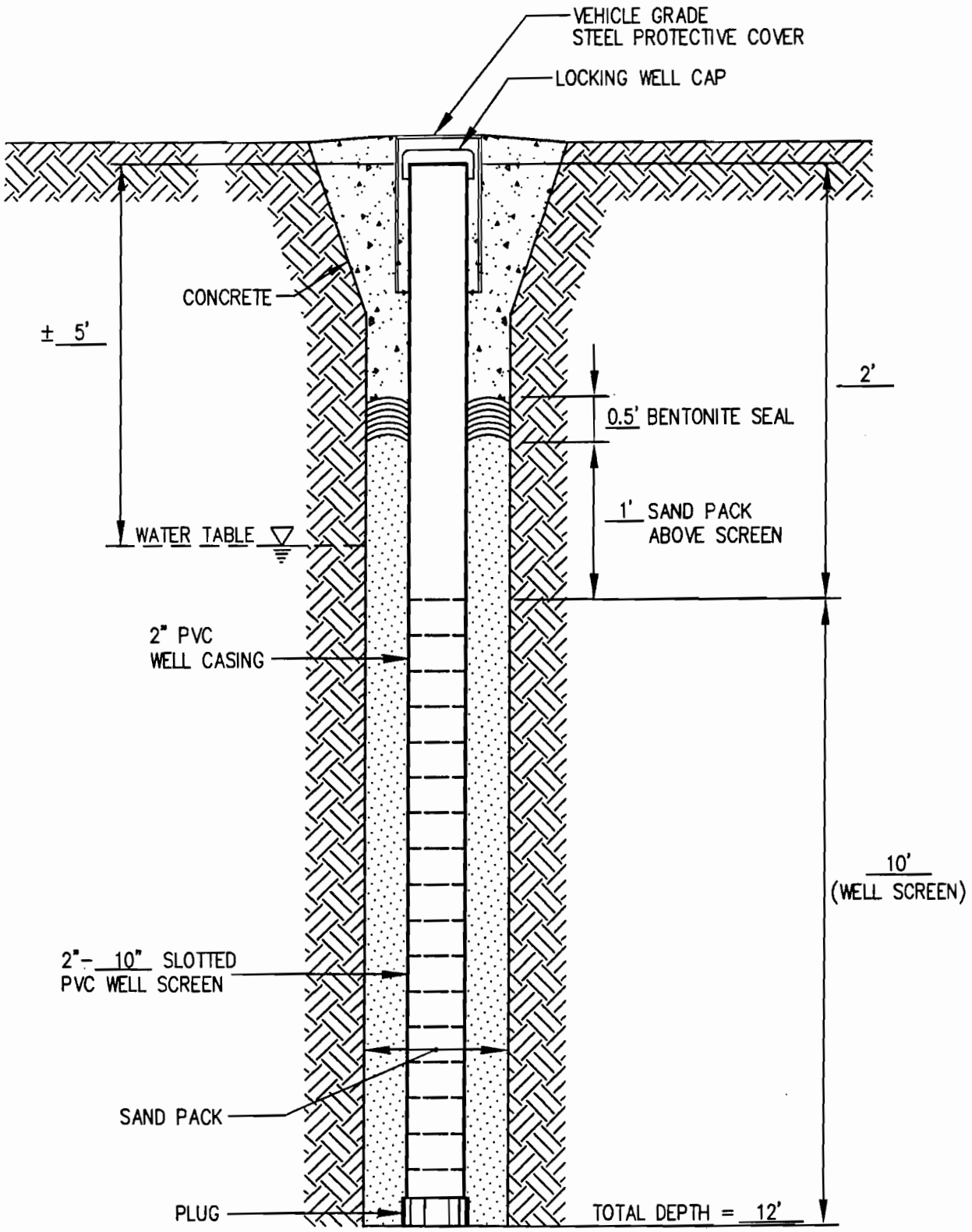
Dated: 2/23/00

KOCH REFINING COMPANY, L.P.

By: _____
Well Owner or Agent


ESTIMATED LOCATION OF ABANDONED PARAXYLENE LINES
MW-29
LOADING RAMP
MW-30
LEGEND
EXISTING PROPOSED DESCRIPTION
BUILDING
TYPE II WELL
TYPE III WELL
PUMPING WELL
PIEZOMETER
NON-POTABLE WATER SUPPLY WELL
PROPOSED TYPE II WELL
PROPOSED TYPE III WELL
STATE PORTS AUTHORITY EAST EQUIPMENT STORAGE YARD
PROPOSED MONITORING WELL LOCATION
MW-20
MW-28
GATE
MW-19
MW-18
MW-17
MW-15
MW-14
MW-16
KRW-3
KRW-4
KRW-5
OFFICE
PARKING
BOILER HOUSE
STORM DRAIN FORCE MAIN
NORTH TRUCK LOADING DOCK
3" RECOVERY WELL FORCE MAIN
4" TANK DRAIN FORCE MAIN
RAIL CAR LOADING BACK AREA
MW-12
MW-11
MW-7
TANK 801
T.D.I. #801
TANK 601
T.D.I. #601
MW-6
TMW-2
MW-10
MW-8
MW-13
MW-3
MW-4
RW-4
D-1
TW-1
D-0
H-0
RW-1
R-1
RW-2
MW-2
RW-3
TANK 301
T.D.I. #301
TANK 401
T.D.I. #401
MW-1
4" TANK DRAIN FORCE MAIN
MW-5
TANK 501
T.D.I. #501
TANK 402
T.D.I. #402
MW-9
TANK 1101
KOCH FUELS NORTH TERMINAL
CAELIN ENGINEERS and SCIENTISTS
WILMINGTON, NORTH CAROLINA
PROJECT
AST 801
KOCH NORTH TERMINAL
WILMINGTON, N.C.
TITLE
PROPOSED MONITORING WELL LOCATION
FIGURE
1
JOB NO. 99160
DATE: FEB 2000
SCALE: 1" = 80'
DRAWN BY: JCR
CHECKED BY: ST

MW-20



CATLIN ENGINEERS and SCIENTISTS, WILMINGTON, NORTH CAROLINA	PROJECT: AST 801, KOCH NORTH TERMINAL, WILMINGTON, N.C.	TITLE: ANTICIPATED AS-BUILT WELL DETAIL			FIGURE 2
	JOB NO: 99160	DATE: FEB 2000	SCALE: NTS	DRAWN BY: JCR	CHECKED BY: ST

9160MW20

APPENDIX E

SELECTED GPR PROFILES

L3, G2

Scan/Sec 32.0 Blks: 10

Dielectric: 7.00

Position: 0.0nS Range: 170.0nS

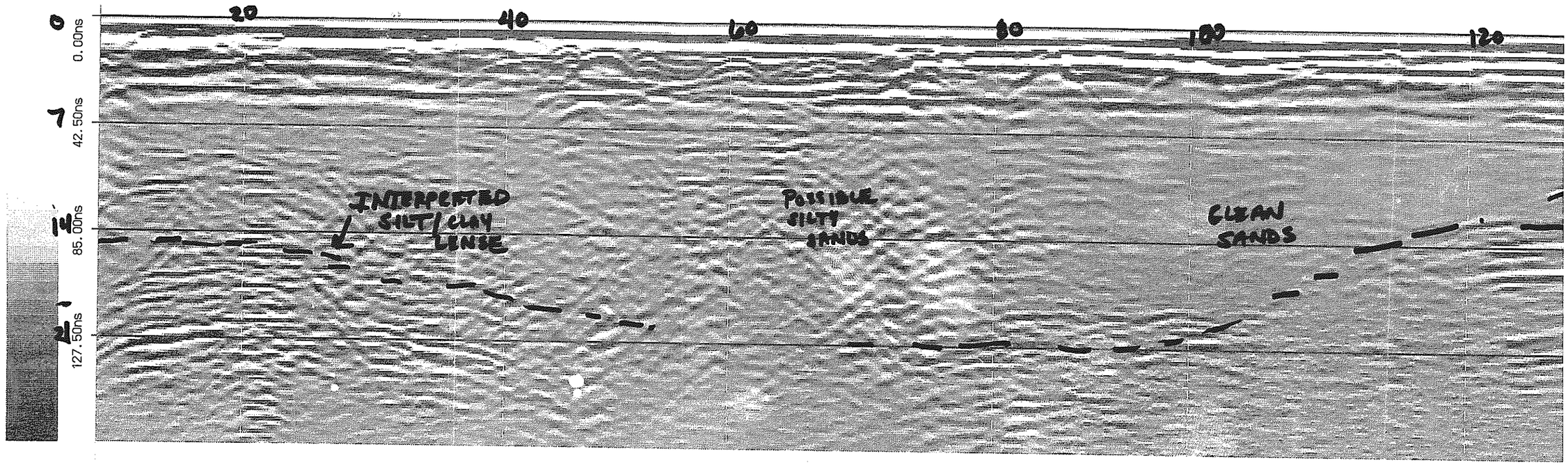
Range Gain 22 33 60 71 70

V(IIR LP N=1 F=600)

V(IIR HP N=1 F=38)

H(IIR STK TC=5)

Table #4: Transform #1

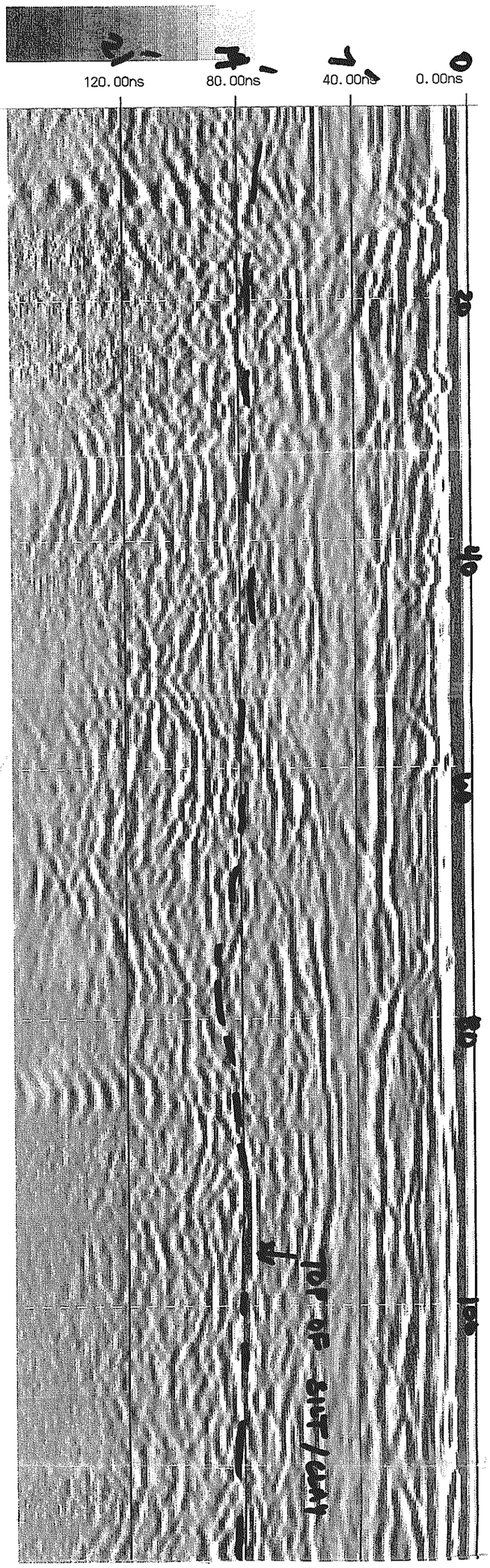


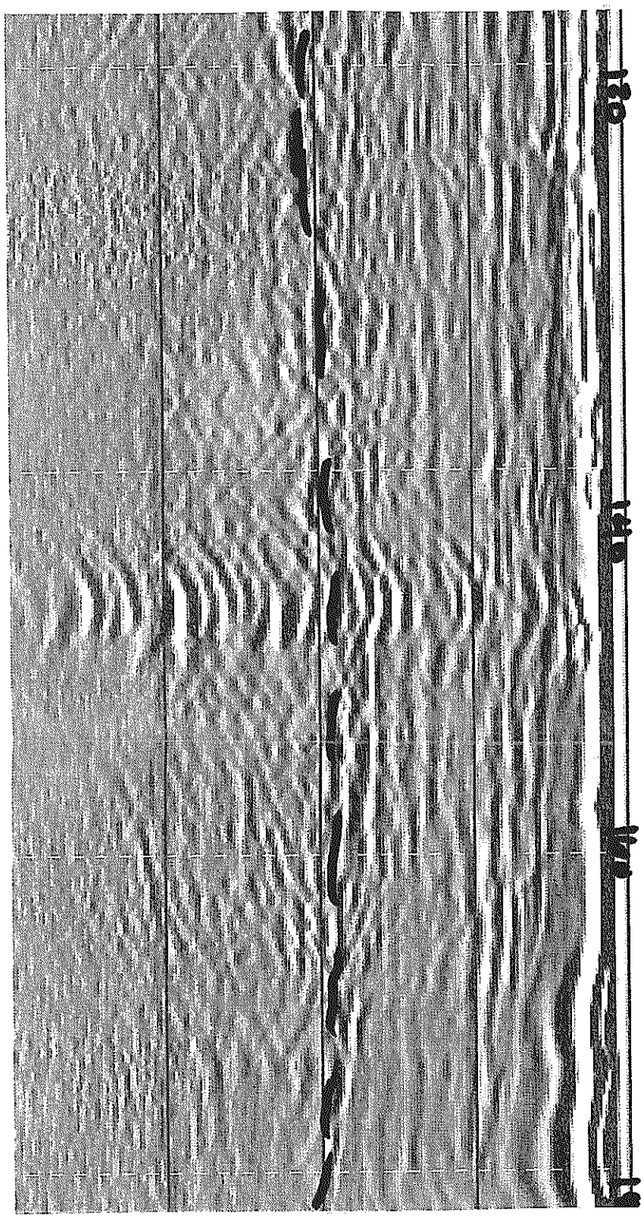
File FILE1406FILE1406(01/04/80 15:16:08) Samp/Scan 512
Scan/S c 32.0 Bits: 16
Dielectric: .00

Position: 0.0nS Range: 160.0nS
Range Gain 22 33 60 71 70
V(IIR LP N=1 F=600)
V(IIR HP N=1 F=38)
H(IIR STK TC=5)

Table #4; Transform #1

L10EW



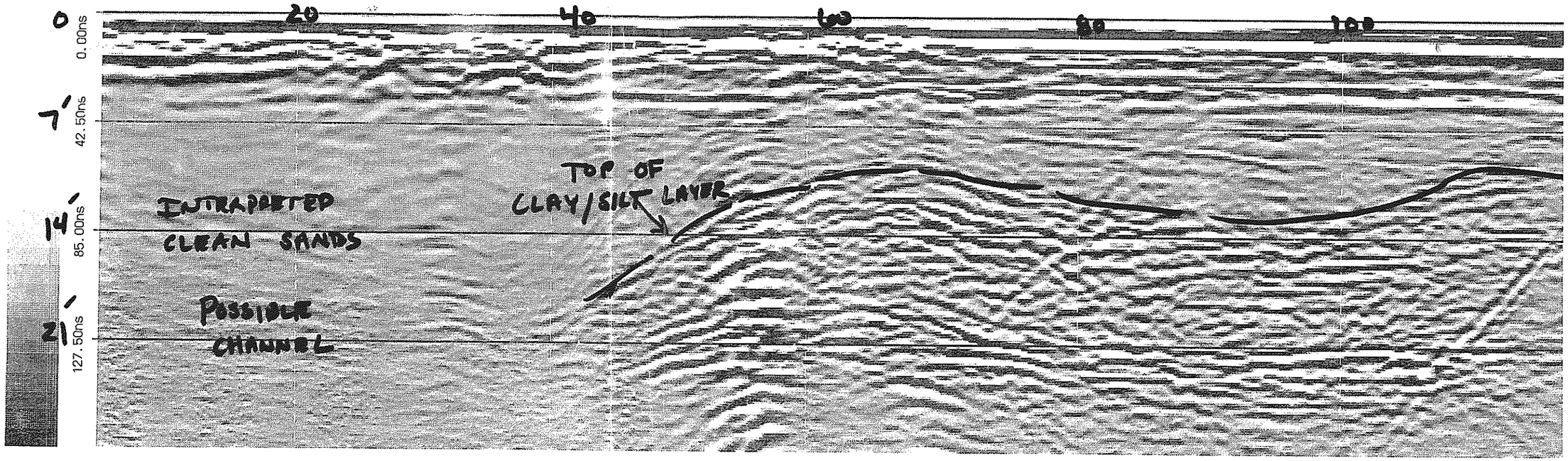


File FILE1415FILE1415(01, :52) Samp/Scan 512
Scan/Sec 32.0 Bits:
Dielectric: 7.00

Position: 0.0nS Range: 170.0nS
Range Gain 22 33 by 1 70
V(IIR LP N=1 F=600)
V(IIR HP N=1 F=38)
H(IIR STK TC=5)

Table #4; Transform #1

L1
G3



L3

B.O.L @

Scan/Sec 32.0 Bits: 16

Dielectric: 7.00

Position: 0.0nS Range: 160.0nS

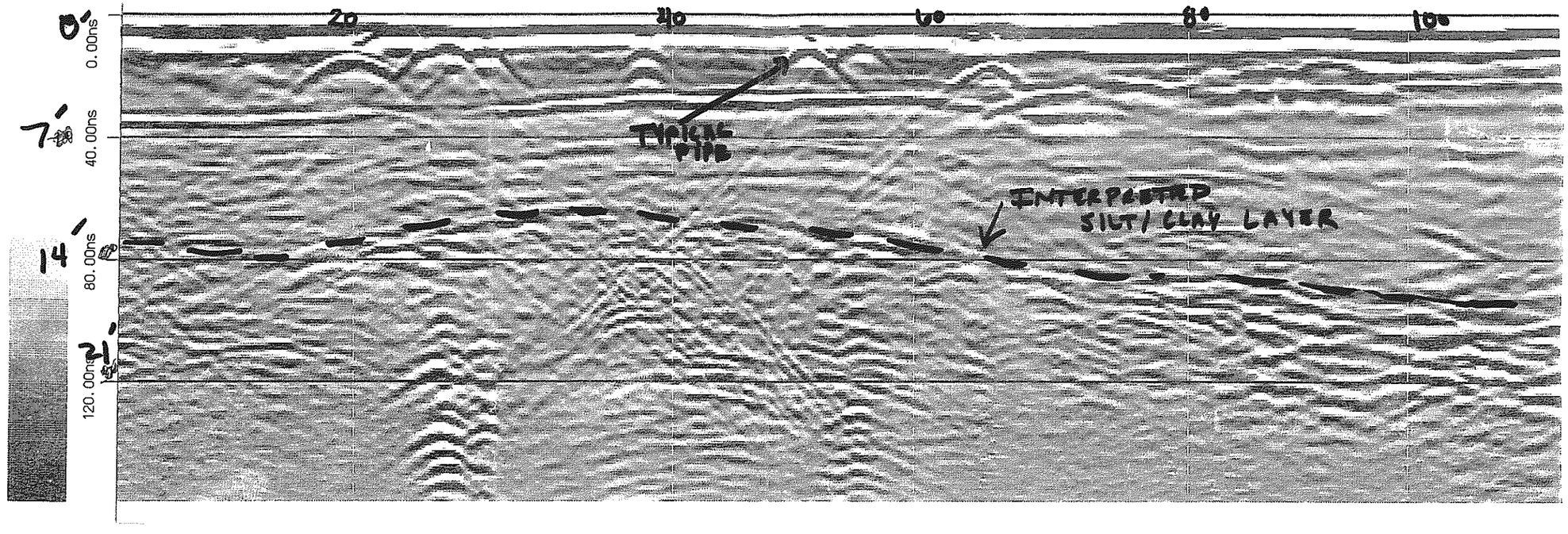
Range Gain 22 33 60 71 70

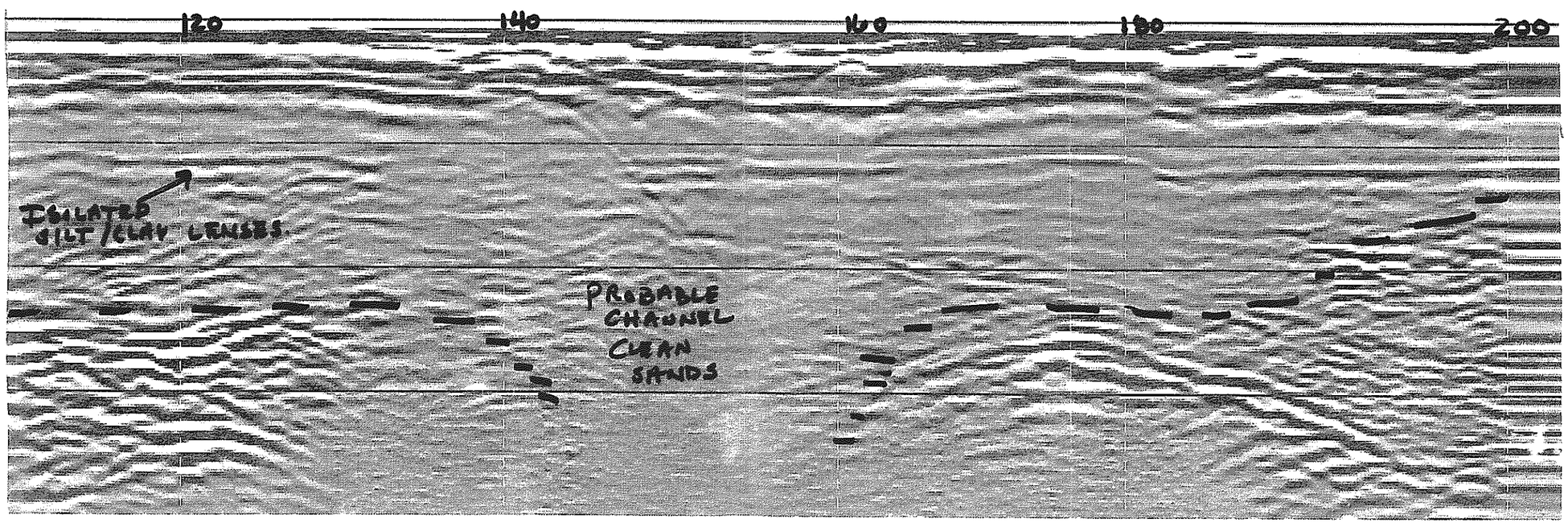
V(IIR LP N=1 F=600)

V(IIR HP N=1 F=38)

H(IIR STK TC=5)

Table #4; Transform #1



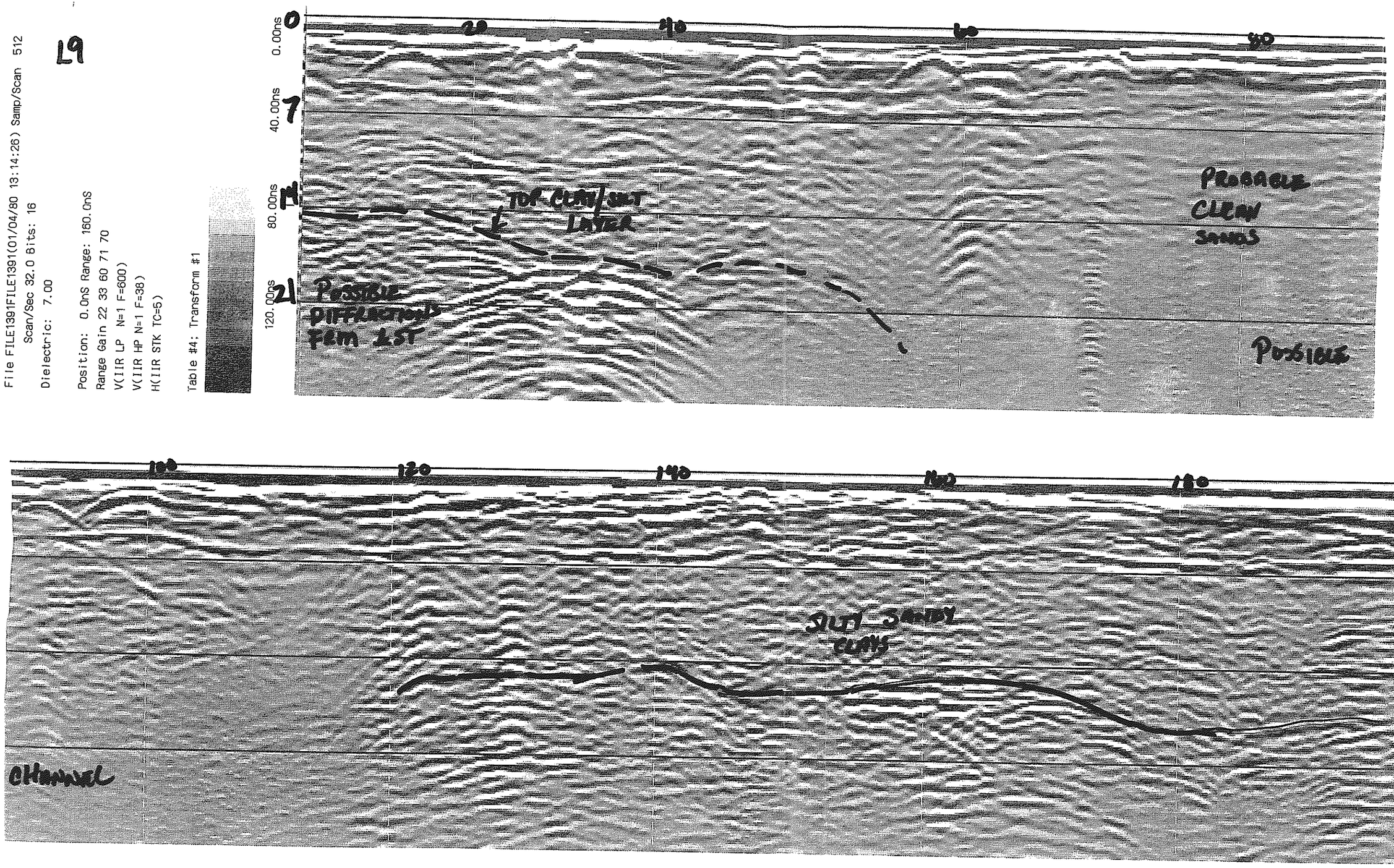


File FILE1391FILE1391(01/04/80 13:14:26) Samp/Scan 512
Scan/Sec 32.0 Bits: 16
Dielectric: 7.00

L9

Position: 0.0nS Range: 160.0nS
Range Gain 22 33 60 71 70
V(IIR LP N=1 F=600)
V(IIR HP N=1 F=38)
H(IIR STK TC=5)

Table #4; Transform #1



APPENDIX F

ROST™ SURVEY DATA SHEETS

ROST™ Testing

Fugro Geosciences, ROST™ (Rapid Optical Screening Tool) Laser-Induced Fluorescence system was used for this investigation to screen soils for petroleum hydrocarbon materials containing aromatic hydrocarbon constituents. The system consists of a tunable laser mounted in the Geoprobe® van that is connected to a down-hole sensor. The down-hole sensor consists of a small diameter window mounted flush with the side of the ROST™ probe.

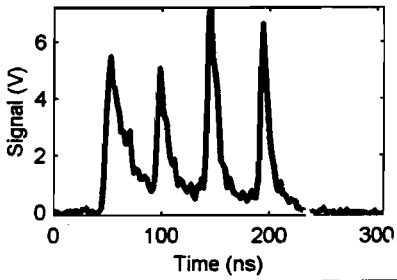
The laser and associated equipment transmit 50 pulses of light per second to the sensor through a fiber optic cable. The wavelength of the pulsed excitation light is tunable and can be set to wavelengths of 266 nanometers (nm) or to wavelengths between 280 and 00 mm. An excitation wavelength of 290 nm was used for each test during this project.

The laser light passes through the sapphire window and is absorbed by aromatic hydrocarbon molecules in contact with the window, as the probe is advanced. This addition of energy (photons) to the aromatic hydrocarbons causes them to fluoresce. A portion of the fluorescence emitted from any encountered aromatic constituents is returned through the sapphire window and conveyed by a second fiber optic cable to a detection system within the Geoprobe® van. The emission data resulting from the pulsed laser light is averaged into one reading per one-second interval (approximately one reading per 2 cm vertical interval) and is recorded continuously. ROST™ may be operated in single or multi-wavelength mode, depending on project objectives. For this project, ROST™ was operated in multi-wavelength mode (MWL).

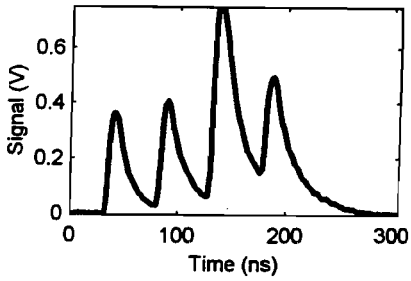
Multi-Wavelength Mode (MWL). In MWL mode, the emitted fluorescence is measured simultaneously at four monitoring wavelengths (340, 390, 440 and 490 nm). The four monitoring wavelengths cover the range of light produced by light fuels through heavy contaminants such as coal tar and creosote and enhance detection of widely ranging product types. The emission data is reported continuously as a total of the fluorescence intensity recorded at each of the four wavelengths. The total fluorescence intensity data is presented in real-time on a computer monitor as a graph of fluorescence intensity versus depth (FVD).

The relative percentage of fluorescence measured at each of the monitoring wavelengths (340, 390, 440 and 490 nm) is plotted continuously on the ROST™ logs as four continuous "color bands". The width of each color band represents the relative percentage of fluorescence emitted by the contaminant at each of the monitoring wavelengths (340, 390, 440 and 490 nm). For general interpretation purposes, lighter aromatic hydrocarbon molecules will emit fluorescence at shorter wavelengths and heavier, longer chained hydrocarbons will emit fluorescence at longer wavelengths.

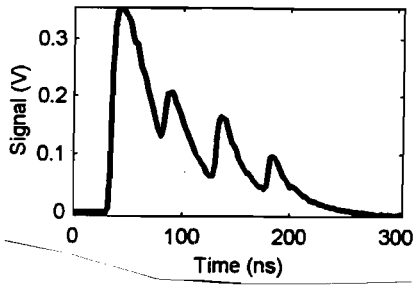
During testing, waveforms, which are "spectral signatures" of the encountered petroleum hydrocarbons, are displayed on the computer monitor in real-time. The waveforms can be compared with waveforms typical of common hydrocarbon products to determine the likely product type that has been encountered (see Appendix A). Logs presenting waveforms for any selected depth can be produced at any time during or after the field investigation and are typically produced at the Client's request.



Typical Natural Soil Fluorescence Waveform



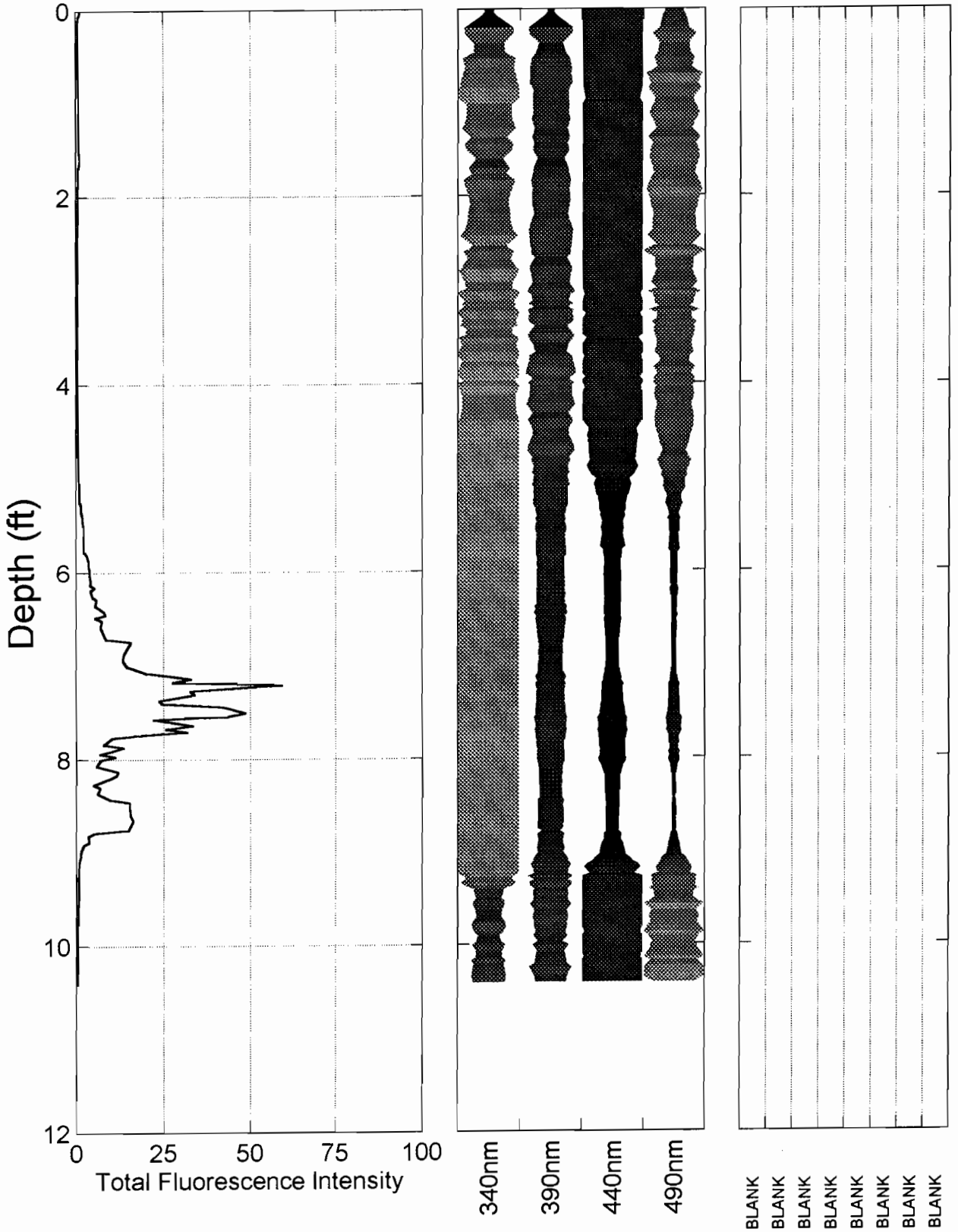
Typical Para-xylene (PX) Fluorescence Waveform

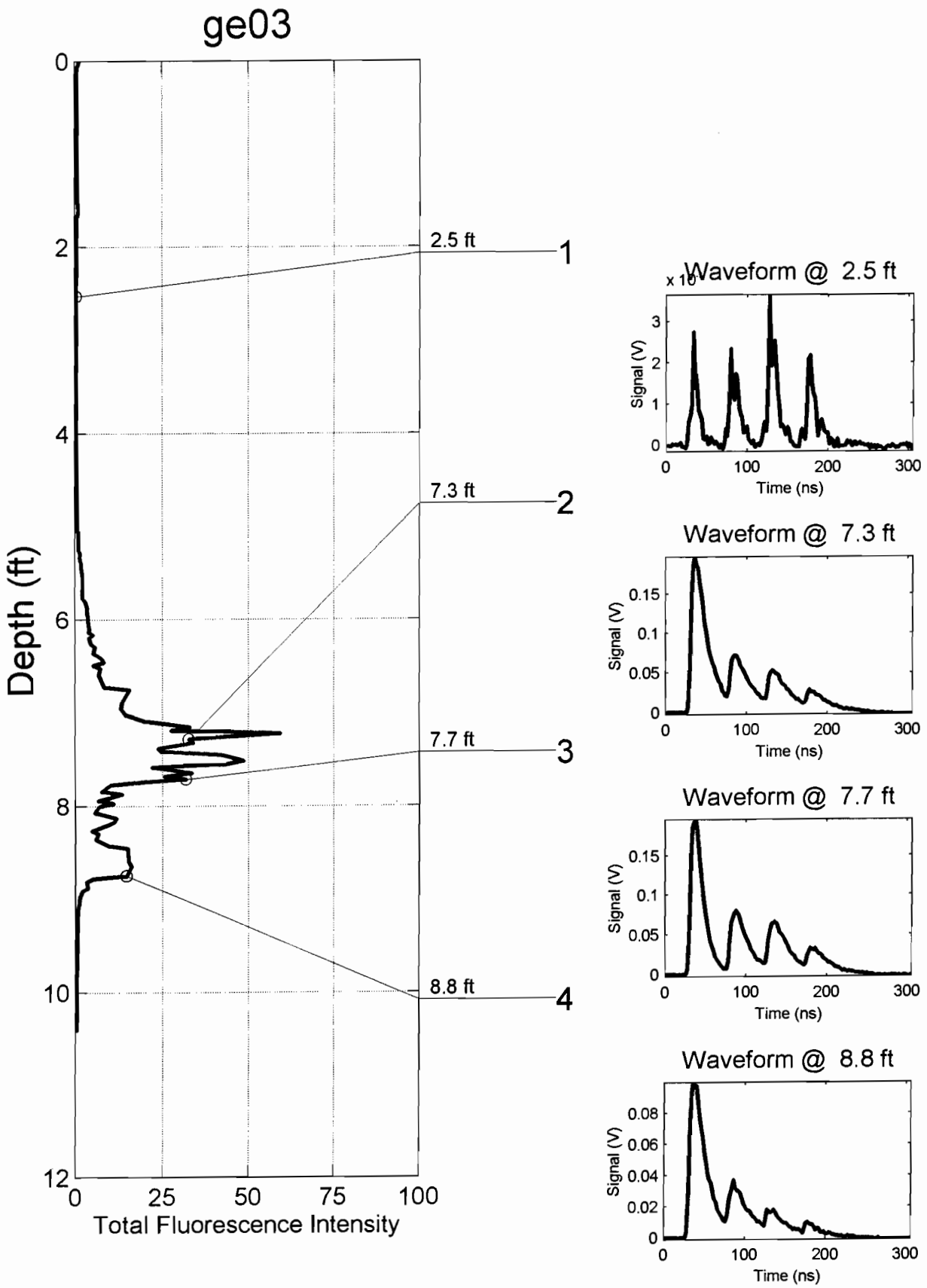


Typical PX/Kerosene Fluorescence Waveform

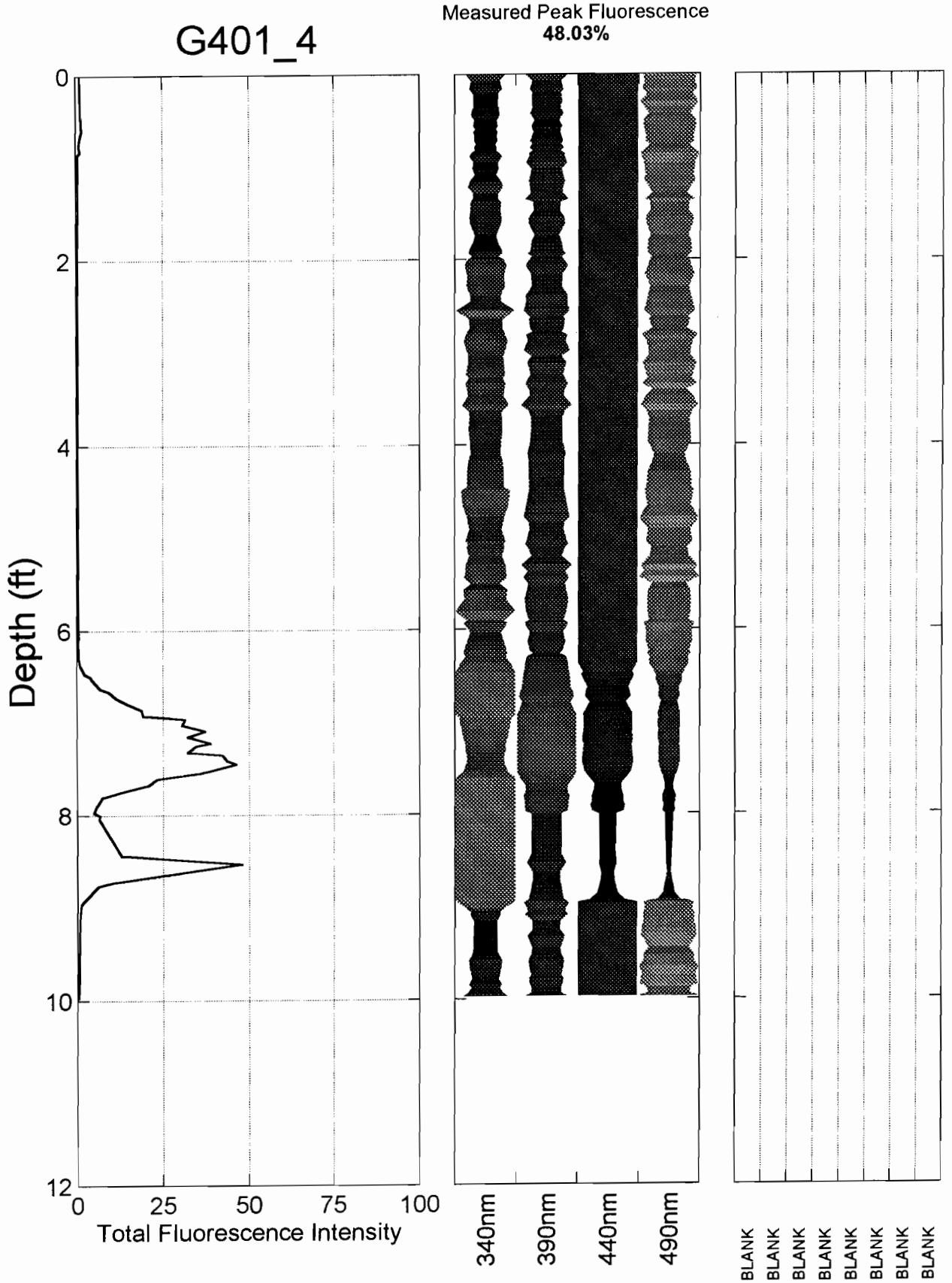
Reference solution. The fluorescence intensity of a reference solution placed on the sapphire window was measured immediately prior to conducting each test. This reference solution measurement serves two purposes. First, as a quality control check, the solution is used to ensure that the performance of the system is within specifications. Second, it allows for normalization of the data from different test locations for variation in laser power, operating conditions, and monitored emission wavelength. The reference solution used for this project was the standard M1 reference, which is a proprietary petroleum hydrocarbon containing solution. M1 provides consistent fluorescence response across the portion of the spectrum analyzed by ROST and therefore, allows the fluorescence data collected to be consistently normalized to intensities recorded as a percentage of M1.

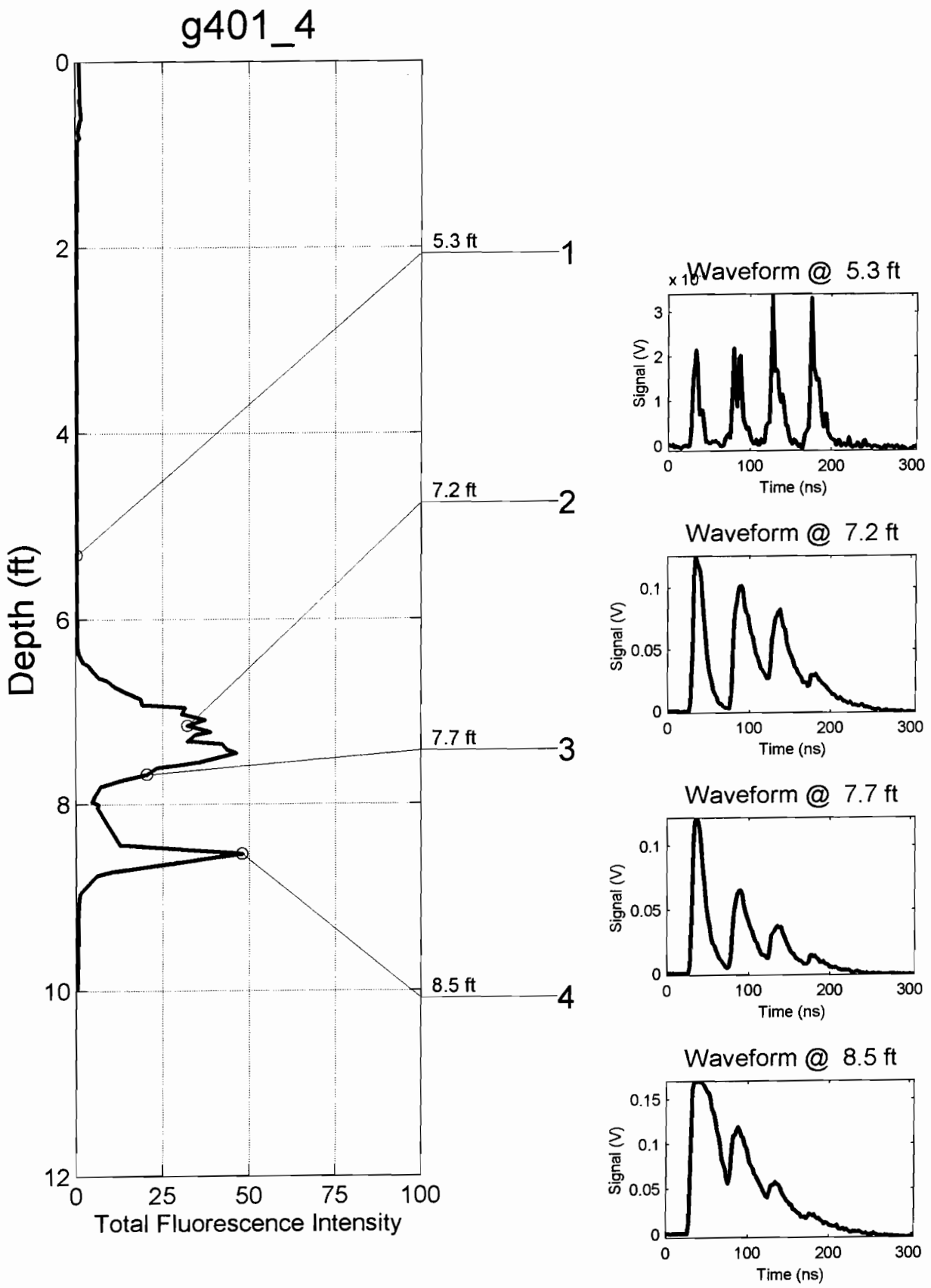
Measured LIF End Depth
10.4 ft
Measured Peak Fluorescence
59.35%




ge03
Depth (ft)
Total Fluorescence Intensity
2.5 ft
7.3 ft
7.7 ft
8.8 ft
1
2
3
4
Waveform @ 2.5 ft
Waveform @ 7.3 ft
Waveform @ 7.7 ft
Waveform @ 8.8 ft
Signal (V)
Time (ns)

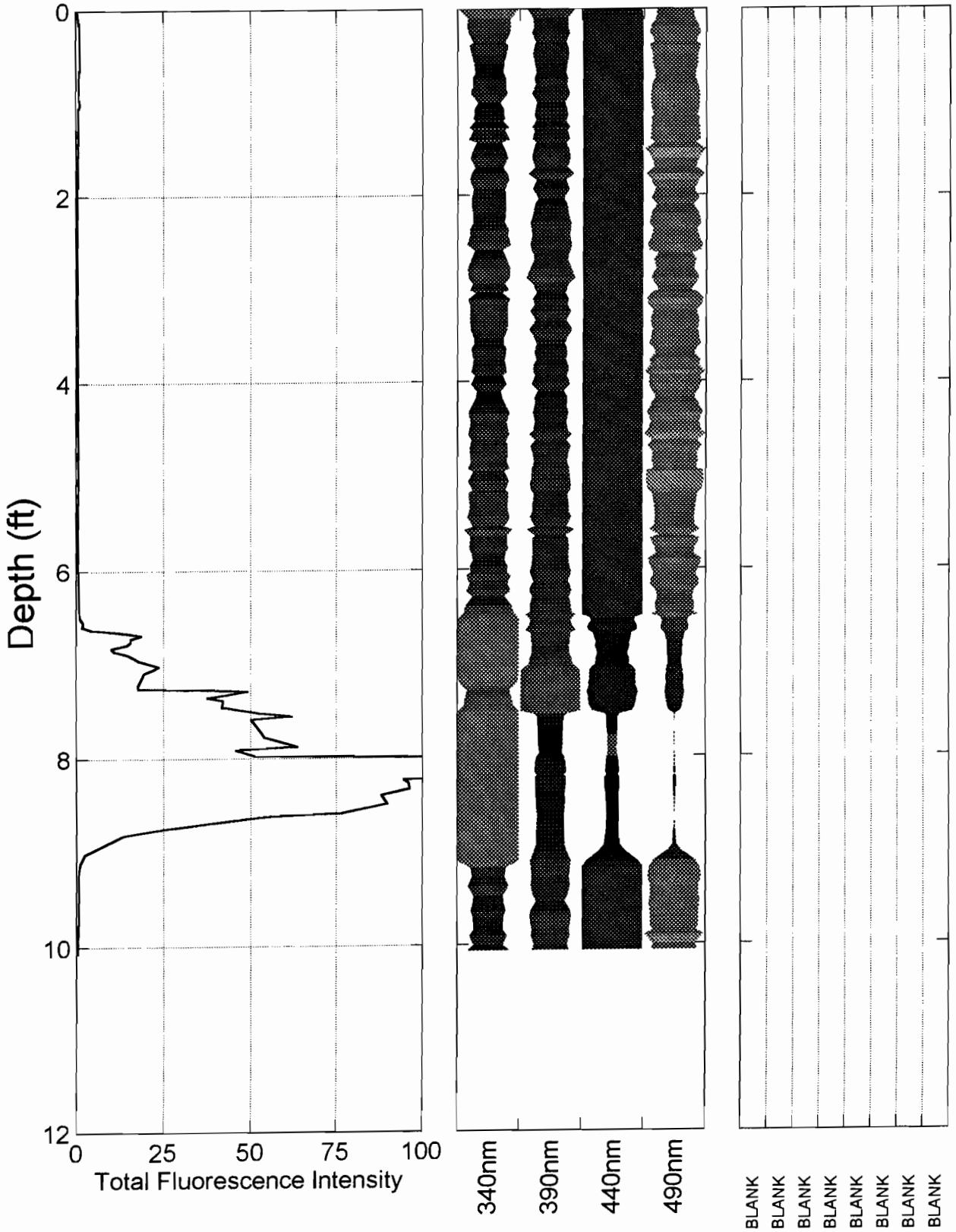
Measured LIF End Depth
9.974 ft
Measured Peak Fluorescence
48.03%

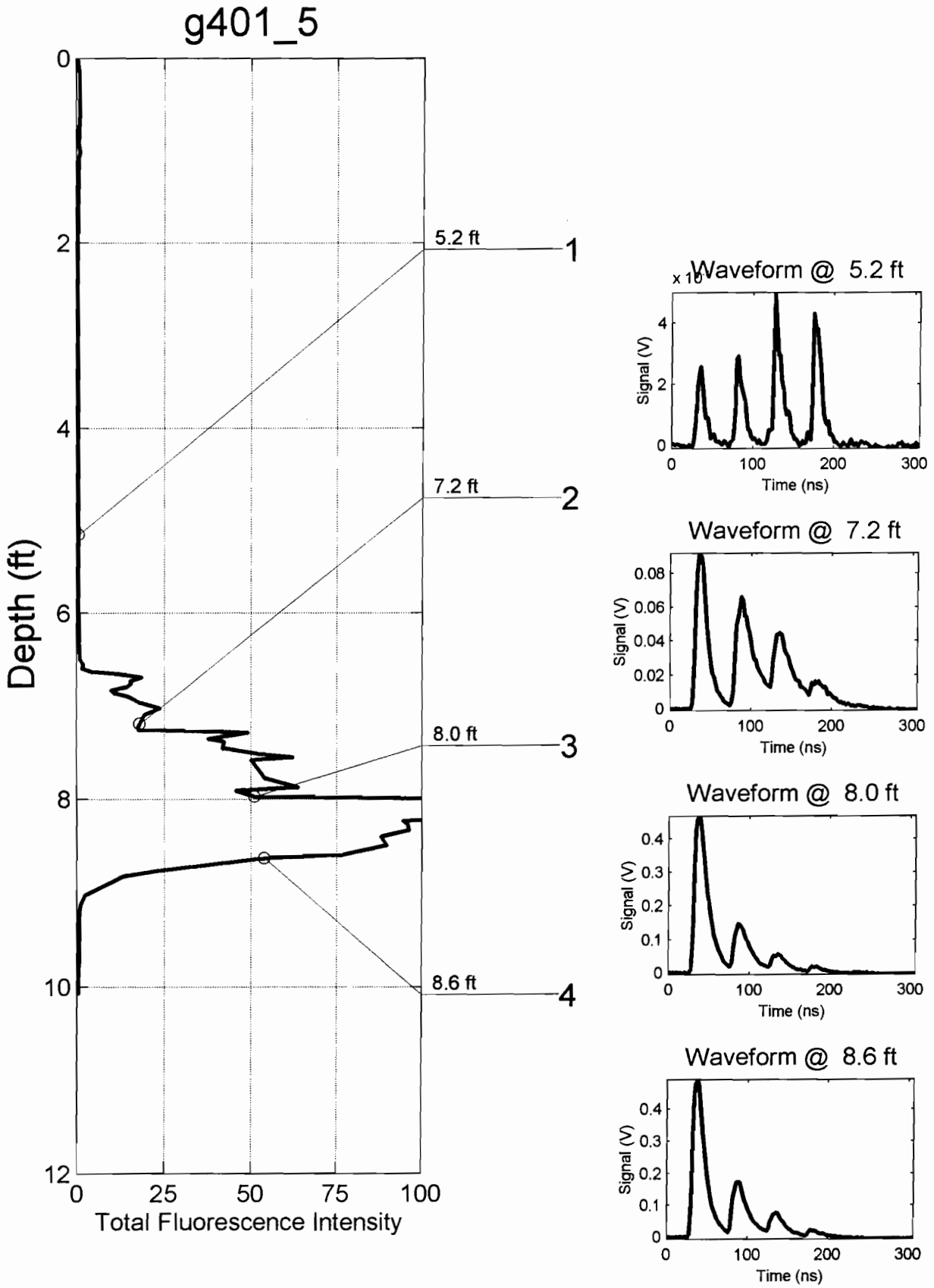



g401_4
Depth (ft)
Total Fluorescence Intensity
5.3 ft
7.2 ft
7.7 ft
8.5 ft
1
2
3
4
Waveform @ 5.3 ft
Waveform @ 7.2 ft
Waveform @ 7.7 ft
Waveform @ 8.5 ft
Signal (V)
Time (ns)

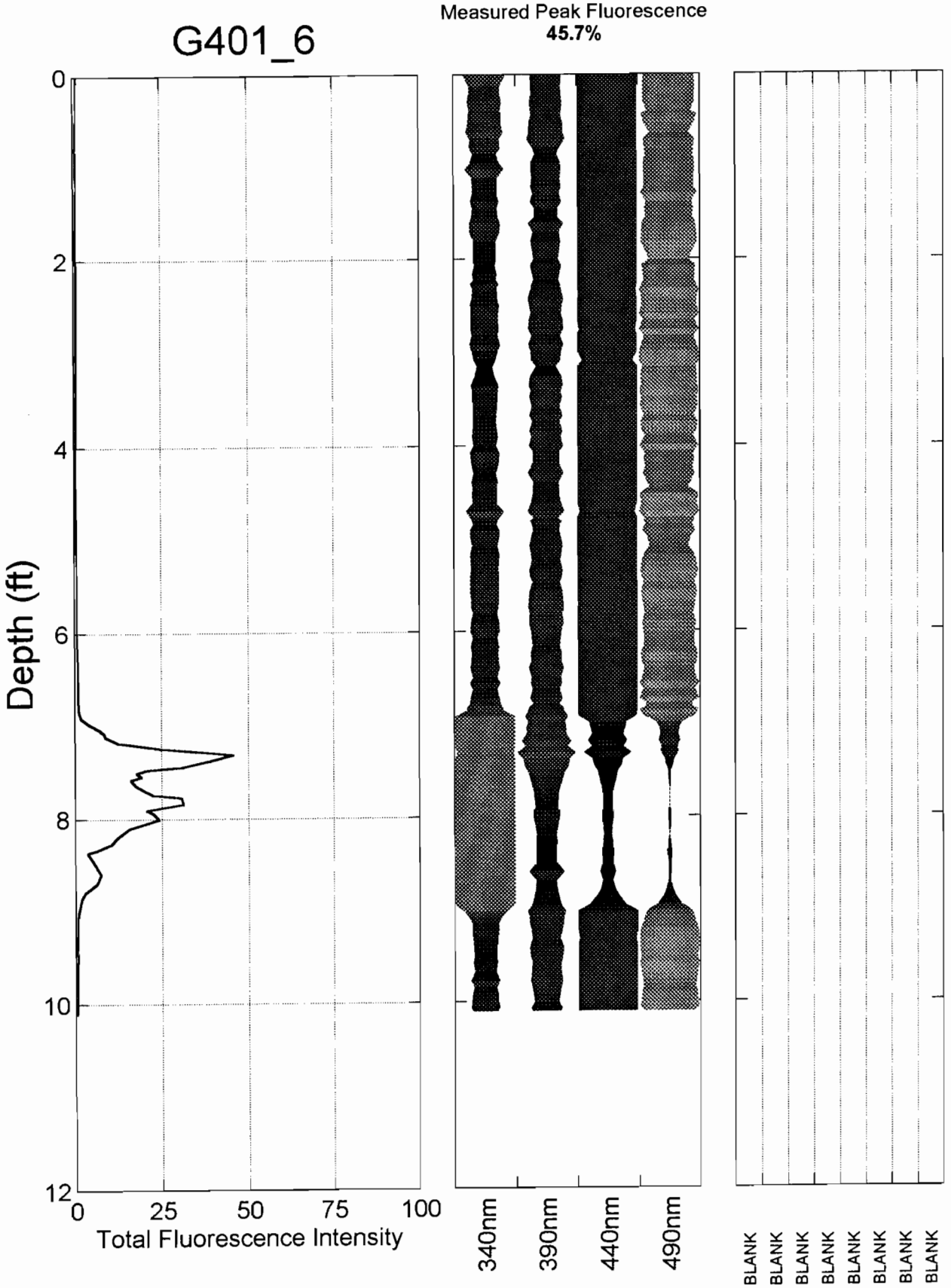
Measured LIF End Depth
10.07 ft
Measured Peak Fluorescence
148.4%

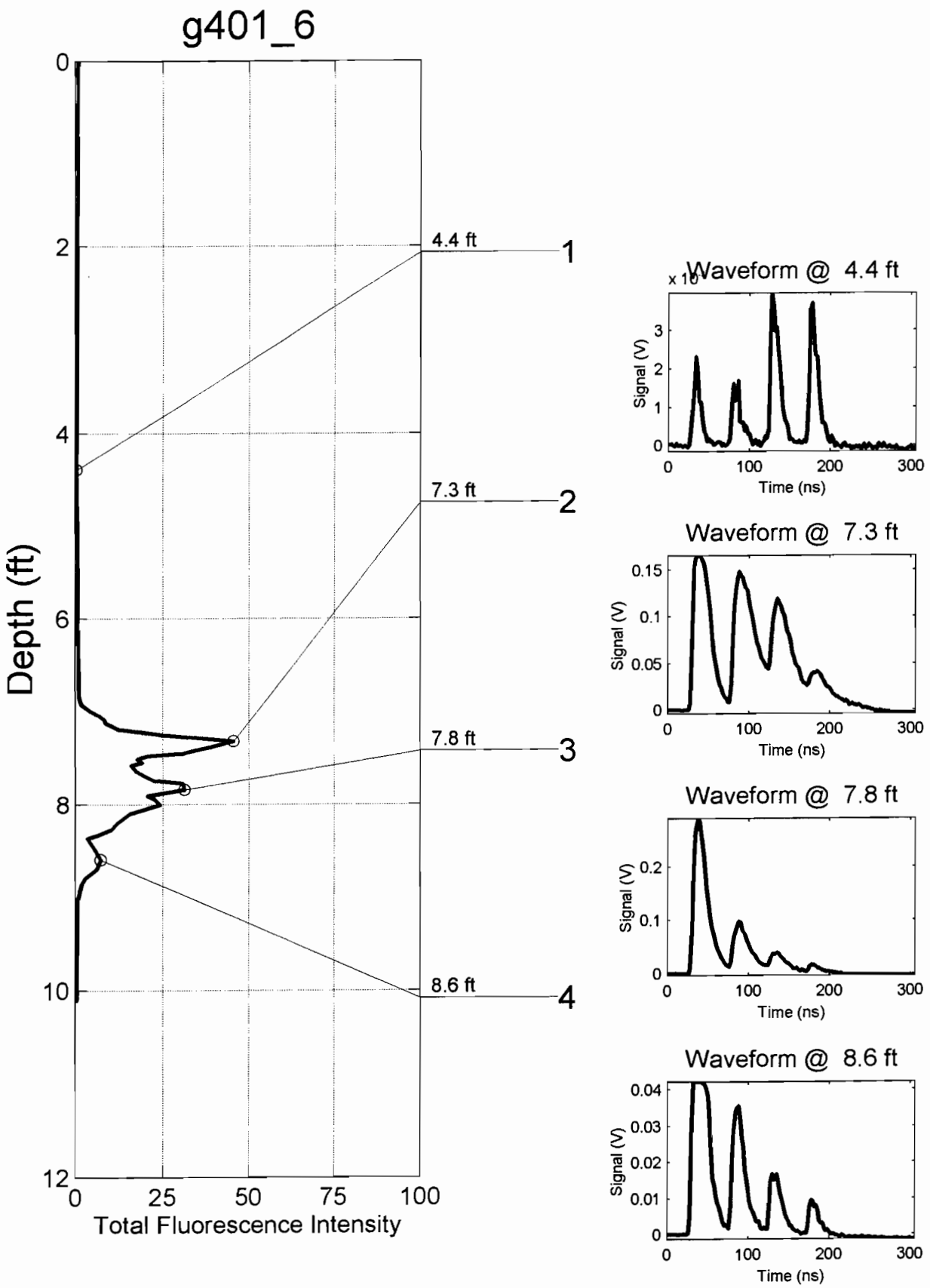
G401_5



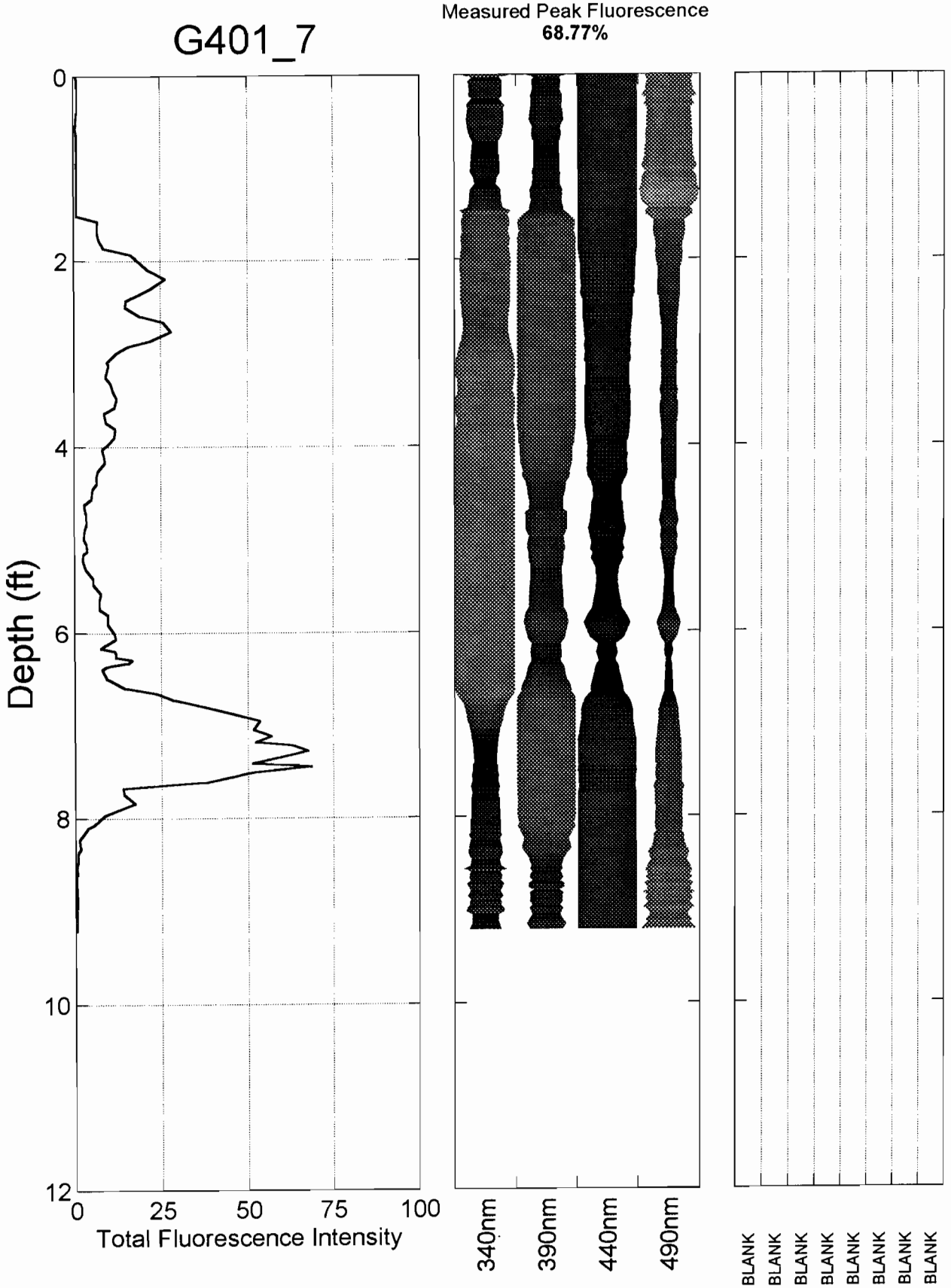

g401_5
Depth (ft)
Total Fluorescence Intensity
5.2 ft
7.2 ft
8.0 ft
8.6 ft
1
2
3
4
Waveform @ 5.2 ft
Waveform @ 7.2 ft
Waveform @ 8.0 ft
Waveform @ 8.6 ft
Signal (V)
Time (ns)

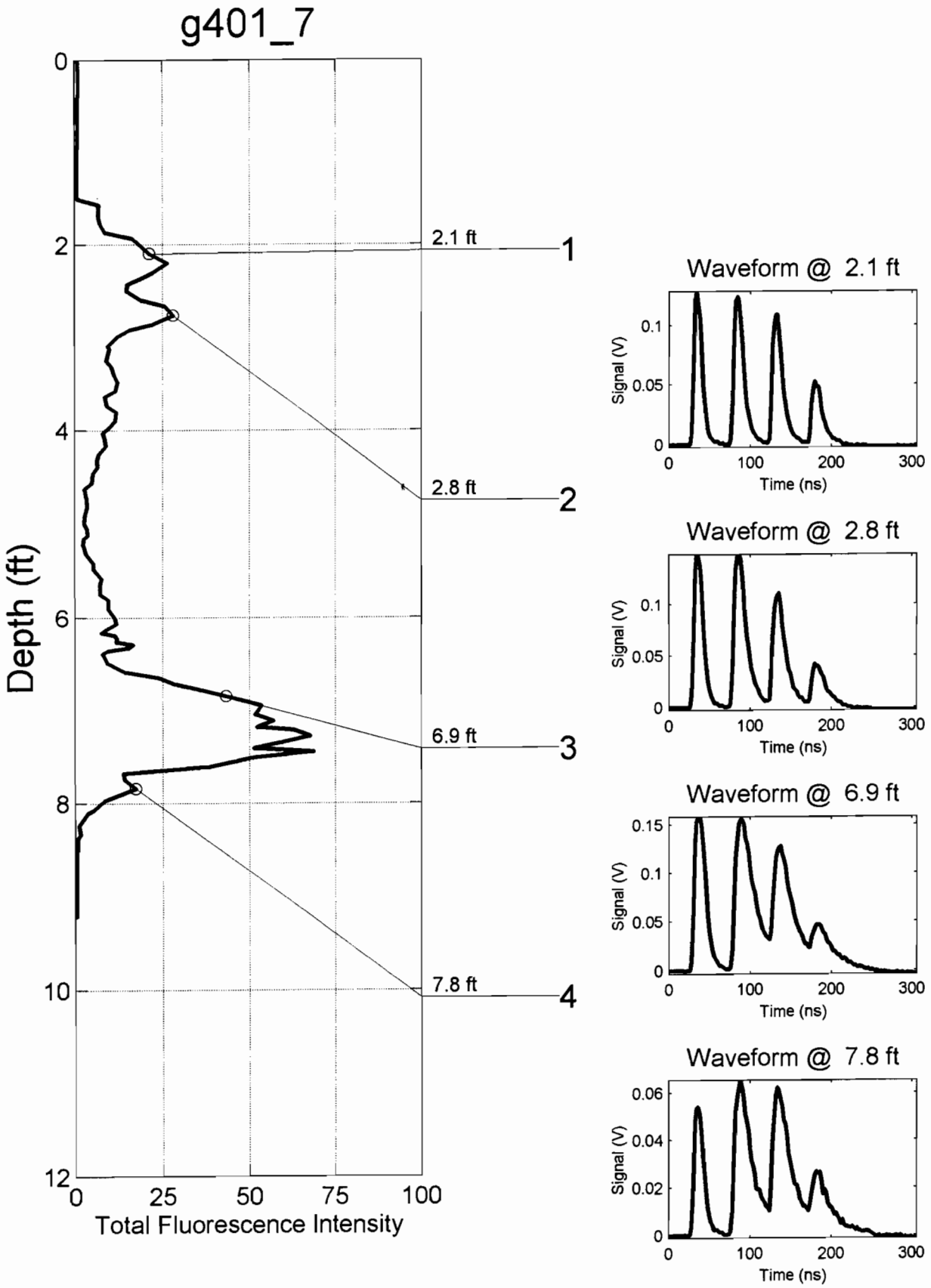
Measured LIF End Depth
10.1 ft
Measured Peak Fluorescence
45.7%




g401_6
Depth (ft)
Total Fluorescence Intensity
4.4 ft
7.3 ft
7.8 ft
8.6 ft
1
2
3
4
Waveform @ 4.4 ft
Waveform @ 7.3 ft
Waveform @ 7.8 ft
Waveform @ 8.6 ft
Signal (V)
Time (ns)

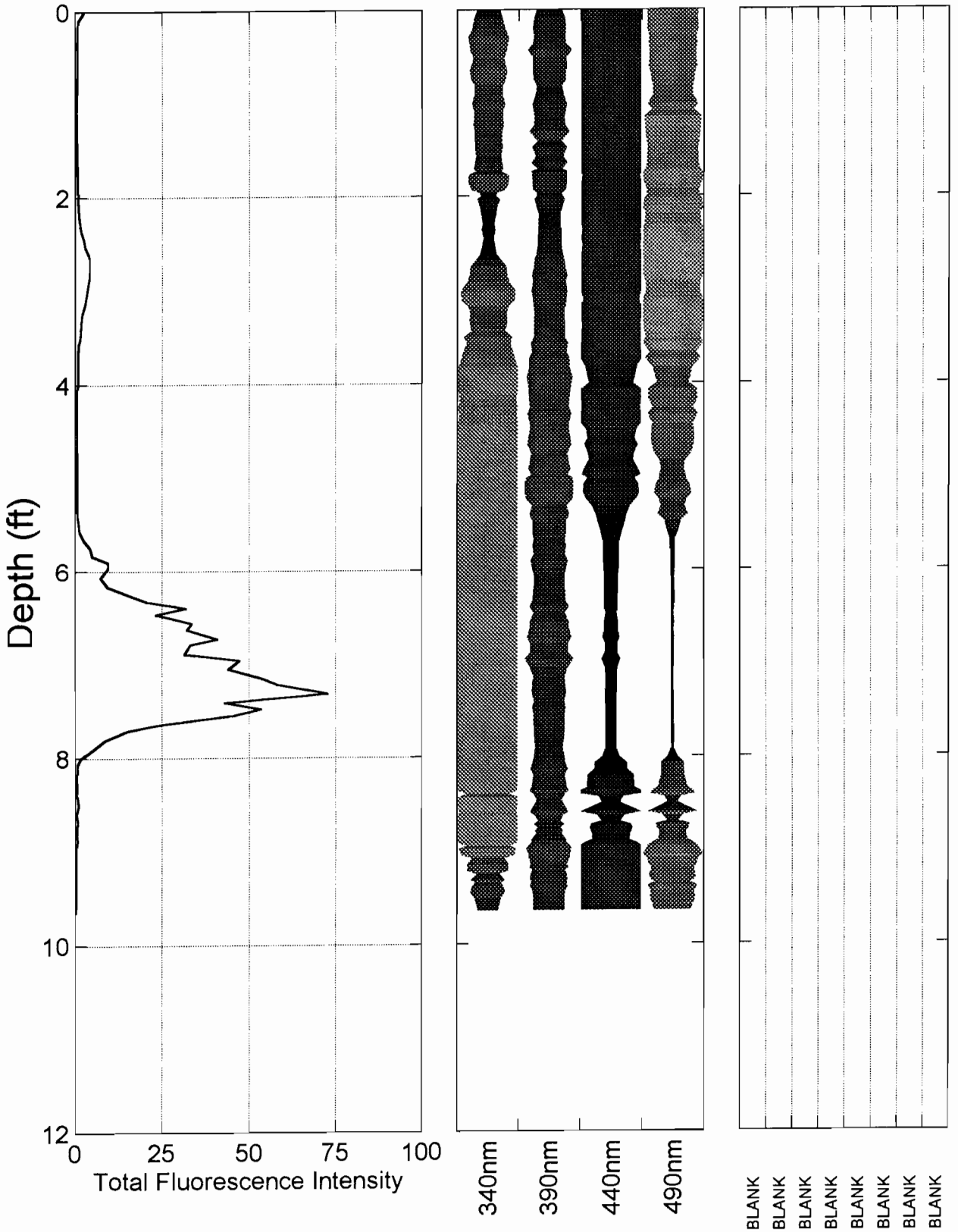
Measured LIF End Depth
9.219 ft
Measured Peak Fluorescence
68.77%

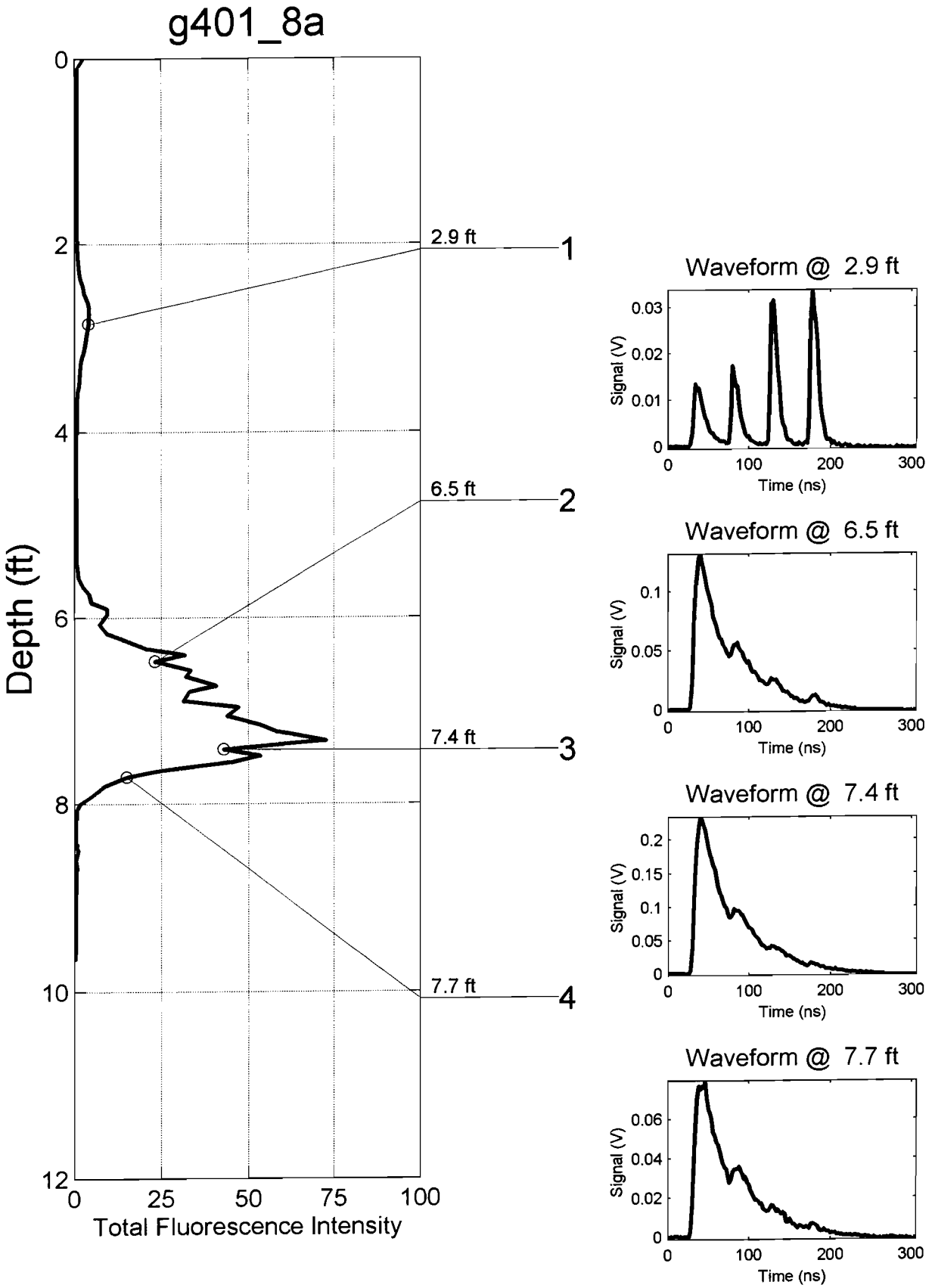



g401_7
Depth (ft)
Total Fluorescence Intensity
2.1 ft
2.8 ft
6.9 ft
7.8 ft
1
2
3
4
Waveform @ 2.1 ft
Waveform @ 2.8 ft
Waveform @ 6.9 ft
Waveform @ 7.8 ft
Signal (V)
Time (ns)

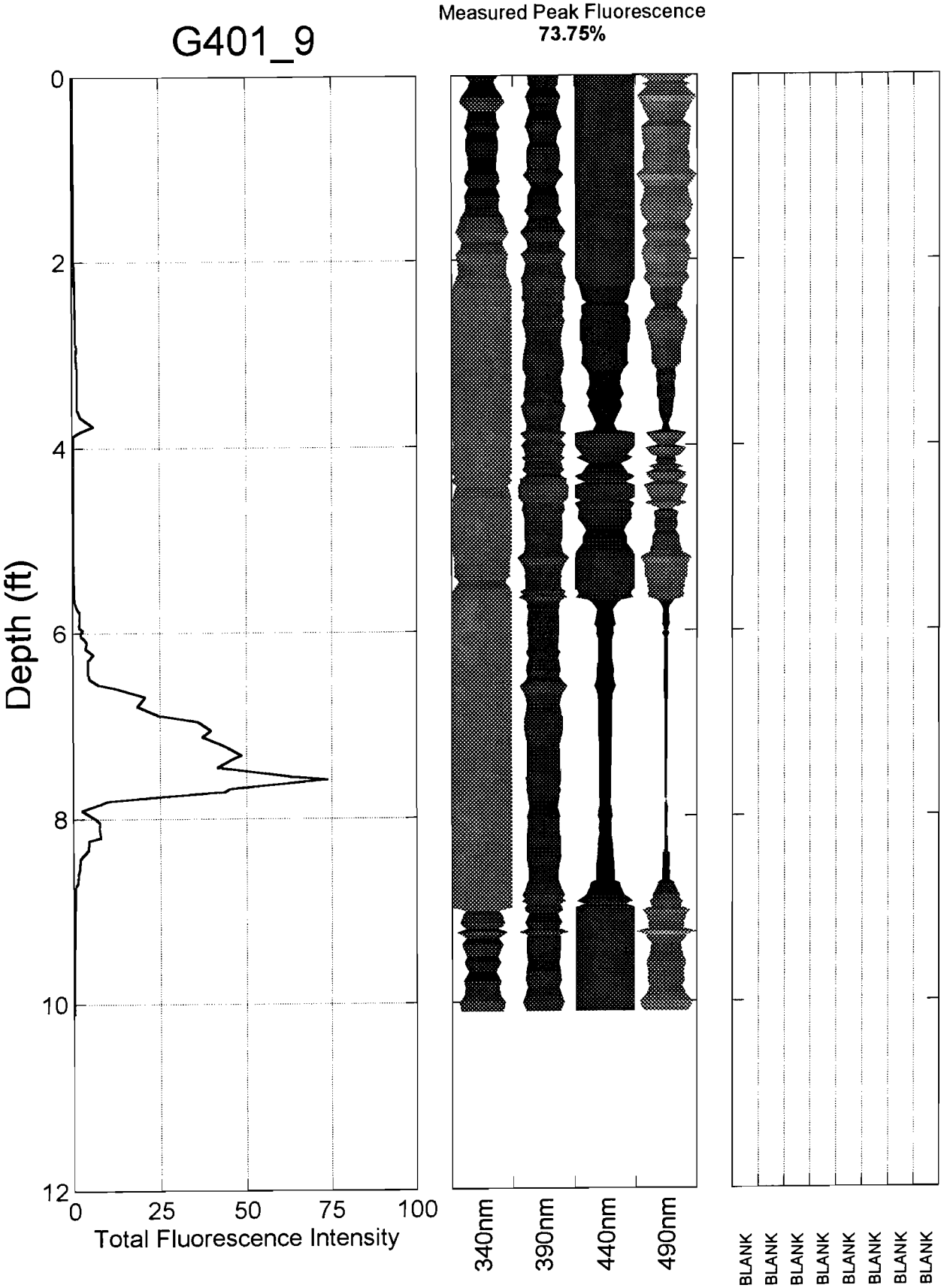
Measured LIF End Depth
9.646 ft
Measured Peak Fluorescence
72.88%

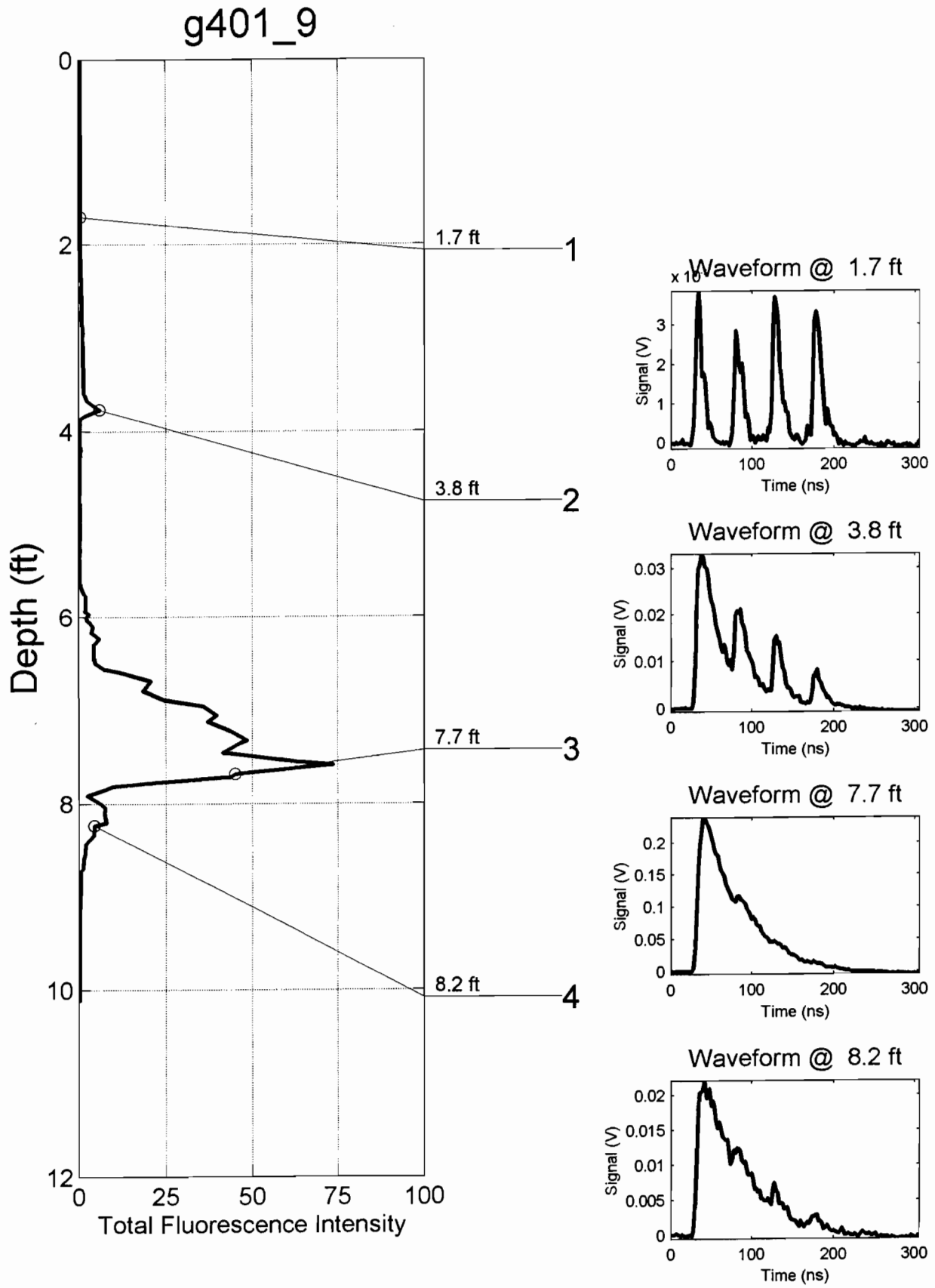
G401_8A



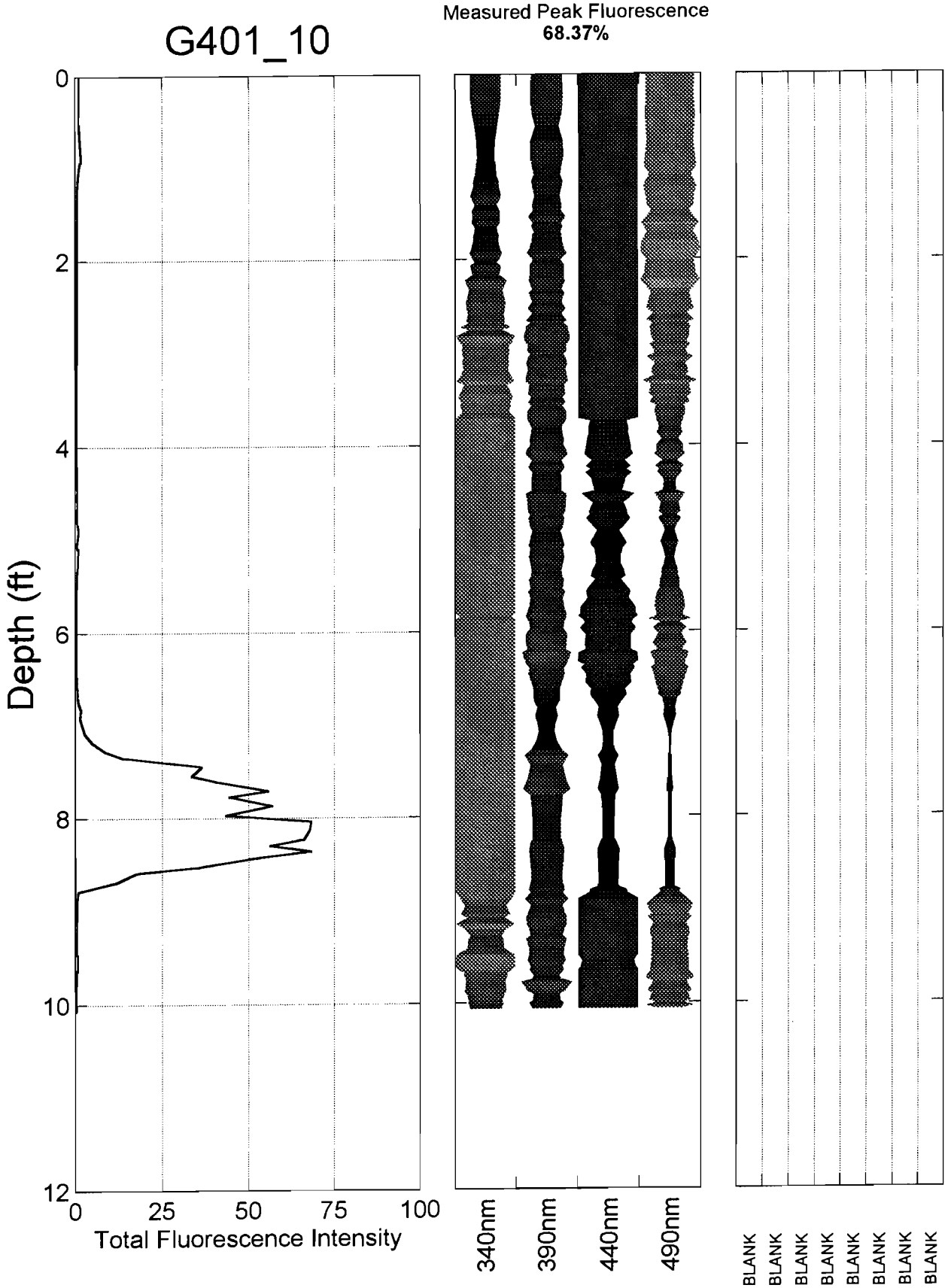

g401_8a
Depth (ft)
Total Fluorescence Intensity
0
2
4
6
8
10
12
0
25
50
75
100
2.9 ft
6.5 ft
7.4 ft
7.7 ft
1
2
3
4
Waveform @ 2.9 ft
Waveform @ 6.5 ft
Waveform @ 7.4 ft
Waveform @ 7.7 ft
Signal (V)
Time (ns)
0
100
200
300

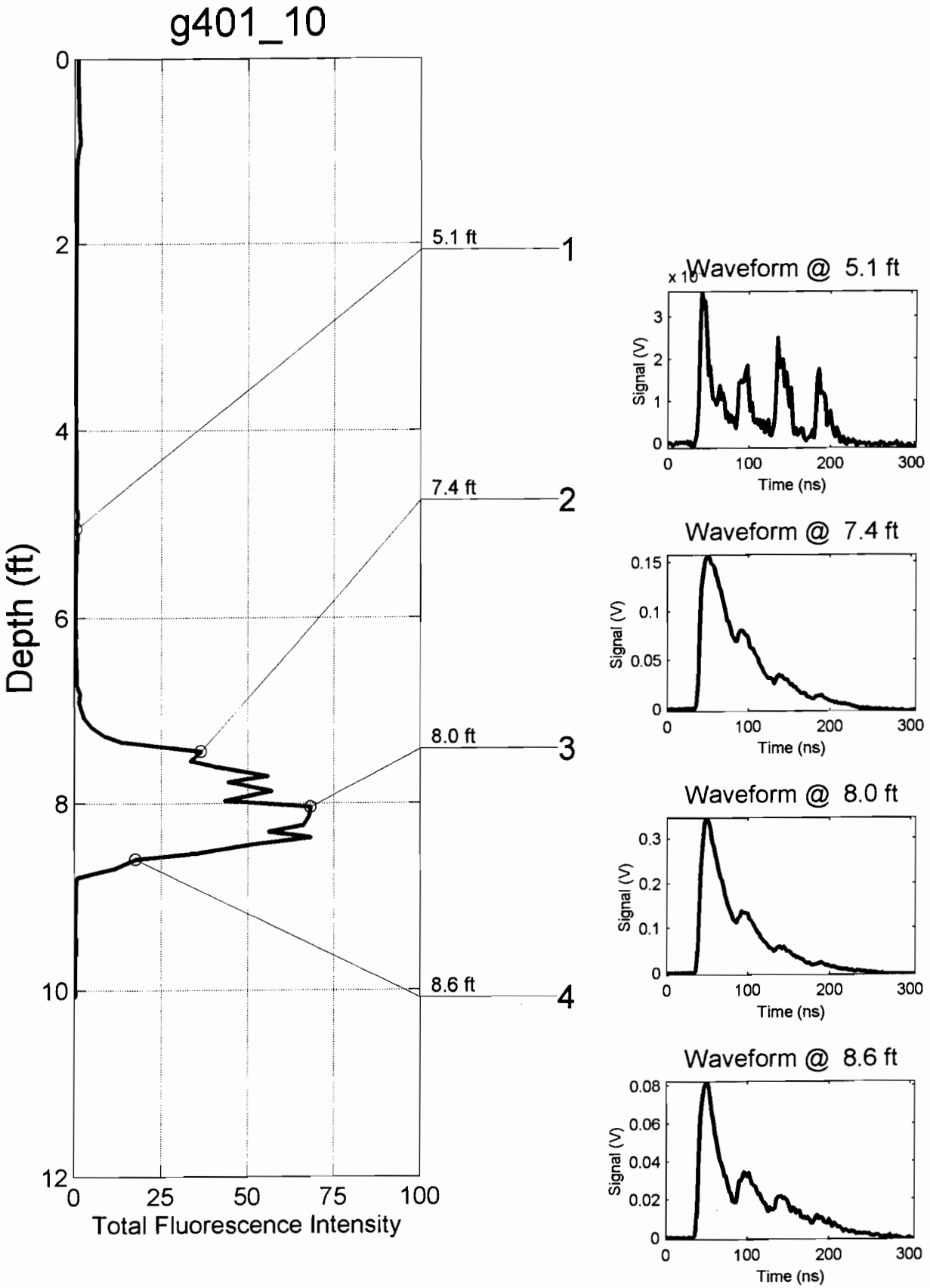
Measured LIF End Depth
10.1 ft
Measured Peak Fluorescence
73.75%



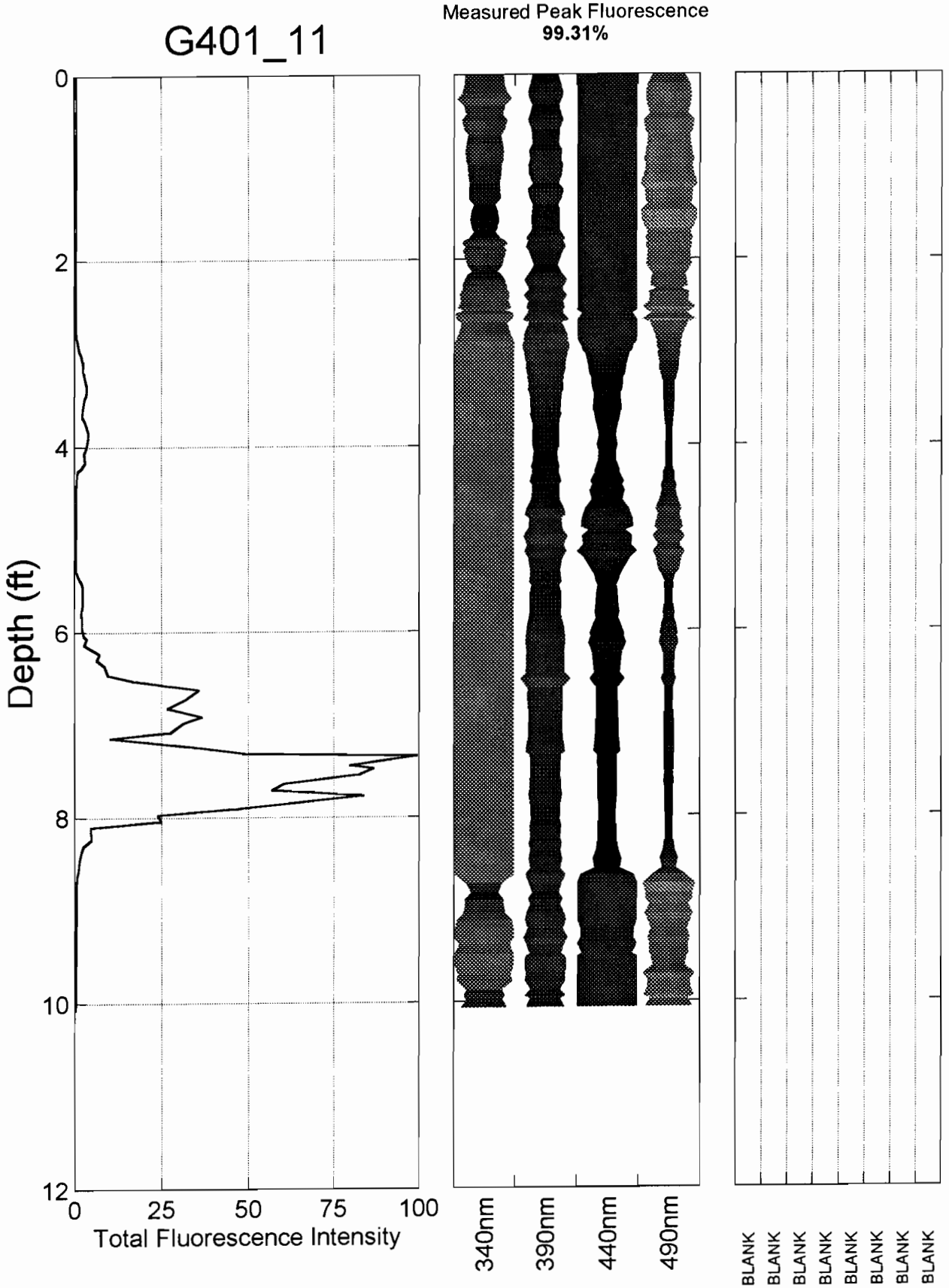

g401_9
Depth (ft)
Total Fluorescence Intensity
1.7 ft
3.8 ft
7.7 ft
8.2 ft
1
2
3
4
Waveform @ 1.7 ft
Waveform @ 3.8 ft
Waveform @ 7.7 ft
Waveform @ 8.2 ft
Signal (V)
Time (ns)

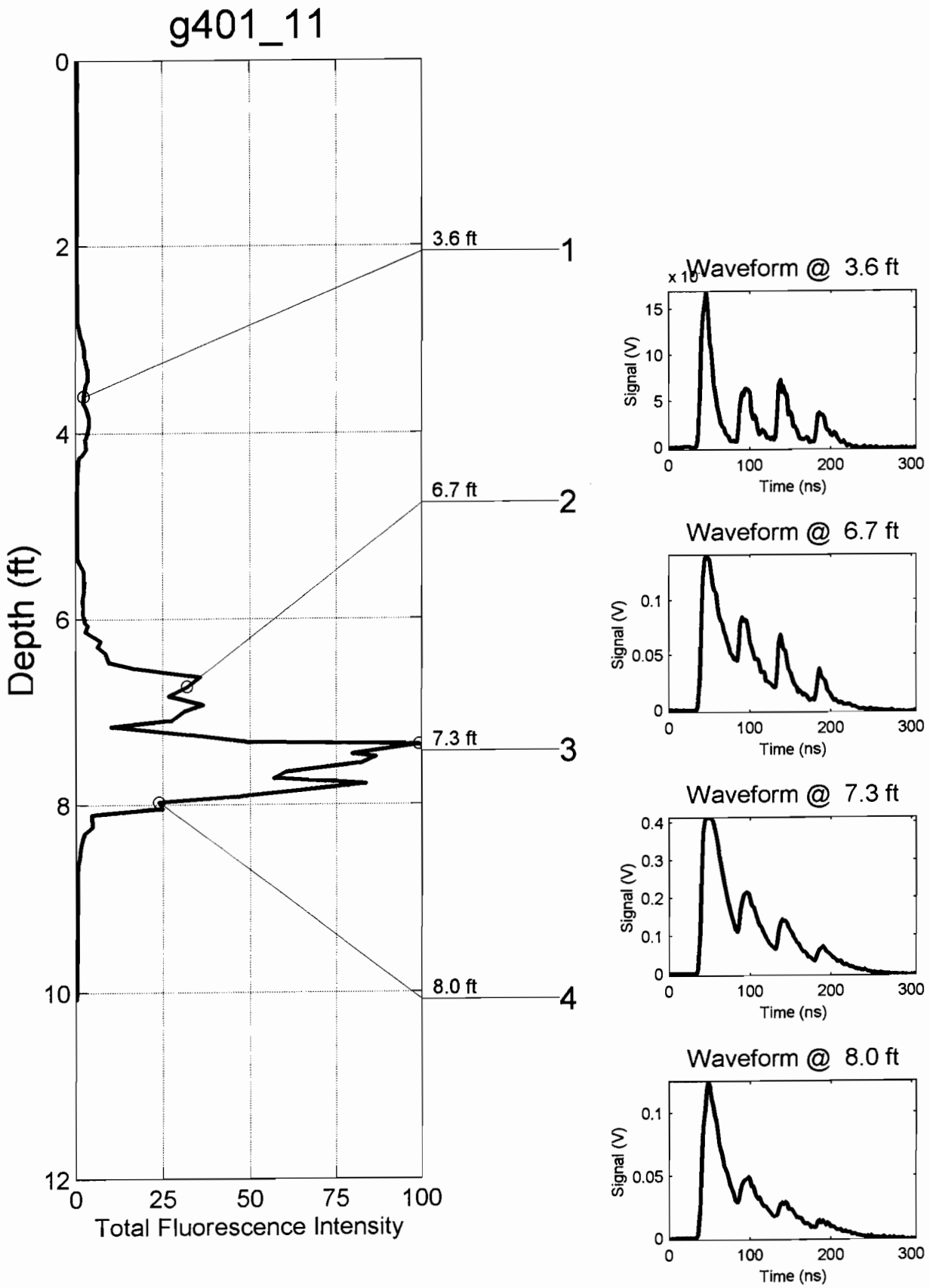
Measured LIF End Depth
10.07 ft
Measured Peak Fluorescence
68.37%




g401_10
Depth (ft)
Total Fluorescence Intensity
5.1 ft
7.4 ft
8.0 ft
8.6 ft
1
2
3
4
Waveform @ 5.1 ft
Waveform @ 7.4 ft
Waveform @ 8.0 ft
Waveform @ 8.6 ft
Signal (V)
Time (ns)

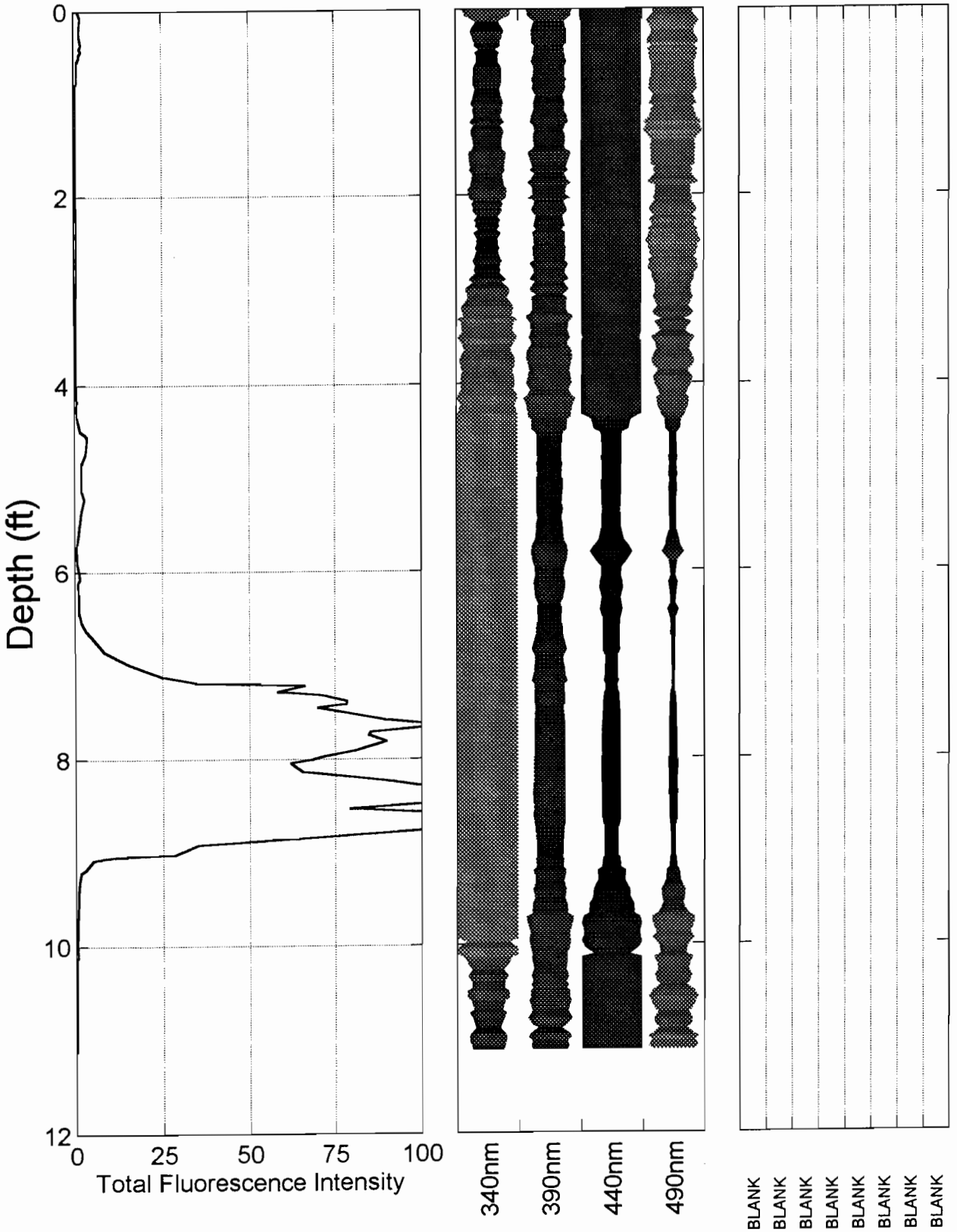
Measured LIF End Depth
10.07 ft
Measured Peak Fluorescence
99.31%

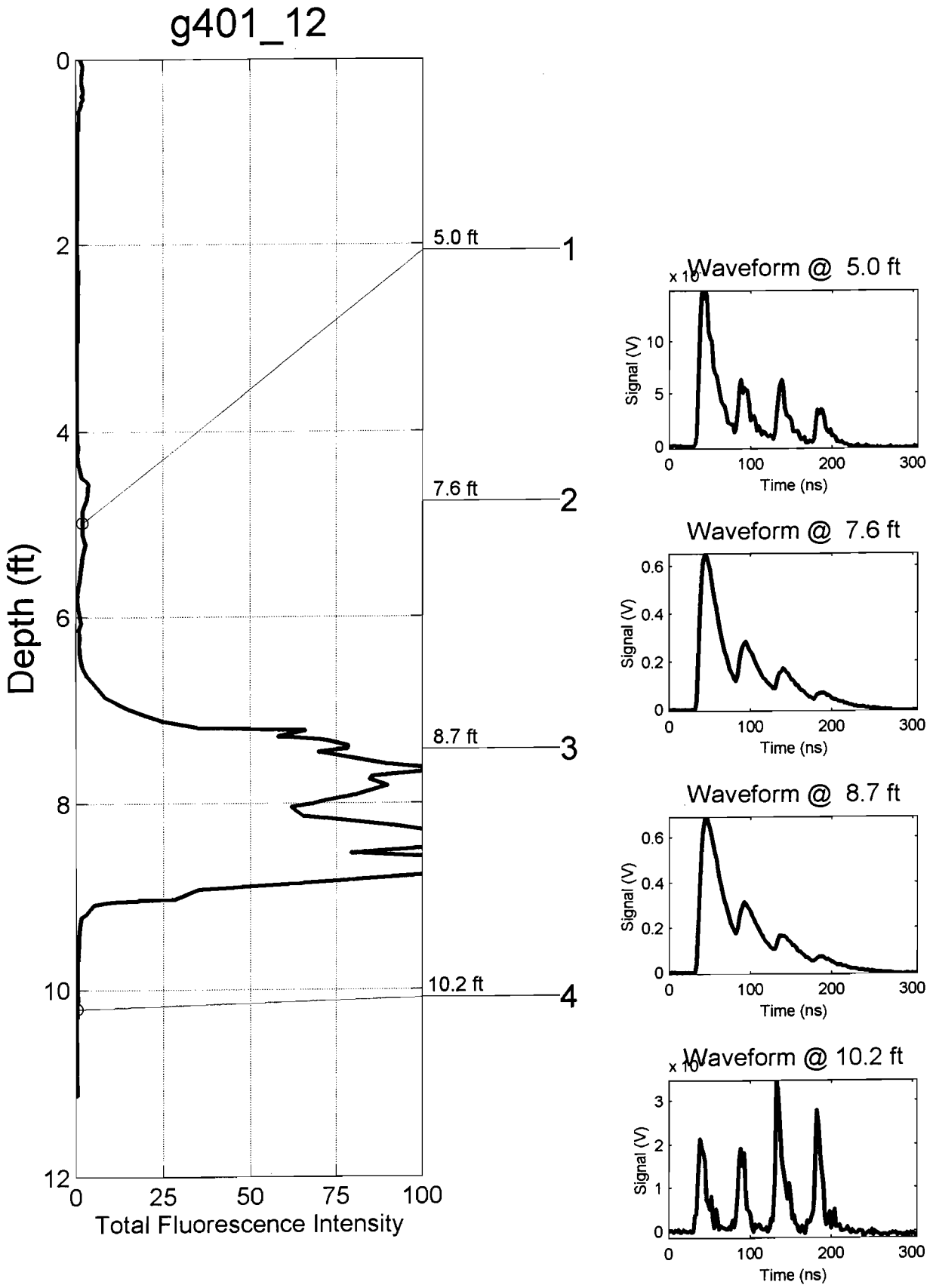



g401_11
Depth (ft)
Total Fluorescence Intensity
3.6 ft
6.7 ft
7.3 ft
8.0 ft
1
2
3
4
Waveform @ 3.6 ft
Waveform @ 6.7 ft
Waveform @ 7.3 ft
Waveform @ 8.0 ft
Signal (V)
Time (ns)

Measured LIF End Depth
11.12 ft
Measured Peak Fluorescence
132.2%

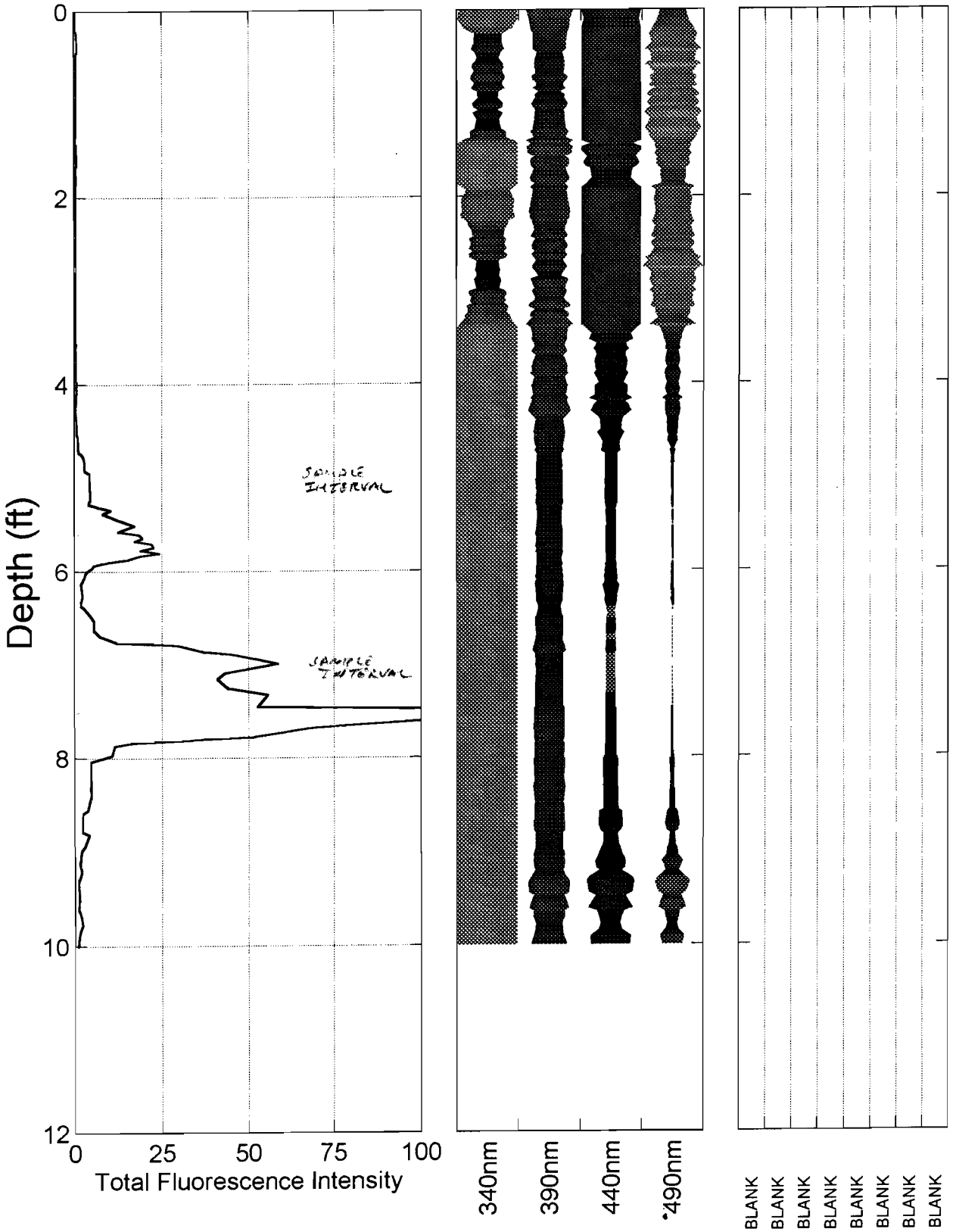
G401_12

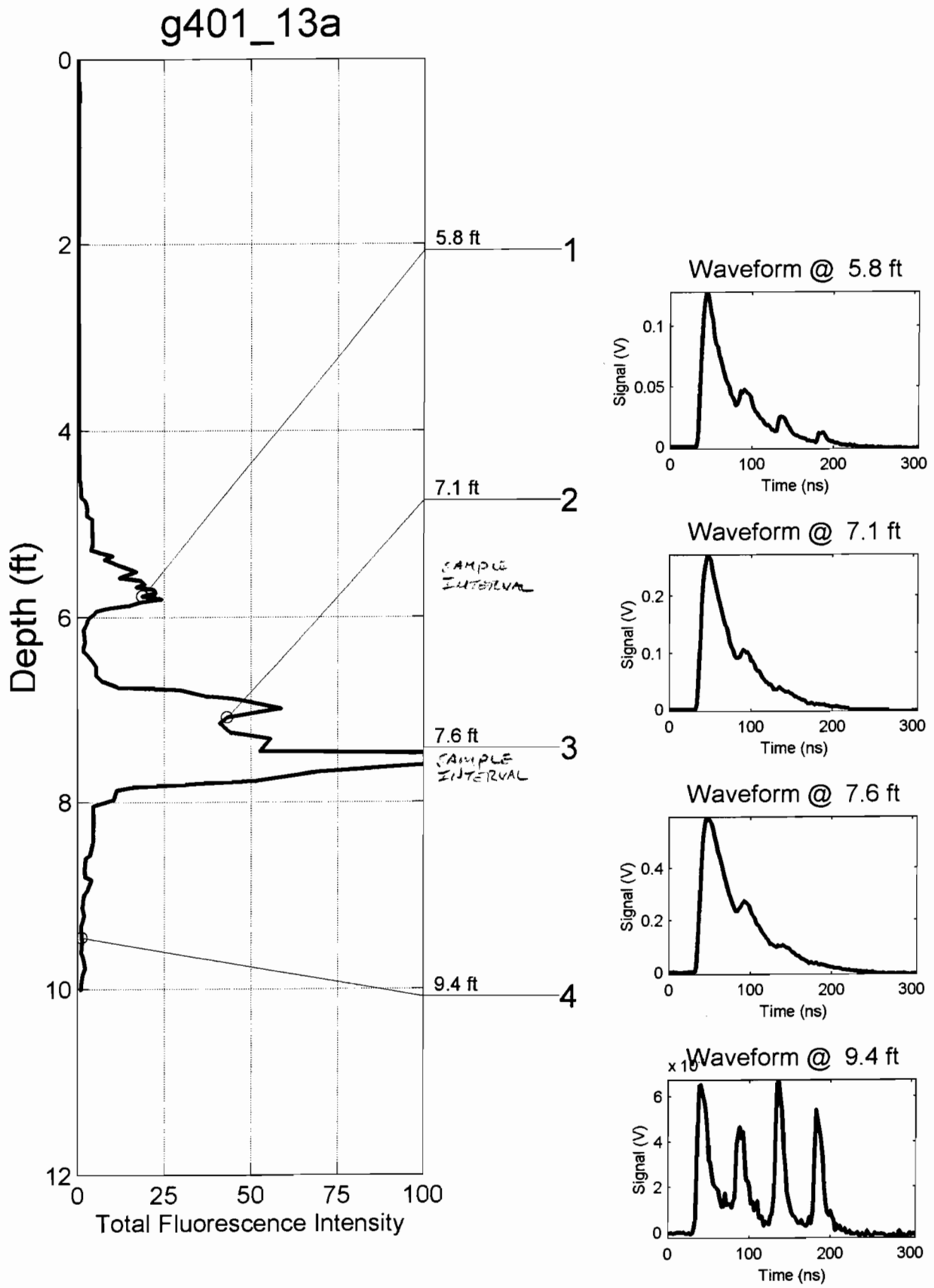



g401_12
Depth (ft)
Total Fluorescence Intensity
5.0 ft
7.6 ft
8.7 ft
10.2 ft
1
2
3
4
Waveform @ 5.0 ft
Waveform @ 7.6 ft
Waveform @ 8.7 ft
Waveform @ 10.2 ft
Signal (V)
Time (ns)

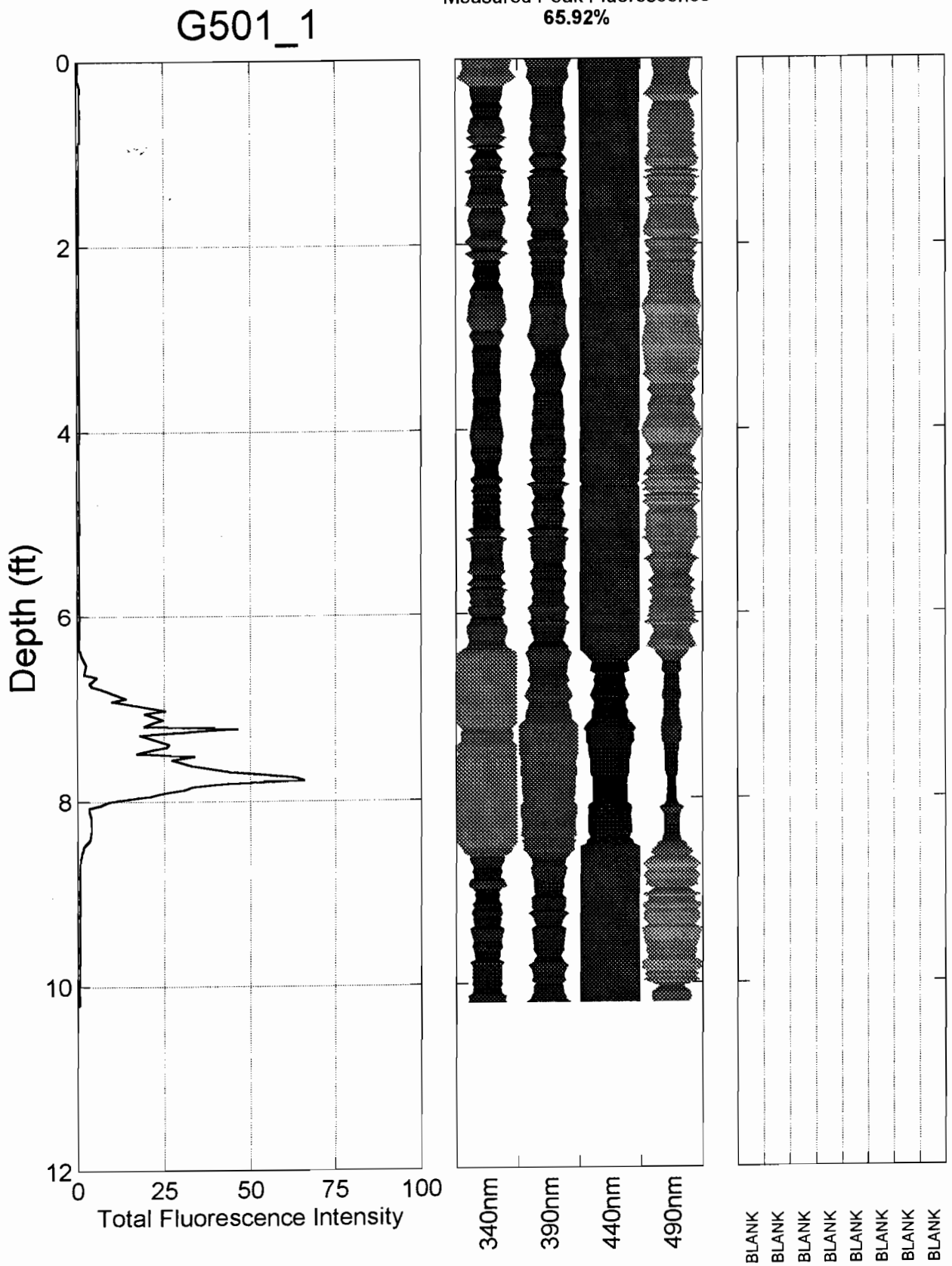
Measured LIF End Depth
10.01 ft
Measured Peak Fluorescence
109.3%

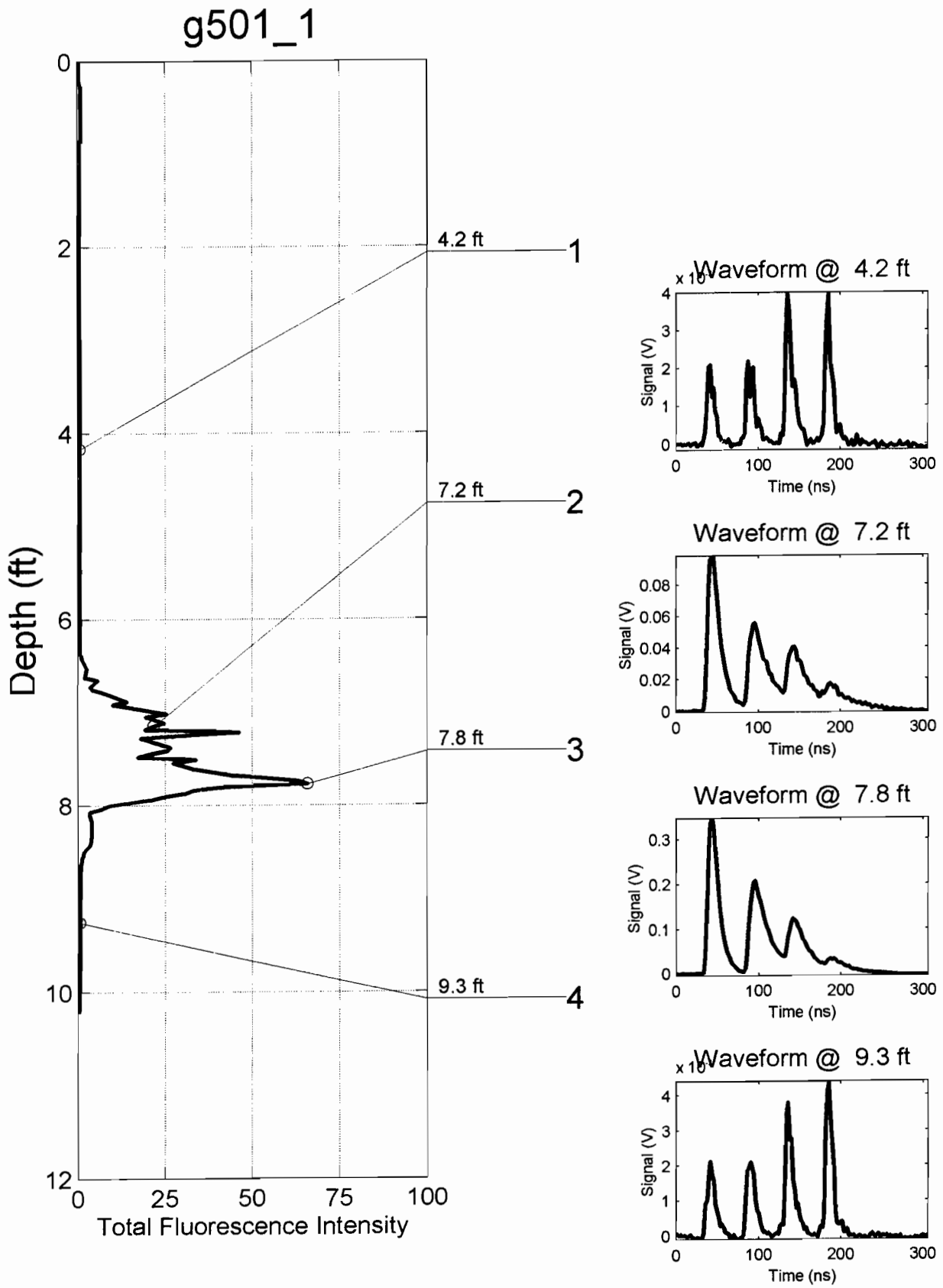
G401_13A



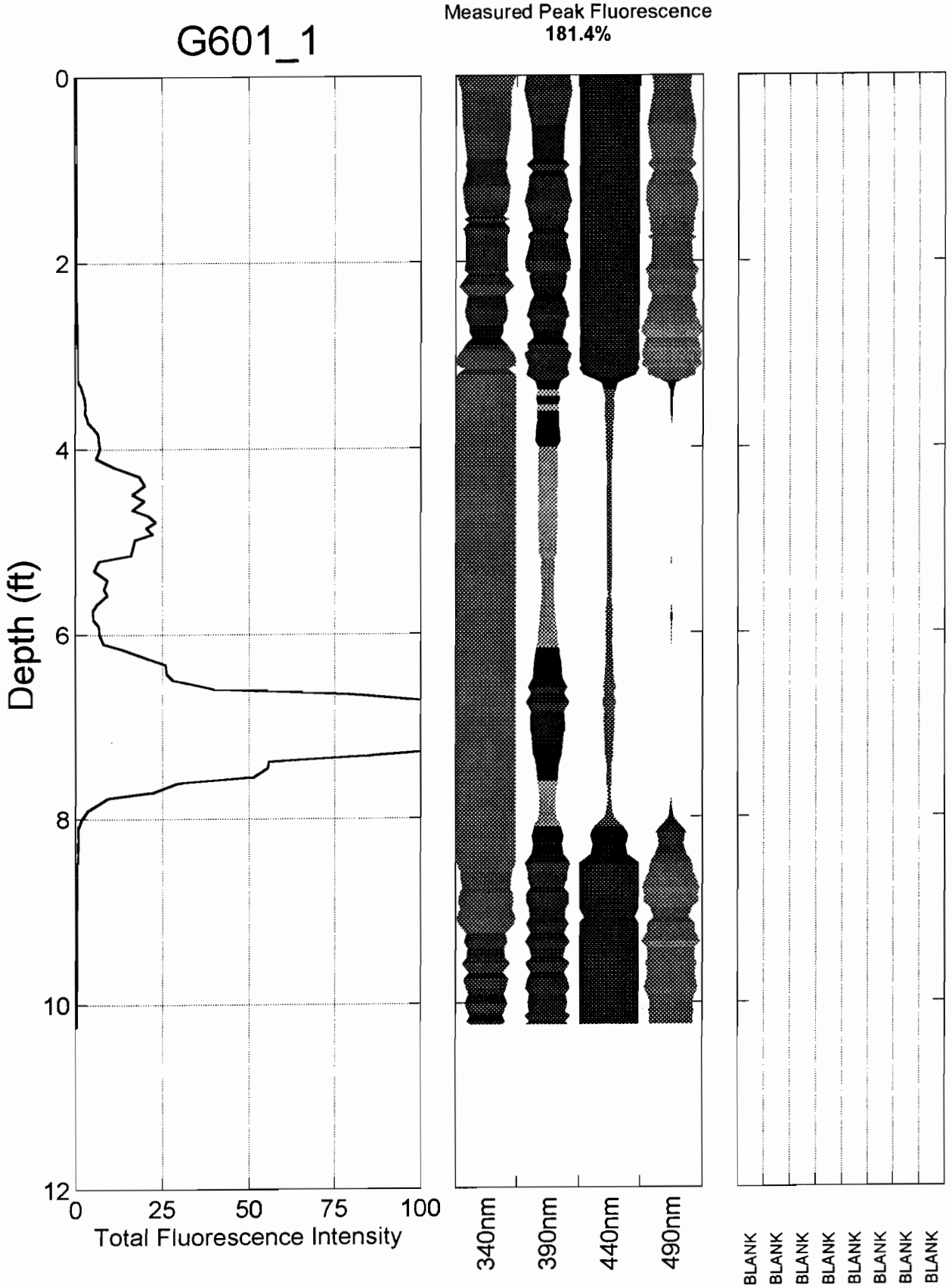

g401_13a
Depth (ft)
Total Fluorescence Intensity
5.8 ft
7.1 ft
7.6 ft
9.4 ft
1
2
3
4
SAMPLE INTERVAL
SAMPLE INTERVAL
Waveform @ 5.8 ft
Waveform @ 7.1 ft
Waveform @ 7.6 ft
Waveform @ 9.4 ft
Signal (V)
Time (ns)

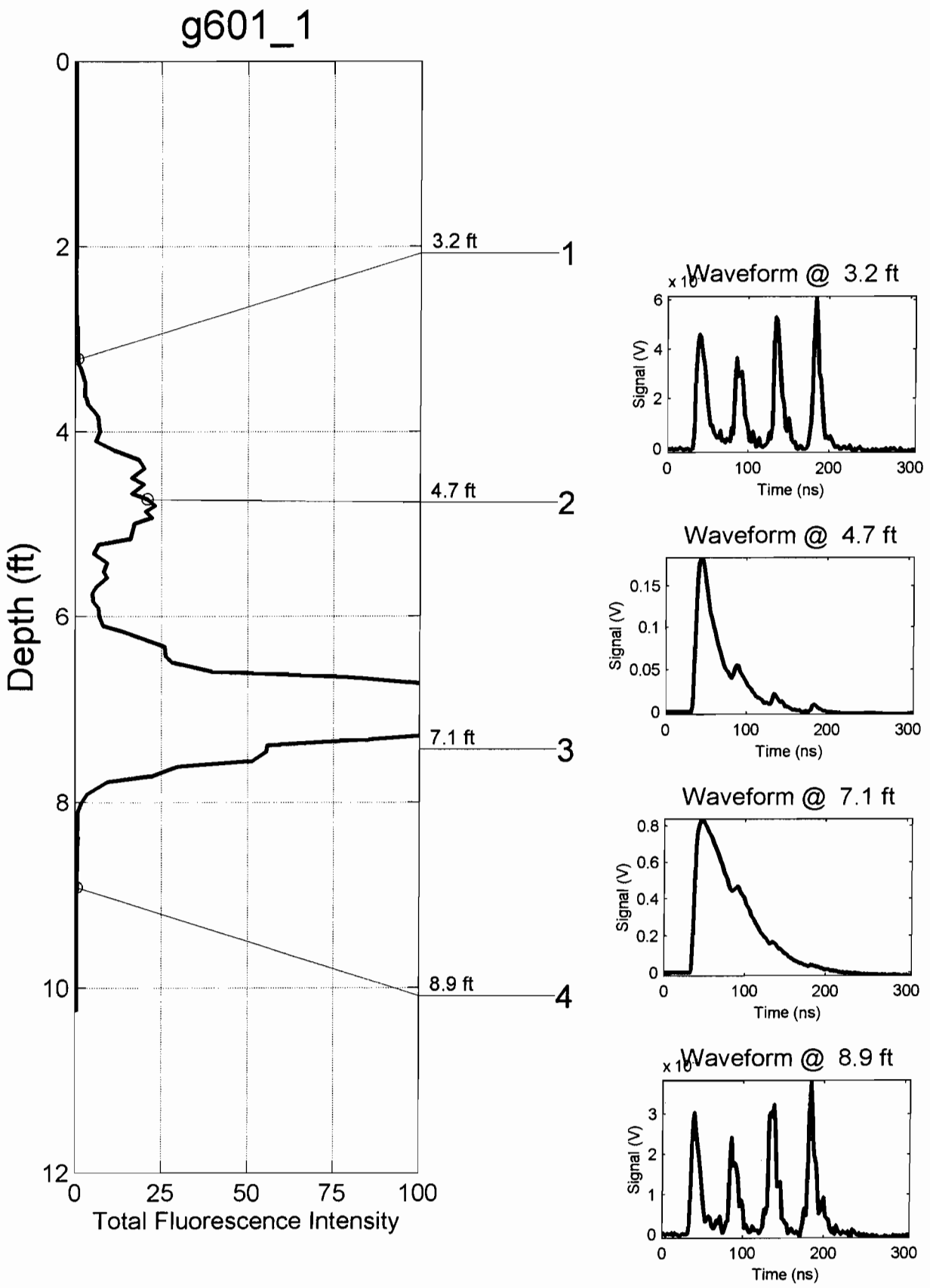
Measured LIF End Depth
10.2 ft
Measured Peak Fluorescence
65.92%



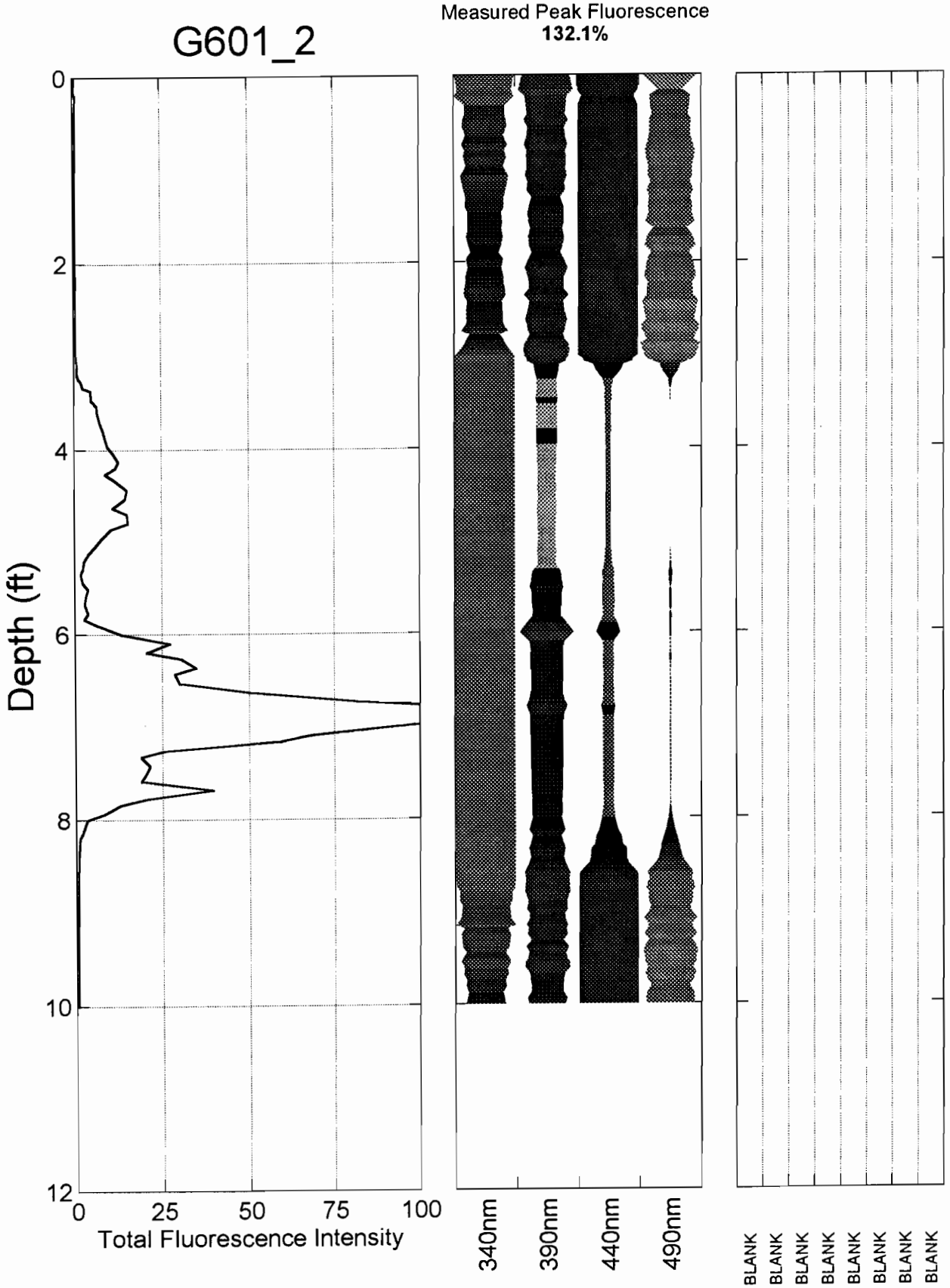

g501_1
Depth (ft)
Total Fluorescence Intensity
4.2 ft
7.2 ft
7.8 ft
9.3 ft
1
2
3
4
Waveform @ 4.2 ft
Waveform @ 7.2 ft
Waveform @ 7.8 ft
Waveform @ 9.3 ft
Signal (V)
Time (ns)

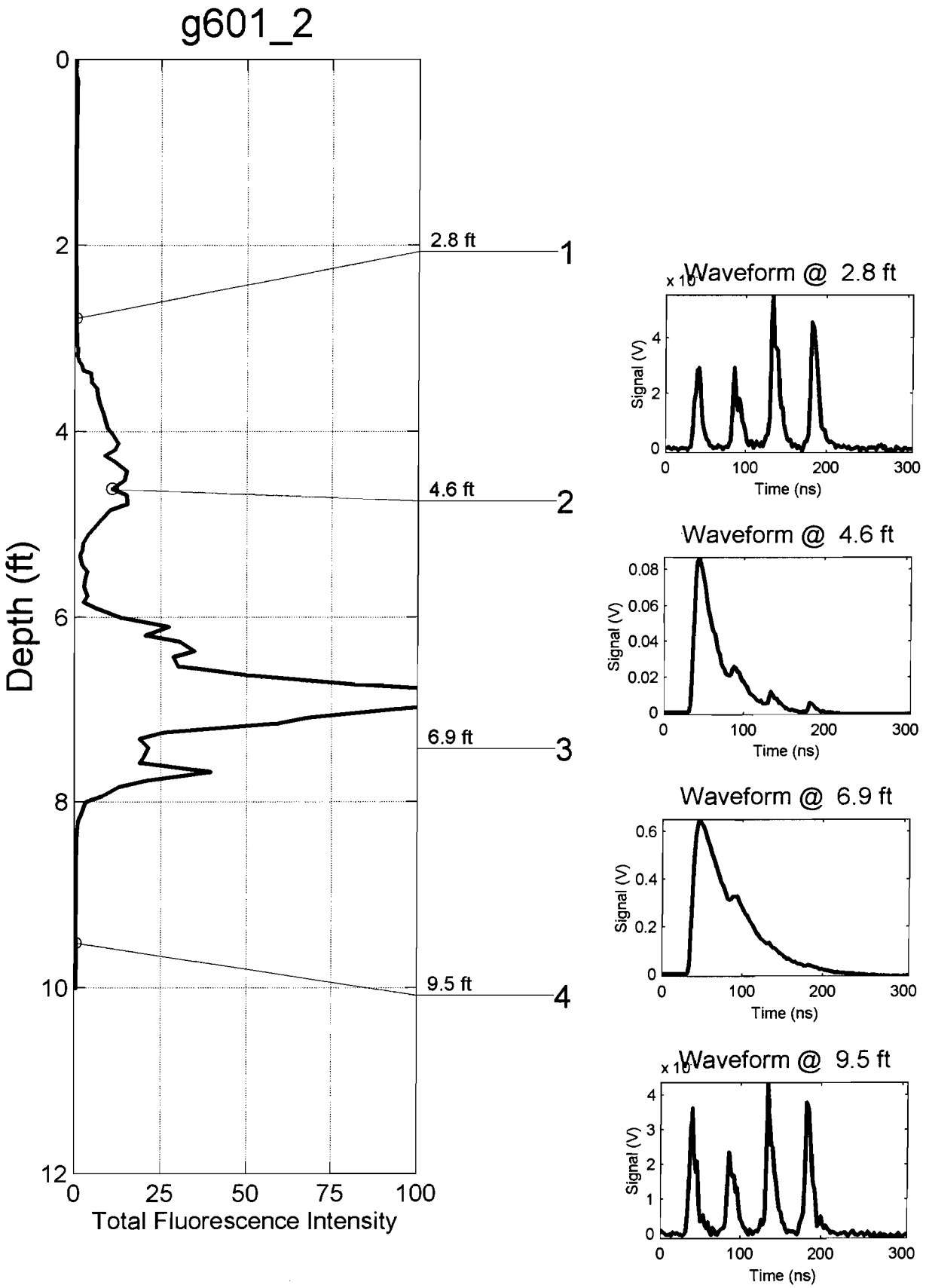
Measured LIF End Depth
10.24 ft
Measured Peak Fluorescence
181.4%



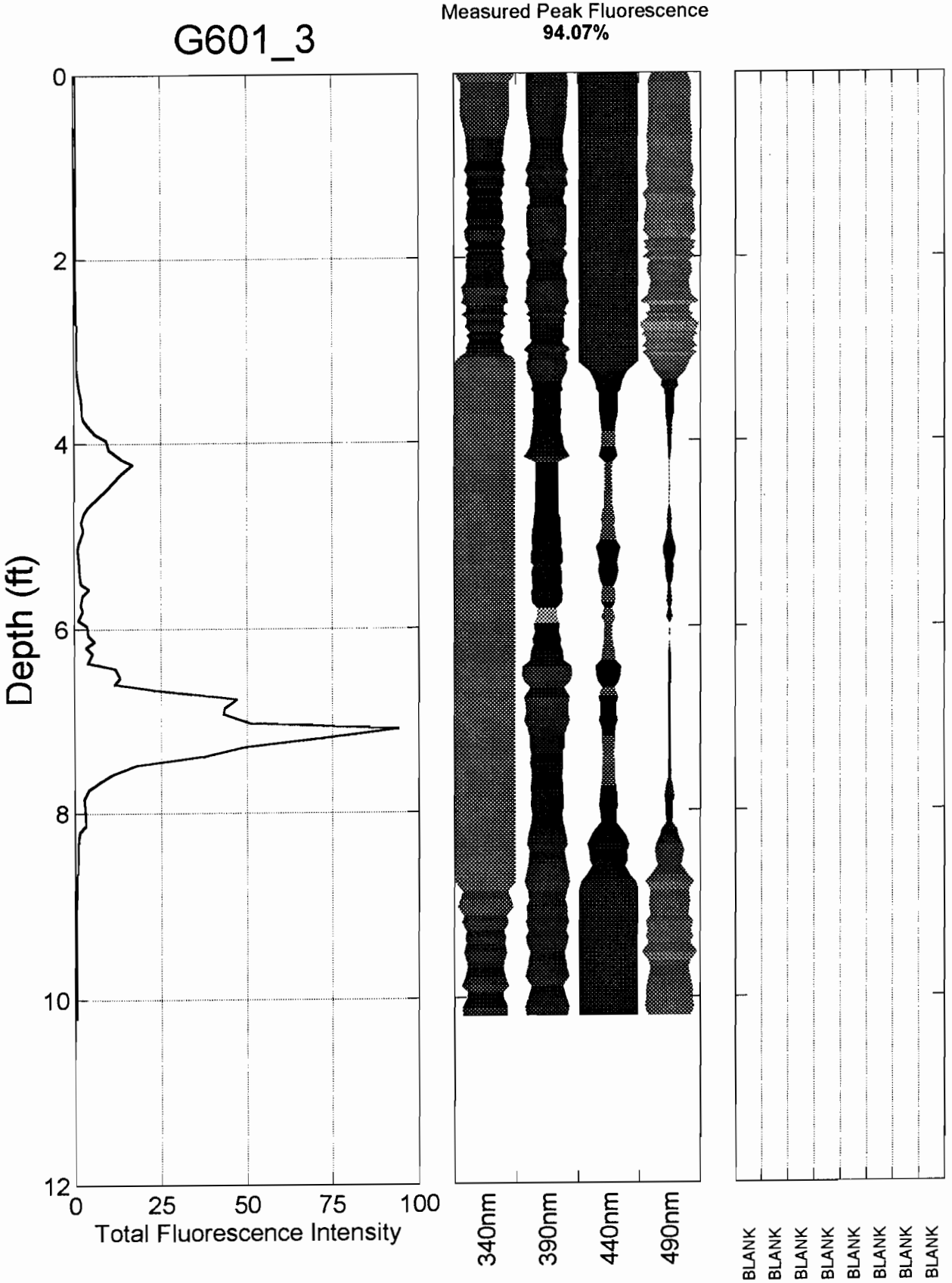

g601_1
Depth (ft)
Total Fluorescence Intensity
3.2 ft
4.7 ft
7.1 ft
8.9 ft
1
2
3
4
Waveform @ 3.2 ft
Waveform @ 4.7 ft
Waveform @ 7.1 ft
Waveform @ 8.9 ft
Signal (V)
Time (ns)

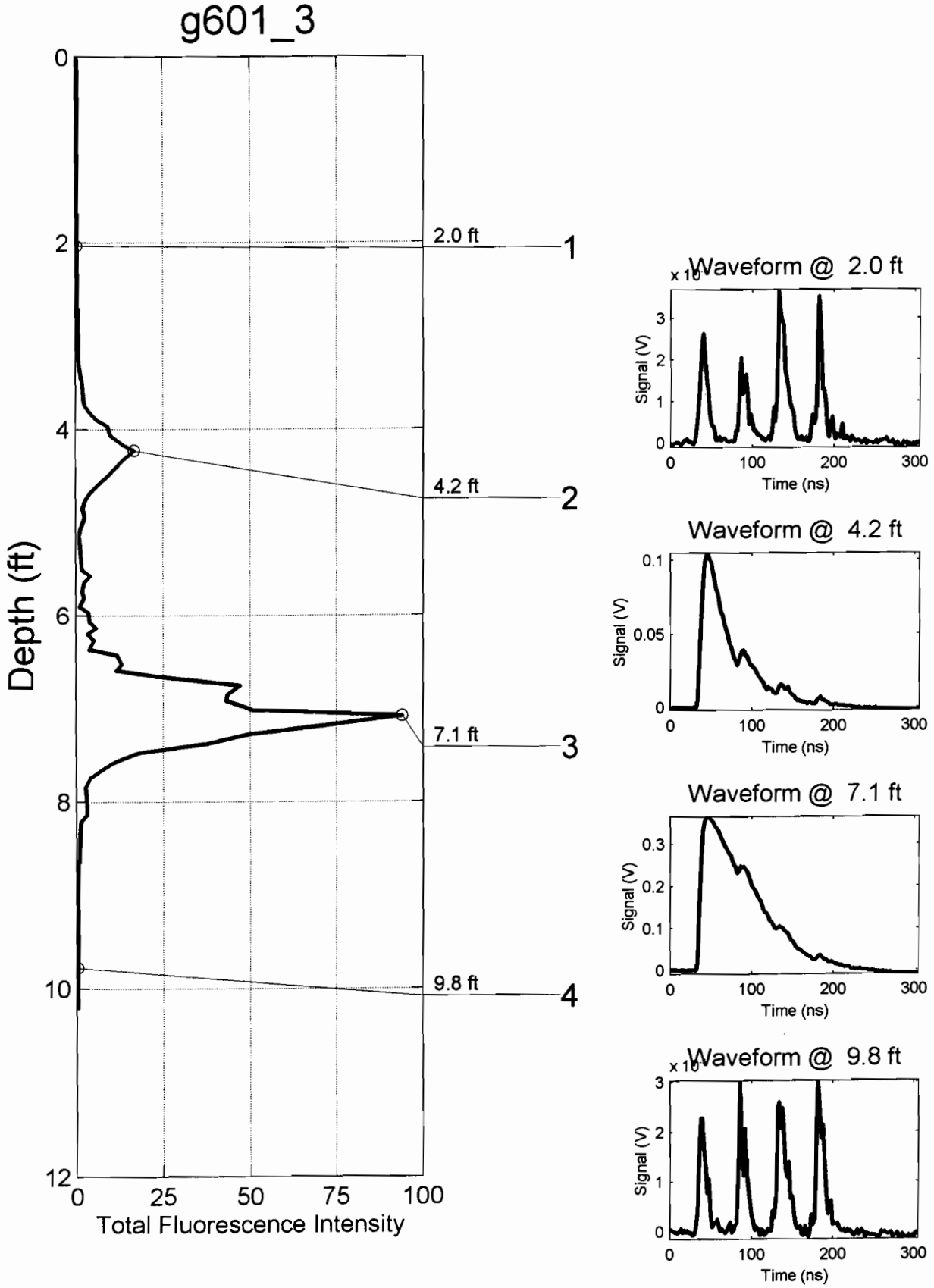
Measured LIF End Depth
10.01 ft
Measured Peak Fluorescence
132.1%



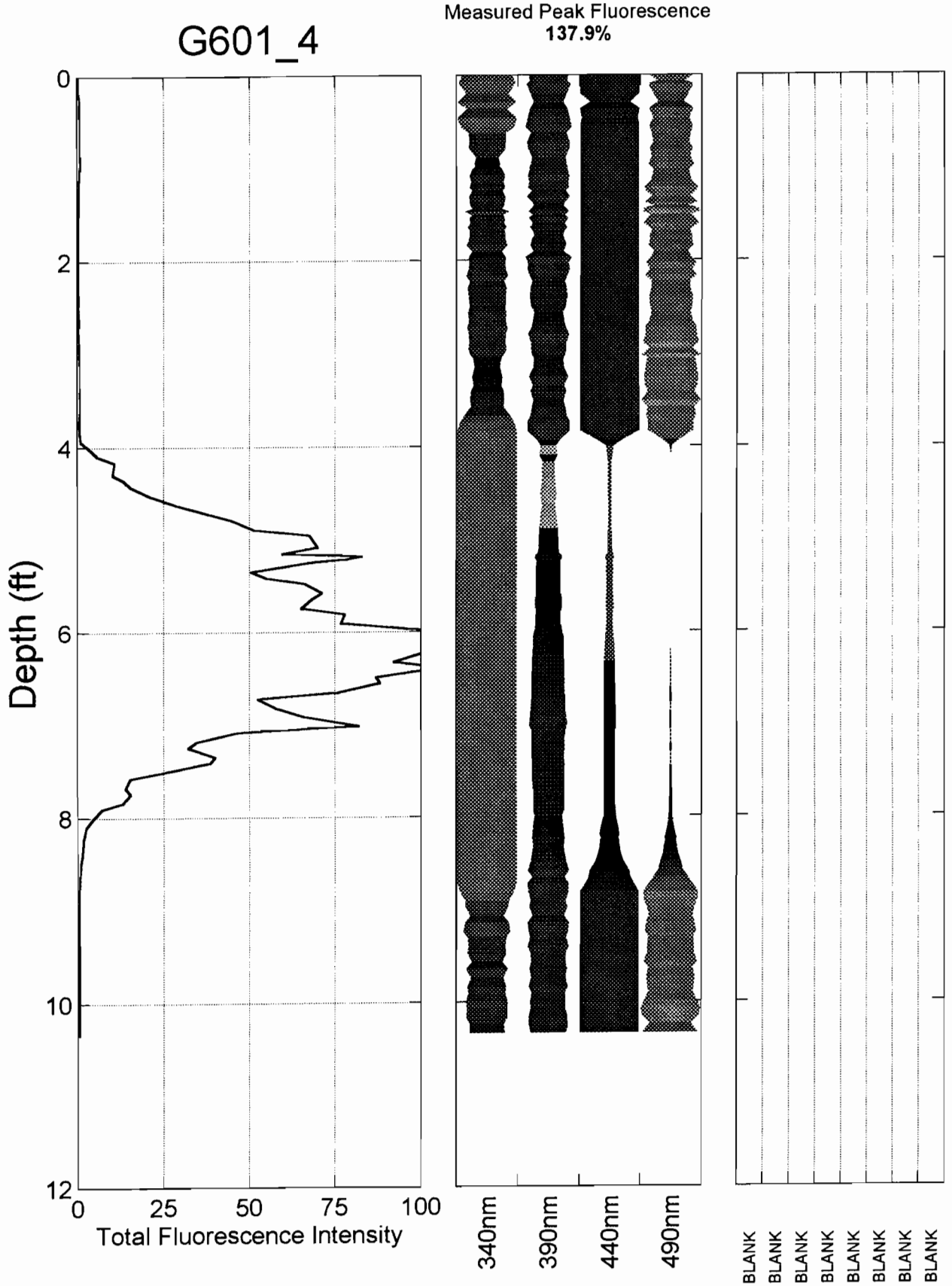

g601_2
Depth (ft)
Total Fluorescence Intensity
2.8 ft
4.6 ft
6.9 ft
9.5 ft
1
2
3
4
Waveform @ 2.8 ft
Waveform @ 4.6 ft
Waveform @ 6.9 ft
Waveform @ 9.5 ft
Signal (V)
Time (ns)

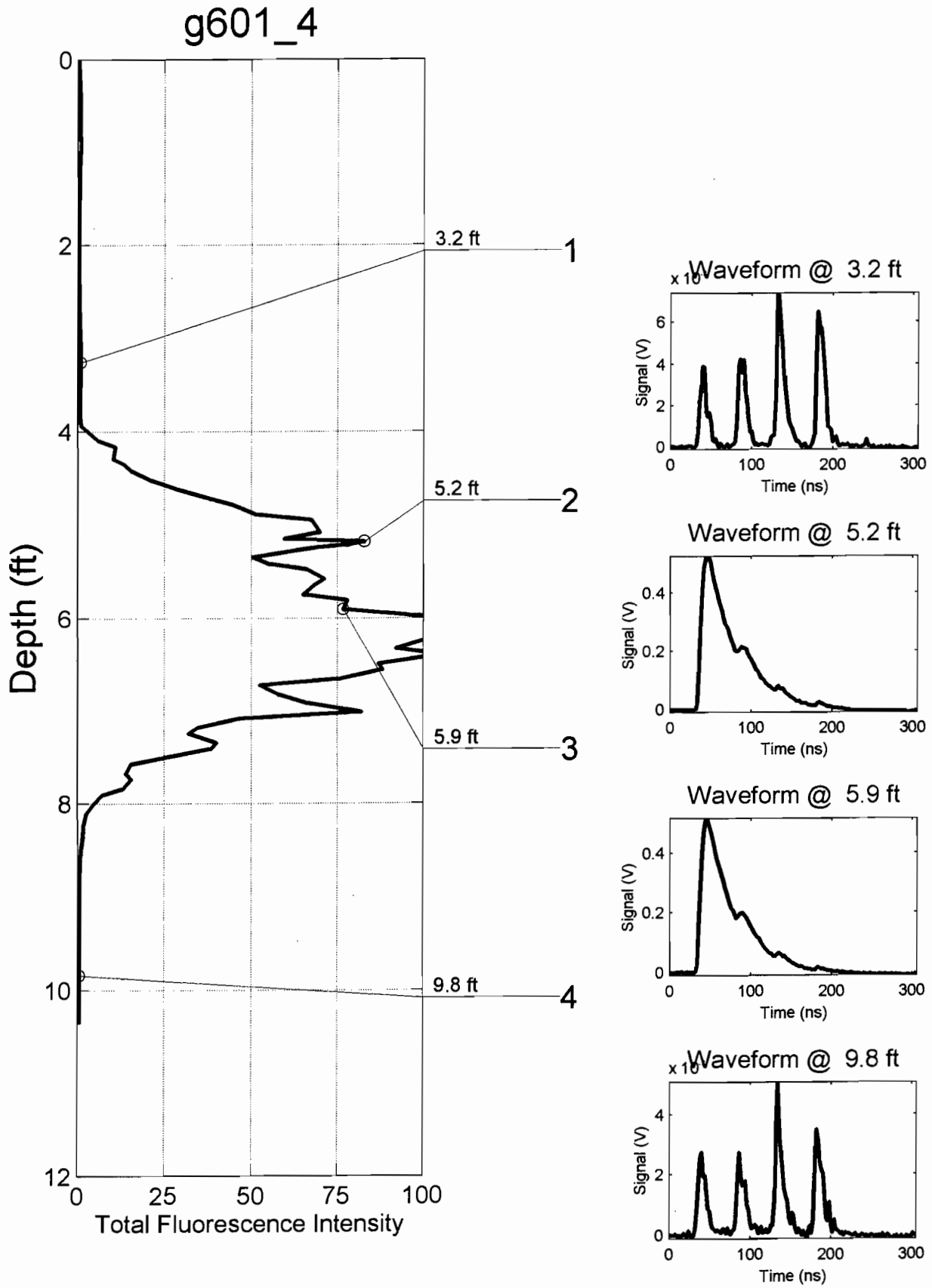
Measured LIF End Depth
10.2 ft
Measured Peak Fluorescence
94.07%



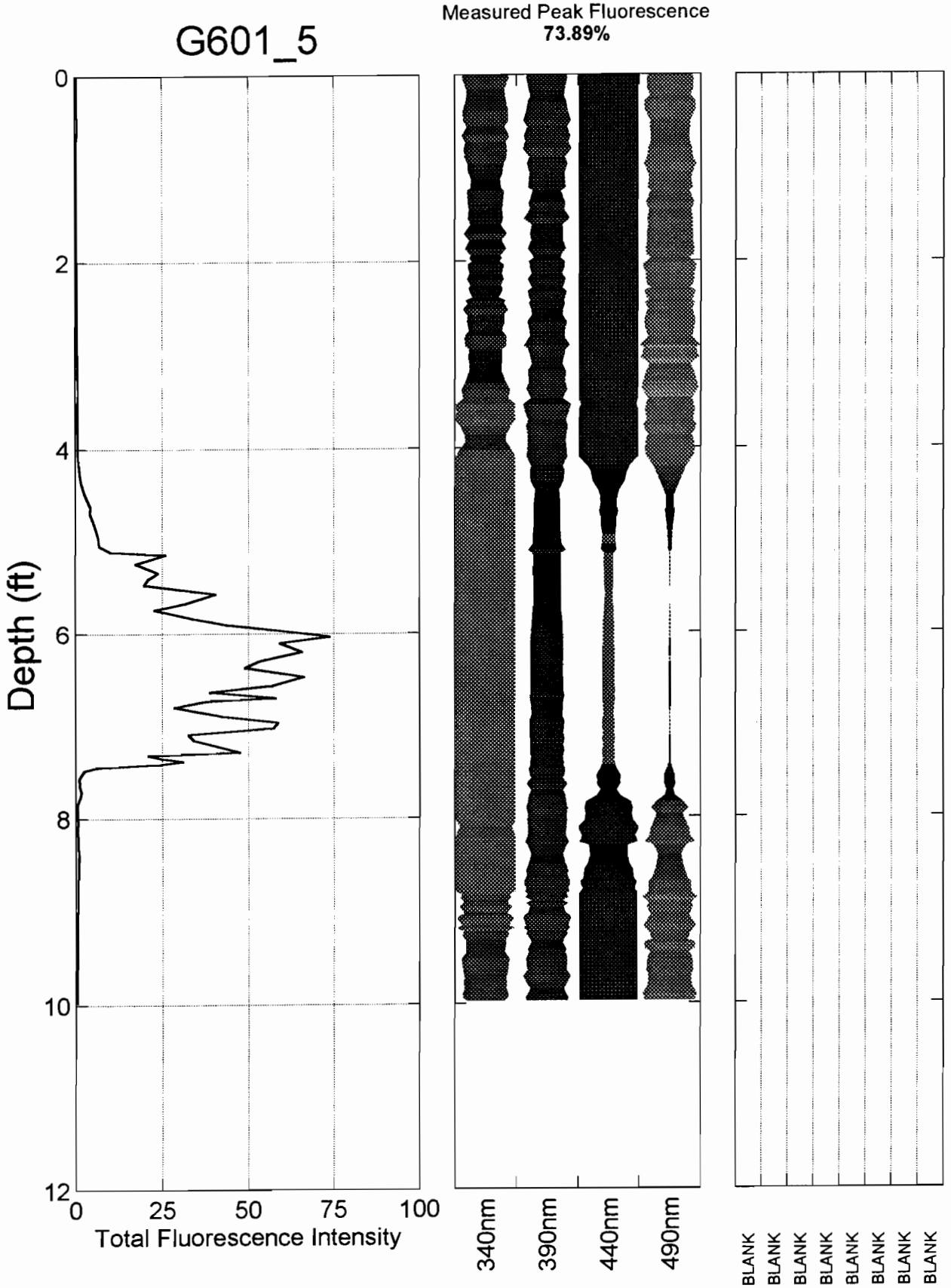

g601_3
Depth (ft)
Total Fluorescence Intensity
2.0 ft
4.2 ft
7.1 ft
9.8 ft
1
2
3
4
Waveform @ 2.0 ft
Waveform @ 4.2 ft
Waveform @ 7.1 ft
Waveform @ 9.8 ft
Signal (V)
Time (ns)

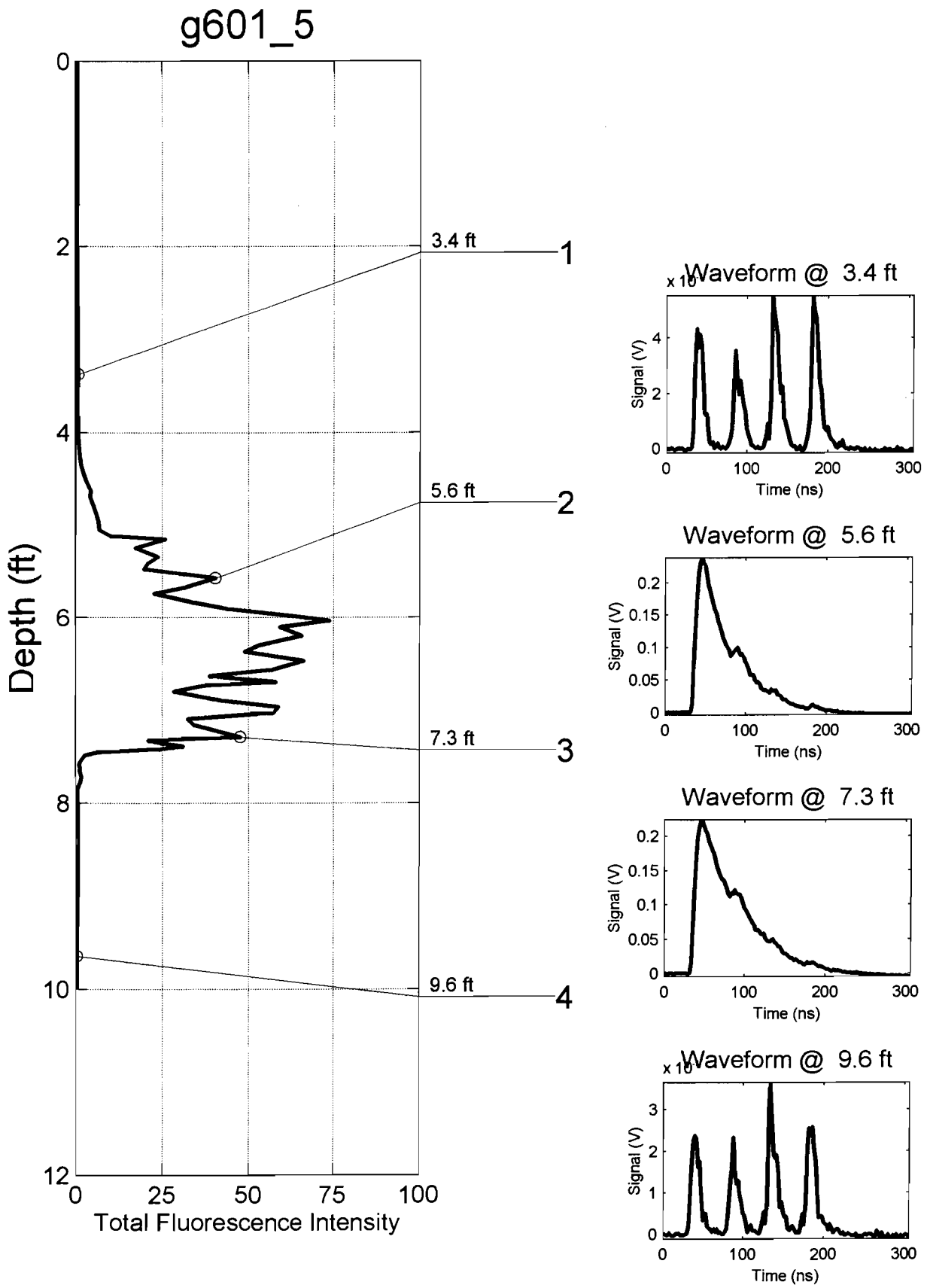
Measured LIF End Depth
10.33 ft
Measured Peak Fluorescence
137.9%



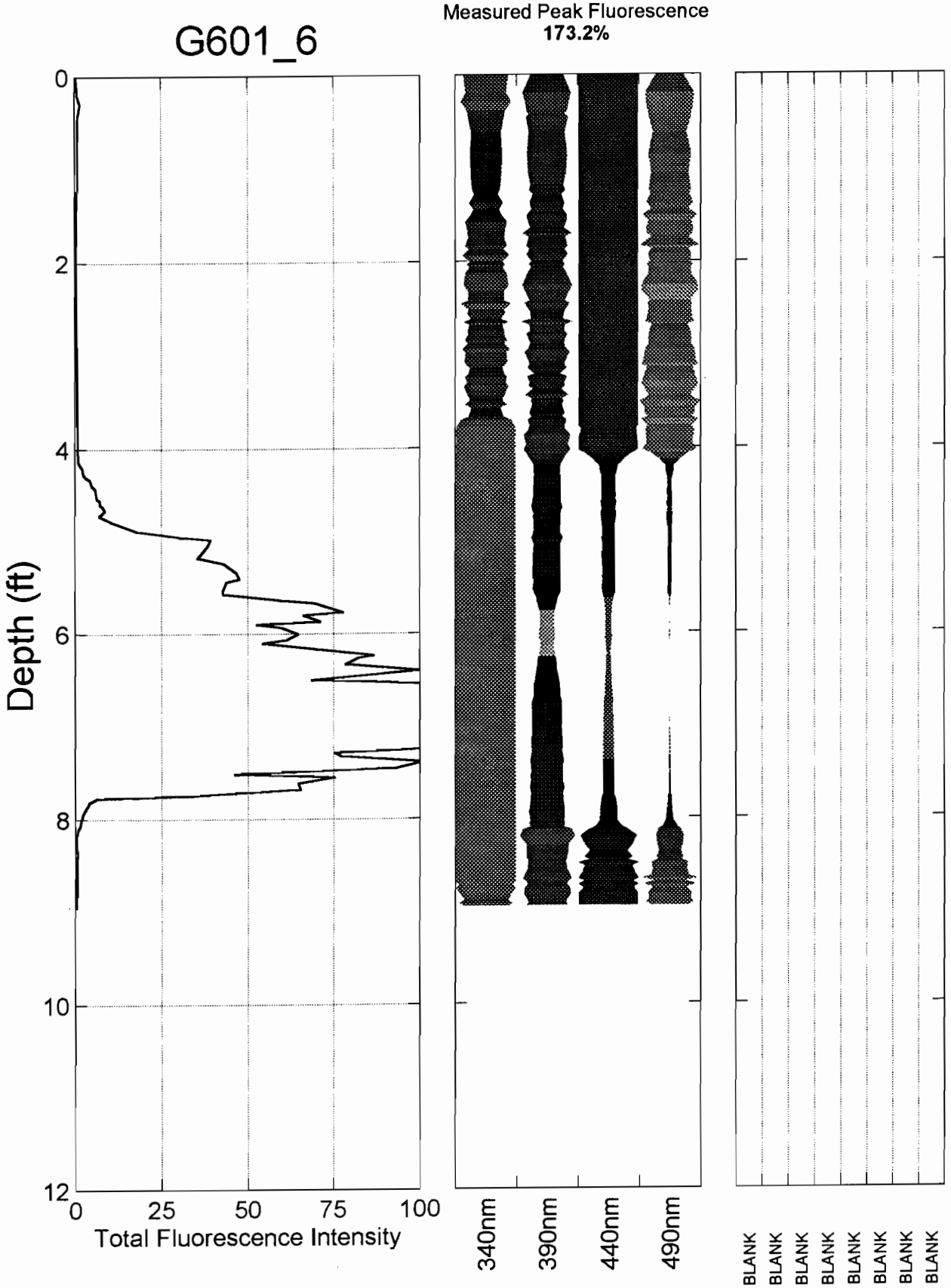

g601_4
Depth (ft)
Total Fluorescence Intensity
3.2 ft
5.2 ft
5.9 ft
9.8 ft
1
2
3
4
Waveform @ 3.2 ft
Waveform @ 5.2 ft
Waveform @ 5.9 ft
Waveform @ 9.8 ft
Signal (V)
Time (ns)

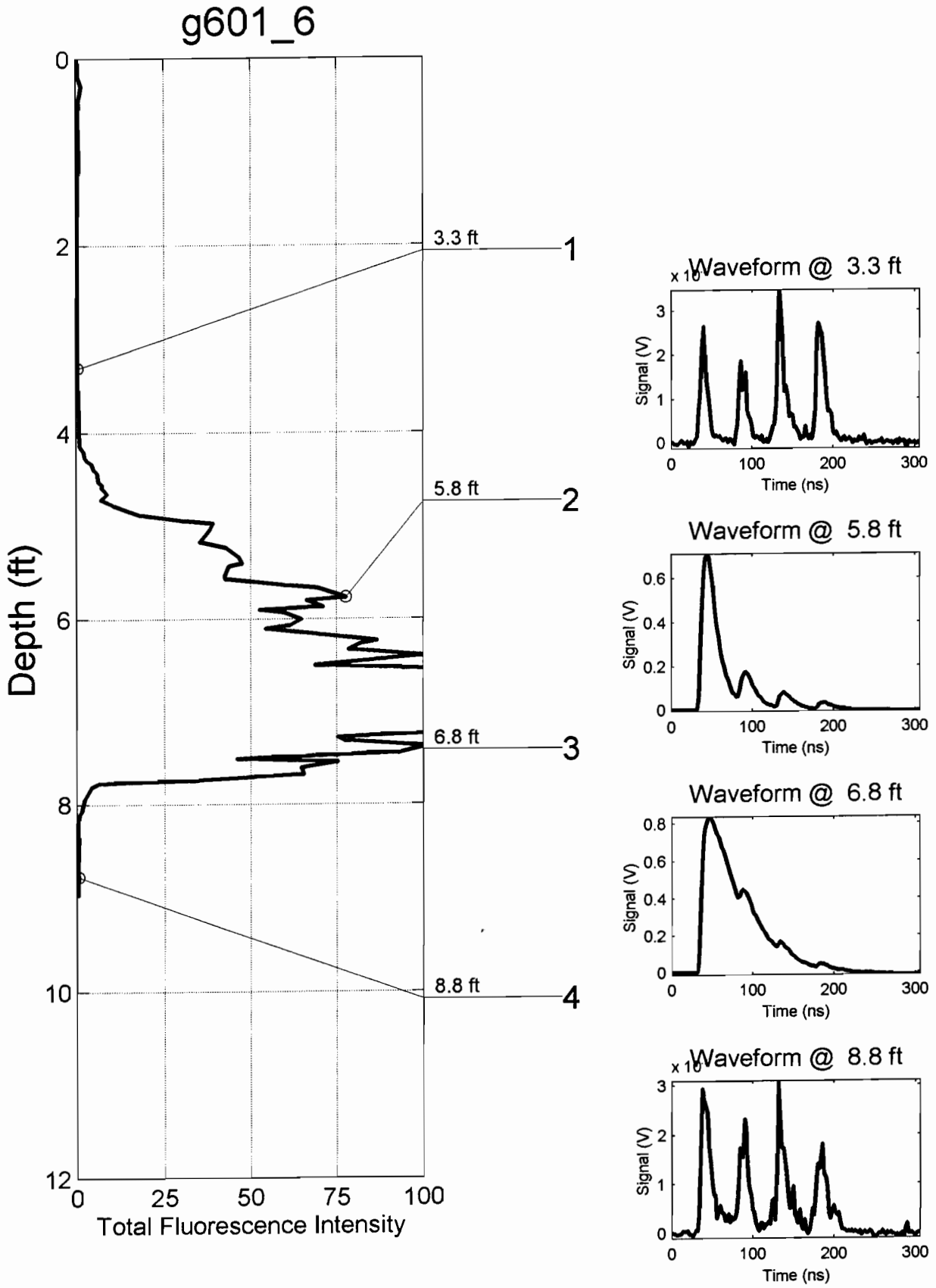
Measured LIF End Depth
9.974 ft
Measured Peak Fluorescence
73.89%



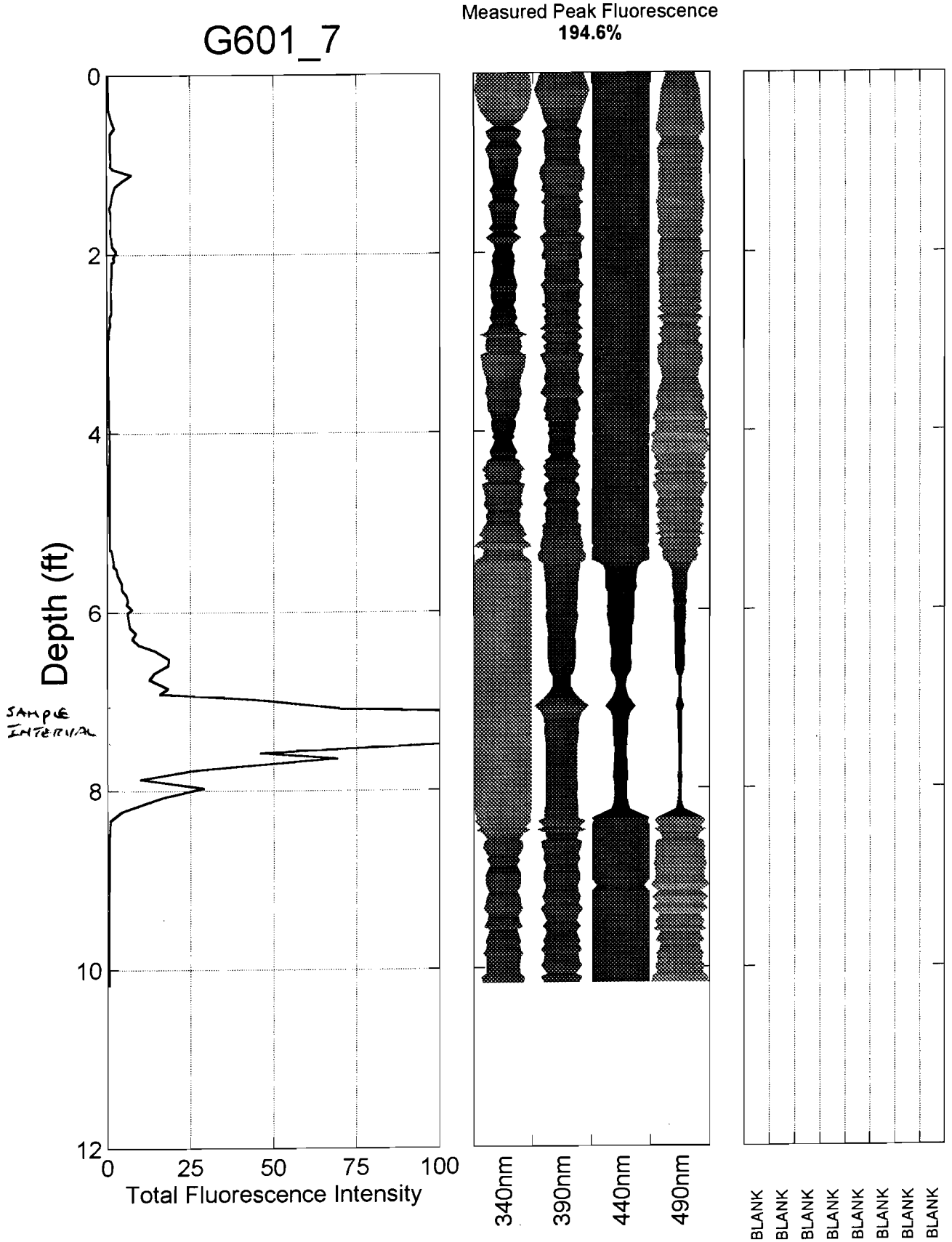

g601_5
Depth (ft)
Total Fluorescence Intensity
3.4 ft
5.6 ft
7.3 ft
9.6 ft
1
2
3
4
Waveform @ 3.4 ft
Waveform @ 5.6 ft
Waveform @ 7.3 ft
Waveform @ 9.6 ft
Signal (V)
Time (ns)

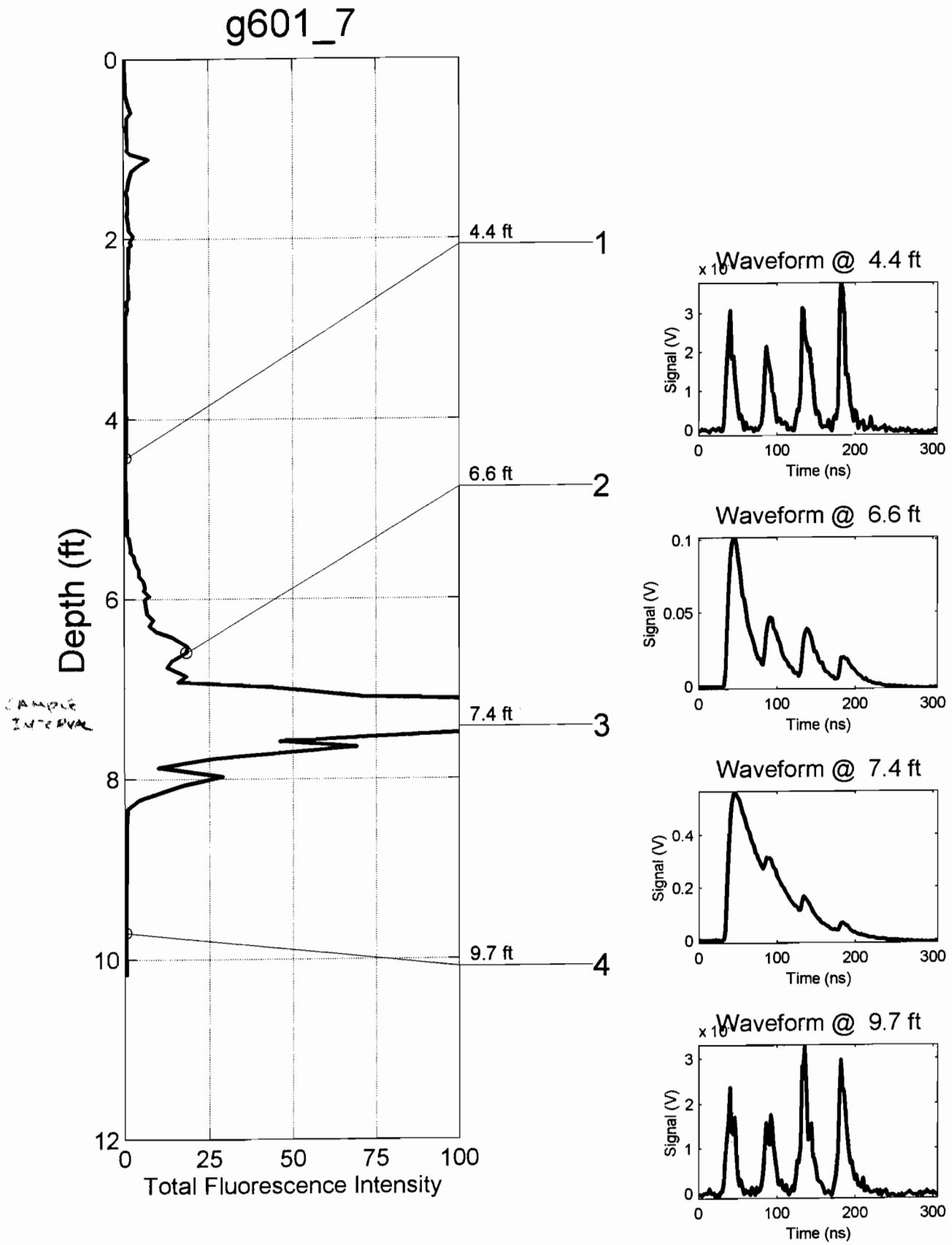
Measured LIF End Depth
8.957 ft
Measured Peak Fluorescence
173.2%



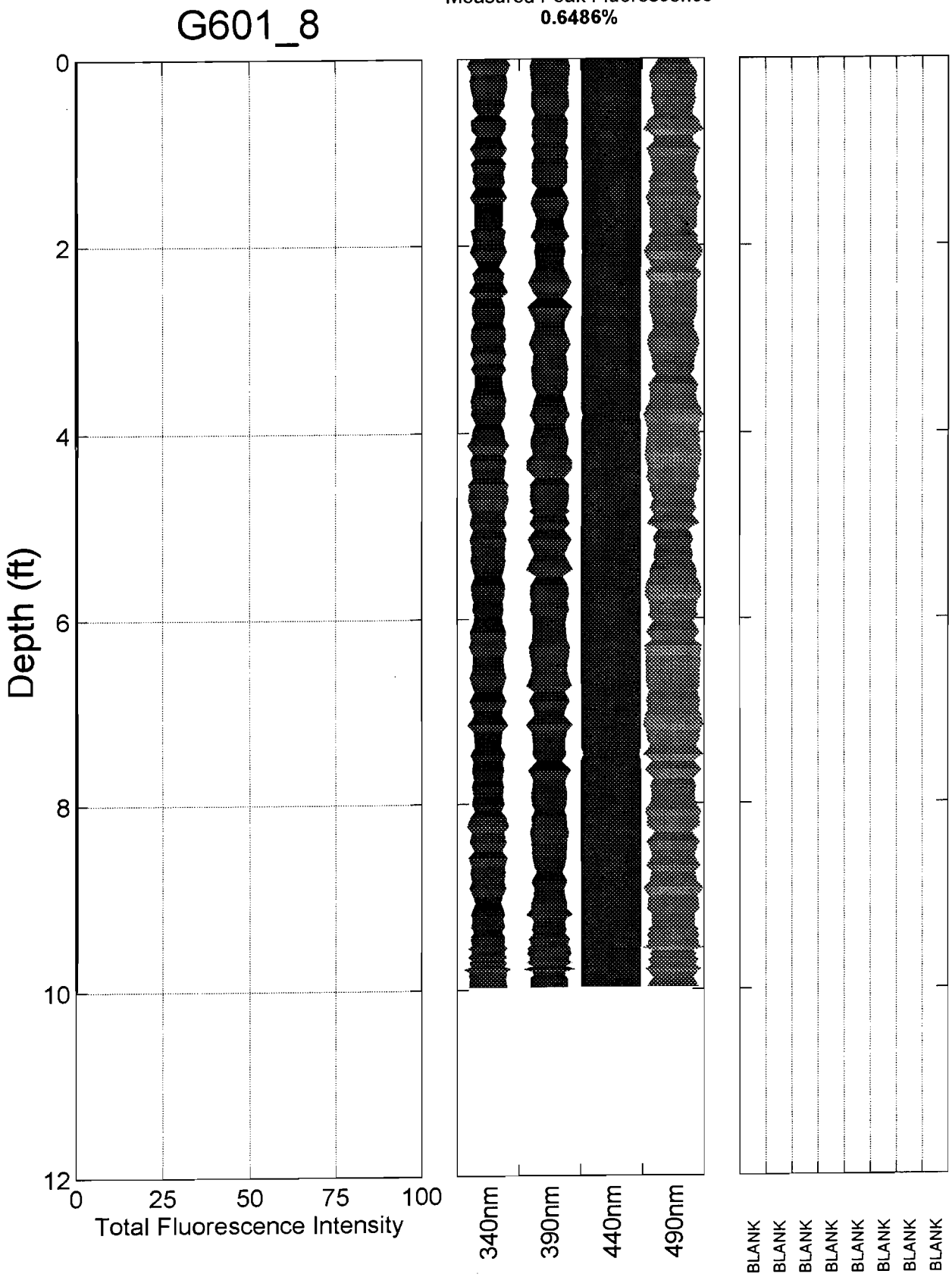

g601_6
Depth (ft)
Total Fluorescence Intensity
3.3 ft
5.8 ft
6.8 ft
8.8 ft
1
2
3
4
Waveform @ 3.3 ft
Waveform @ 5.8 ft
Waveform @ 6.8 ft
Waveform @ 8.8 ft
Signal (V)
Time (ns)

Measured LIF End Depth
10.17 ft
Measured Peak Fluorescence
194.6%

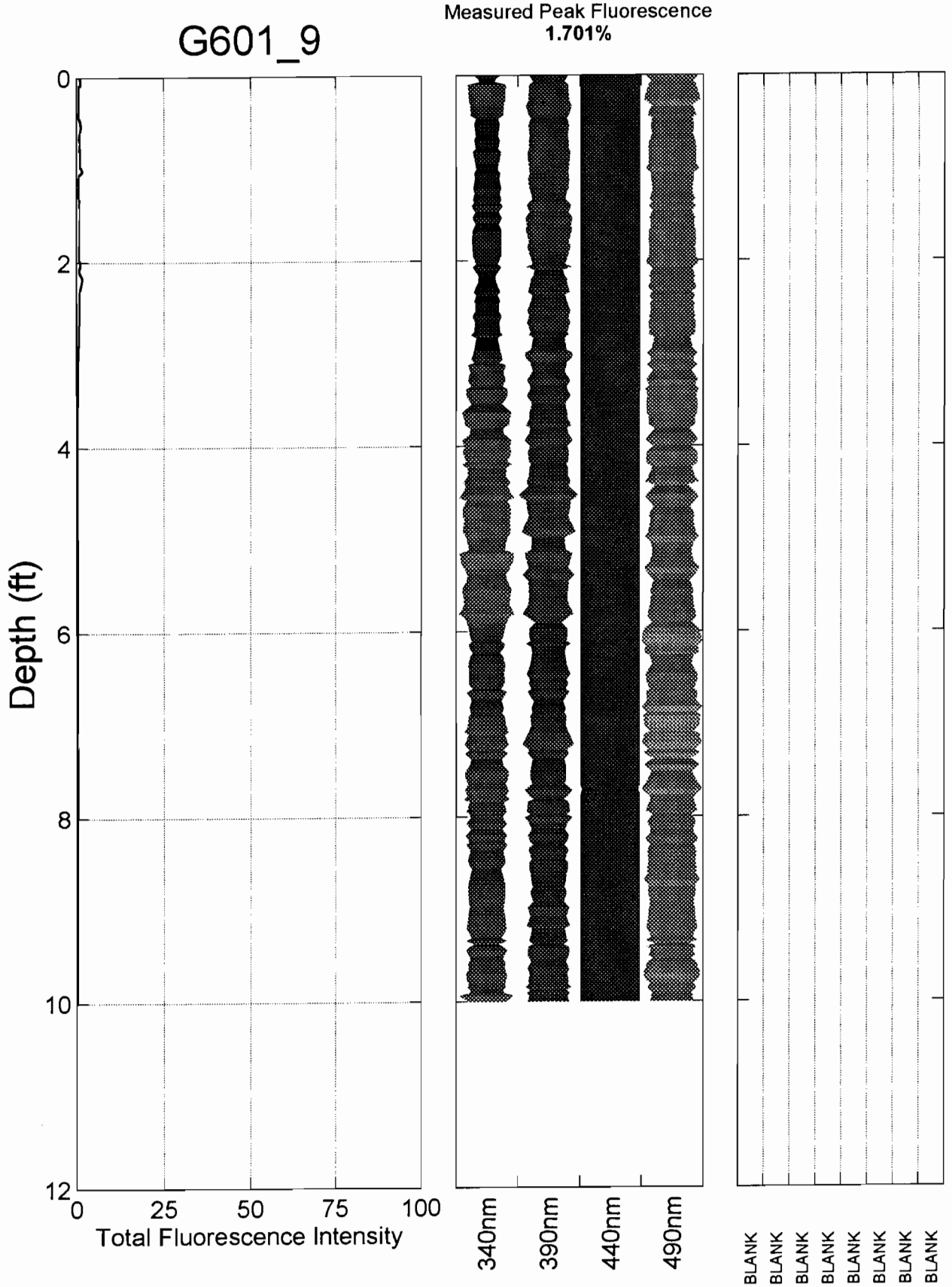



g601_7
Depth (ft)
Total Fluorescence Intensity
4.4 ft
6.6 ft
7.4 ft
9.7 ft
1
2
3
4
Waveform @ 4.4 ft
Waveform @ 6.6 ft
Waveform @ 7.4 ft
Waveform @ 9.7 ft
Signal (V)
Time (ns)

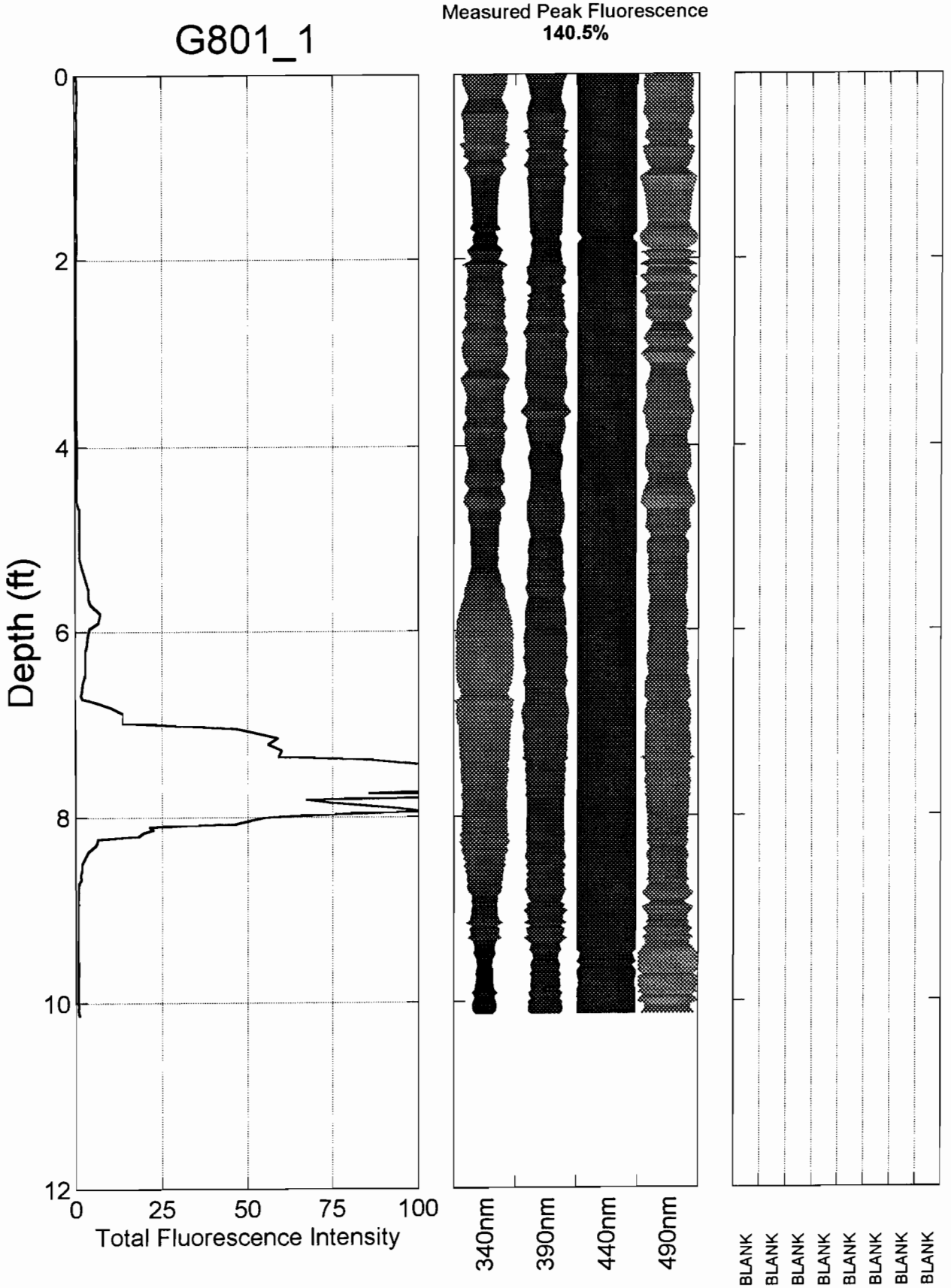
Measured LIF End Depth
9.974 ft
Measured Peak Fluorescence
0.6486%

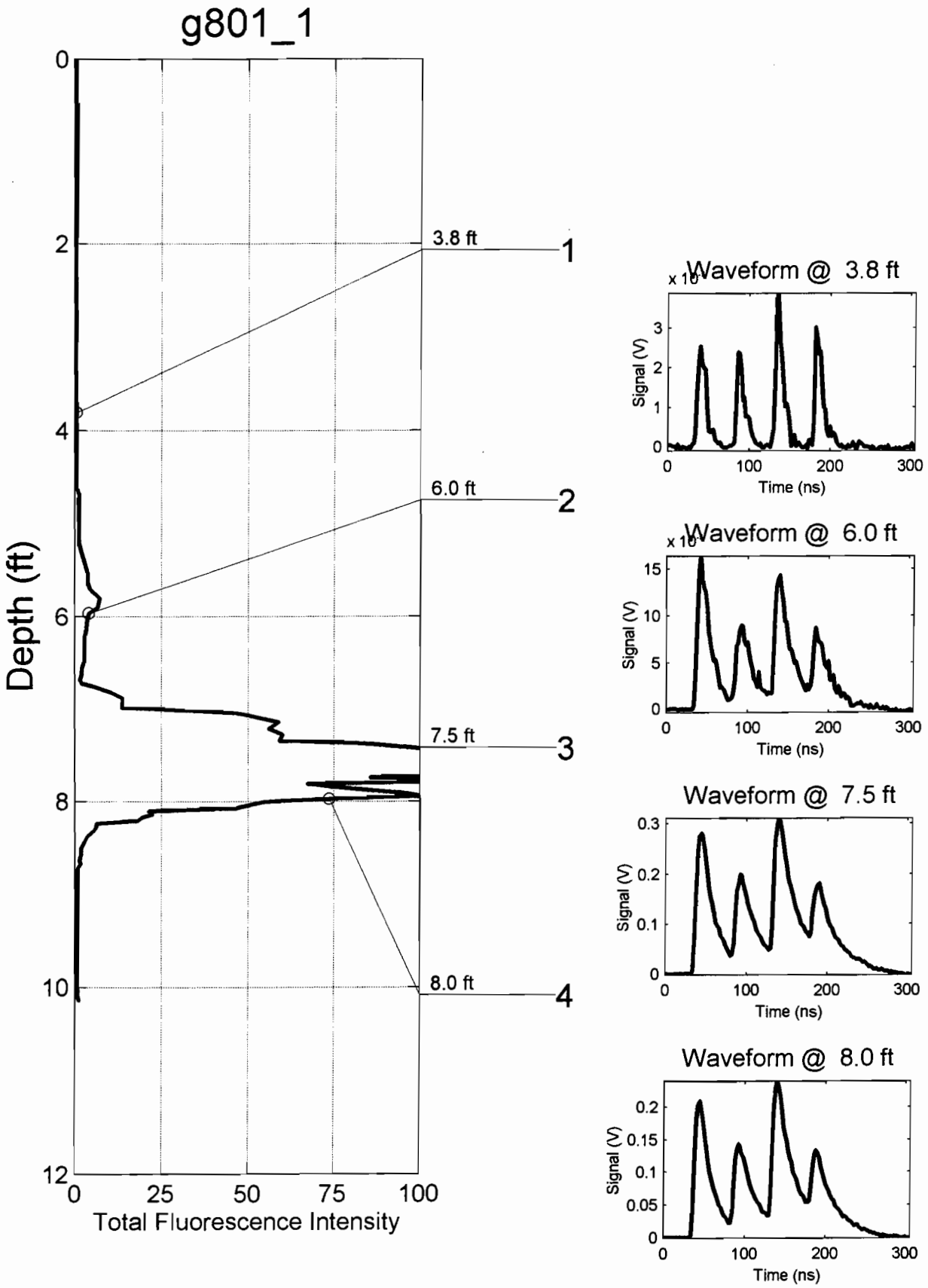


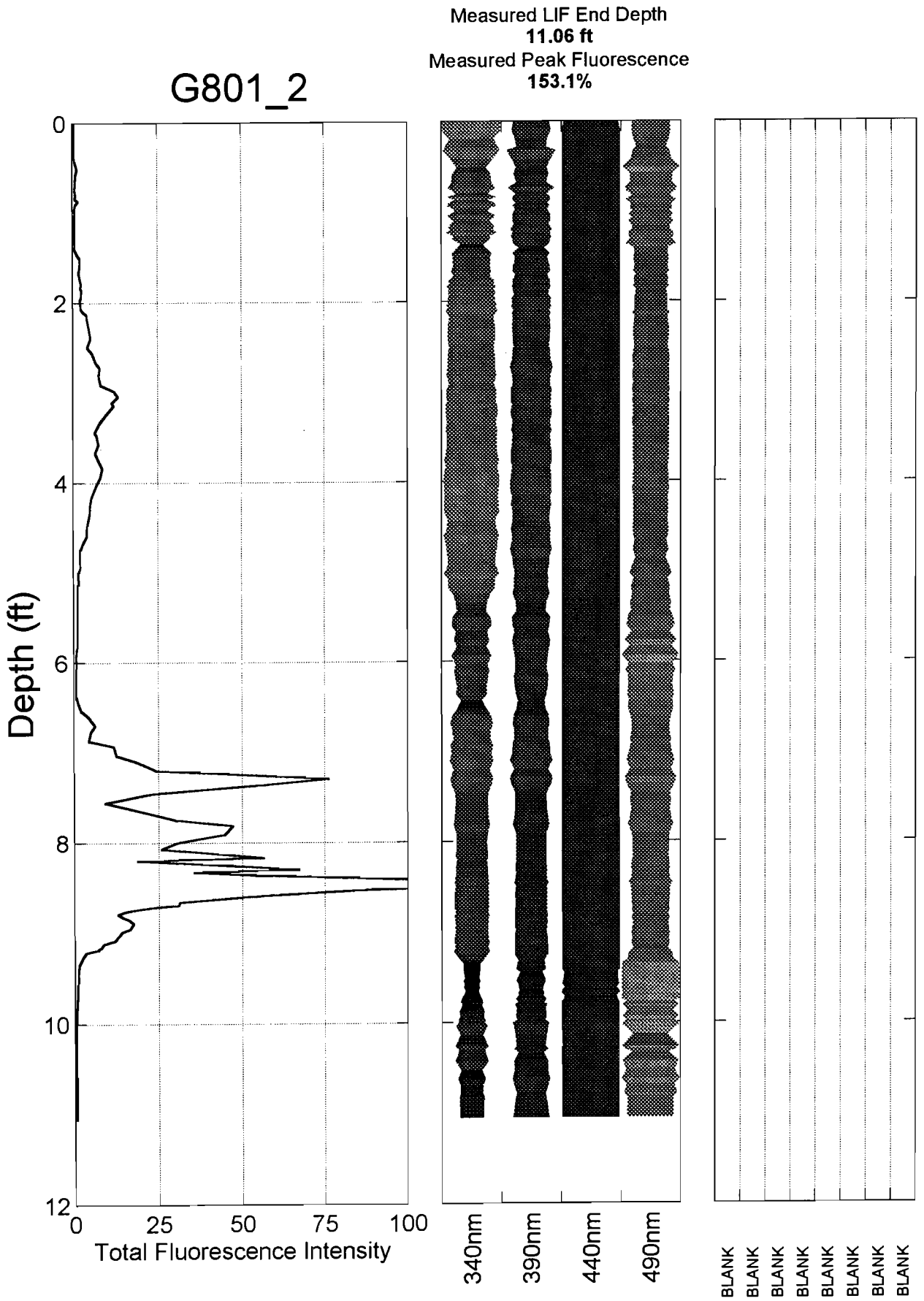
Measured LIF End Depth
10.01 ft
Measured Peak Fluorescence
1.701%

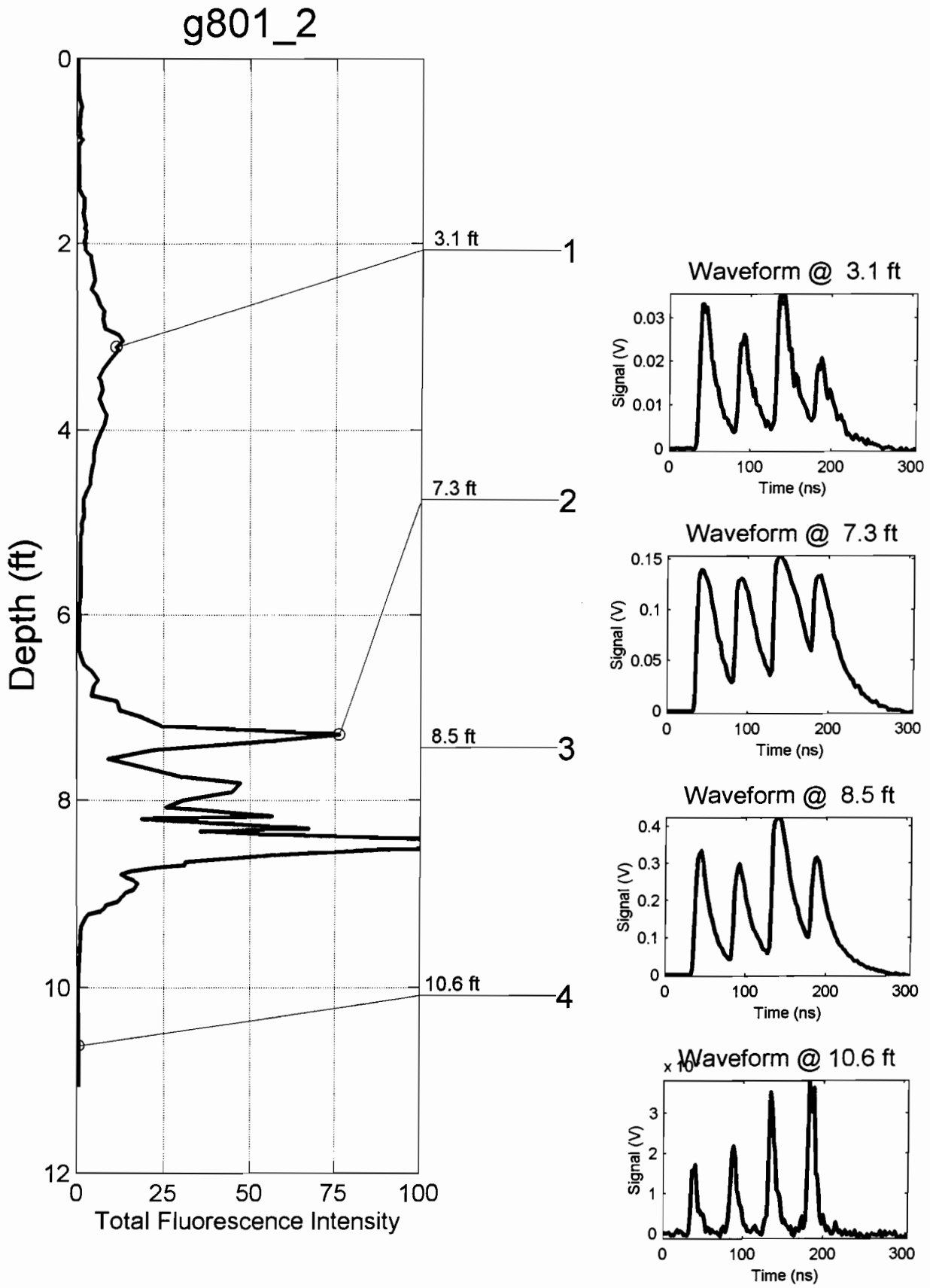


Measured LIF End Depth
10.14 ft
Measured Peak Fluorescence
140.5%

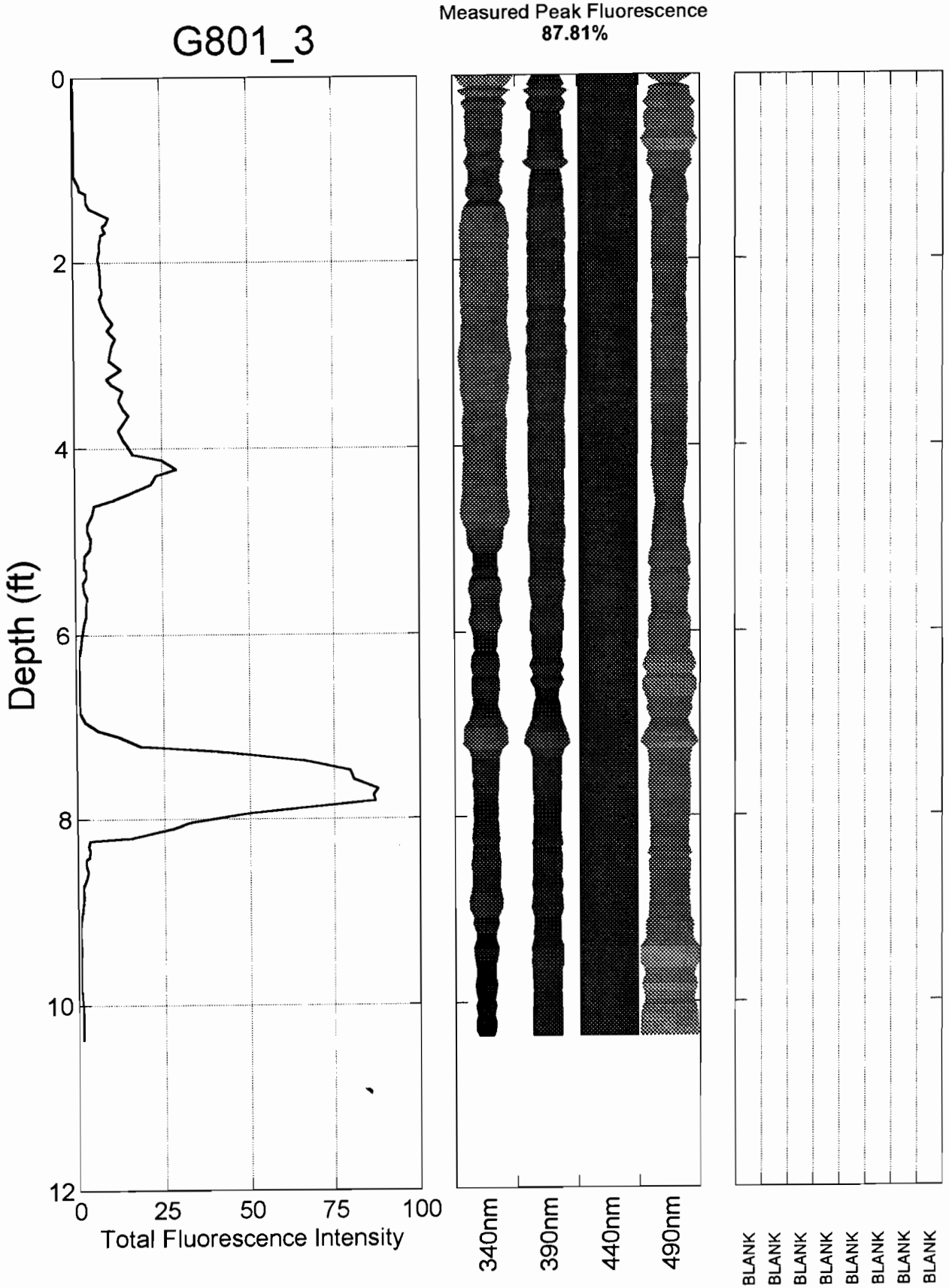


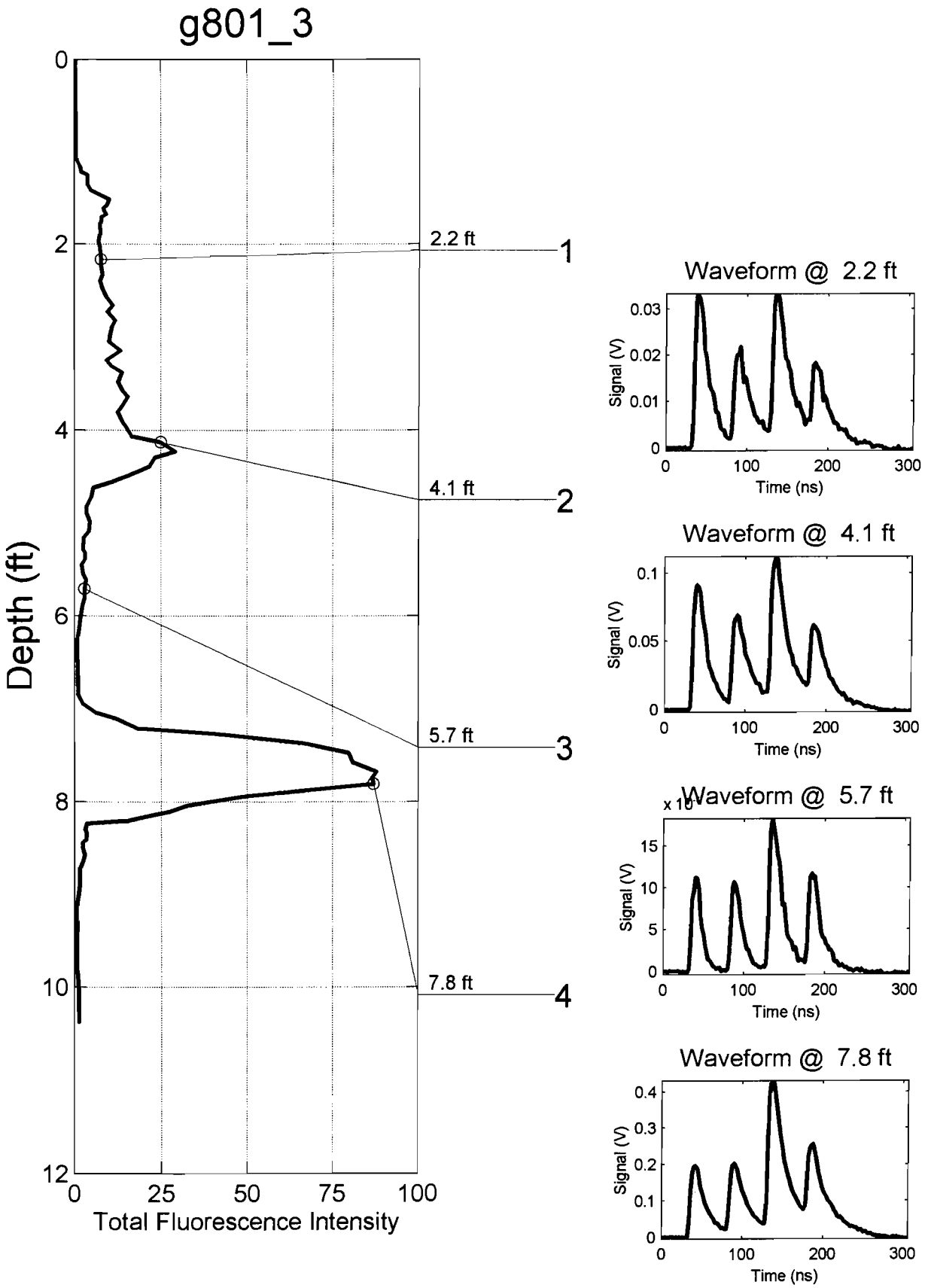

g801_1
Depth (ft)
Total Fluorescence Intensity
3.8 ft
6.0 ft
7.5 ft
8.0 ft
1
2
3
4
Waveform @ 3.8 ft
Waveform @ 6.0 ft
Waveform @ 7.5 ft
Waveform @ 8.0 ft
Signal (V)
Time (ns)


Measured LIF End Depth
11.06 ft
Measured Peak Fluorescence
153.1%
G801_2
Depth (ft)
0
2
4
6
8
10
12
0
25
50
75
100
Total Fluorescence Intensity
340nm
390nm
440nm
490nm
BLANK
BLANK
BLANK
BLANK
BLANK
BLANK
BLANK
BLANK


g801_2
Depth (ft)
Total Fluorescence Intensity
3.1 ft
7.3 ft
8.5 ft
10.6 ft
1
2
3
4
Waveform @ 3.1 ft
Waveform @ 7.3 ft
Waveform @ 8.5 ft
Waveform @ 10.6 ft
Signal (V)
Time (ns)

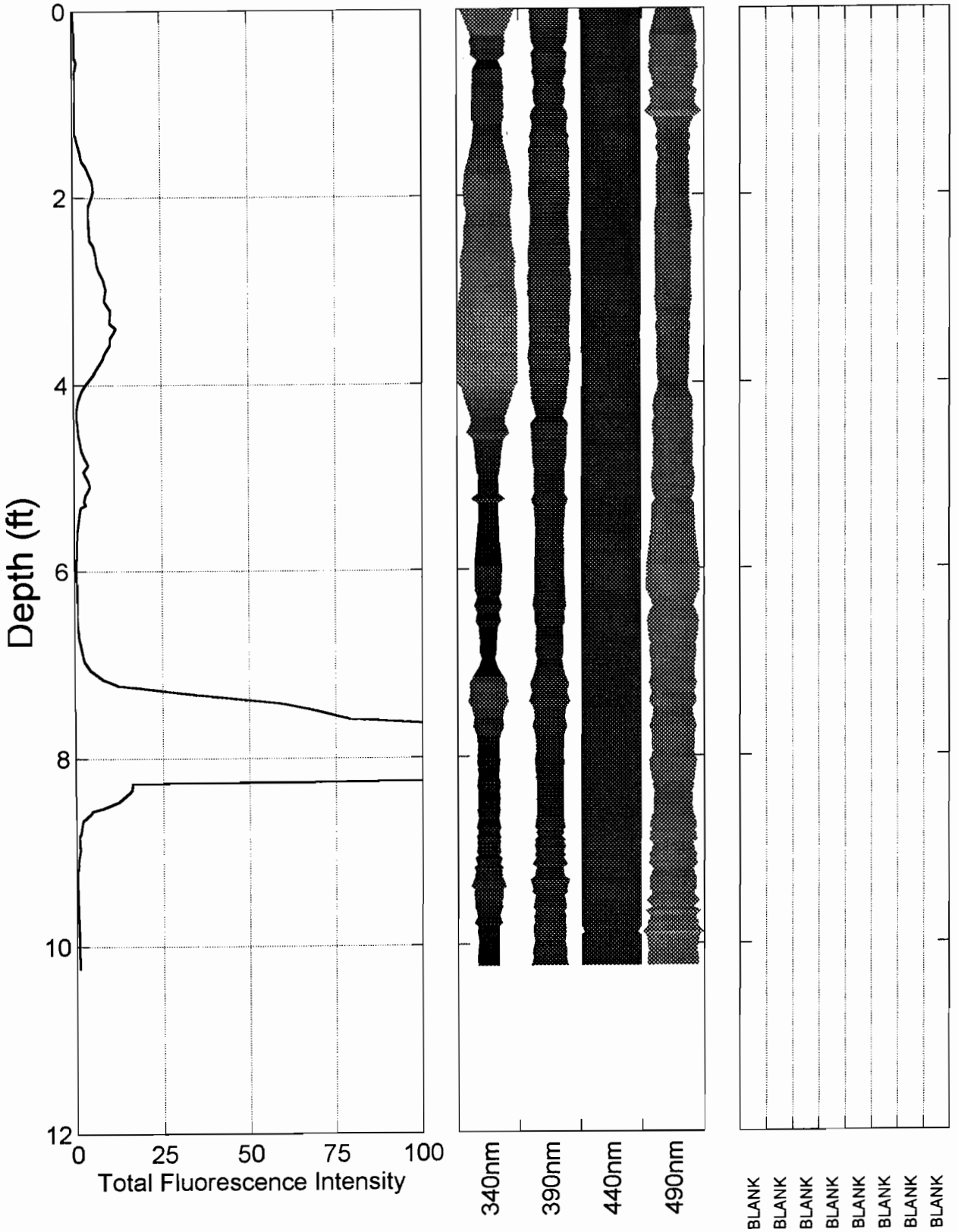
Measured LIF End Depth
10.37 ft
Measured Peak Fluorescence
87.81%

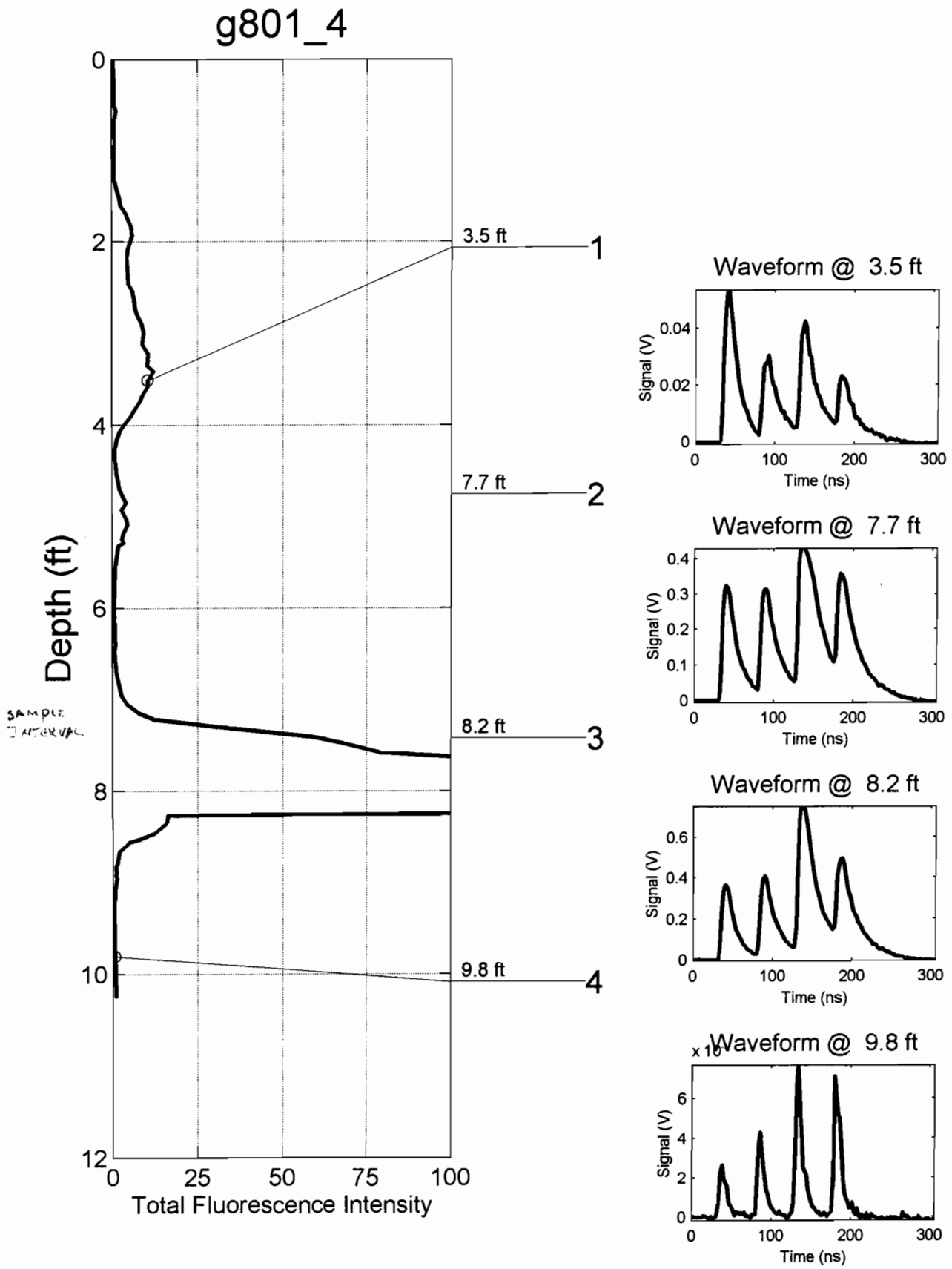



g801_3
Depth (ft)
Total Fluorescence Intensity
2.2 ft
4.1 ft
5.7 ft
7.8 ft
1
2
3
4
Waveform @ 2.2 ft
Waveform @ 4.1 ft
Waveform @ 5.7 ft
Waveform @ 7.8 ft
Signal (V)
Time (ns)

Measured LIF End Depth
10.24 ft
Measured Peak Fluorescence
214.1%

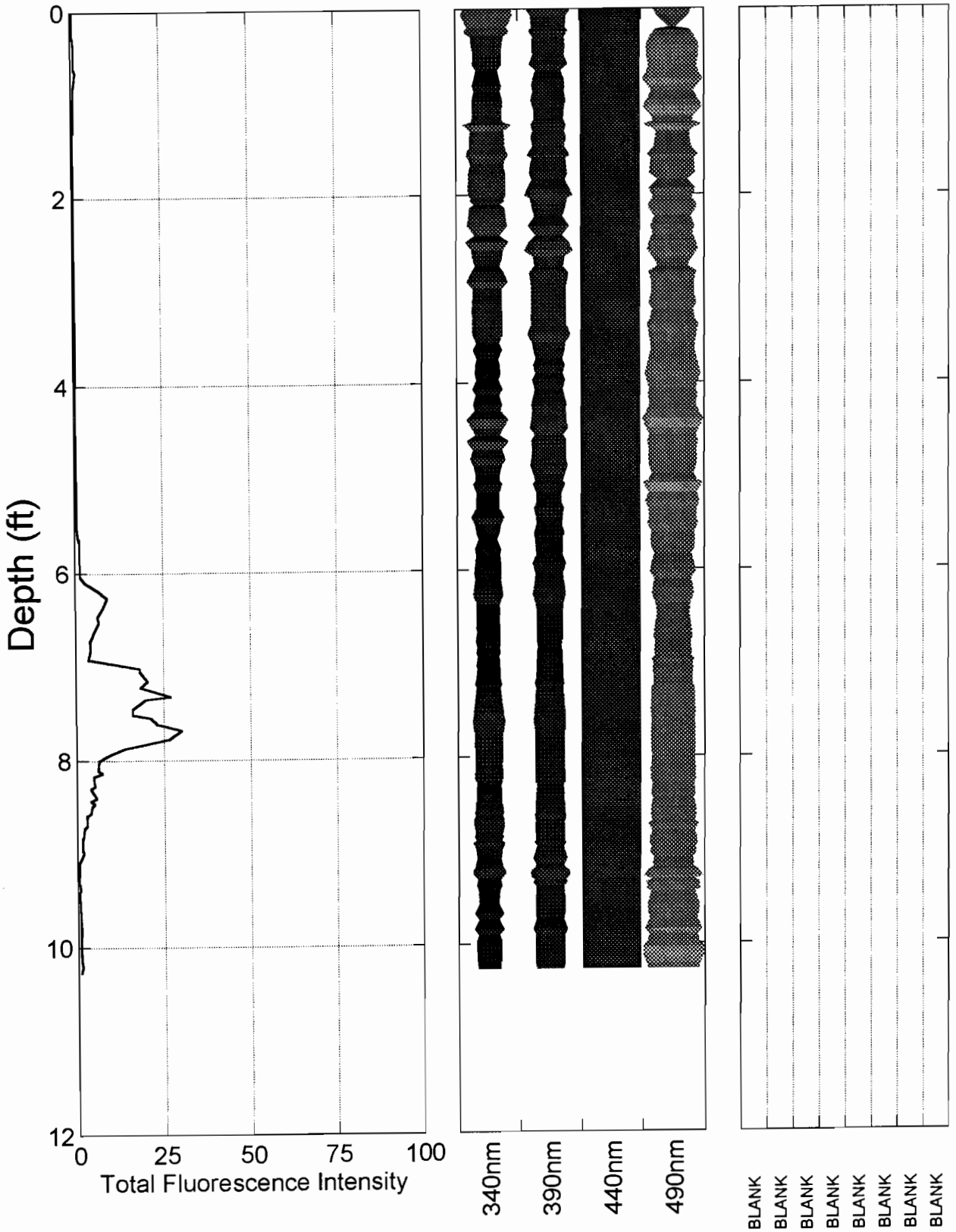
G801_4

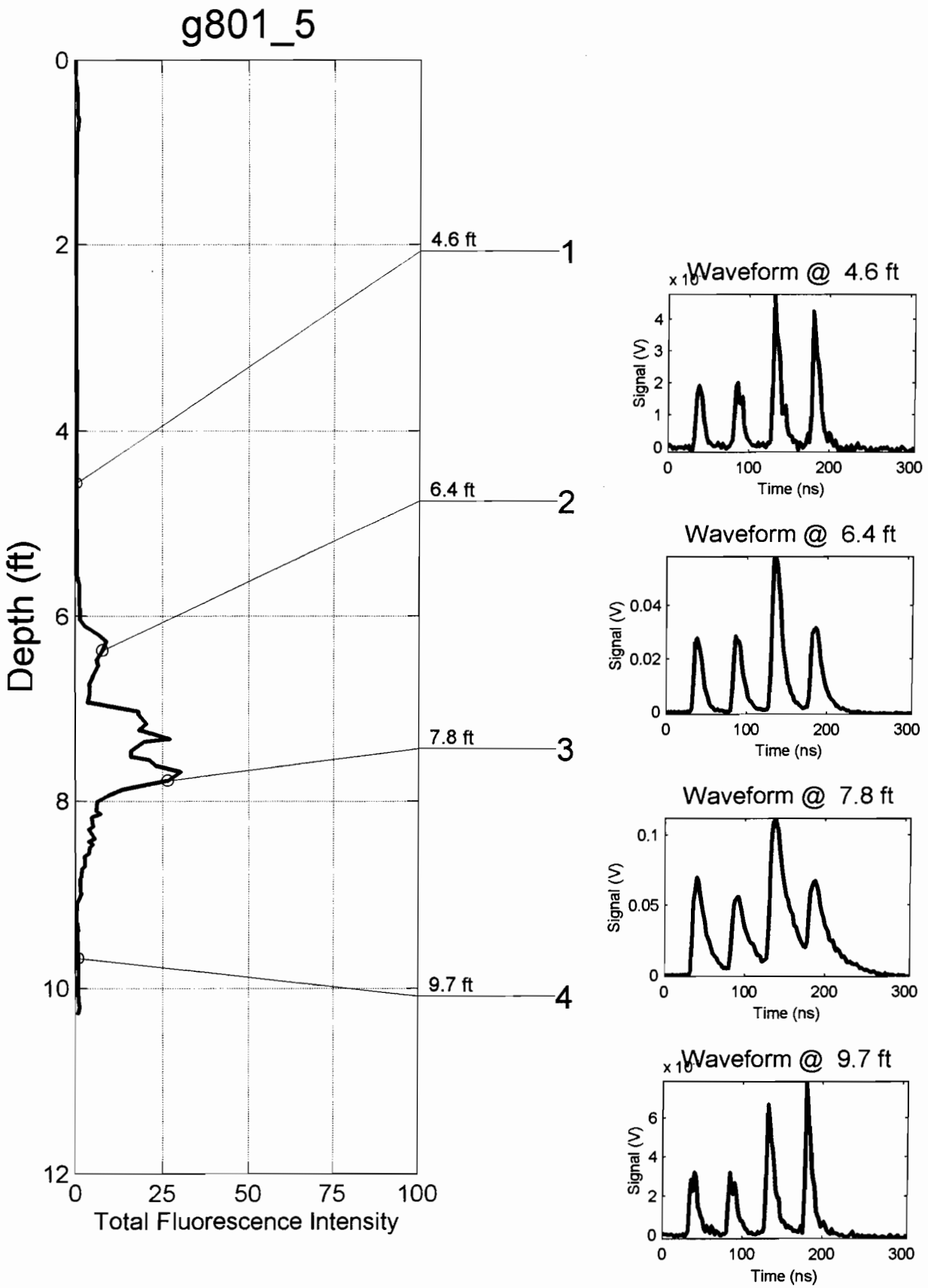



g801_4
Depth (ft)
Total Fluorescence Intensity
3.5 ft
7.7 ft
8.2 ft
9.8 ft
1
2
3
4
Waveform @ 3.5 ft
Waveform @ 7.7 ft
Waveform @ 8.2 ft
Waveform @ 9.8 ft
Signal (V)
Time (ns)
x 10

Measured LIF End Depth
10.27 ft
Measured Peak Fluorescence
30.33%

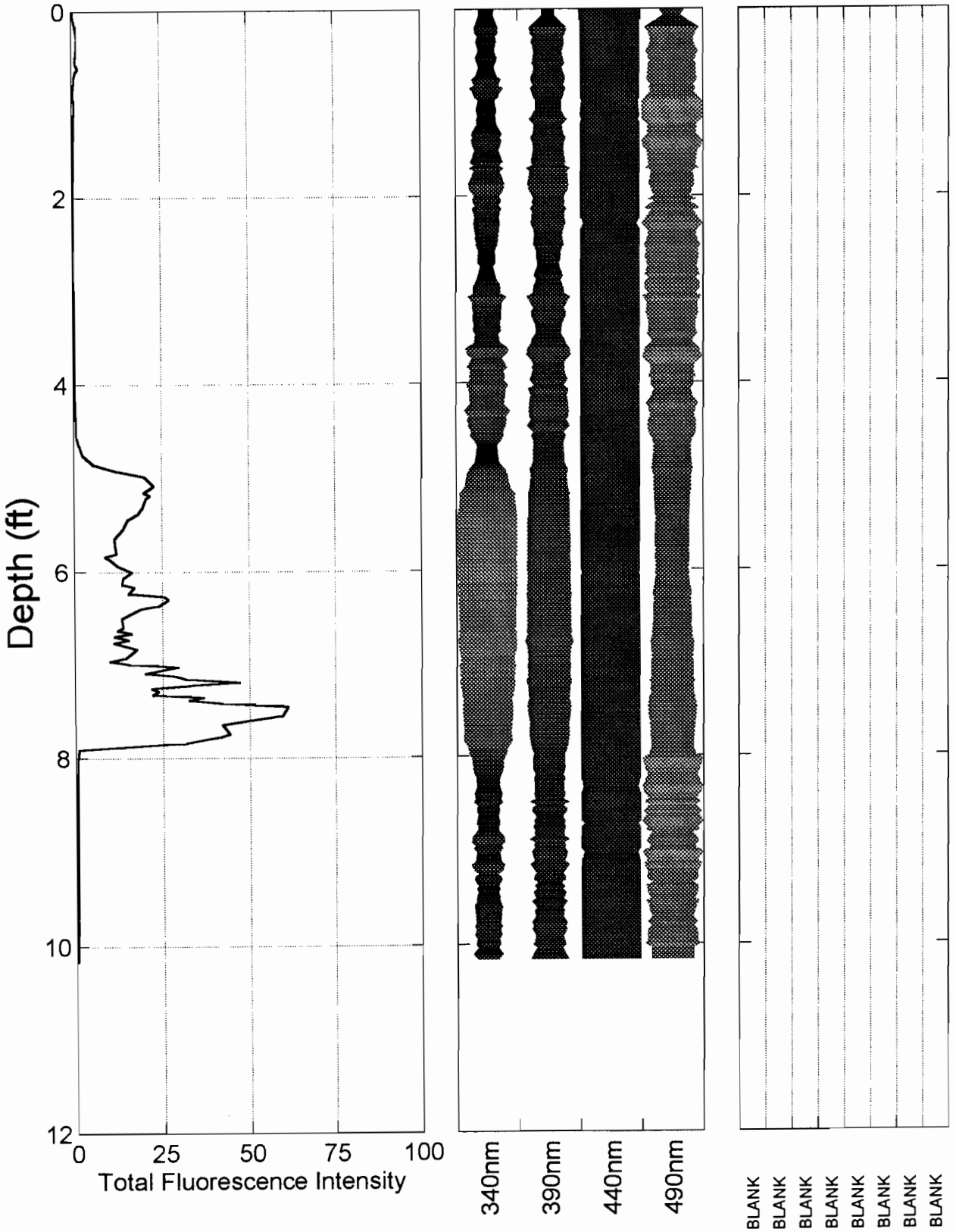
G801_5

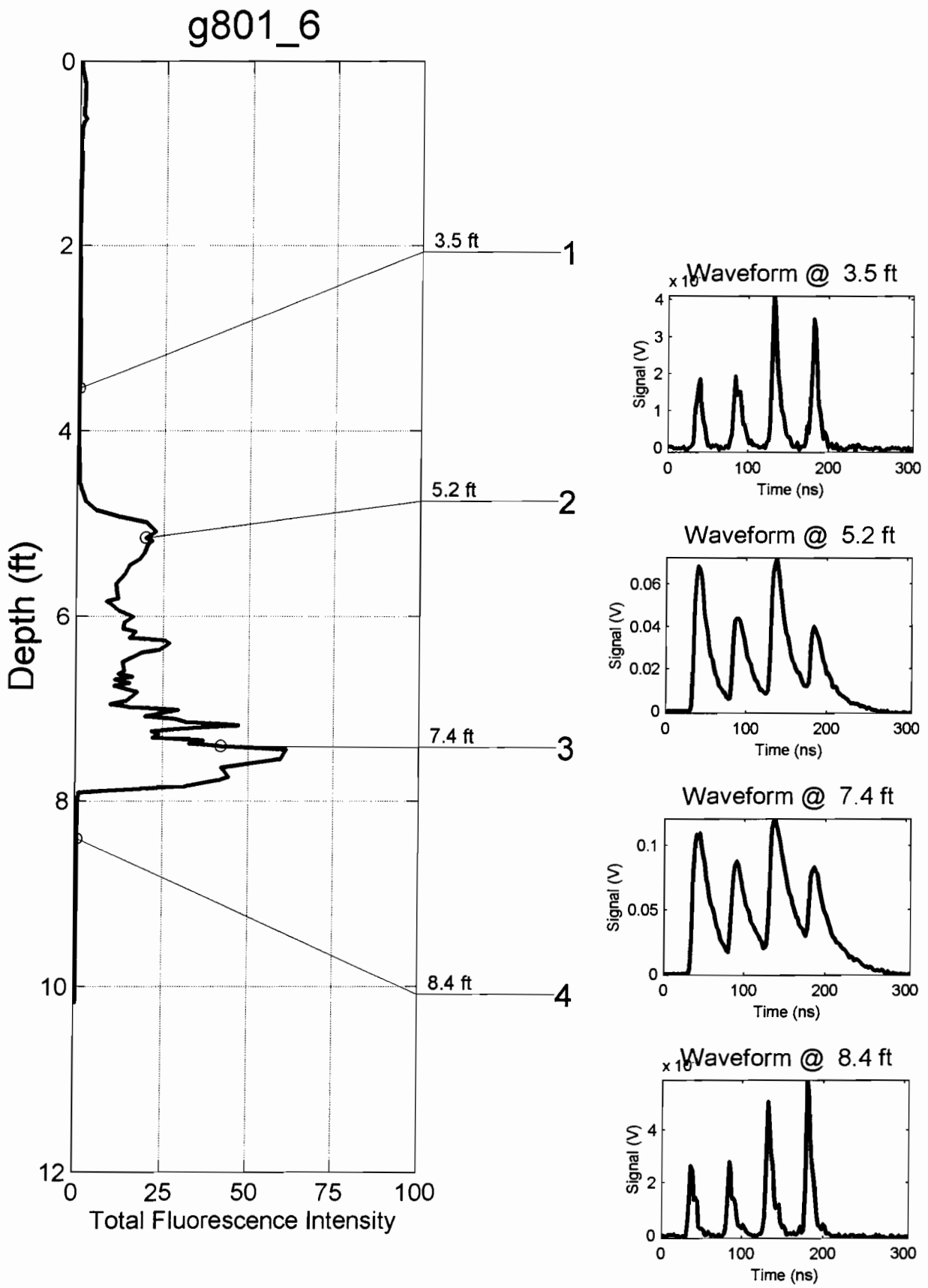



g801_5
Depth (ft)
Total Fluorescence Intensity
4.6 ft
6.4 ft
7.8 ft
9.7 ft
1
2
3
4
Waveform @ 4.6 ft
Waveform @ 6.4 ft
Waveform @ 7.8 ft
Waveform @ 9.7 ft
Signal (V)
Time (ns)

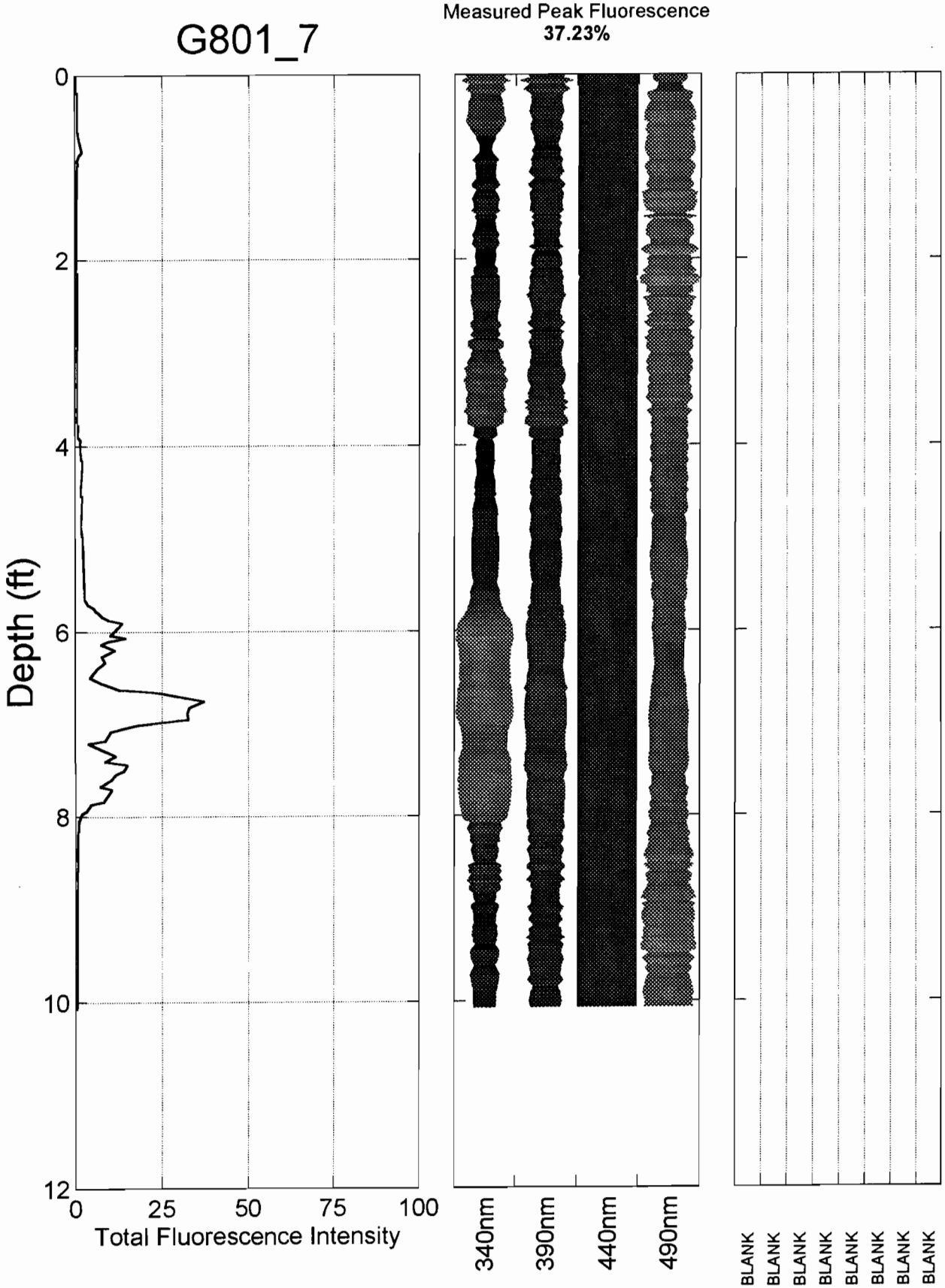
Measured LIF End Depth
10.17 ft
Measured Peak Fluorescence
61.24%

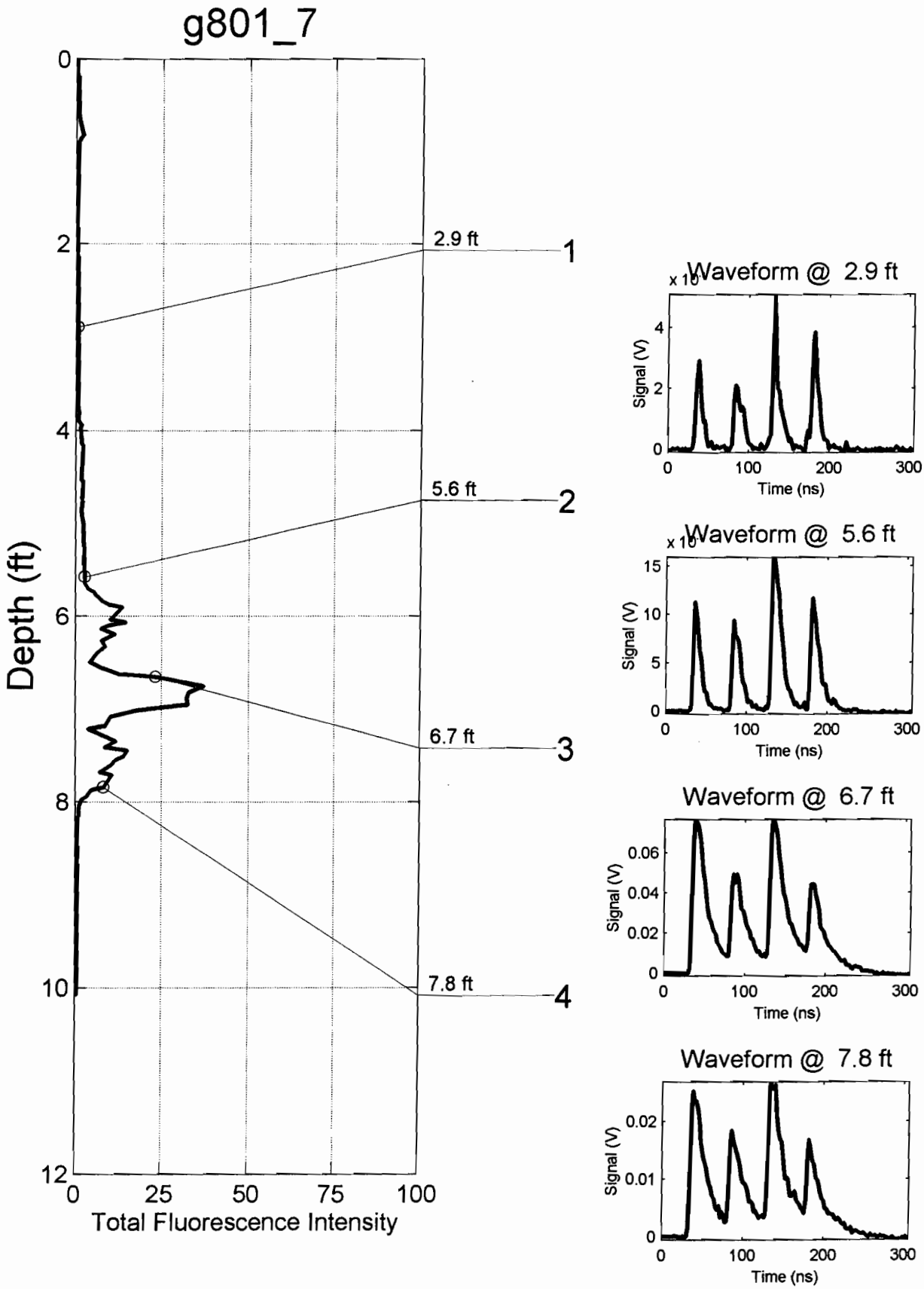
G801_6




g801_6
Depth (ft)
Total Fluorescence Intensity
3.5 ft
5.2 ft
7.4 ft
8.4 ft
1
2
3
4
Waveform @ 3.5 ft
Waveform @ 5.2 ft
Waveform @ 7.4 ft
Waveform @ 8.4 ft
Signal (V)
Time (ns)

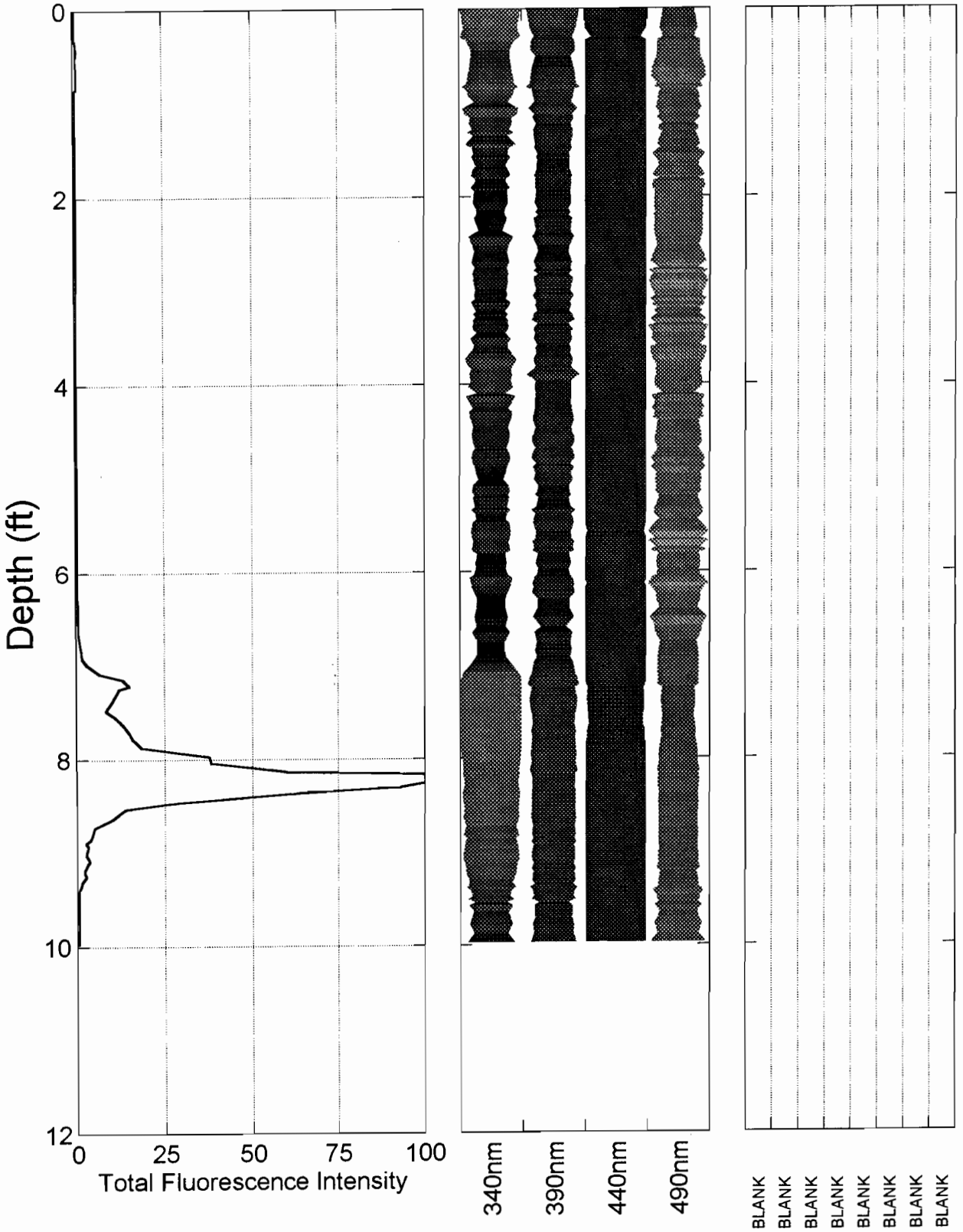
Measured LIF End Depth
10.07 ft
Measured Peak Fluorescence
37.23%

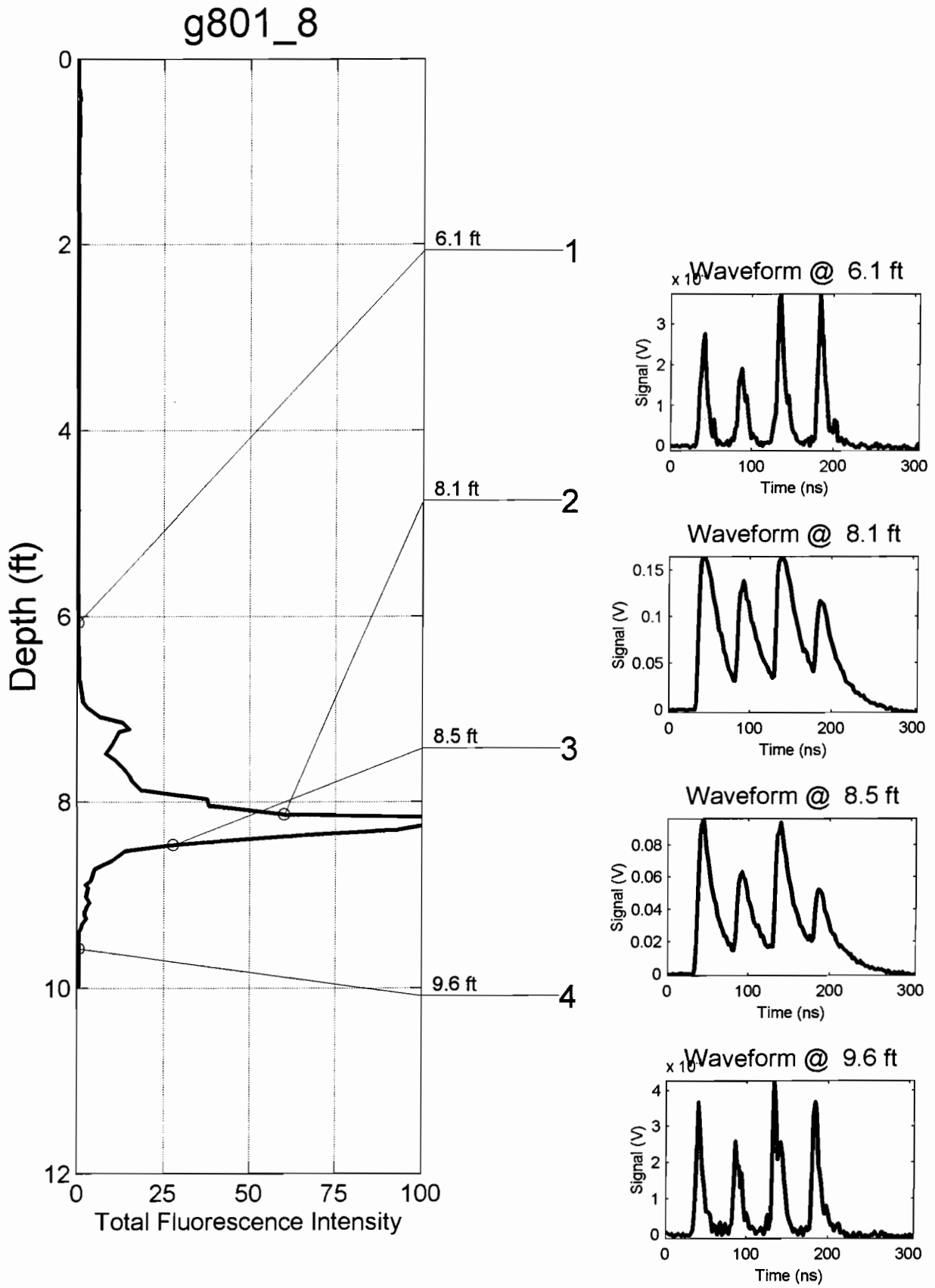


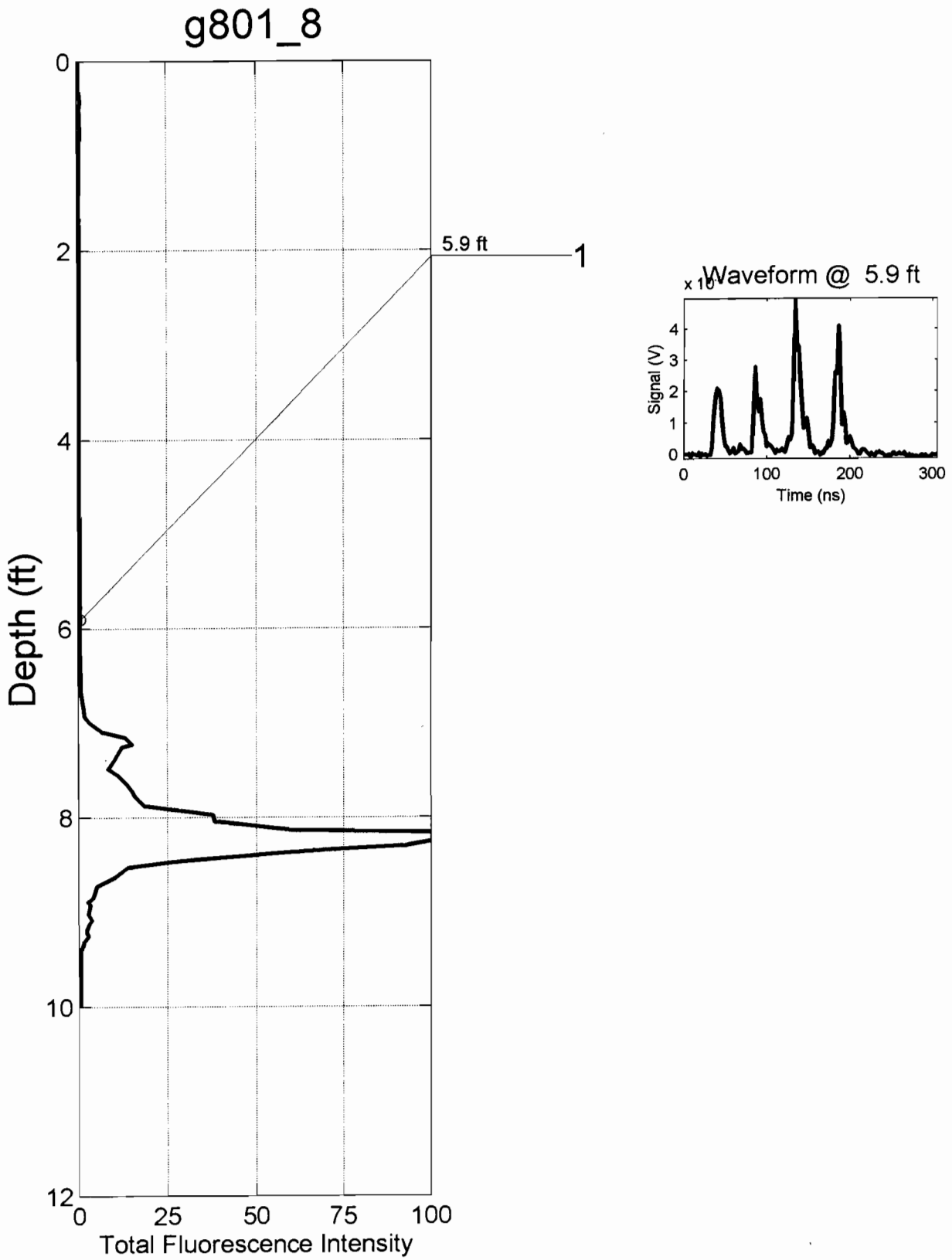

g801_7
Depth (ft)
Total Fluorescence Intensity
2.9 ft
5.6 ft
6.7 ft
7.8 ft
1
2
3
4
Waveform @ 2.9 ft
Waveform @ 5.6 ft
Waveform @ 6.7 ft
Waveform @ 7.8 ft
Signal (V)
Time (ns)

Measured LIF End Depth
9.974 ft
Measured Peak Fluorescence
110.4%

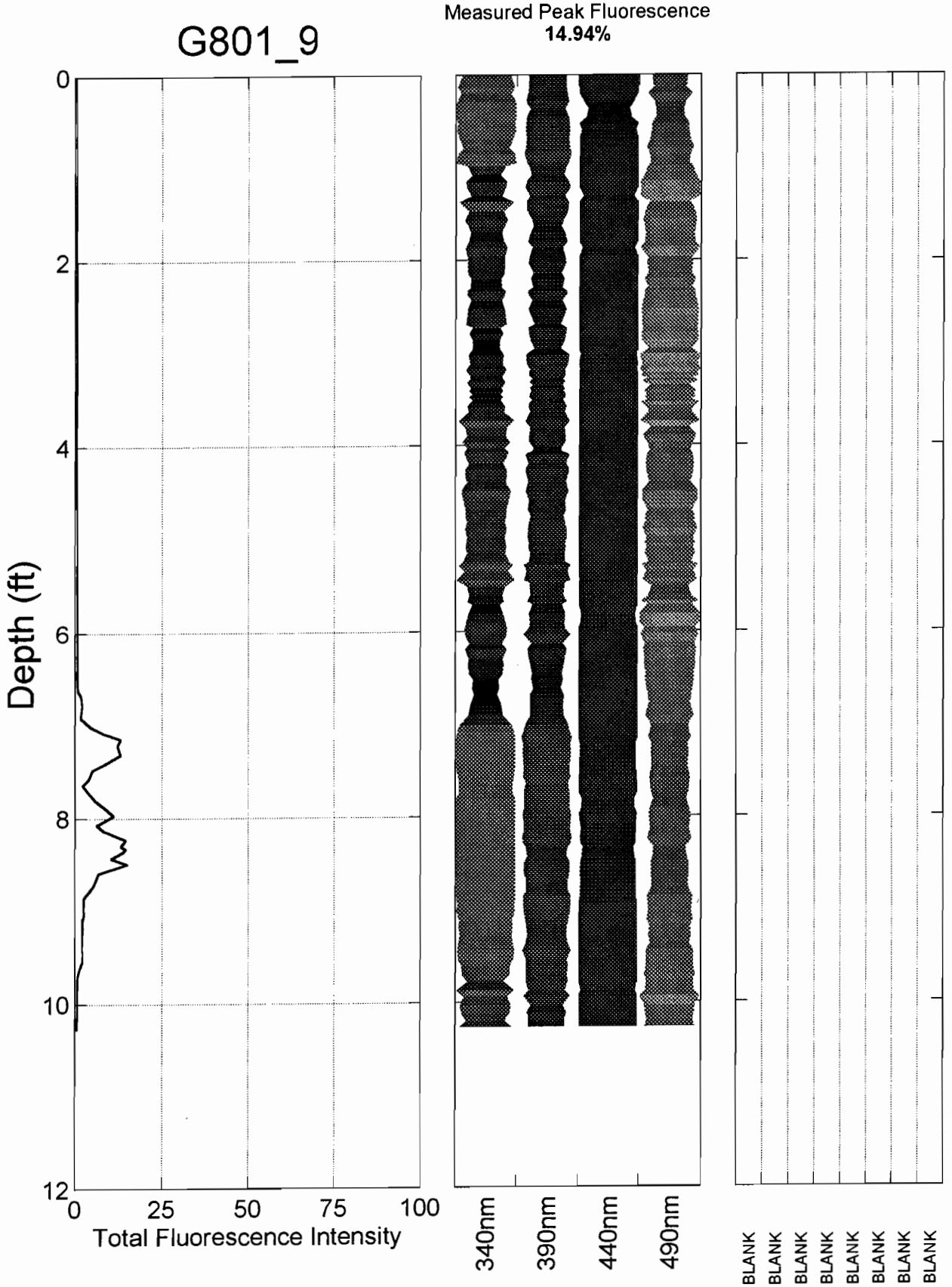
G801_8

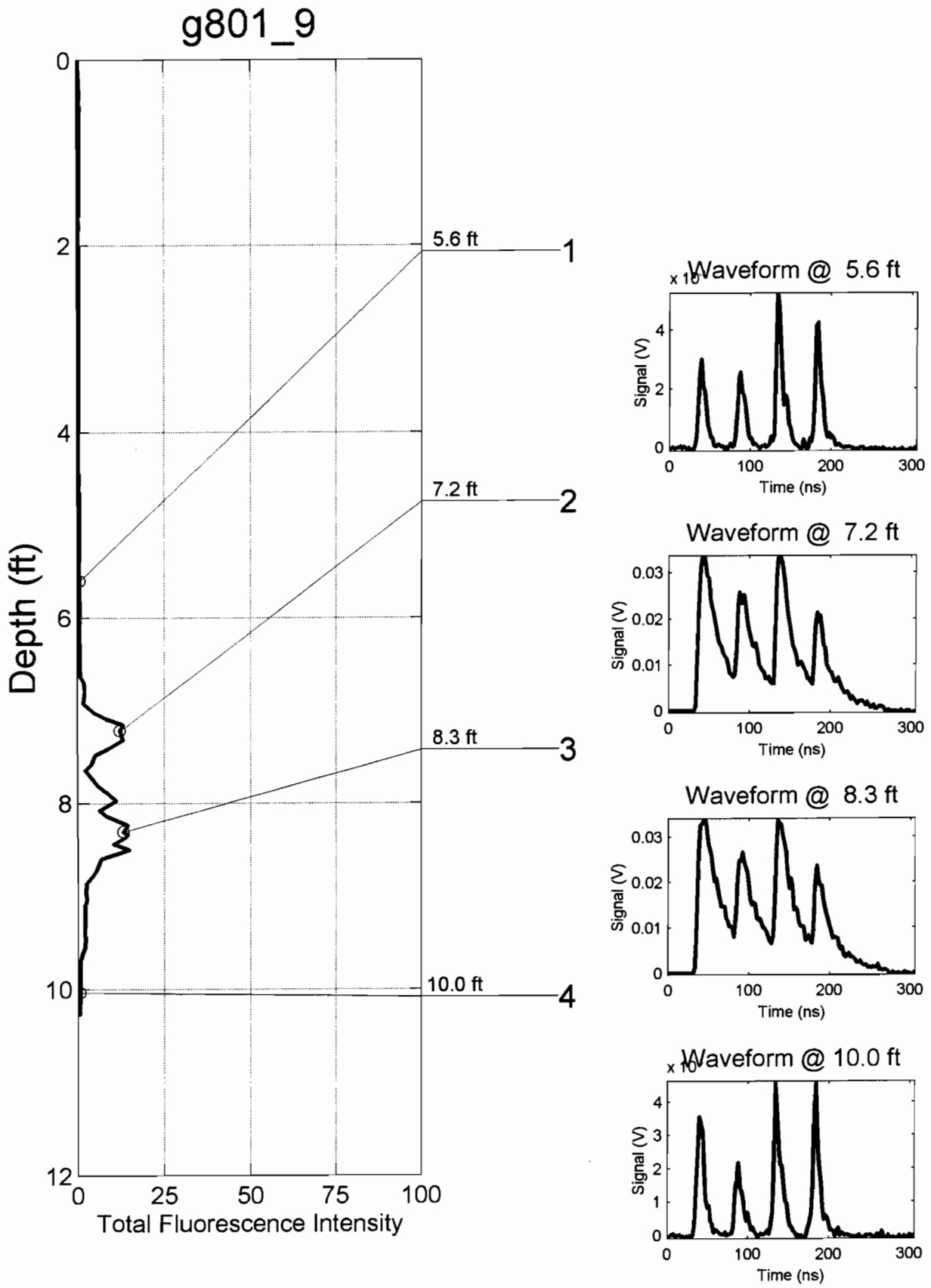



g801_8
Depth (ft)
Total Fluorescence Intensity
6.1 ft
8.1 ft
8.5 ft
9.6 ft
1
2
3
4
Waveform @ 6.1 ft
Waveform @ 8.1 ft
Waveform @ 8.5 ft
Waveform @ 9.6 ft
Signal (V)
Time (ns)

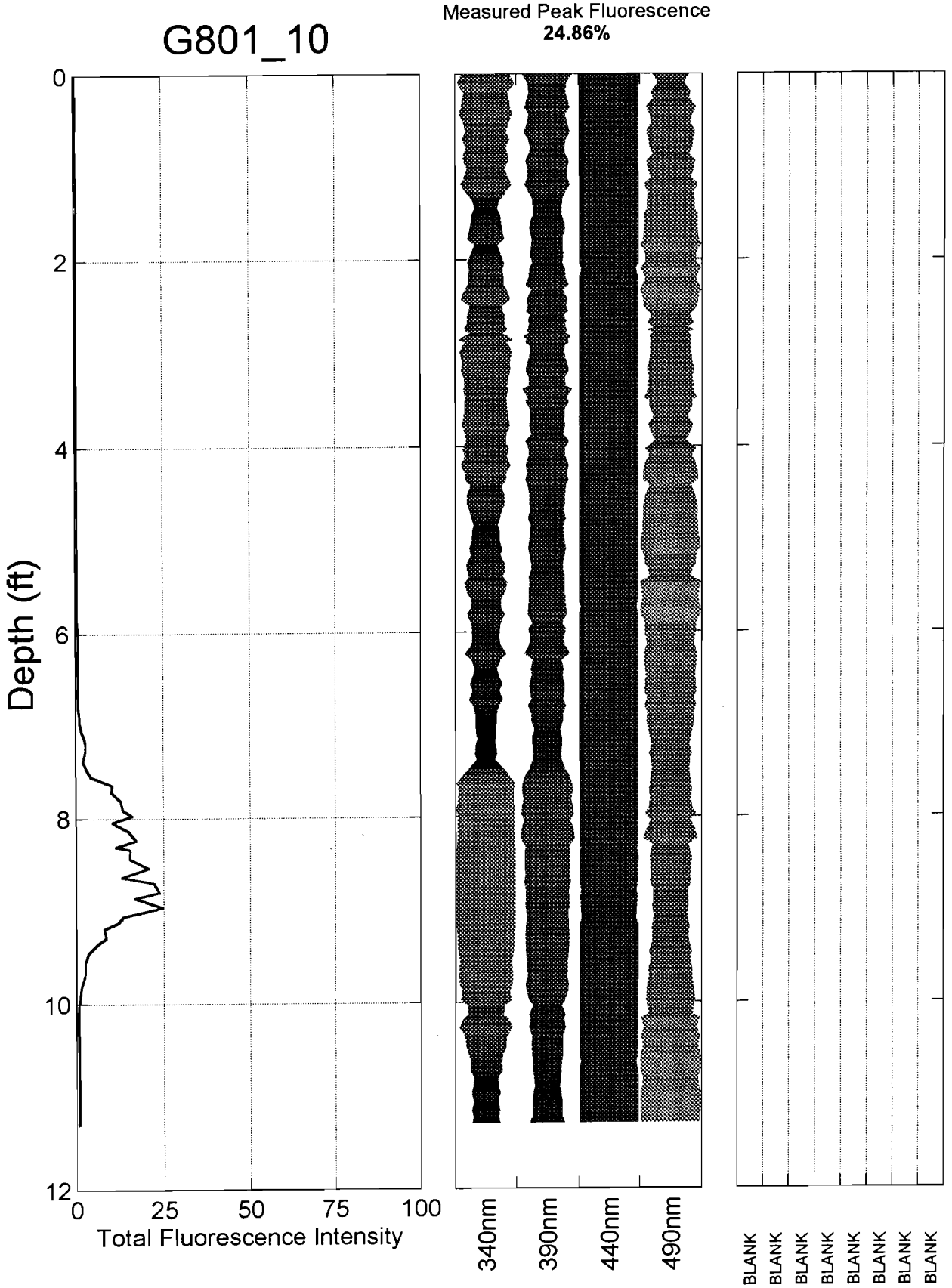

g801_8
Depth (ft)
Total Fluorescence Intensity
5.9 ft
1
Waveform @ 5.9 ft
Signal (V)
Time (ns)

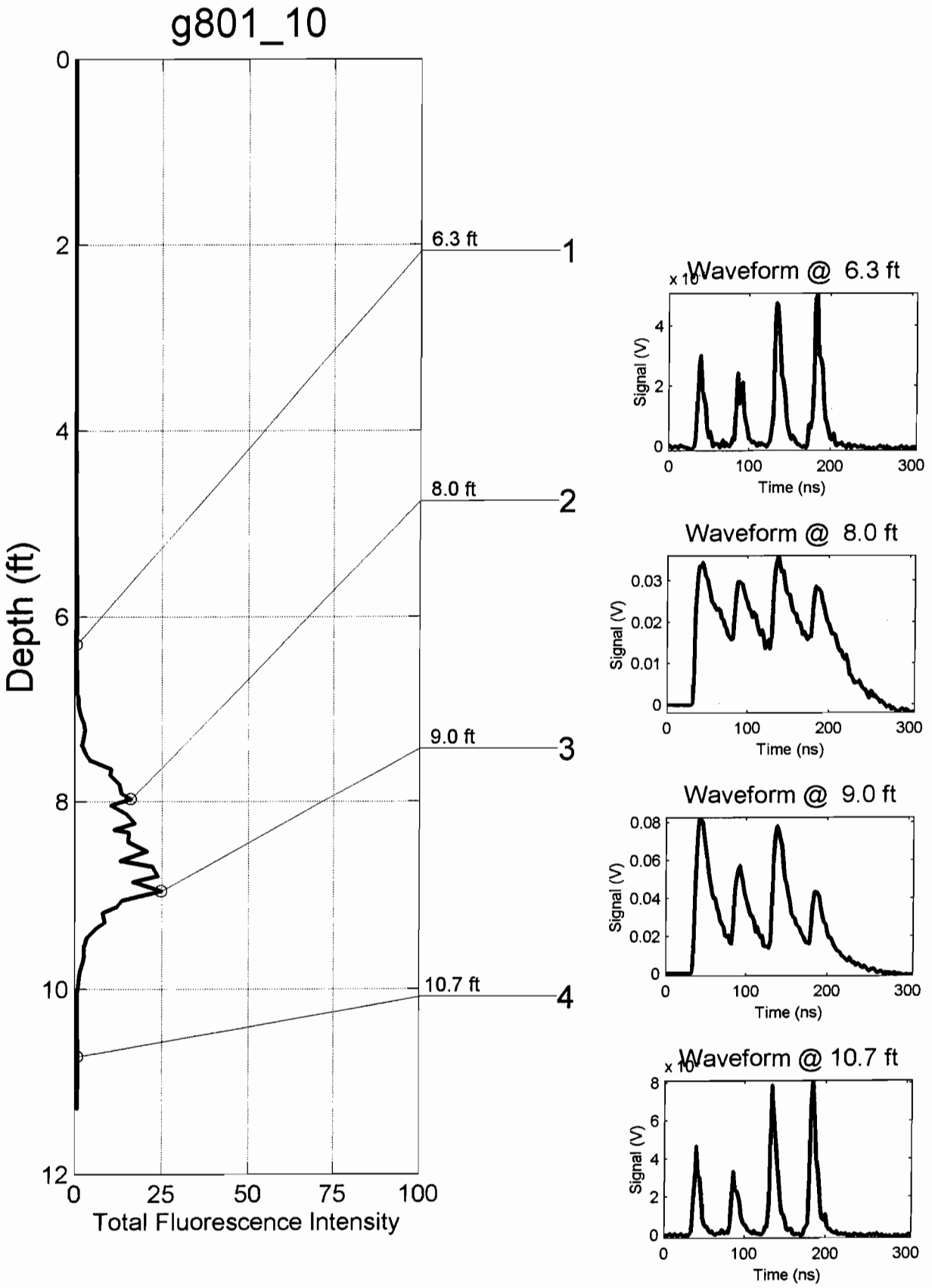
Measured LIF End Depth
10.27 ft
Measured Peak Fluorescence
14.94%



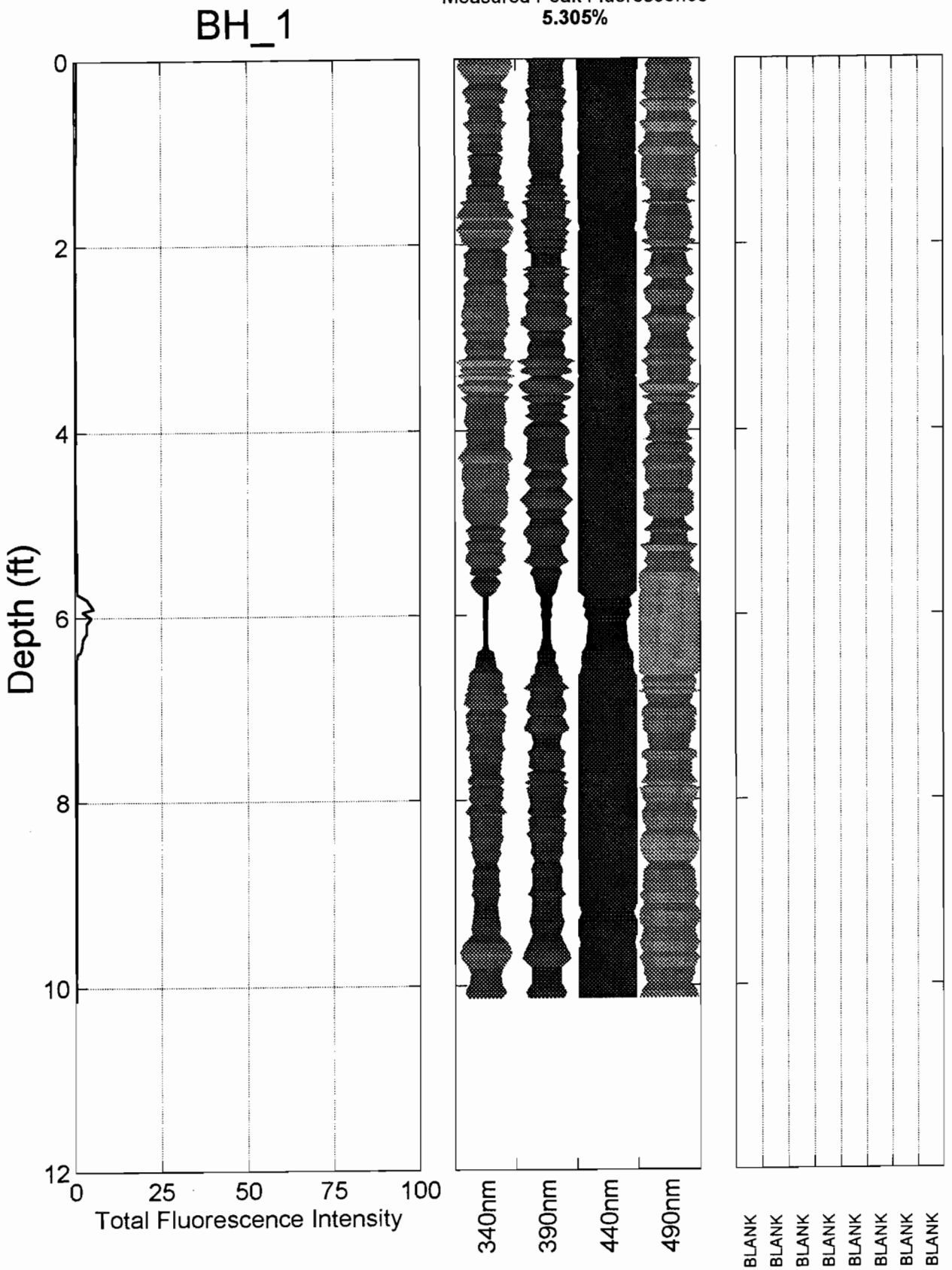

g801_9
Depth (ft)
Total Fluorescence Intensity
5.6 ft
7.2 ft
8.3 ft
10.0 ft
1
2
3
4
Waveform @ 5.6 ft
Waveform @ 7.2 ft
Waveform @ 8.3 ft
Waveform @ 10.0 ft
Signal (V)
Time (ns)

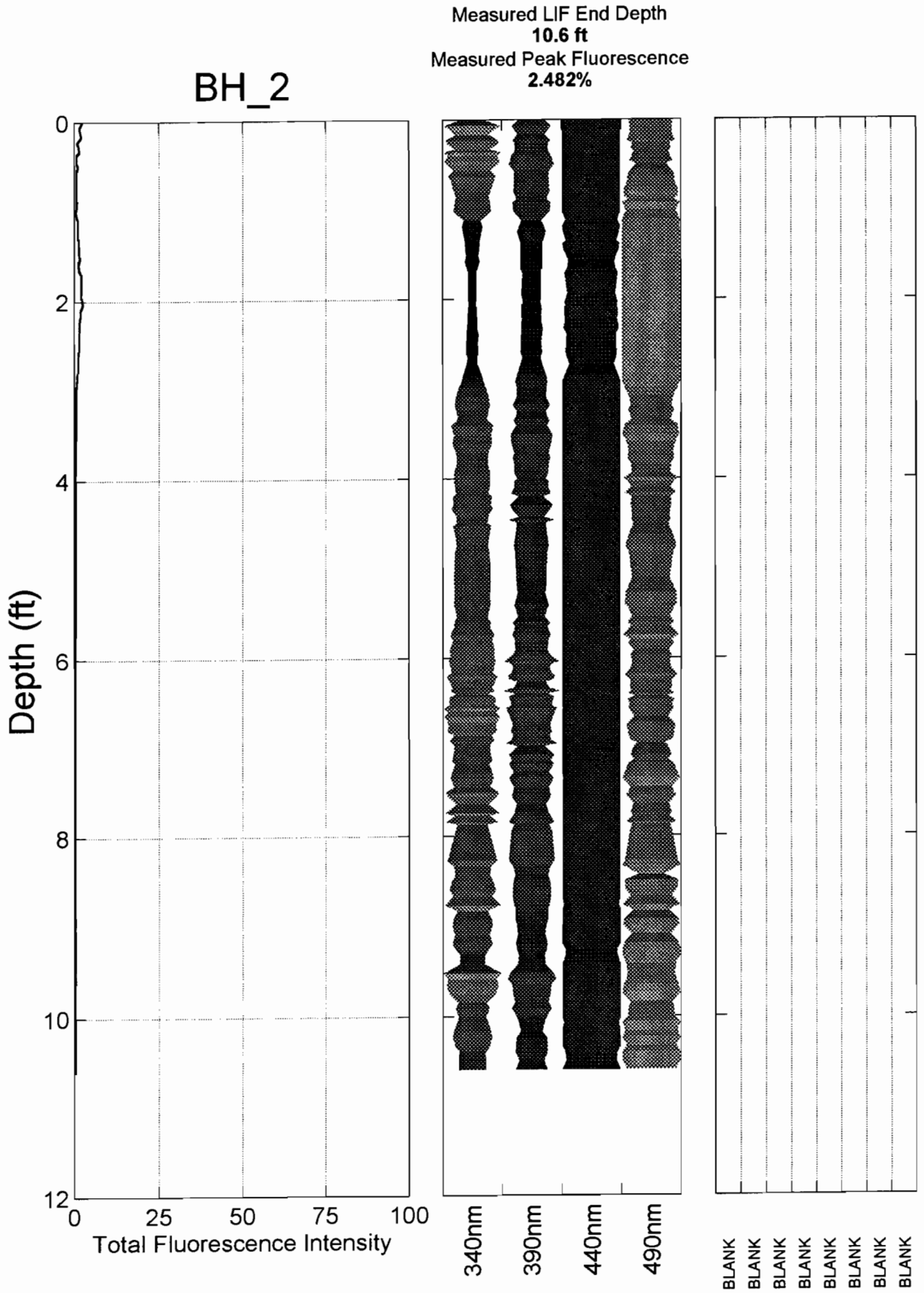
Measured LIF End Depth
11.29 ft
Measured Peak Fluorescence
24.86%



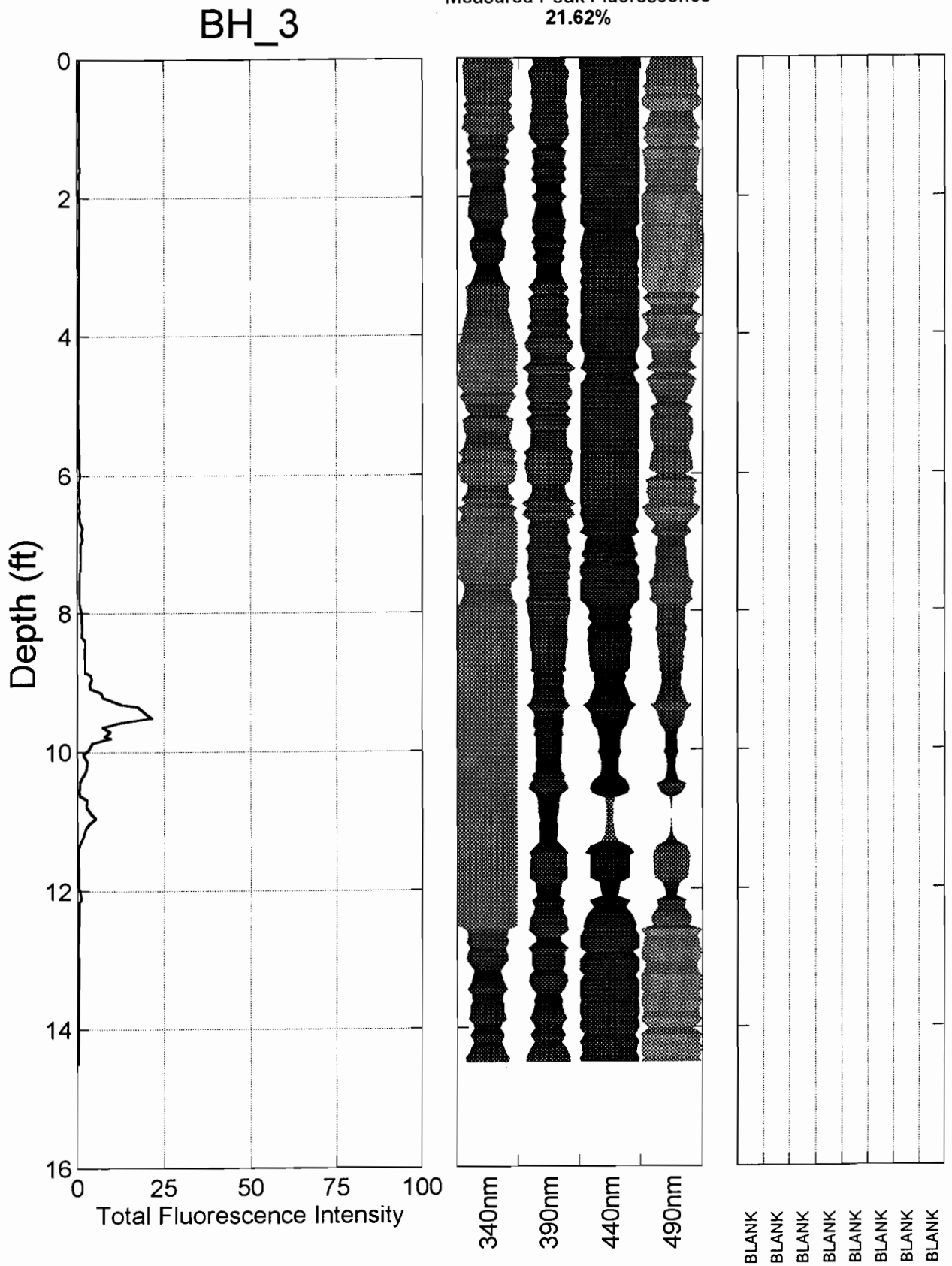

g801_10
Depth (ft)
Total Fluorescence Intensity
6.3 ft
8.0 ft
9.0 ft
10.7 ft
1
2
3
4
Waveform @ 6.3 ft
Waveform @ 8.0 ft
Waveform @ 9.0 ft
Waveform @ 10.7 ft
Signal (V)
Time (ns)

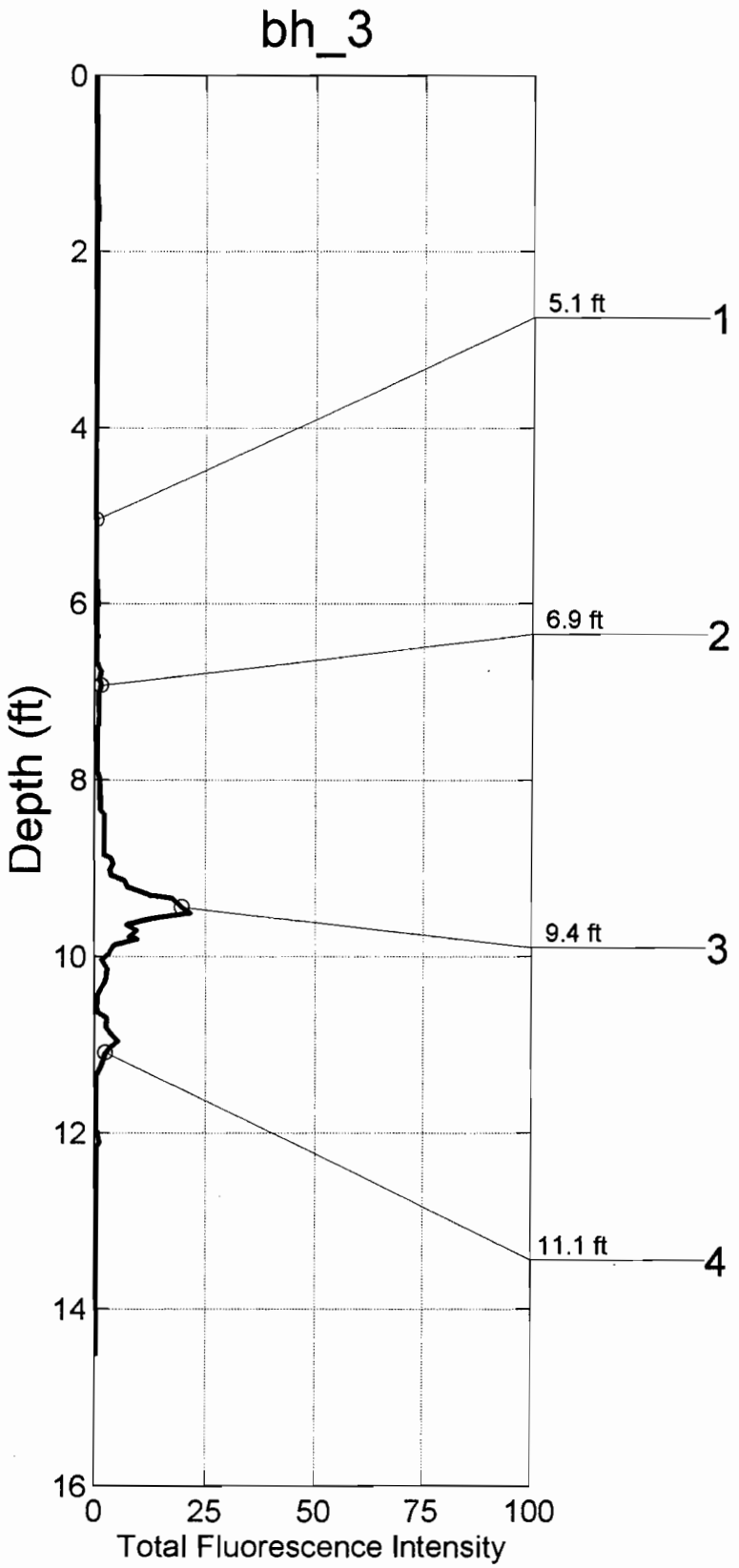
Measured LIF End Depth
10.14 ft
Measured Peak Fluorescence
5.305%

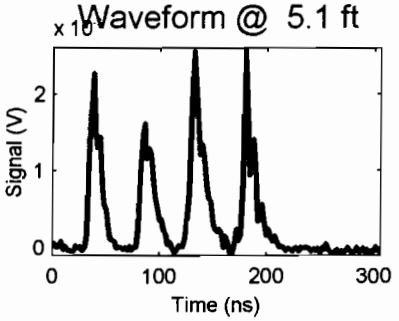


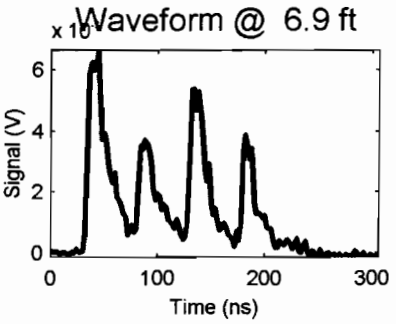

Measured LIF End Depth
10.6 ft
Measured Peak Fluorescence
2.482%
BH_2
Depth (ft)
0
2
4
6
8
10
12
0
25
50
75
100
Total Fluorescence Intensity
340nm
390nm
440nm
490nm
BLANK
BLANK
BLANK
BLANK
BLANK
BLANK
BLANK
BLANK

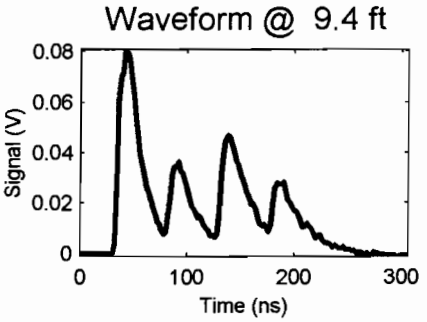
Measured LIF End Depth
14.5 ft
Measured Peak Fluorescence
21.62%

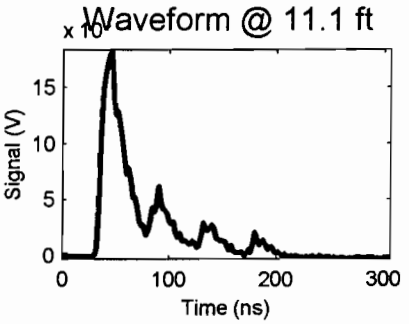



bh_3
Depth (ft)
Total Fluorescence Intensity
5.1 ft
6.9 ft
9.4 ft
11.1 ft
1
2
3
4

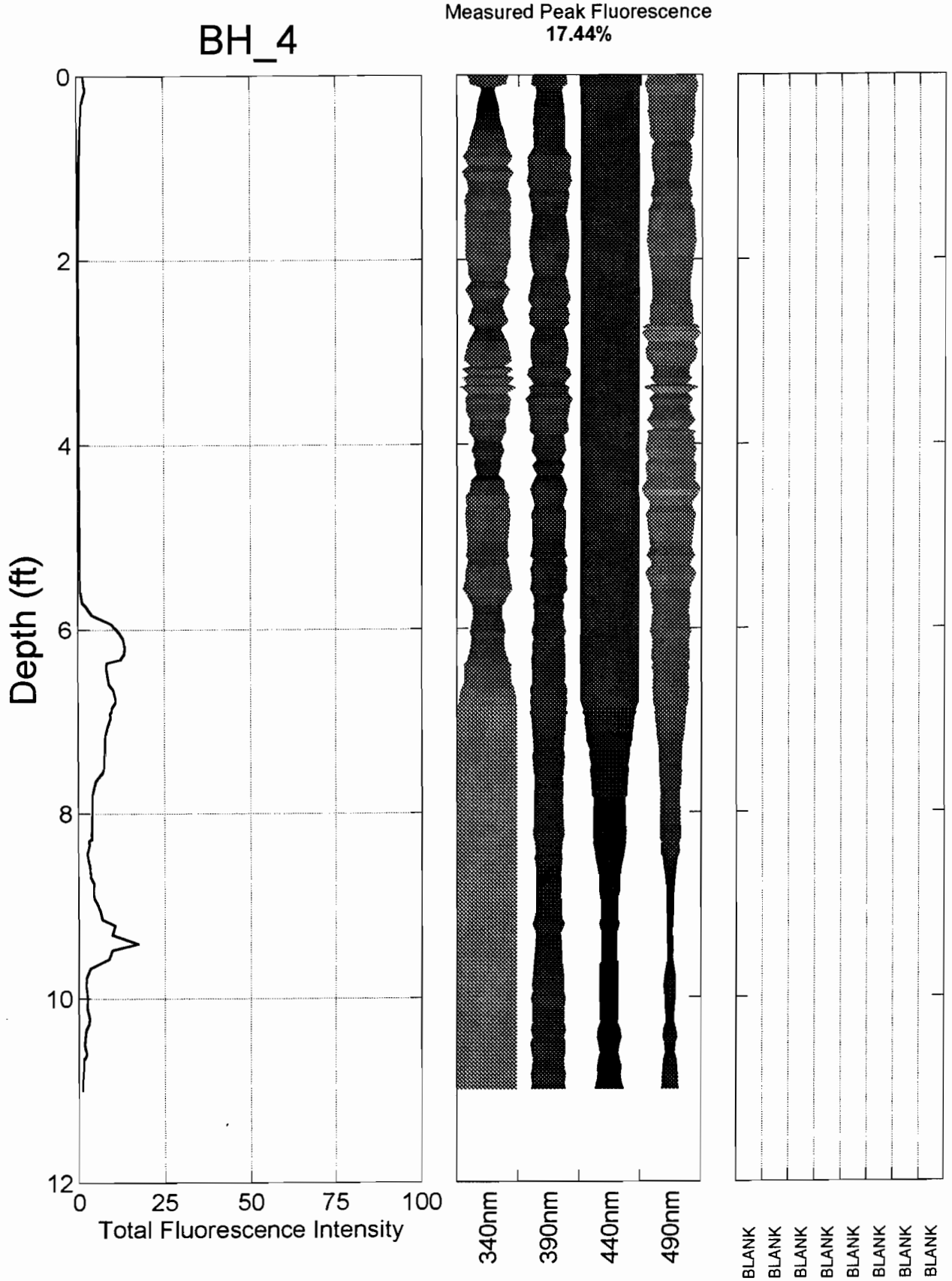

Waveform @ 5.1 ft
Signal (V)
Time (ns)

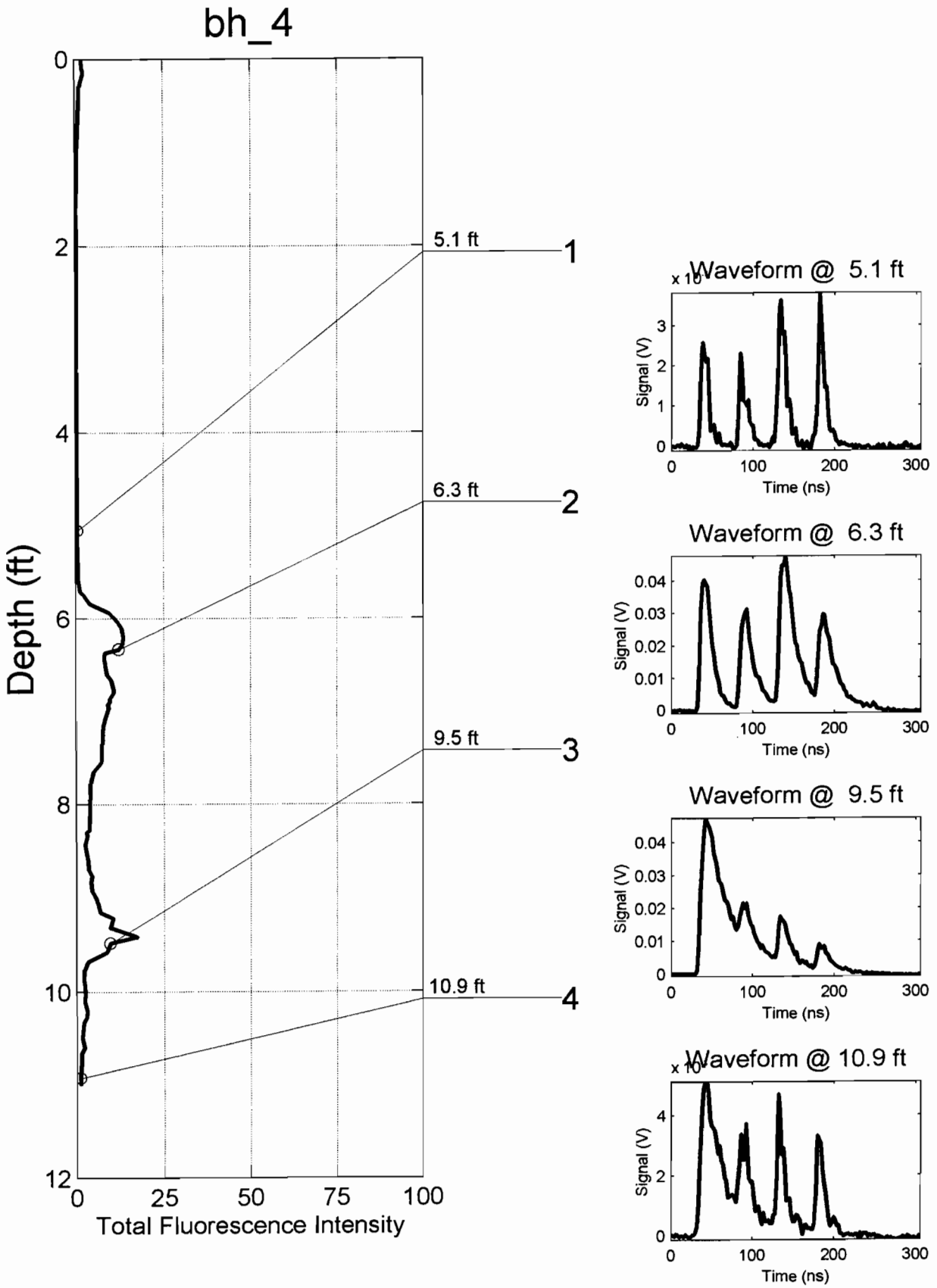

Waveform @ 6.9 ft
Signal (V)
Time (ns)

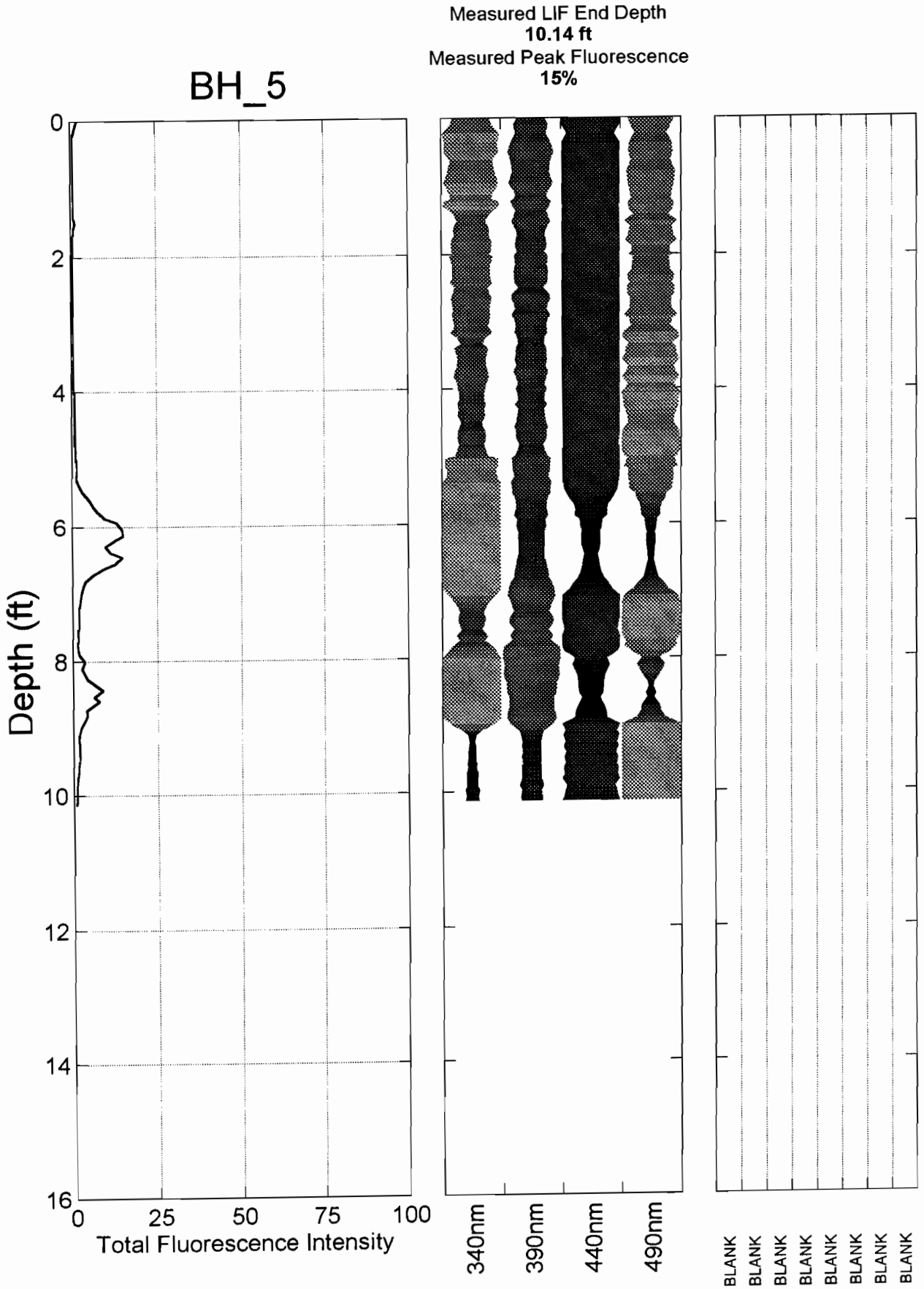

Waveform @ 9.4 ft
Signal (V)
Time (ns)

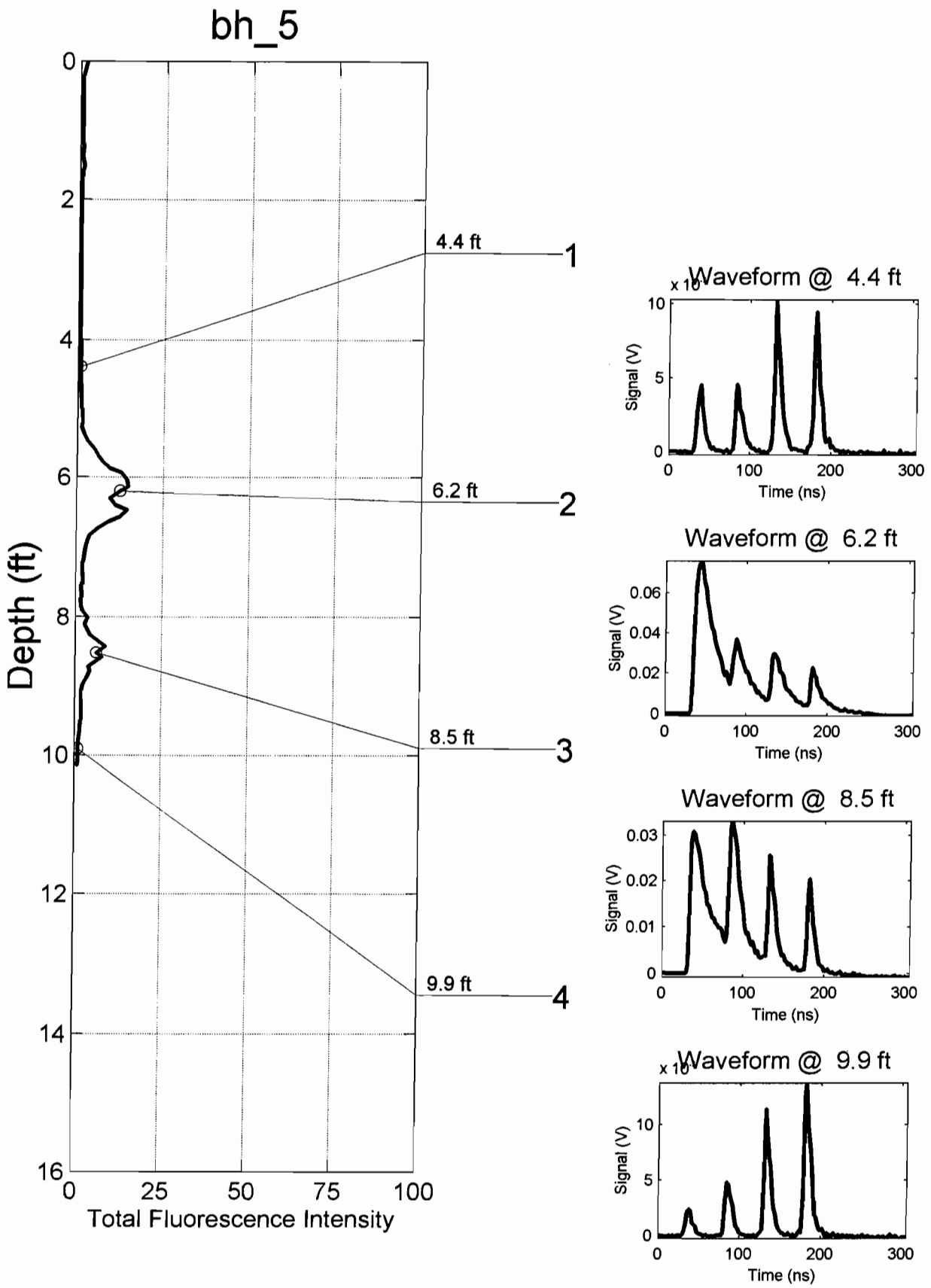

Waveform @ 11.1 ft
Signal (V)
Time (ns)

Measured LIF End Depth
10.99 ft
Measured Peak Fluorescence
17.44%



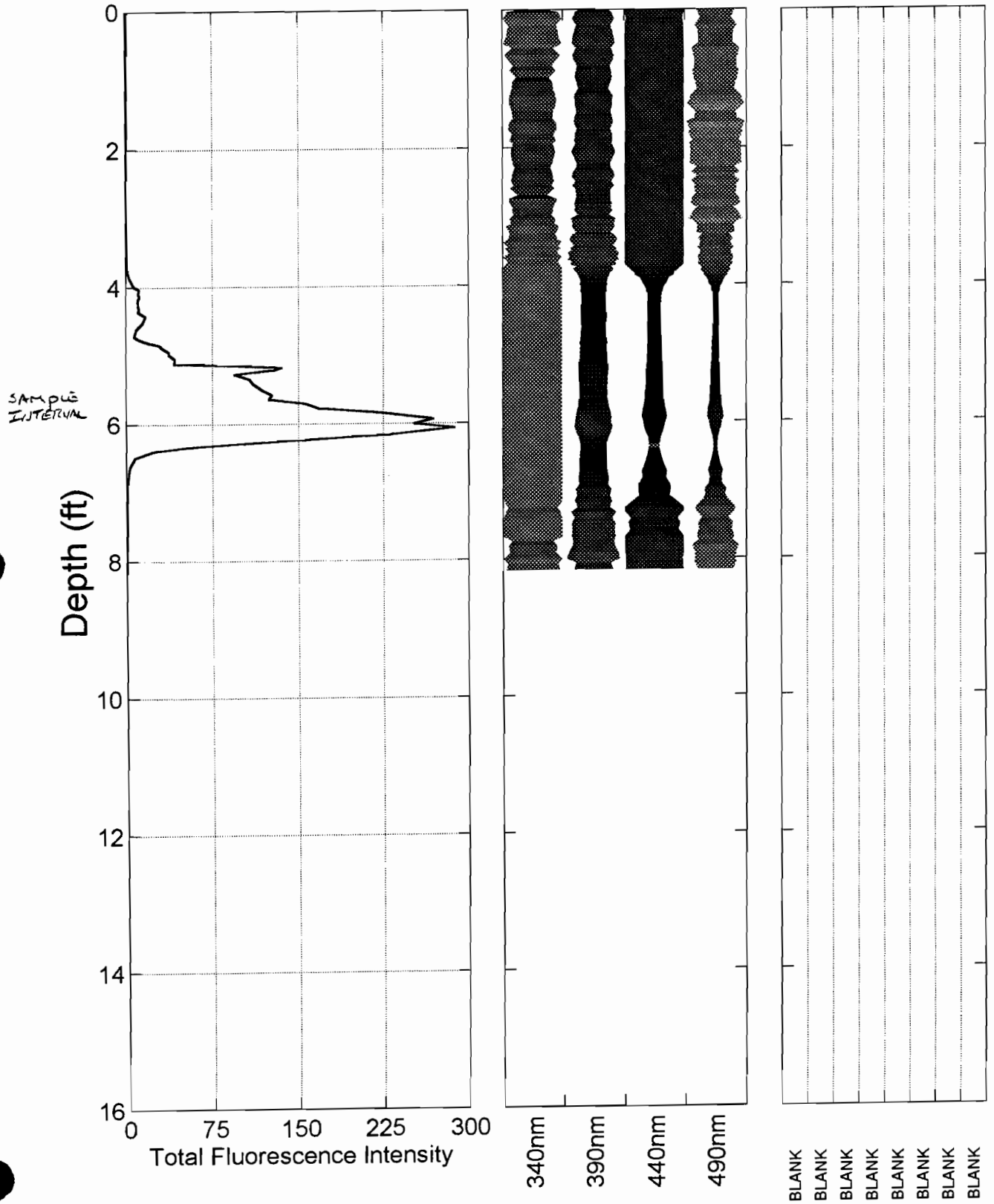

bh_4
Depth (ft)
Total Fluorescence Intensity
5.1 ft
6.3 ft
9.5 ft
10.9 ft
1
2
3
4
Waveform @ 5.1 ft
Waveform @ 6.3 ft
Waveform @ 9.5 ft
Waveform @ 10.9 ft
Signal (V)
Time (ns)

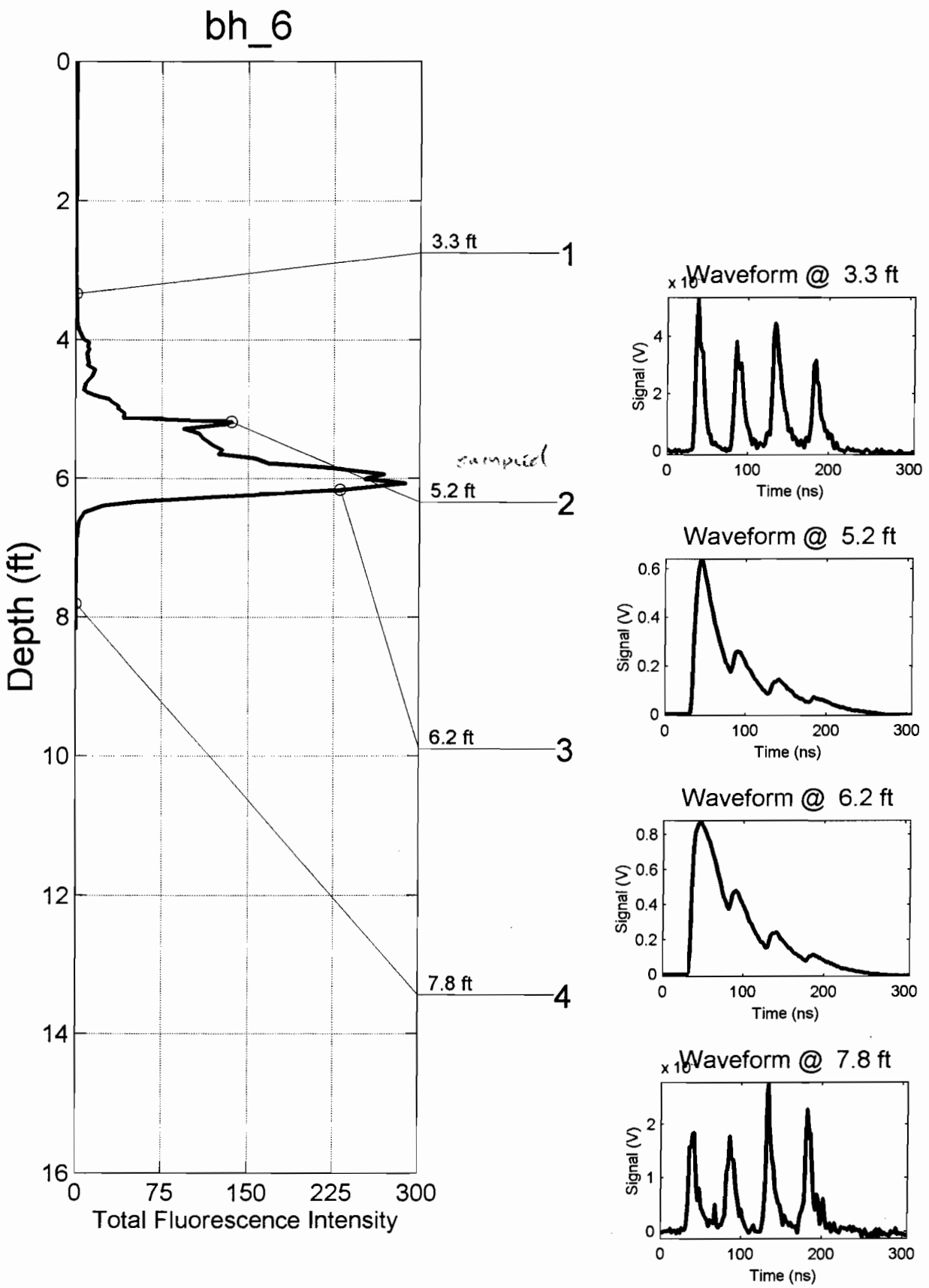

Measured LIF End Depth
10.14 ft
Measured Peak Fluorescence
15%
BH_5
Depth (ft)
0
2
4
6
8
10
12
14
16
0
25
50
75
100
Total Fluorescence Intensity
340nm
390nm
440nm
490nm
BLANK
BLANK
BLANK
BLANK
BLANK
BLANK
BLANK
BLANK


bh_5
Depth (ft)
Total Fluorescence Intensity
4.4 ft
6.2 ft
8.5 ft
9.9 ft
1
2
3
4
Waveform @ 4.4 ft
Waveform @ 6.2 ft
Waveform @ 8.5 ft
Waveform @ 9.9 ft
Signal (V)
Time (ns)

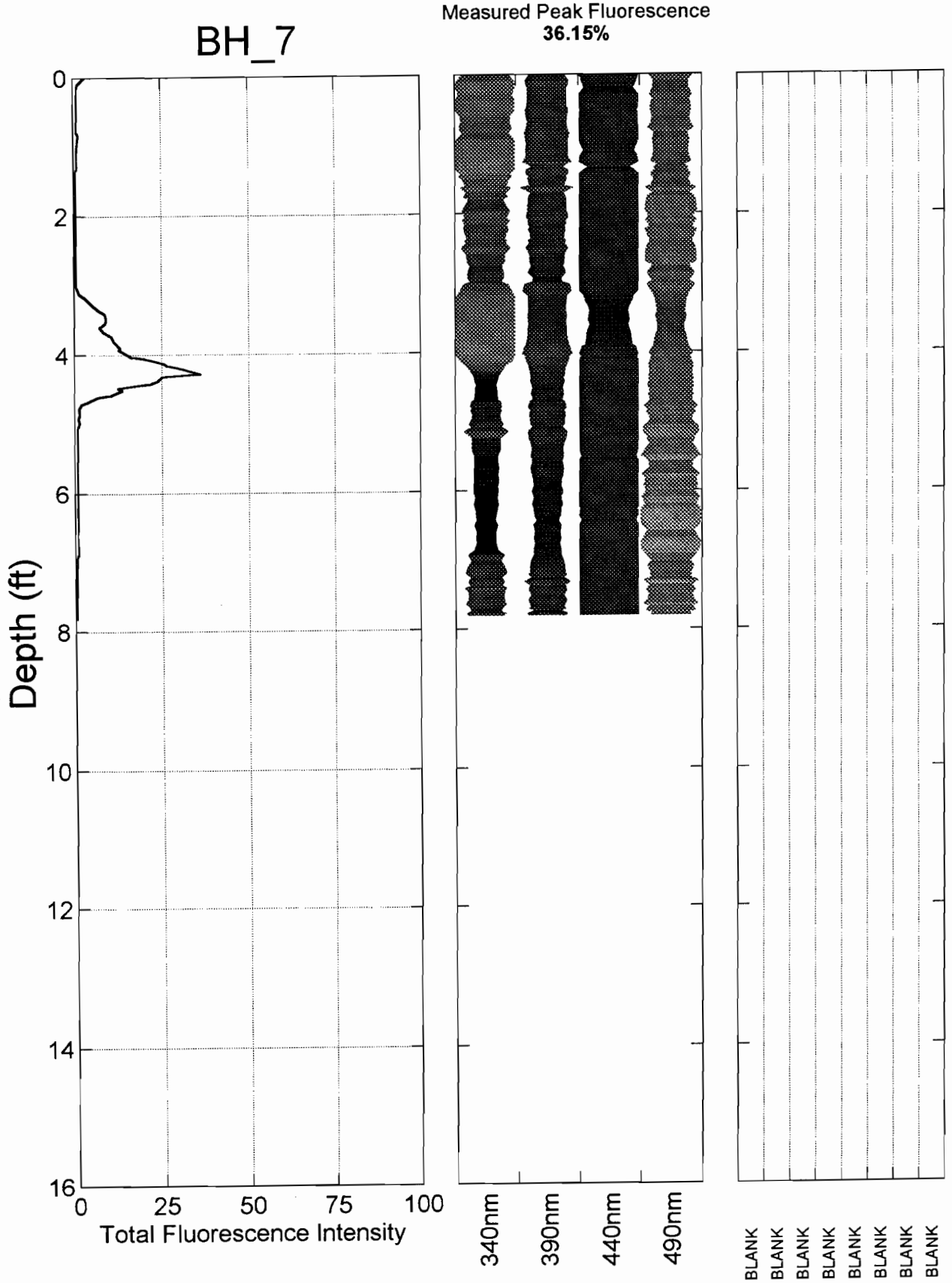
Measured LIF End Depth
8.169 ft
Measured Peak Fluorescence
287.6%

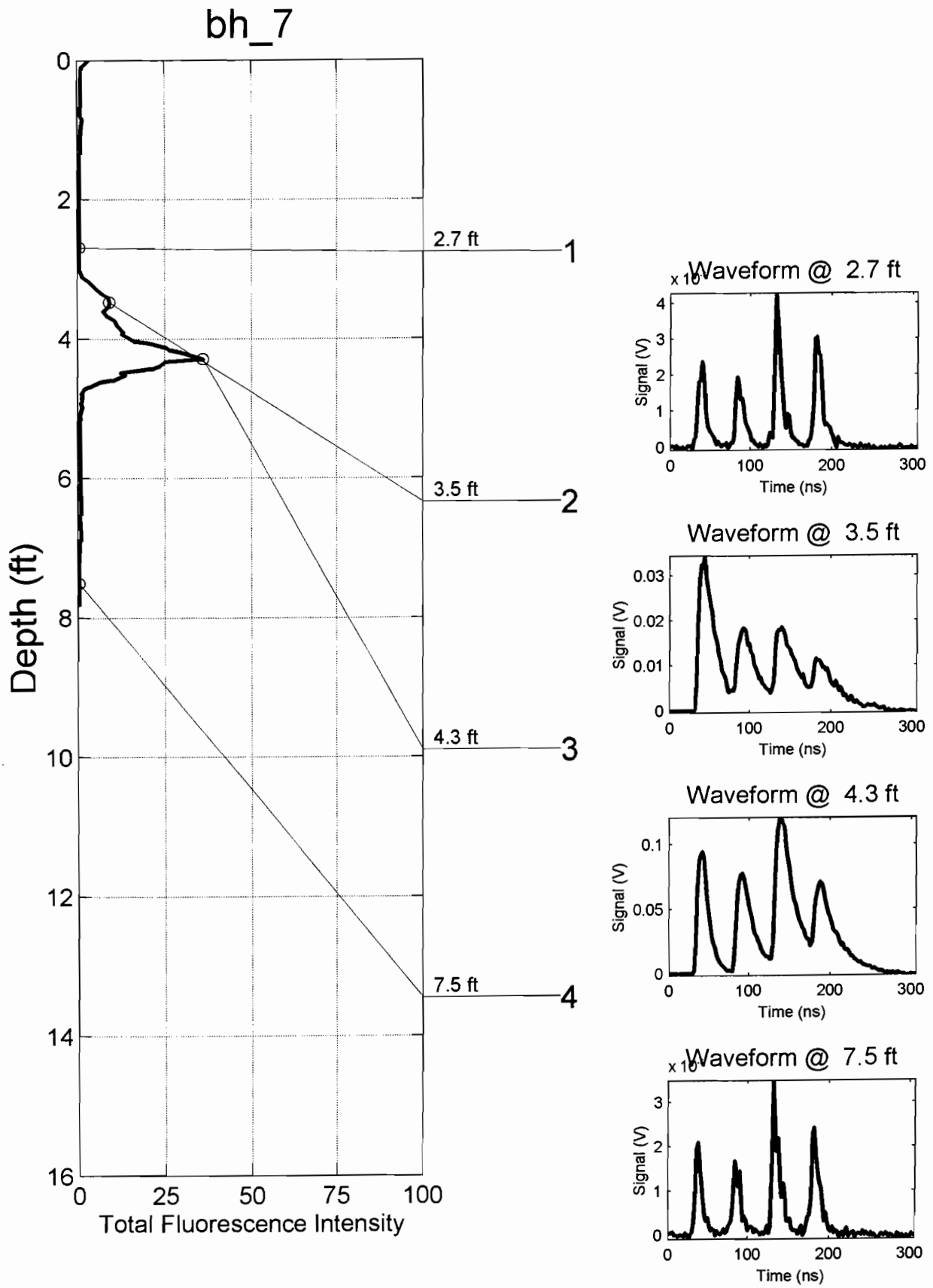
BH_6



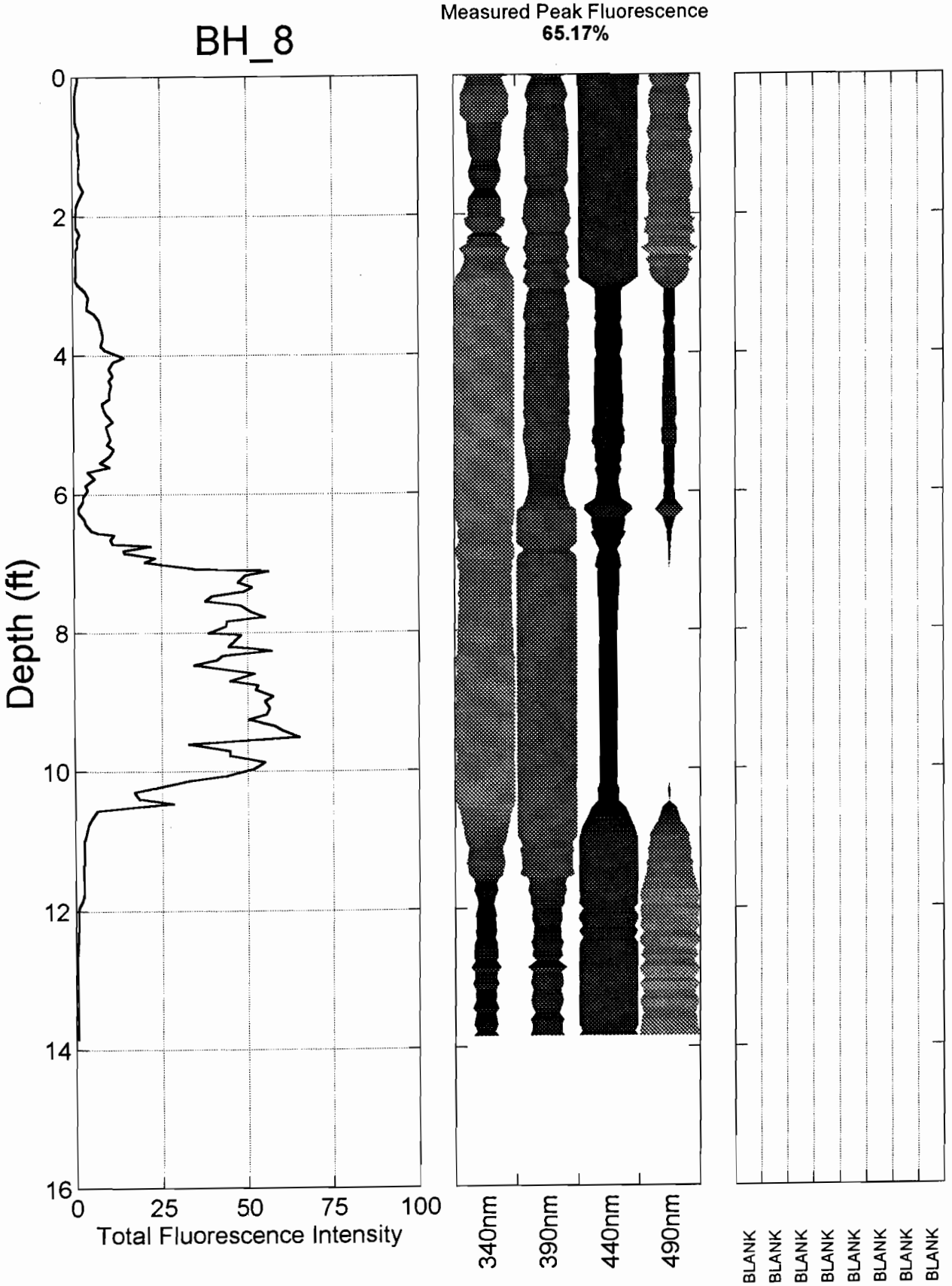

bh_6
Depth (ft)
Total Fluorescence Intensity
3.3 ft
5.2 ft
6.2 ft
7.8 ft
1
2
3
4
sampled
Waveform @ 3.3 ft
Waveform @ 5.2 ft
Waveform @ 6.2 ft
Waveform @ 7.8 ft
Signal (V)
Time (ns)

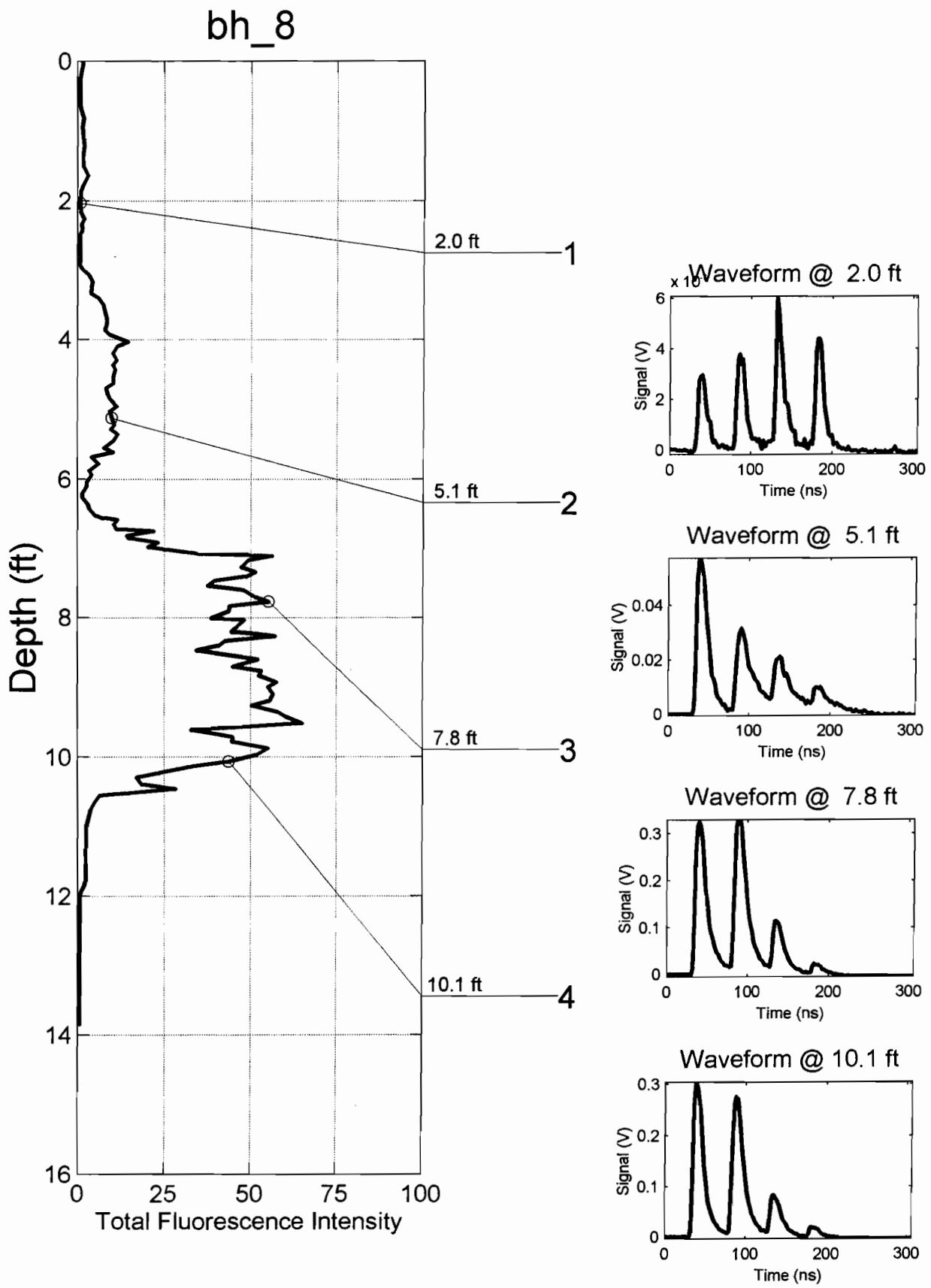
Measured LIF End Depth
7.808 ft
Measured Peak Fluorescence
36.15%




bh_7
Depth (ft)
Total Fluorescence Intensity
2.7 ft
3.5 ft
4.3 ft
7.5 ft
1
2
3
4
Waveform @ 2.7 ft
Waveform @ 3.5 ft
Waveform @ 4.3 ft
Waveform @ 7.5 ft
Signal (V)
Time (ns)

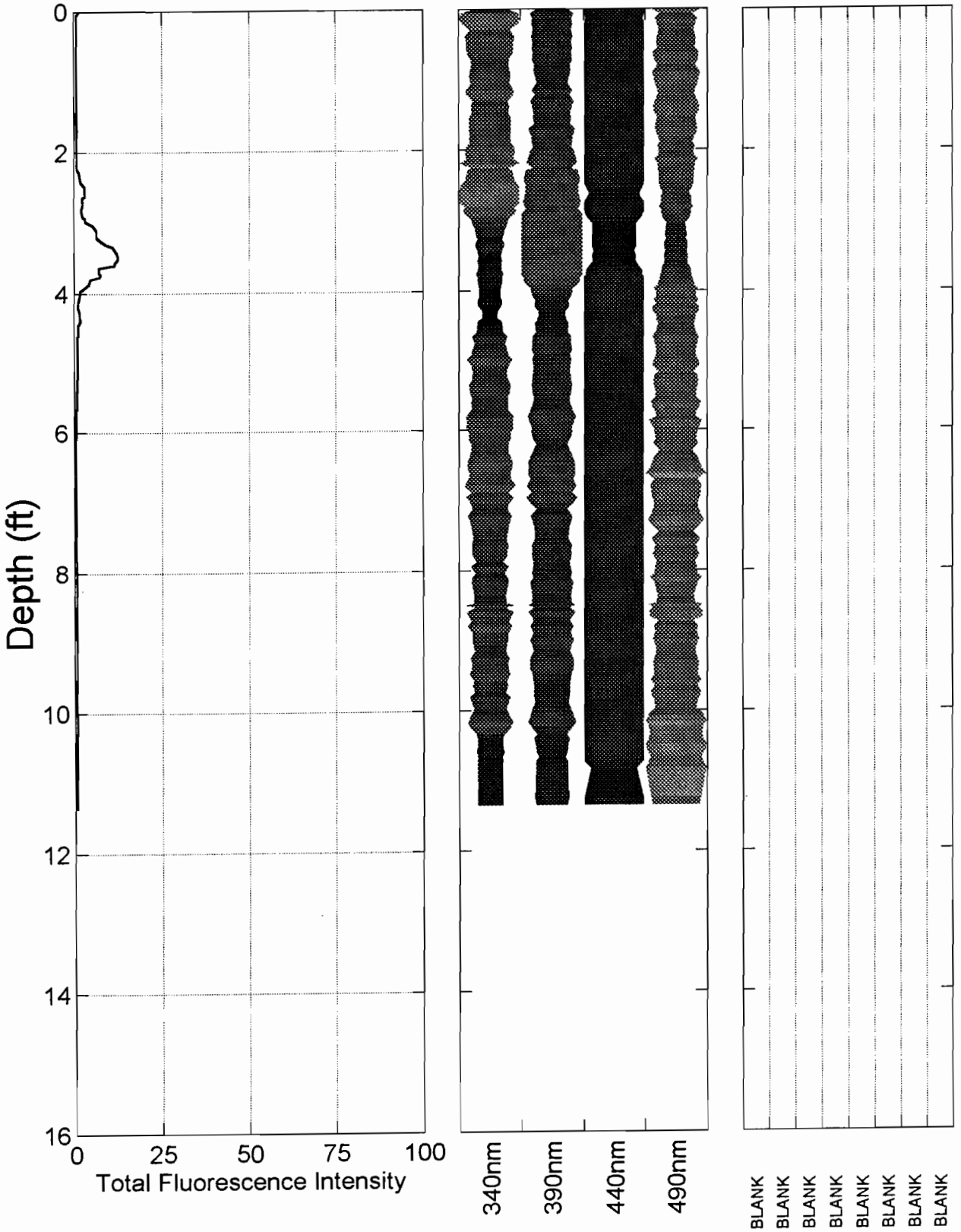
Measured LIF End Depth
13.85 ft
Measured Peak Fluorescence
65.17%

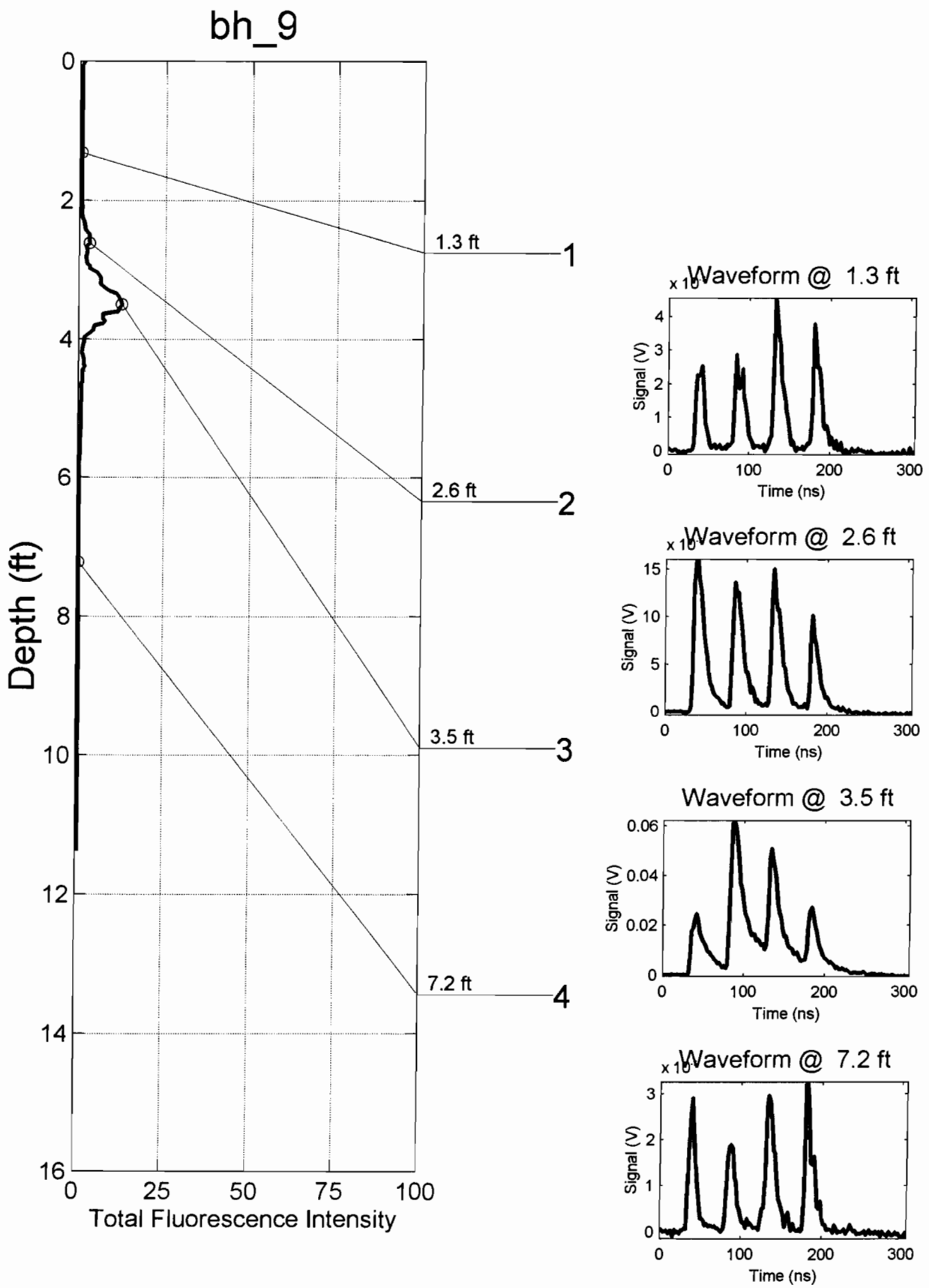


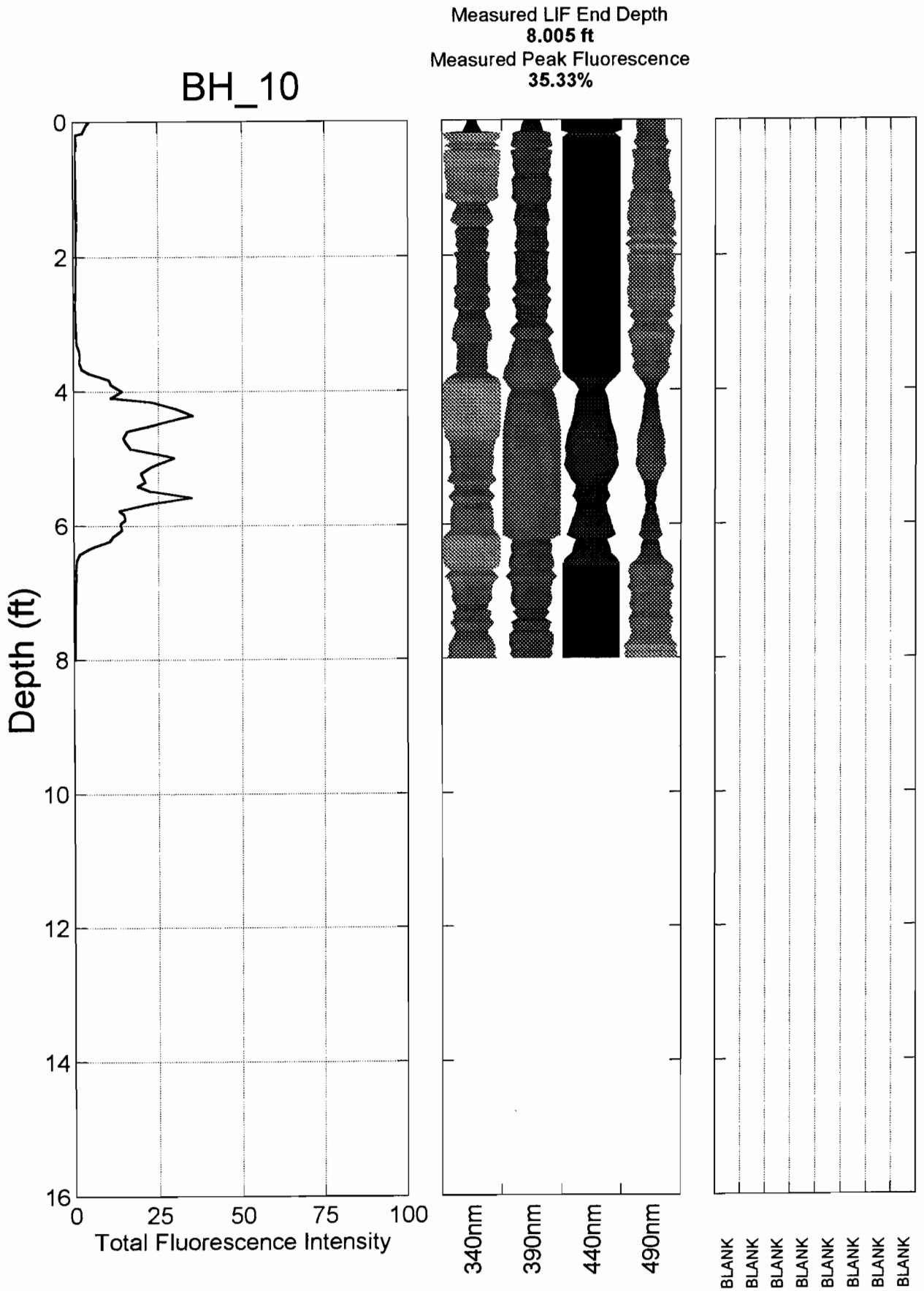

bh_8
Depth (ft)
Total Fluorescence Intensity
2.0 ft
5.1 ft
7.8 ft
10.1 ft
1
2
3
4
Waveform @ 2.0 ft
Waveform @ 5.1 ft
Waveform @ 7.8 ft
Waveform @ 10.1 ft
Signal (V)
Time (ns)

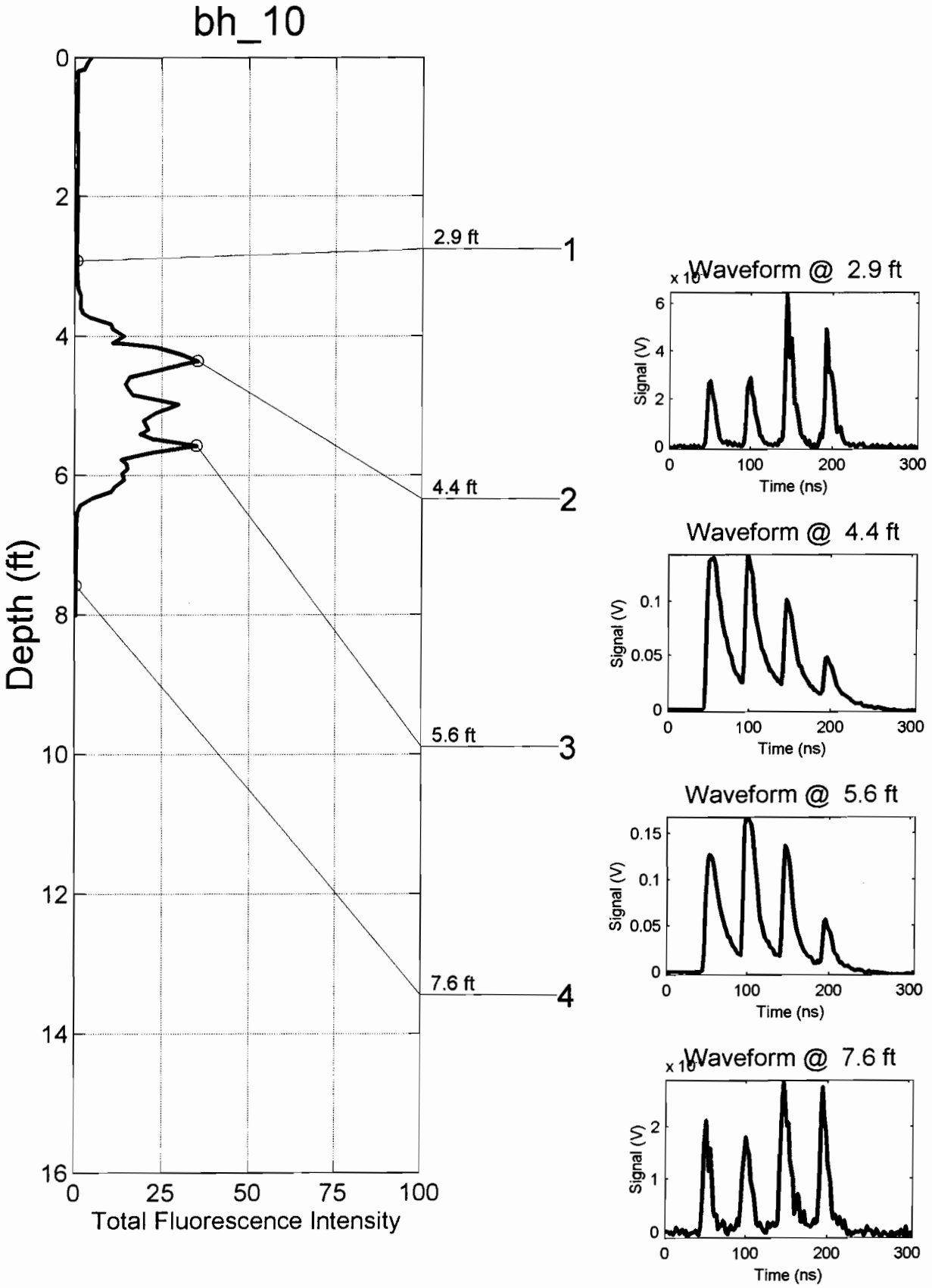
Measured LIF End Depth
11.35 ft
Measured Peak Fluorescence
12.62%

BH_9



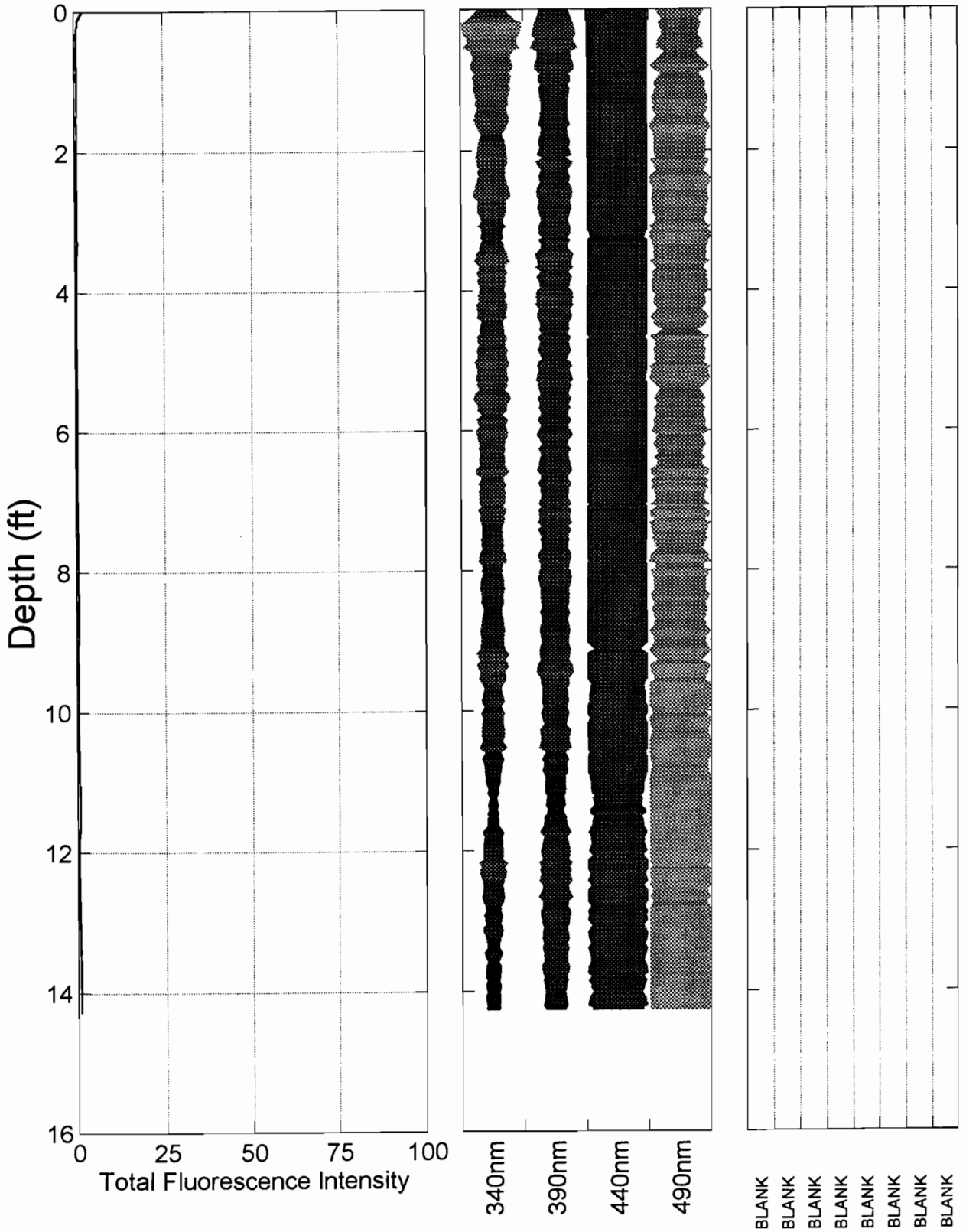

bh_9
Depth (ft)
Total Fluorescence Intensity
1.3 ft
2.6 ft
3.5 ft
7.2 ft
1
2
3
4
Waveform @ 1.3 ft
Waveform @ 2.6 ft
Waveform @ 3.5 ft
Waveform @ 7.2 ft
Signal (V)
Time (ns)


Measured LIF End Depth
8.005 ft
Measured Peak Fluorescence
35.33%
BH_10
Depth (ft)
0
2
4
6
8
10
12
14
16
0
25
50
75
100
Total Fluorescence Intensity
340nm
390nm
440nm
490nm
BLANK
BLANK
BLANK
BLANK
BLANK
BLANK
BLANK
BLANK

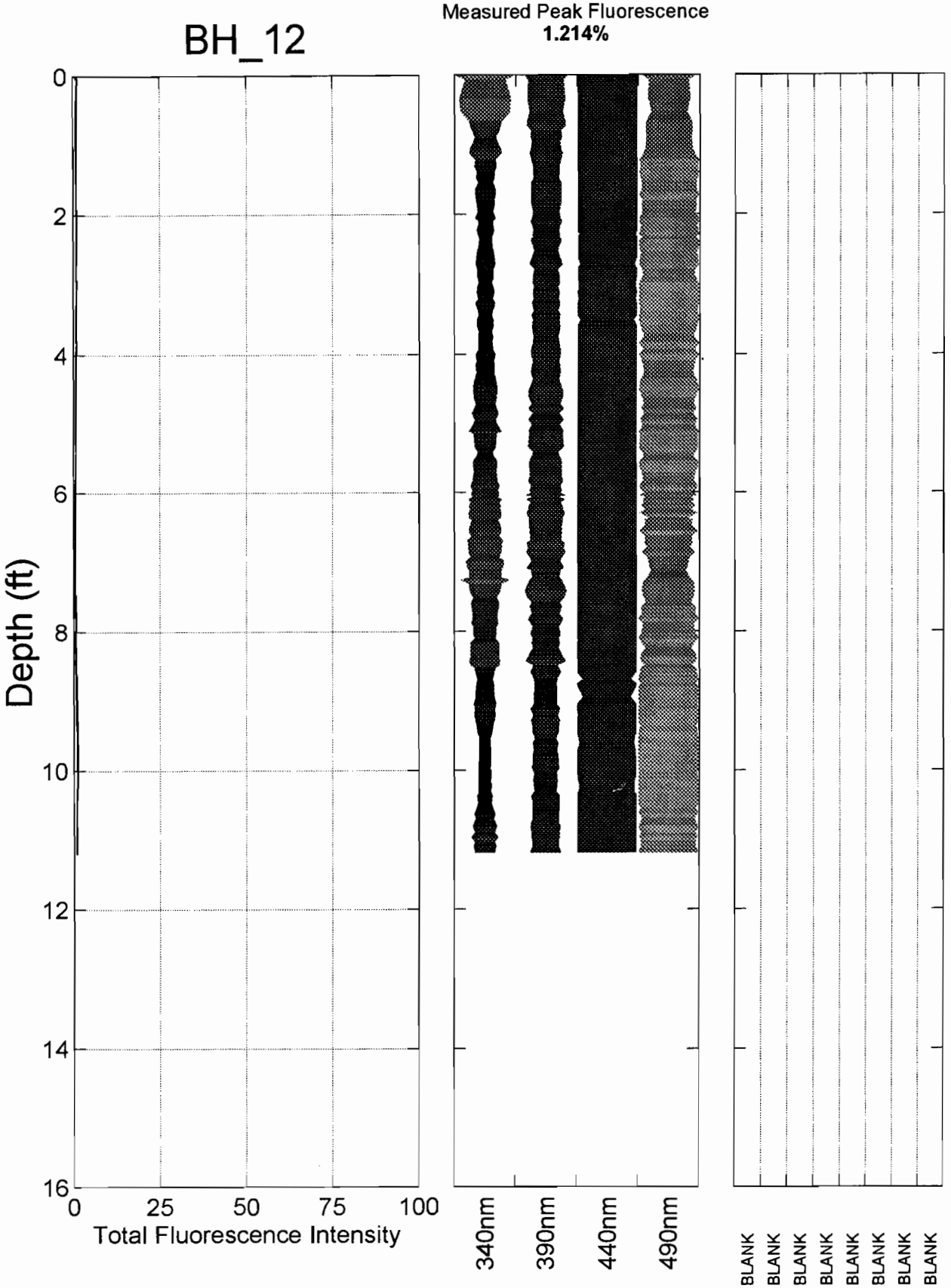

bh_10
Depth (ft)
Total Fluorescence Intensity
2.9 ft
4.4 ft
5.6 ft
7.6 ft
1
2
3
4
Waveform @ 2.9 ft
Waveform @ 4.4 ft
Waveform @ 5.6 ft
Waveform @ 7.6 ft
Signal (V)
Time (ns)

Measured LIF End Depth
14.27 ft
Measured Peak Fluorescence
0.9402%

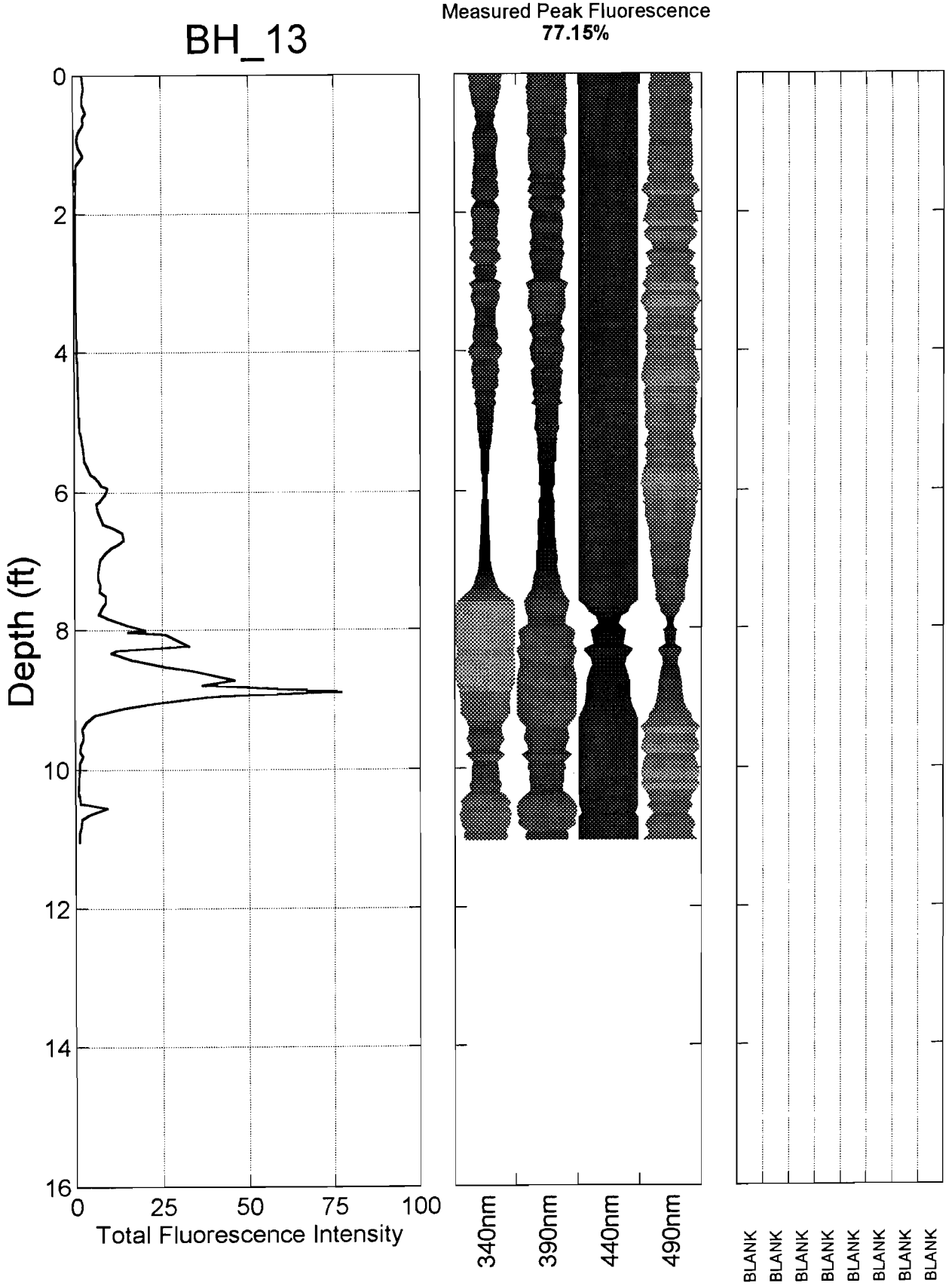
BH_11

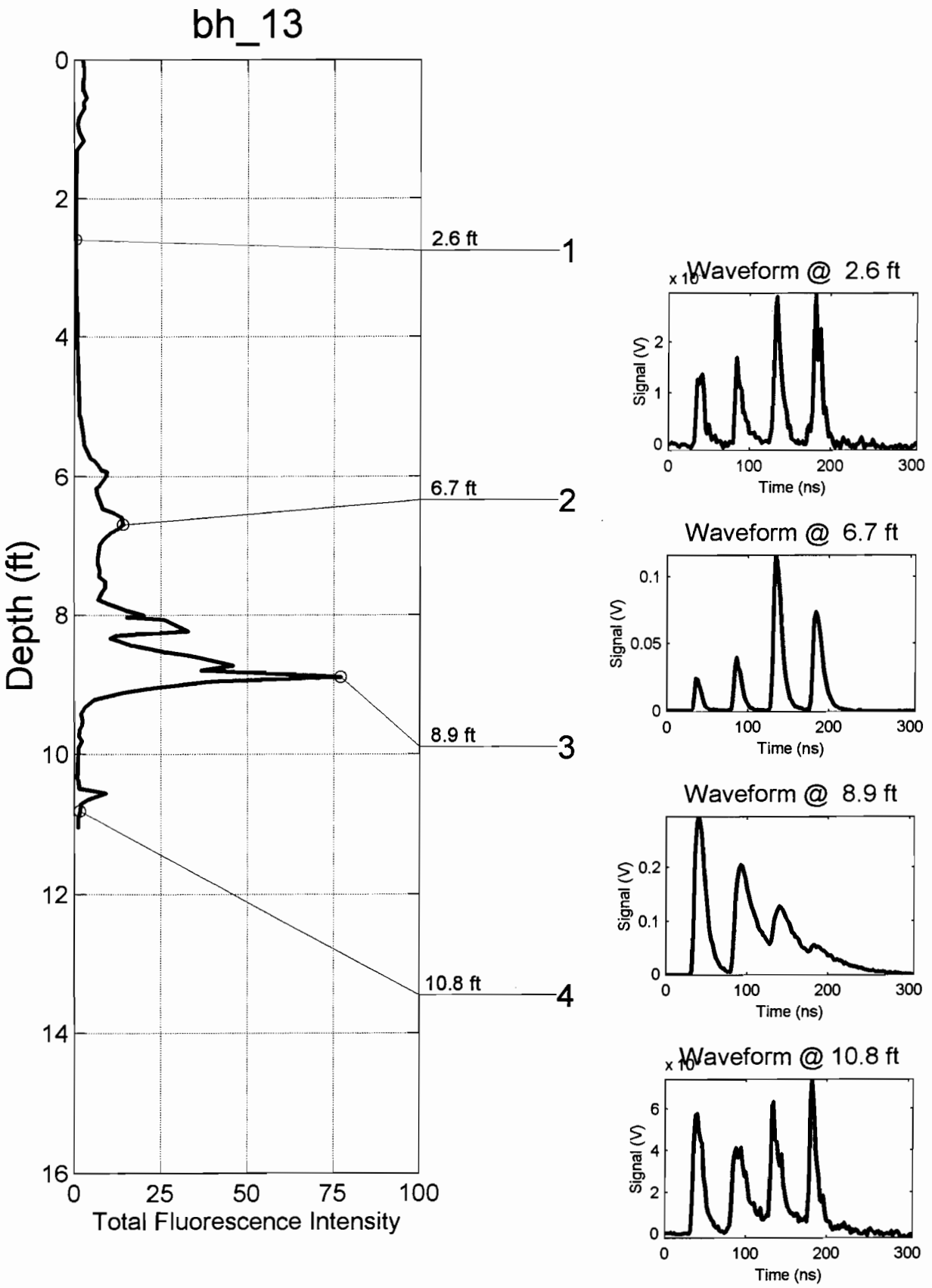


Measured LIF End Depth
11.19 ft
Measured Peak Fluorescence
1.214%

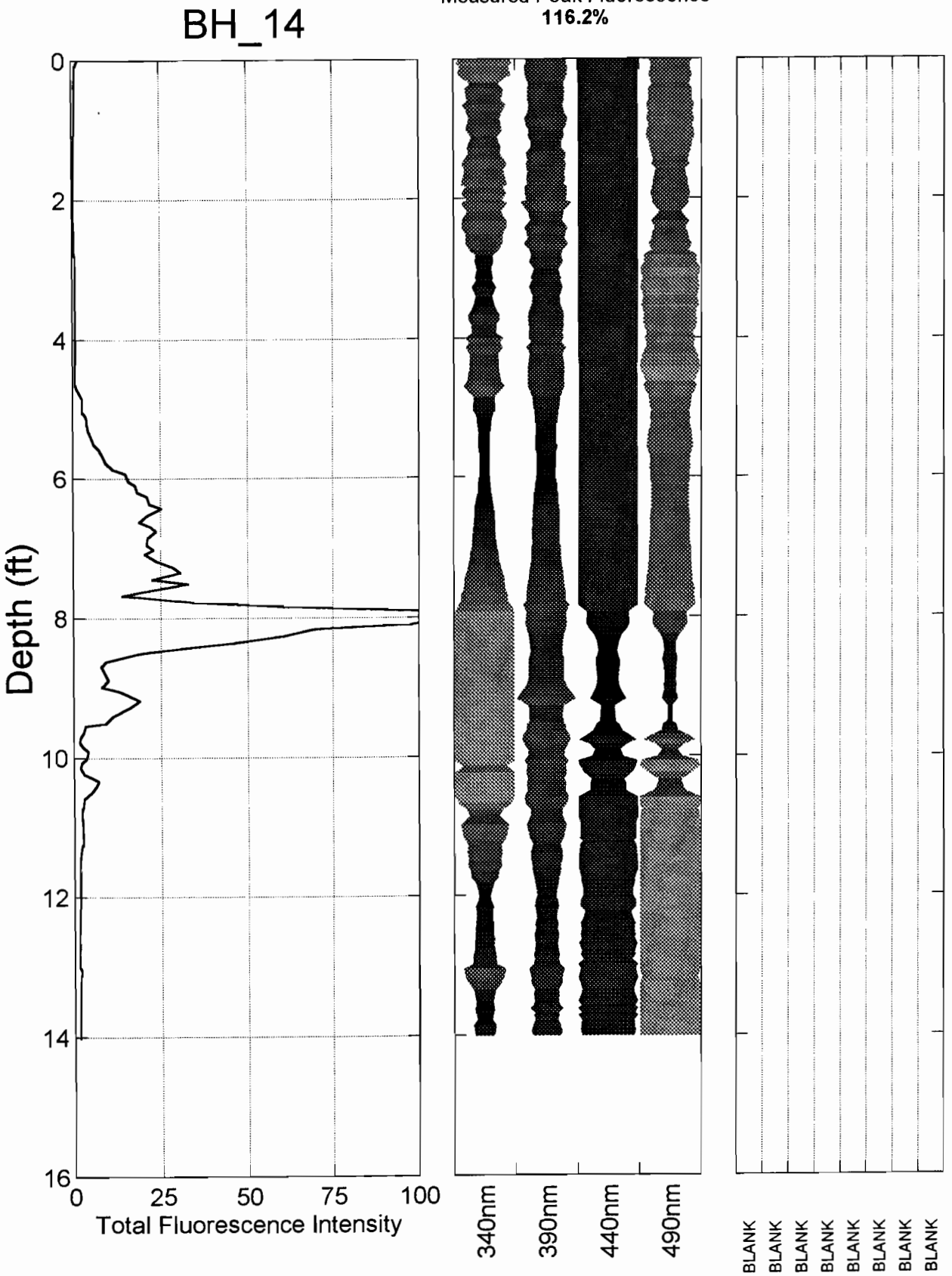


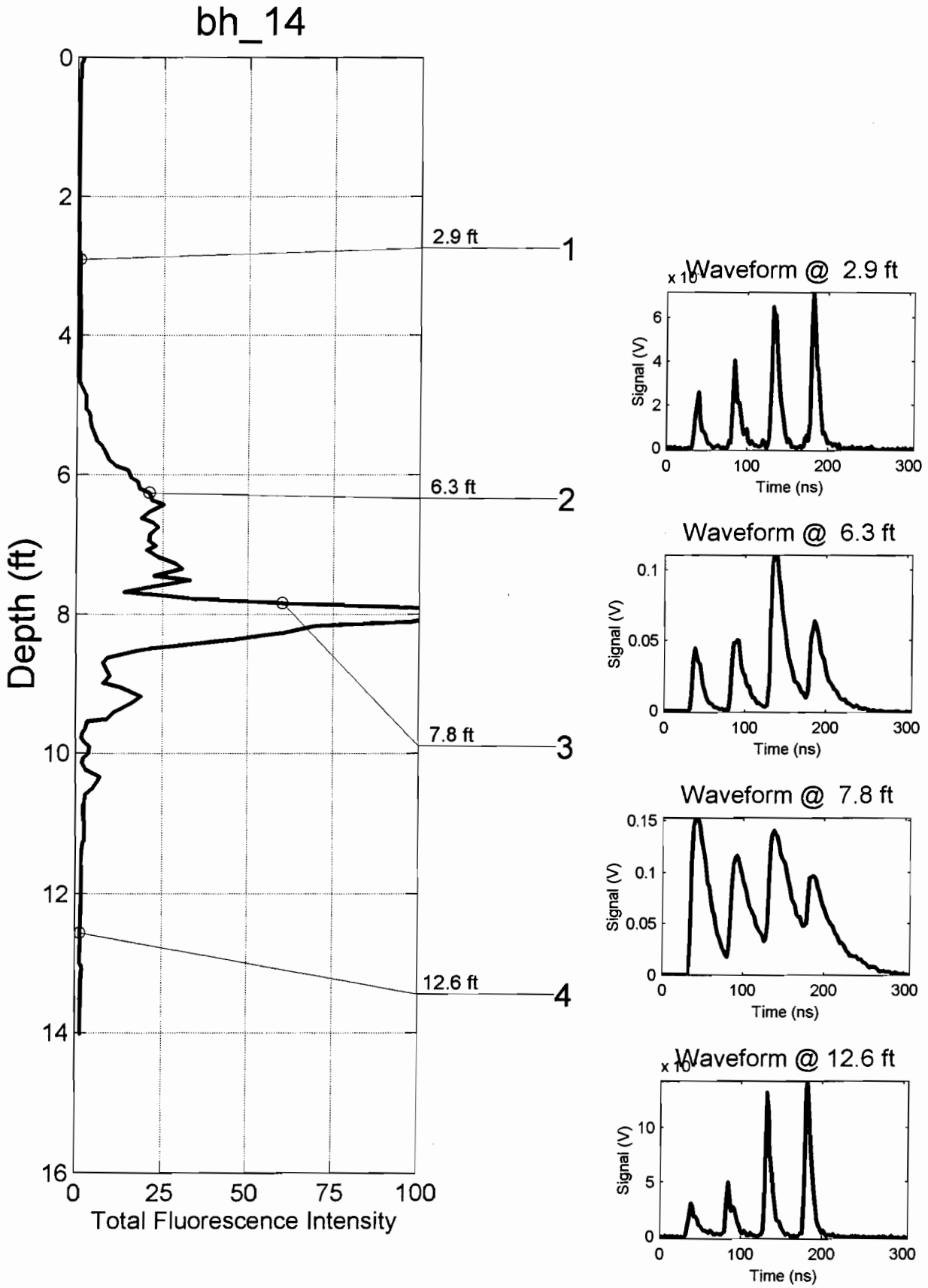
Measured LIF End Depth
11.06 ft
Measured Peak Fluorescence
77.15%

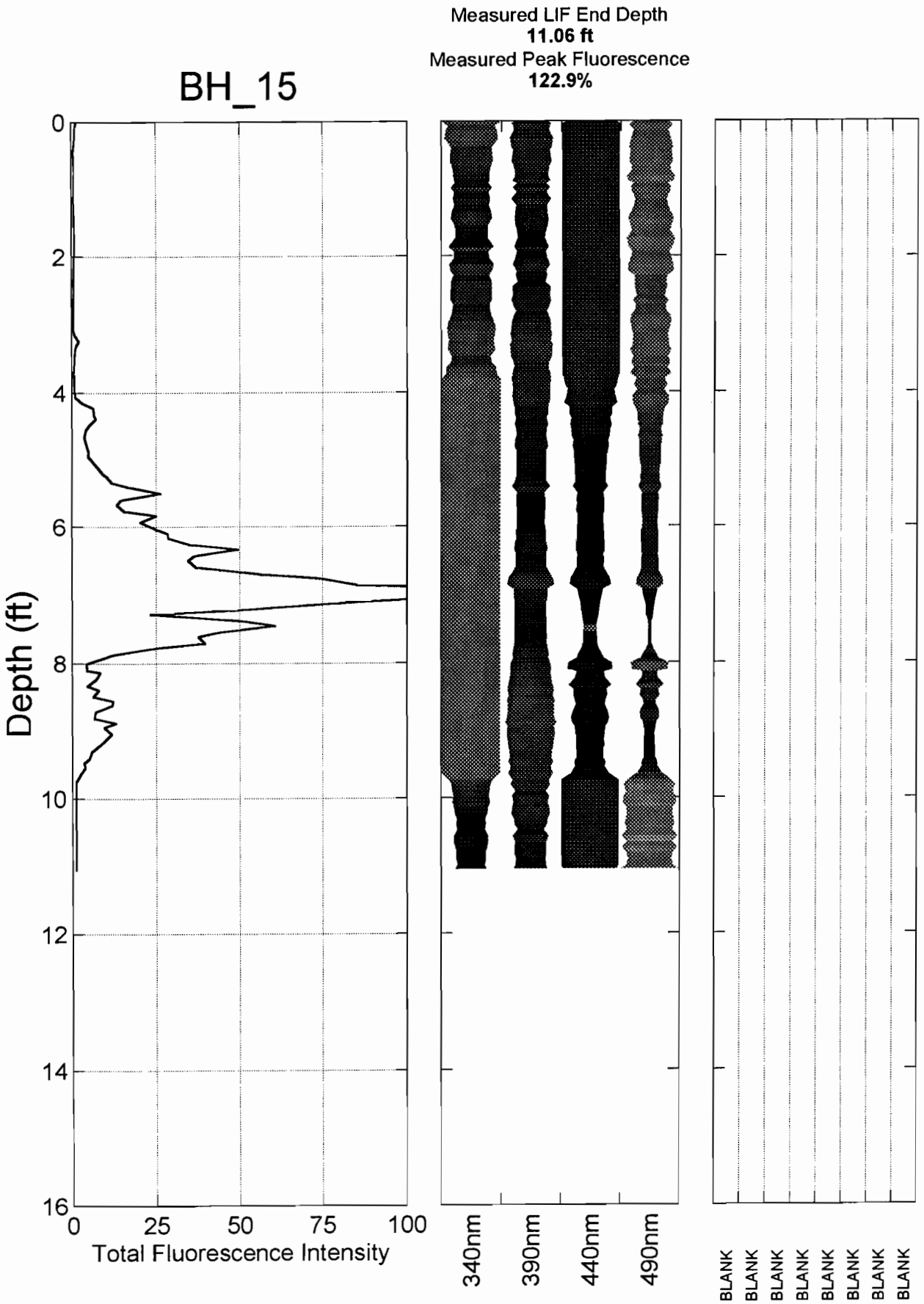


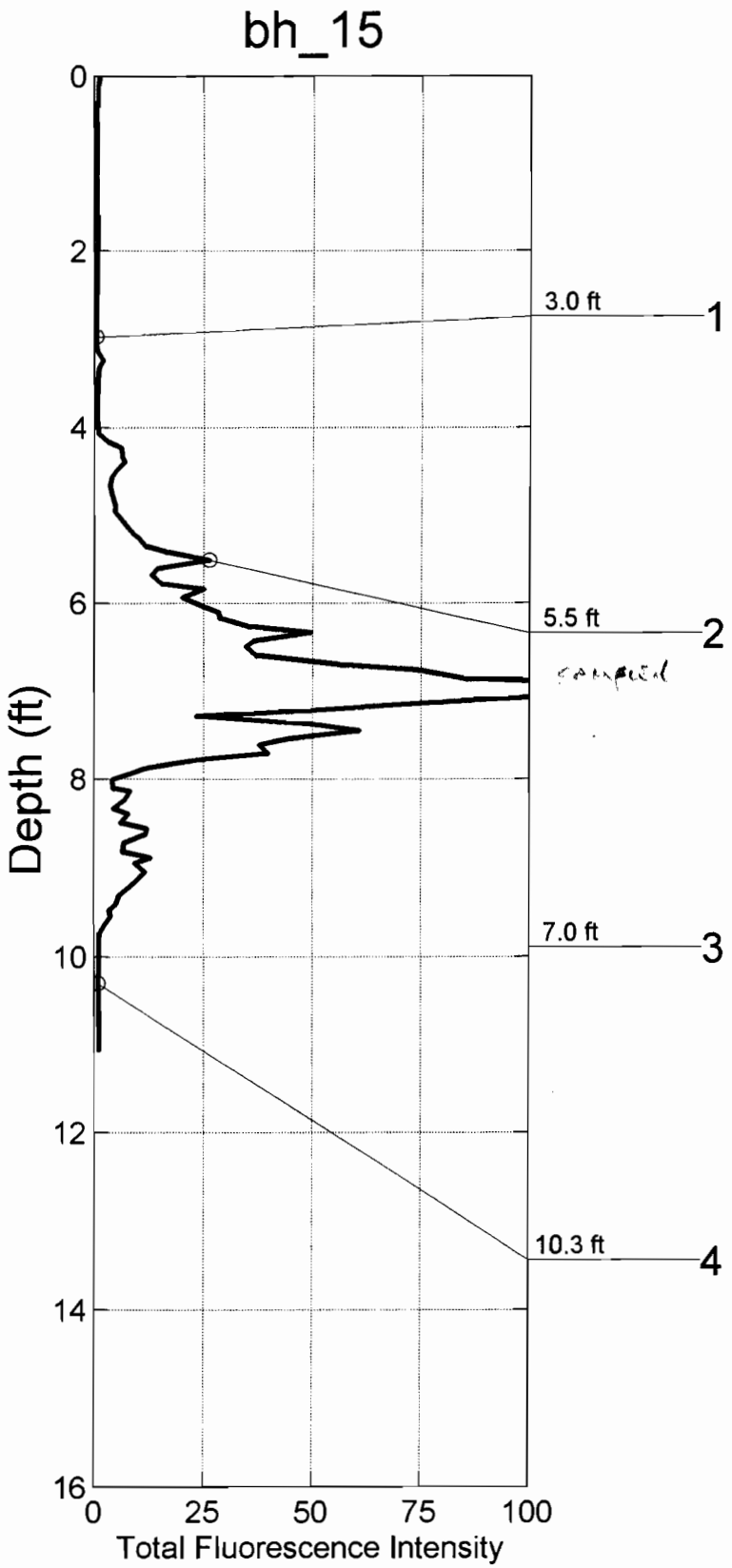

bh_13
Depth (ft)
Total Fluorescence Intensity
2.6 ft
6.7 ft
8.9 ft
10.8 ft
1
2
3
4
Waveform @ 2.6 ft
Waveform @ 6.7 ft
Waveform @ 8.9 ft
Waveform @ 10.8 ft
Signal (V)
Time (ns)

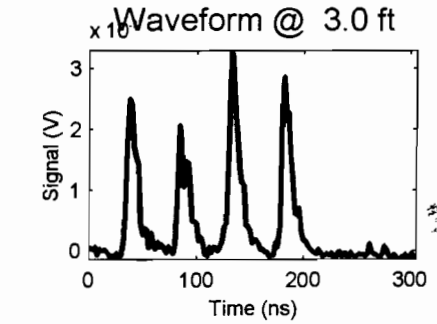
Measured LIF End Depth
14.01 ft
Measured Peak Fluorescence
116.2%

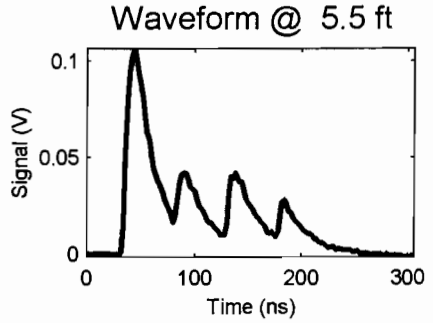


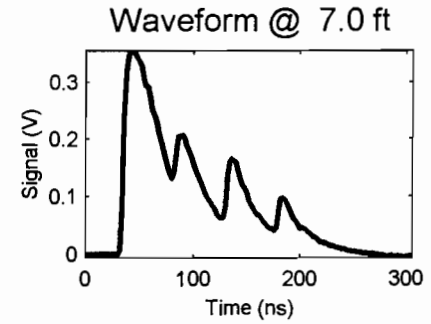

bh_14
Depth (ft)
Total Fluorescence Intensity
2.9 ft
6.3 ft
7.8 ft
12.6 ft
1
2
3
4
Waveform @ 2.9 ft
Waveform @ 6.3 ft
Waveform @ 7.8 ft
Waveform @ 12.6 ft
Signal (V)
Time (ns)

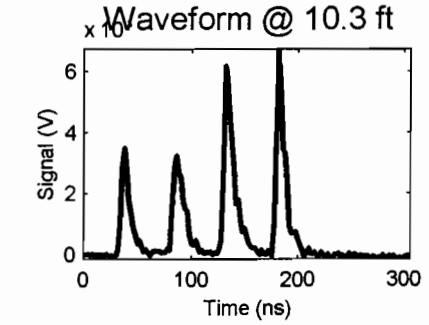

Measured LIF End Depth
11.06 ft
Measured Peak Fluorescence
122.9%
BH_15
Depth (ft)
0
2
4
6
8
10
12
14
16
0
25
50
75
100
Total Fluorescence Intensity
340nm
390nm
440nm
490nm
BLANK
BLANK
BLANK
BLANK
BLANK
BLANK
BLANK
BLANK


bh_15
Depth (ft)
Total Fluorescence Intensity
3.0 ft
5.5 ft
7.0 ft
10.3 ft
1
2
3
4
sampled


Waveform @ 3.0 ft
Signal (V)
Time (ns)

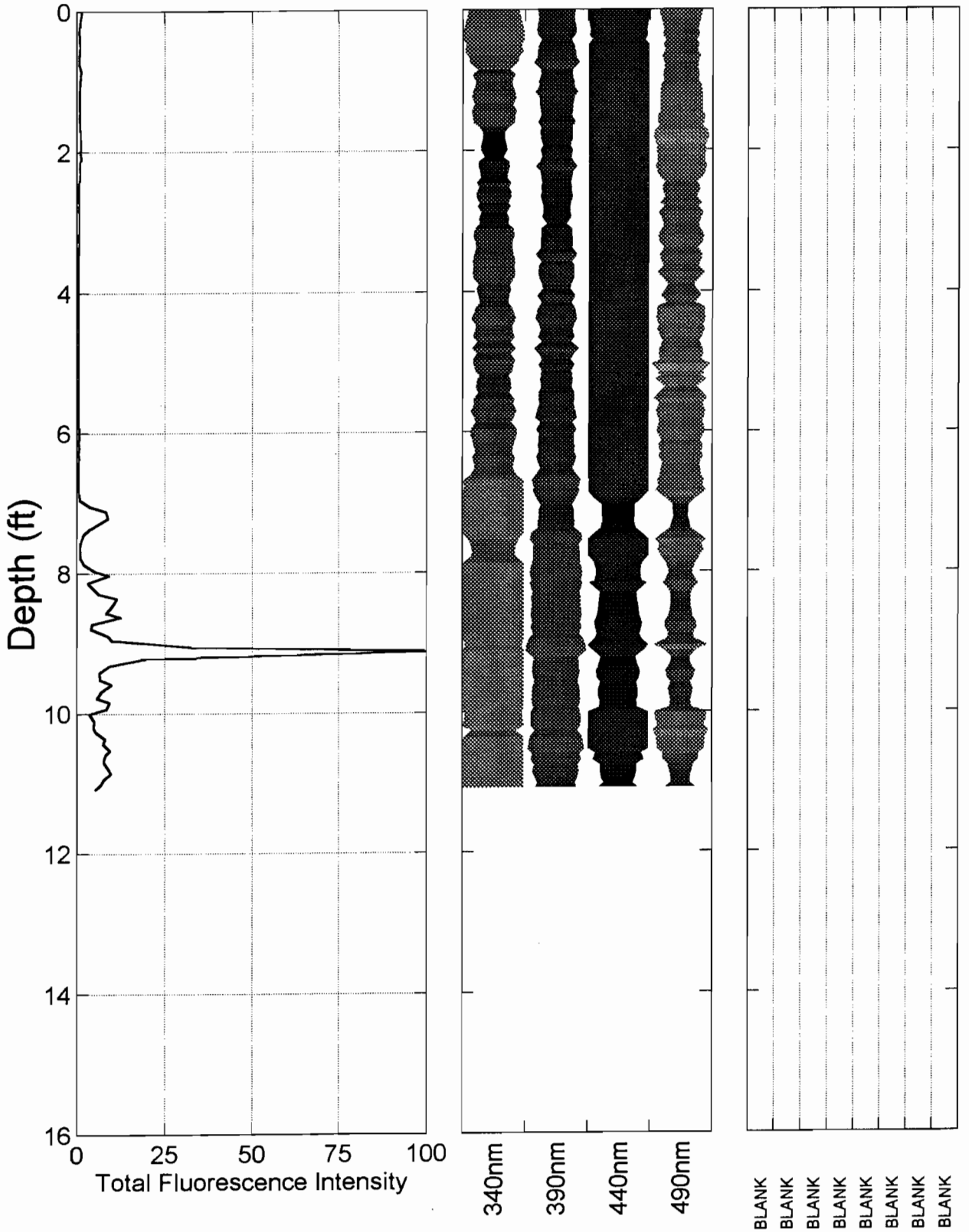

Waveform @ 5.5 ft
Signal (V)
Time (ns)

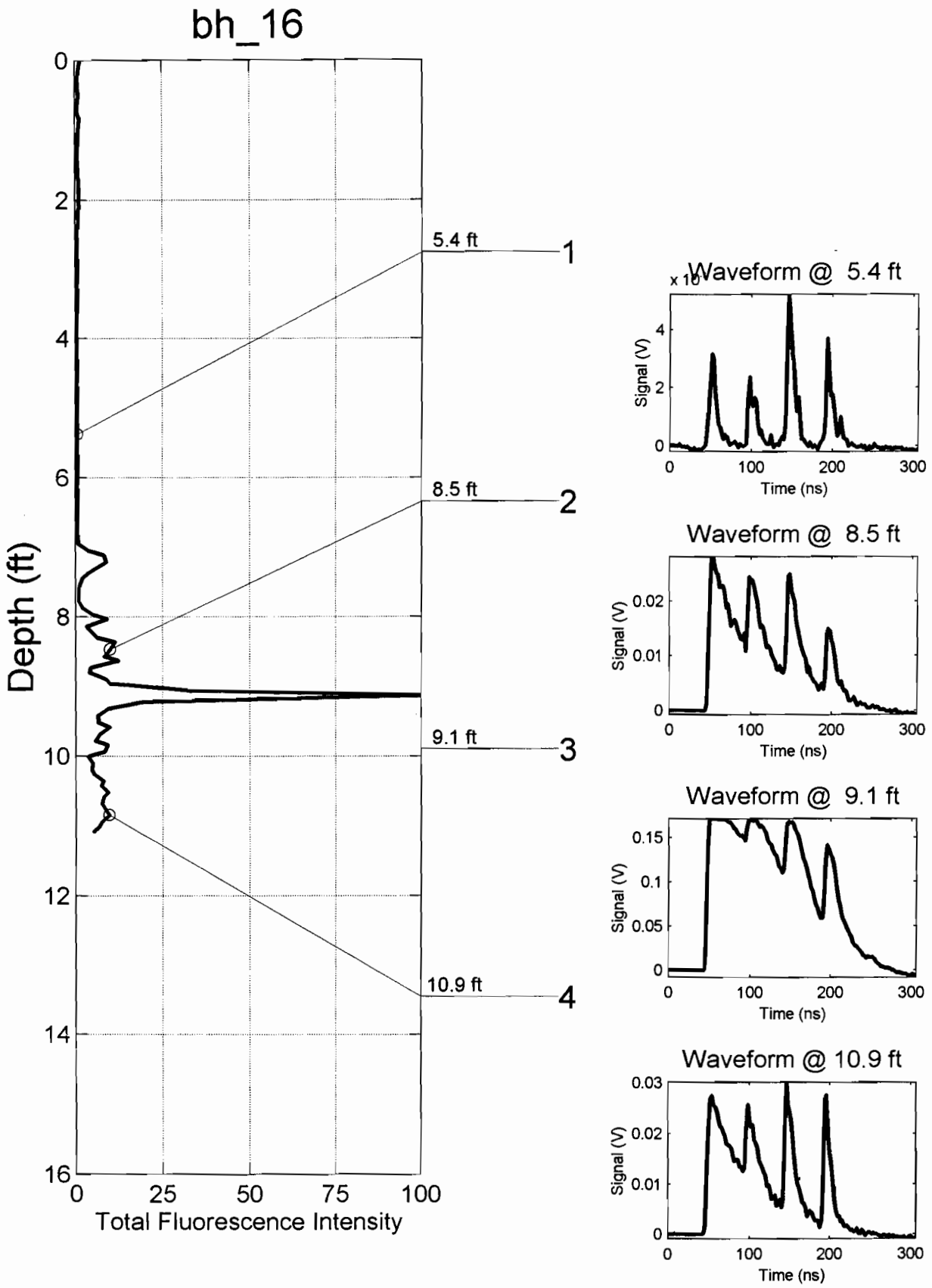

Waveform @ 7.0 ft
Signal (V)
Time (ns)


Waveform @ 10.3 ft
Signal (V)
Time (ns)

Measured LIF End Depth
11.09 ft
Measured Peak Fluorescence
102.6%

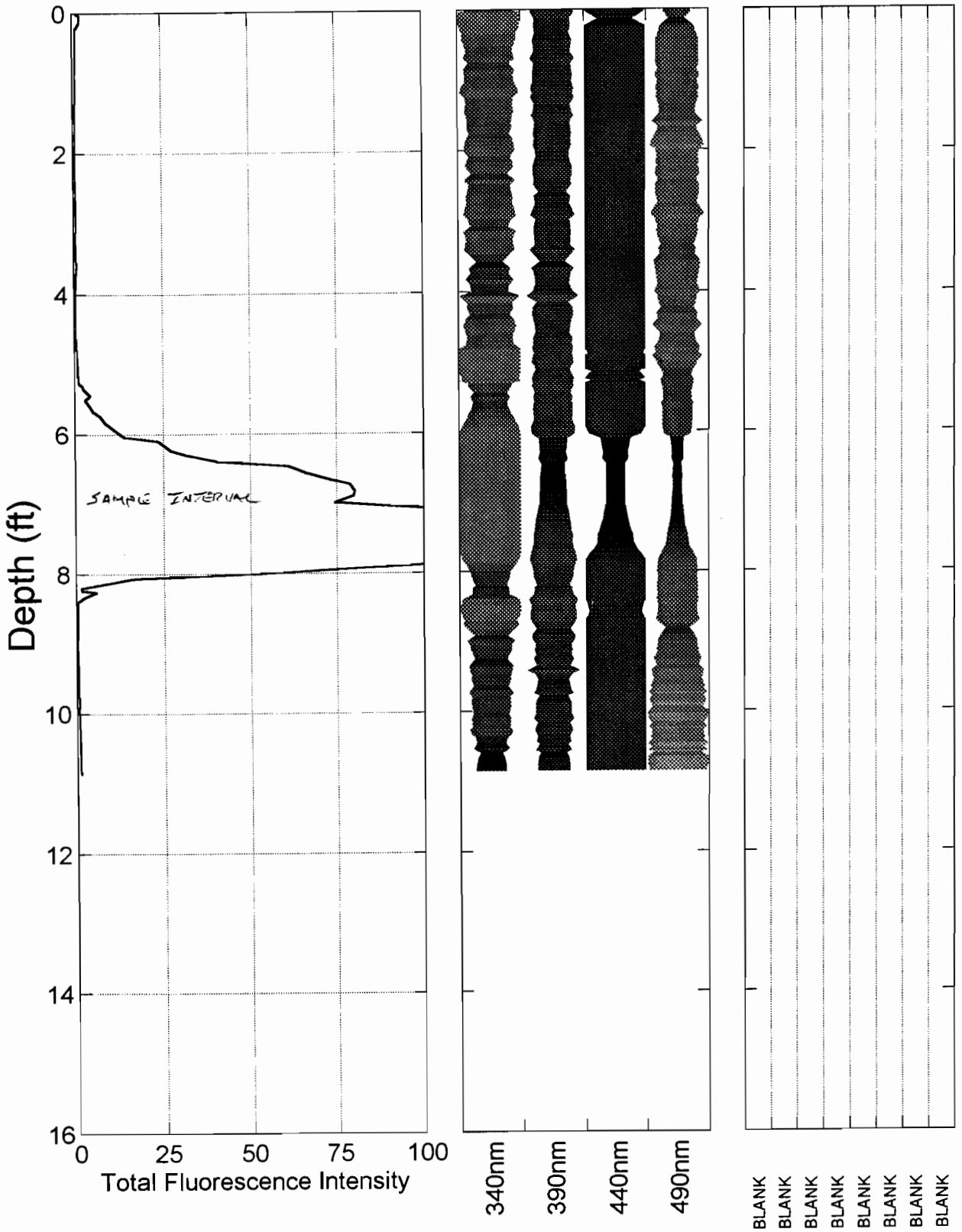
BH_16

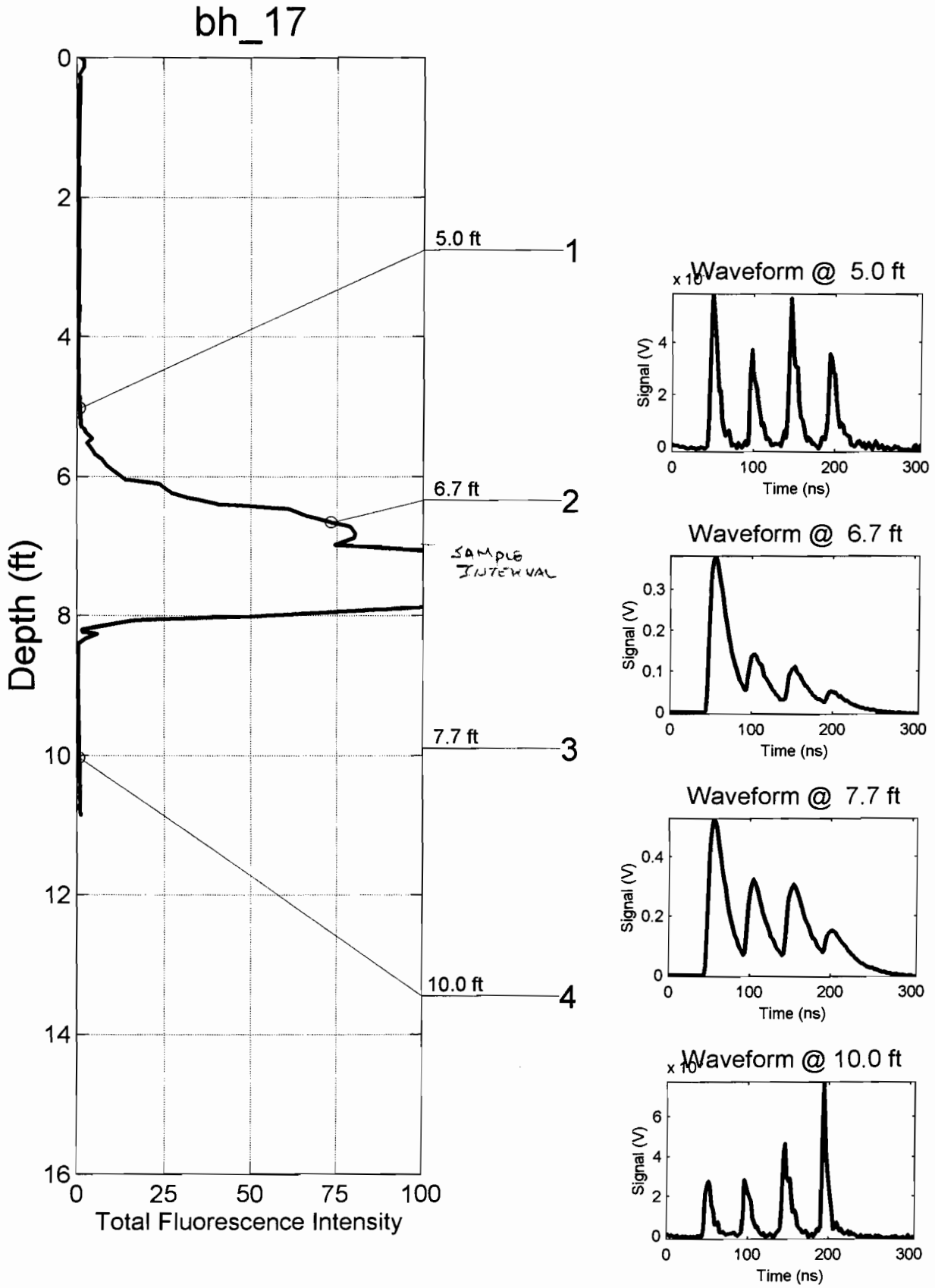



bh_16
Depth (ft)
Total Fluorescence Intensity
5.4 ft
8.5 ft
9.1 ft
10.9 ft
1
2
3
4
Waveform @ 5.4 ft
Waveform @ 8.5 ft
Waveform @ 9.1 ft
Waveform @ 10.9 ft
Signal (V)
Time (ns)

Measured LIF End Depth
10.86 ft
Measured Peak Fluorescence
162.3%

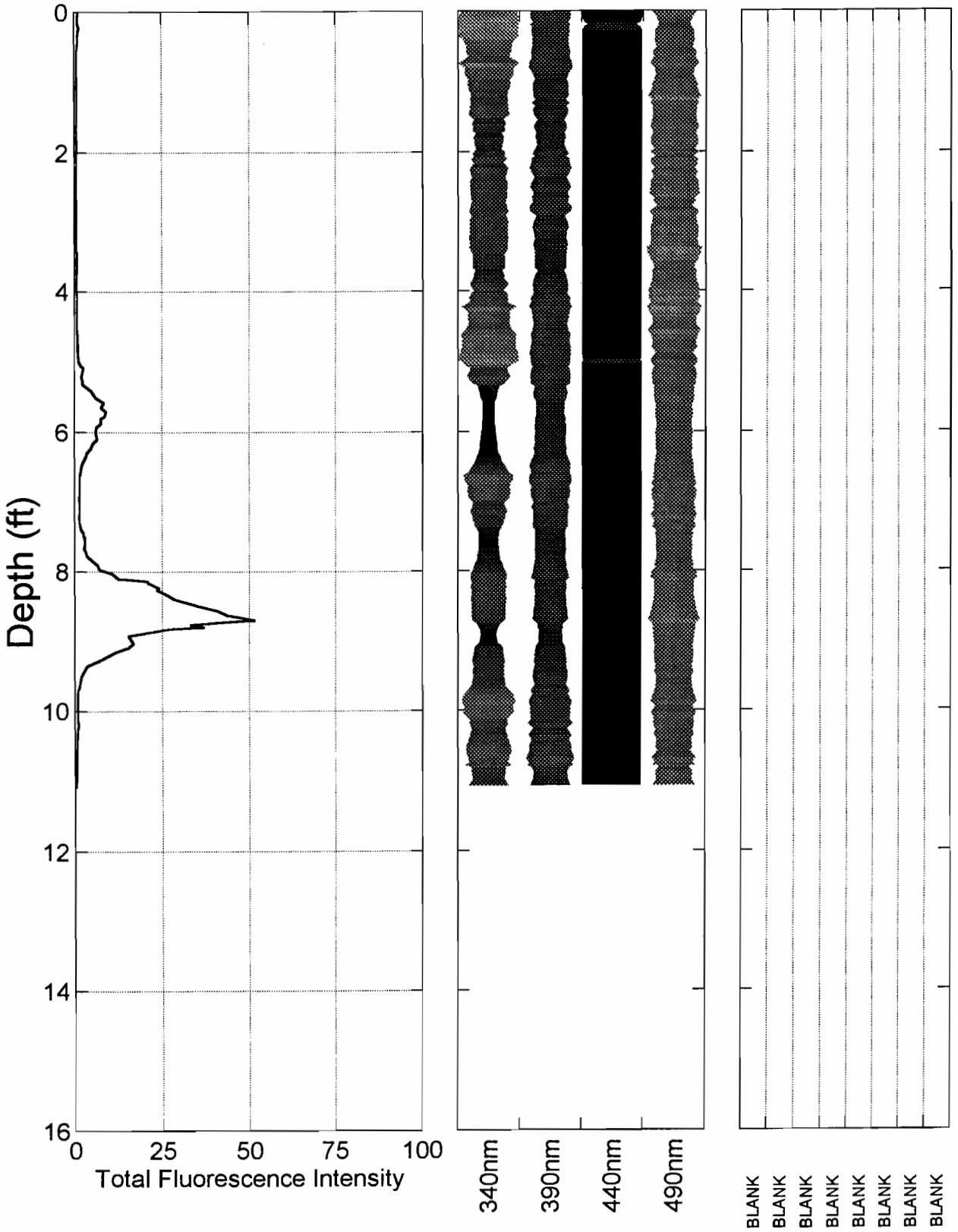
BH_17

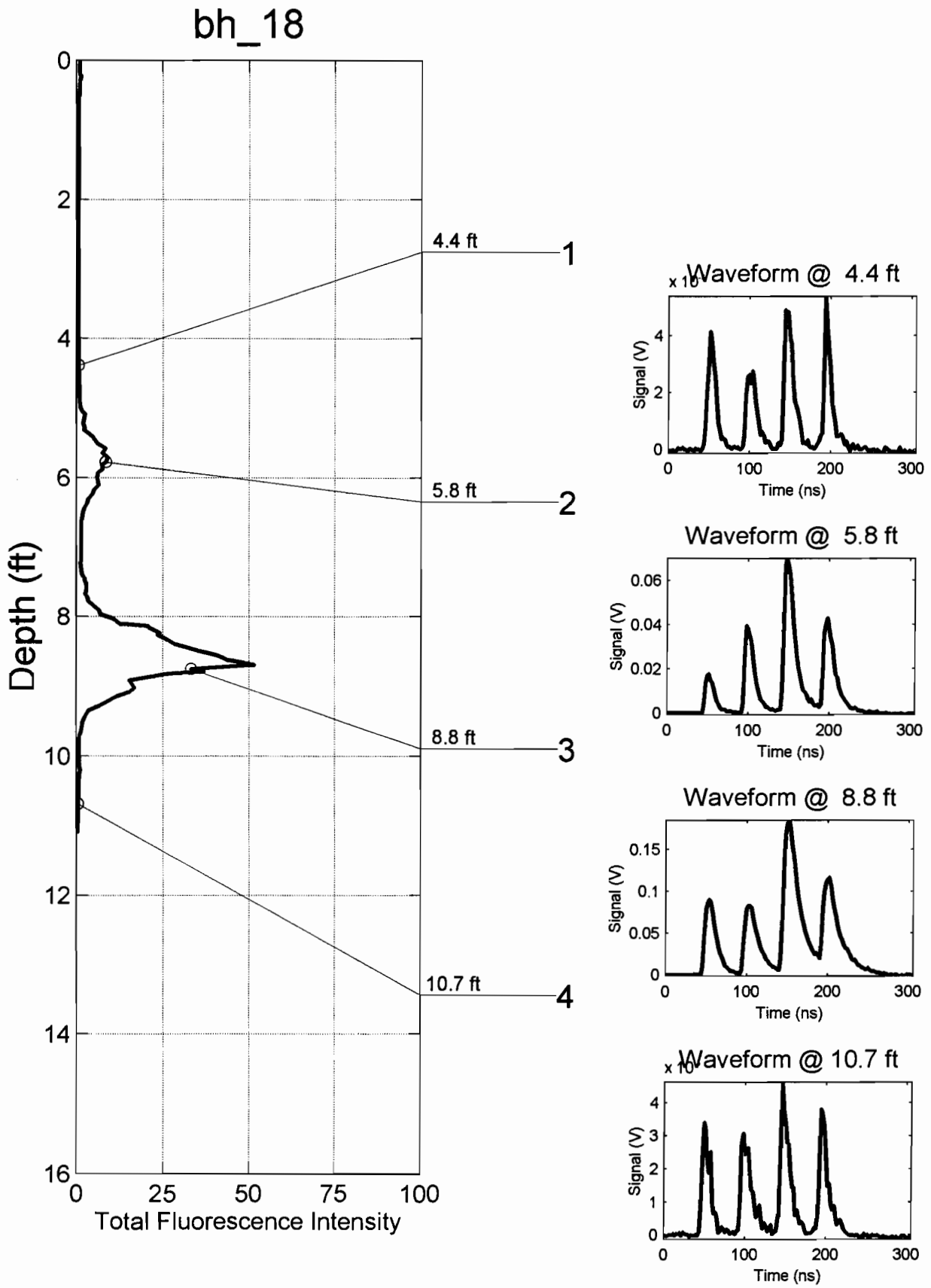



bh_17
Depth (ft)
Total Fluorescence Intensity
5.0 ft
6.7 ft
7.7 ft
10.0 ft
1
2
3
4
SAMPLE INTERVAL
Waveform @ 5.0 ft
Waveform @ 6.7 ft
Waveform @ 7.7 ft
Waveform @ 10.0 ft
Signal (V)
Time (ns)

Measured LIF End Depth
11.09 ft
Measured Peak Fluorescence
51.65%

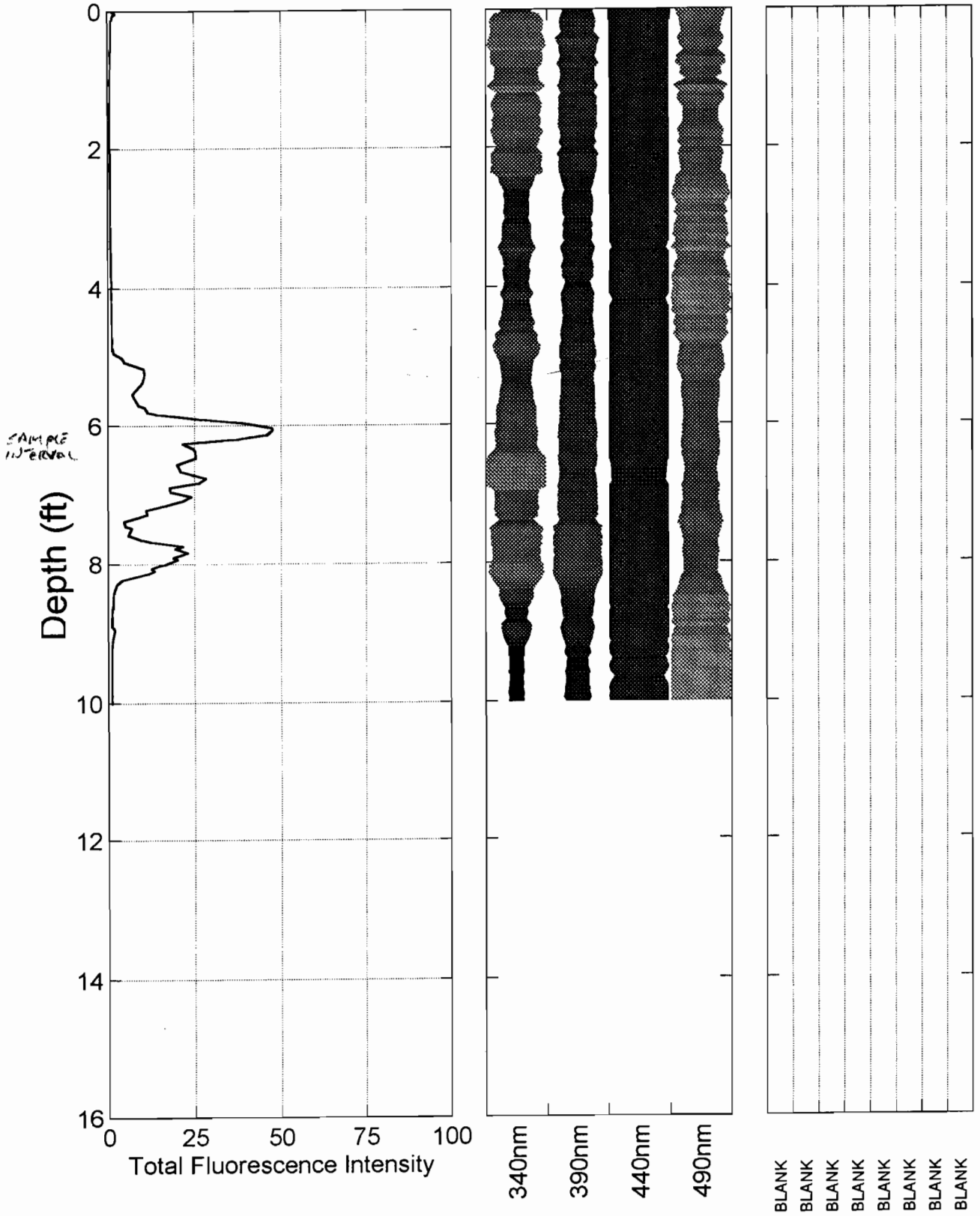
BH_18

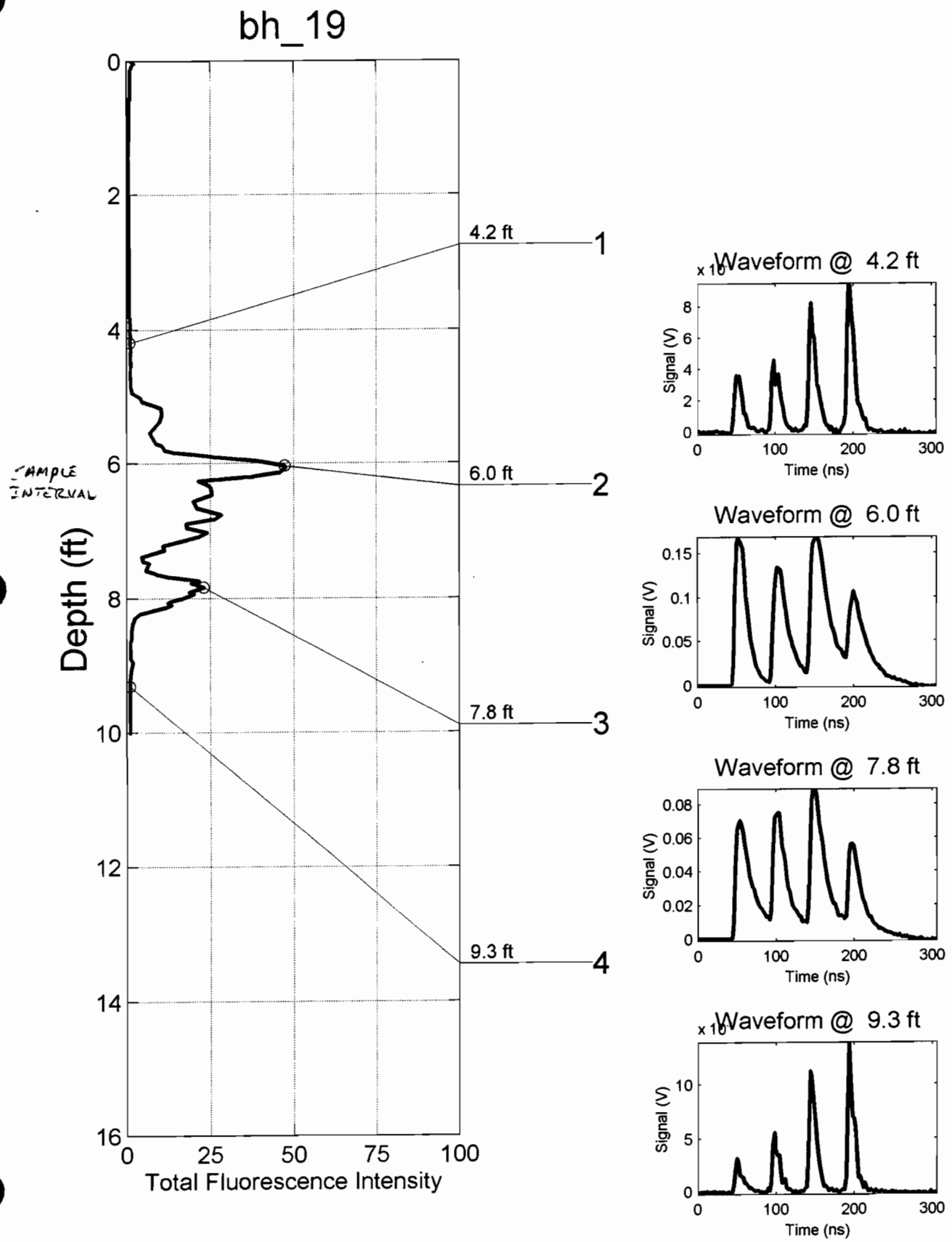



bh_18
Depth (ft)
Total Fluorescence Intensity
4.4 ft
5.8 ft
8.8 ft
10.7 ft
1
2
3
4
Waveform @ 4.4 ft
Waveform @ 5.8 ft
Waveform @ 8.8 ft
Waveform @ 10.7 ft
Signal (V)
Time (ns)

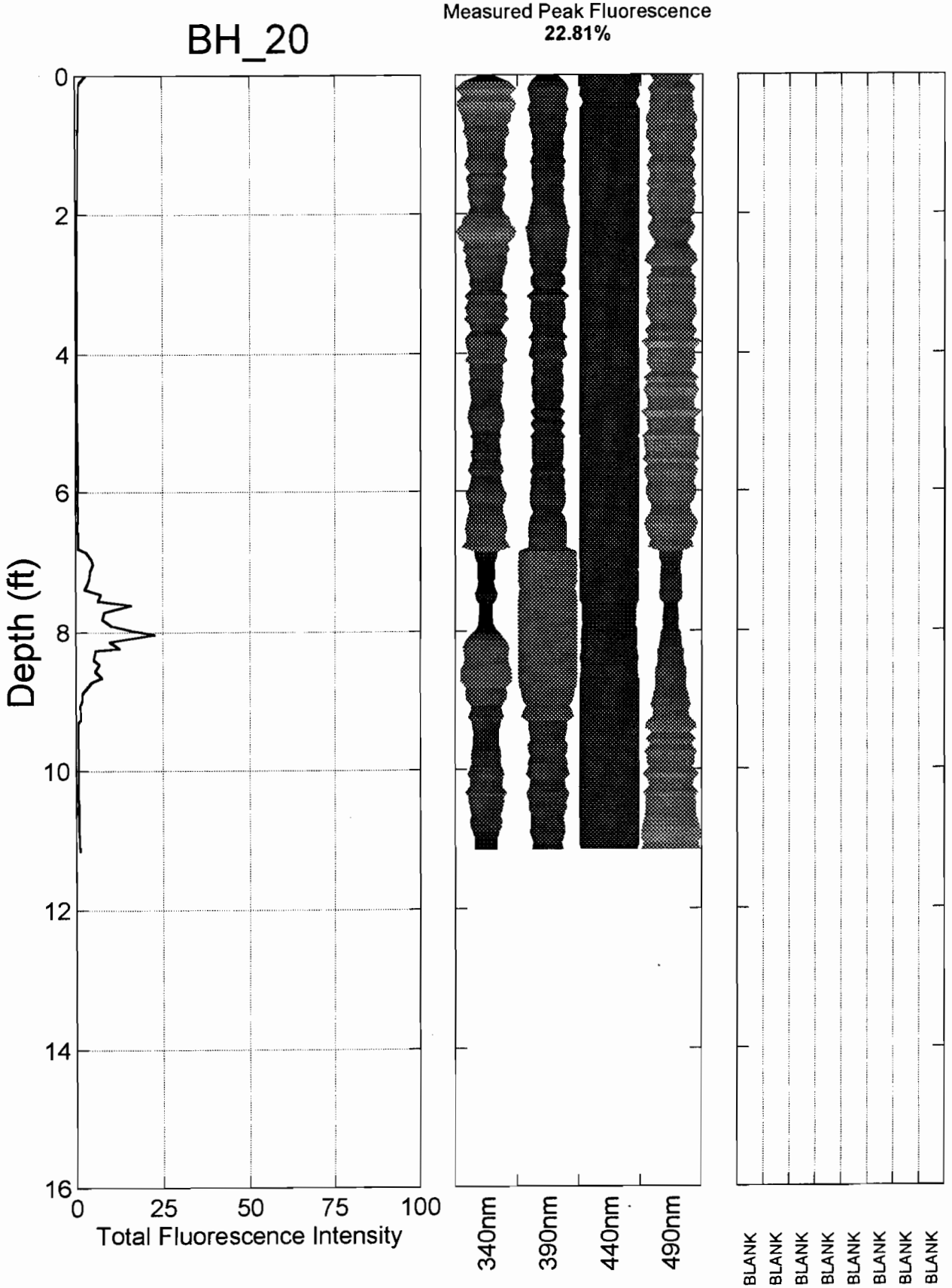
Measured LIF End Depth
10.01 ft
Measured Peak Fluorescence
47.7%

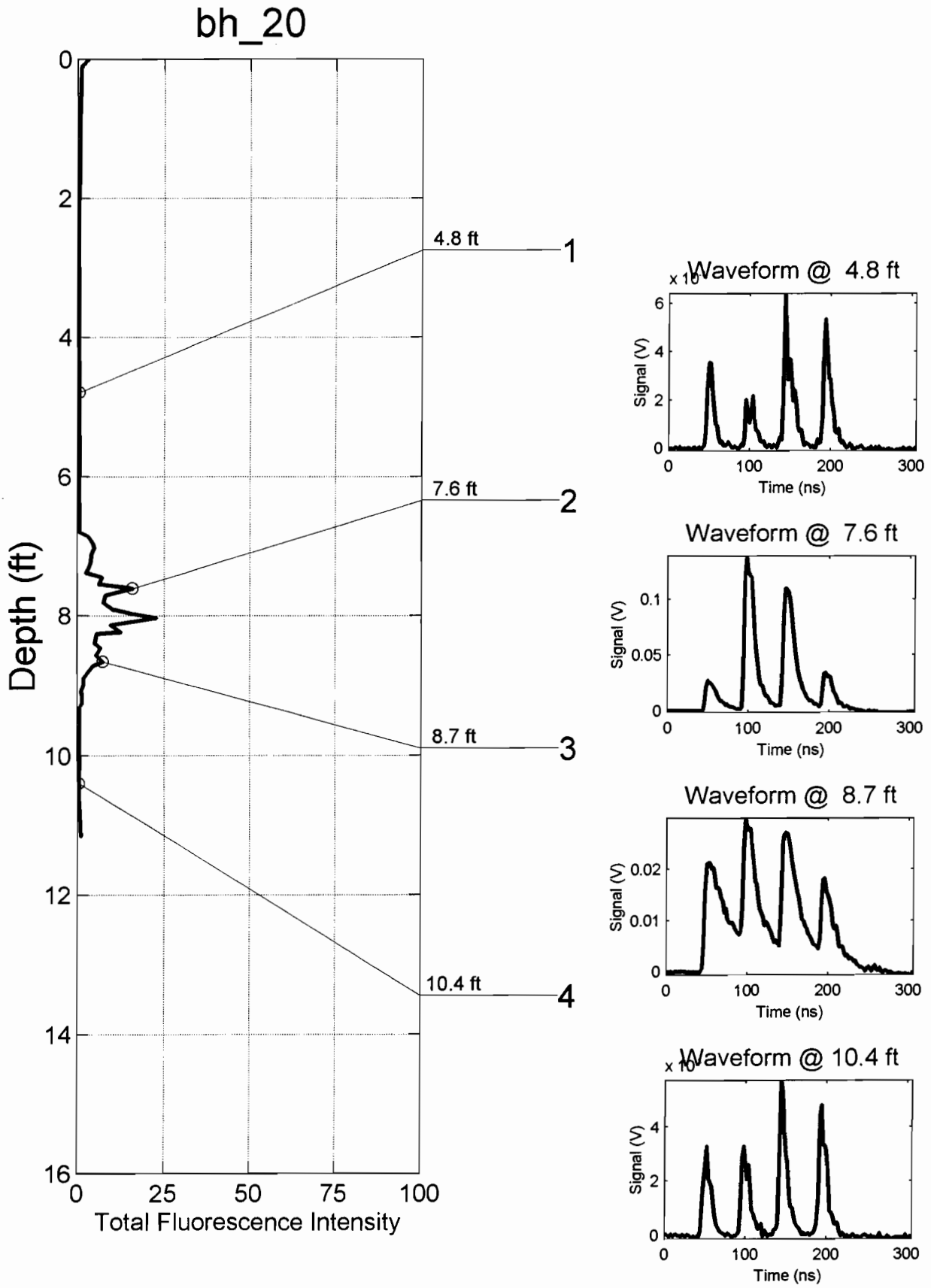
BH_19



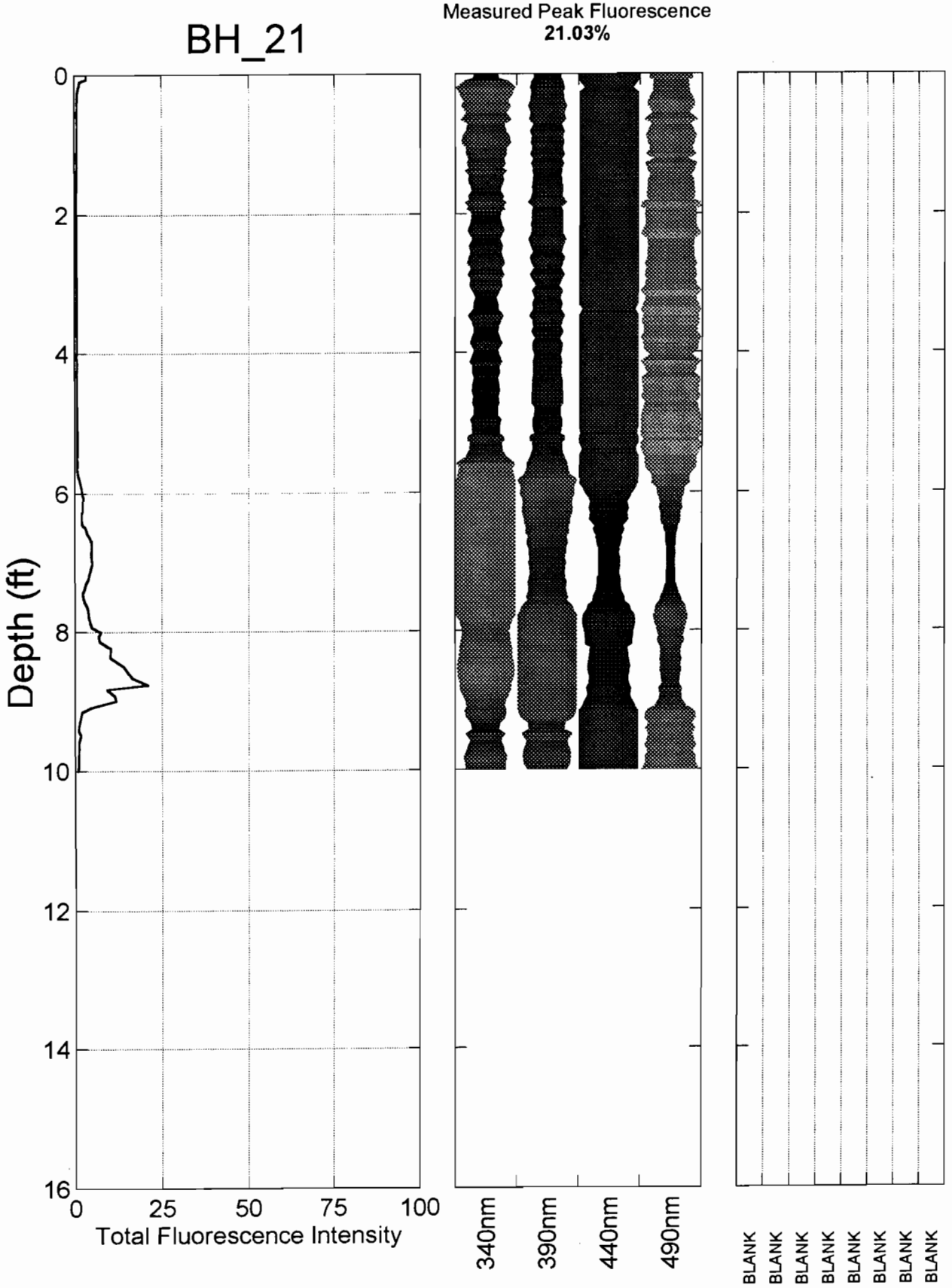

bh_19
Depth (ft)
Total Fluorescence Intensity
4.2 ft
6.0 ft
7.8 ft
9.3 ft
1
2
3
4
SAMPLE INTERVAL
Waveform @ 4.2 ft
Waveform @ 6.0 ft
Waveform @ 7.8 ft
Waveform @ 9.3 ft
Signal (V)
Time (ns)

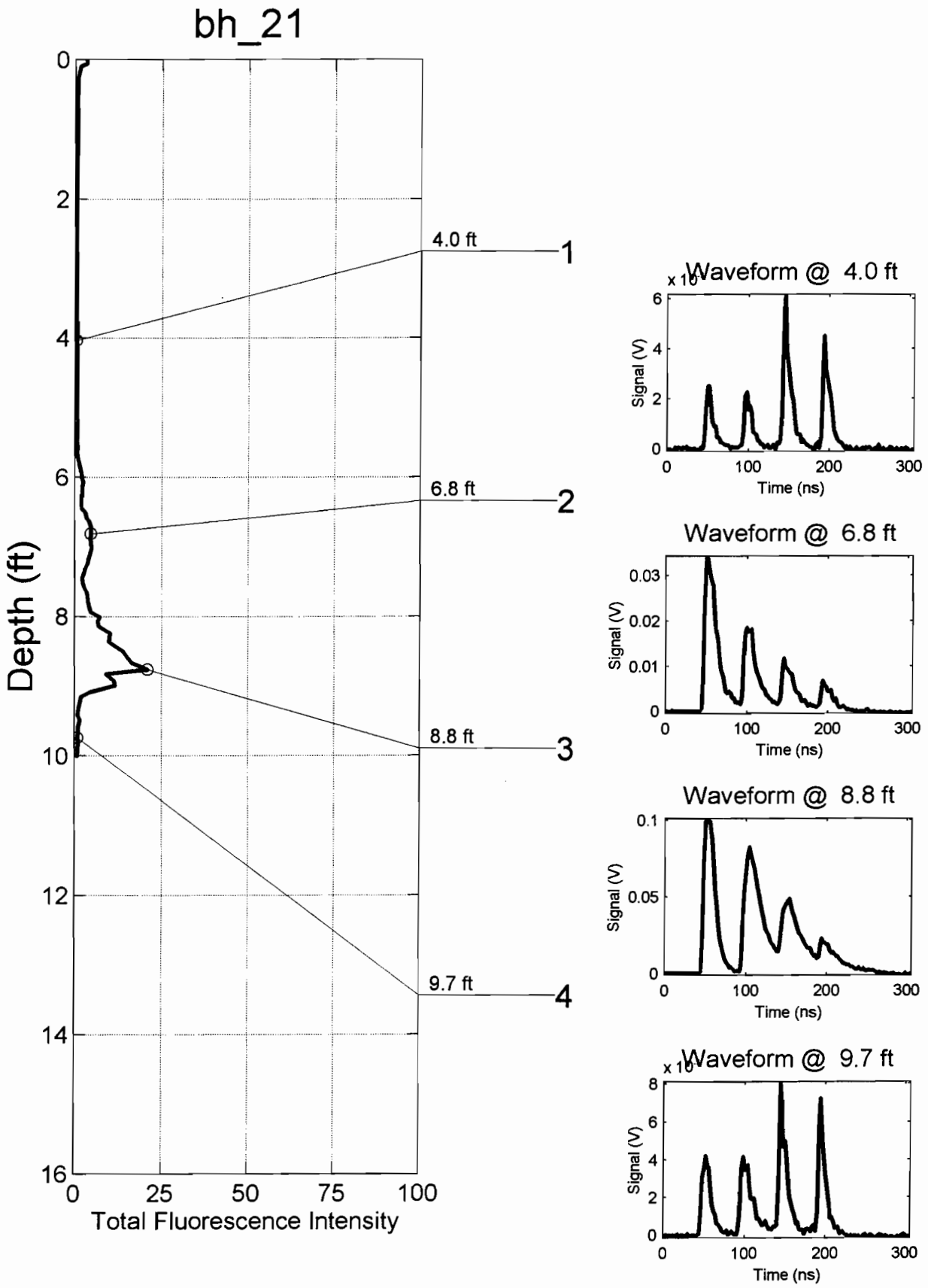
Measured LIF End Depth
11.15 ft
Measured Peak Fluorescence
22.81%



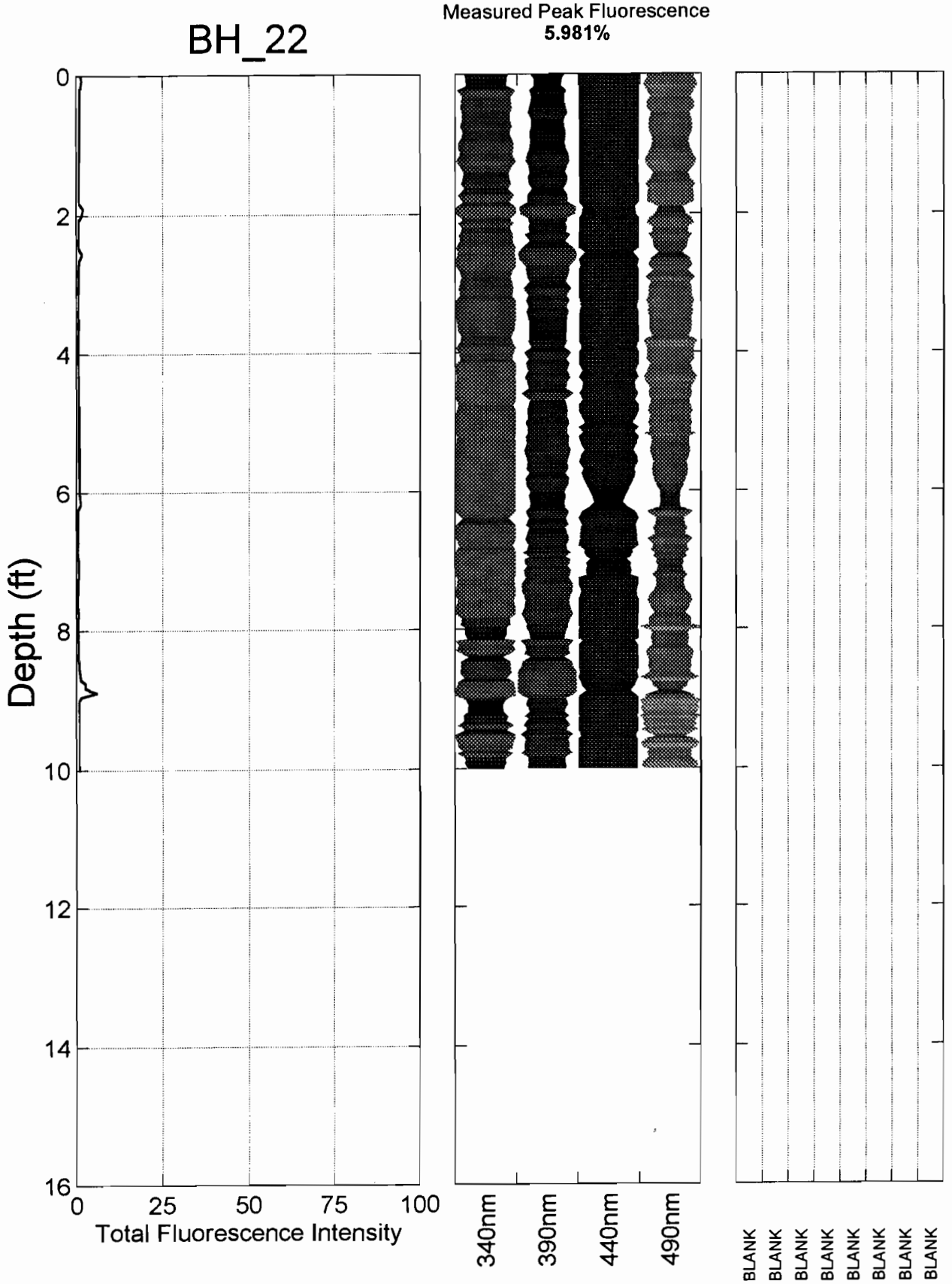

bh_20
Depth (ft)
Total Fluorescence Intensity
4.8 ft
7.6 ft
8.7 ft
10.4 ft
1
2
3
4
Waveform @ 4.8 ft
Waveform @ 7.6 ft
Waveform @ 8.7 ft
Waveform @ 10.4 ft
Signal (V)
Time (ns)

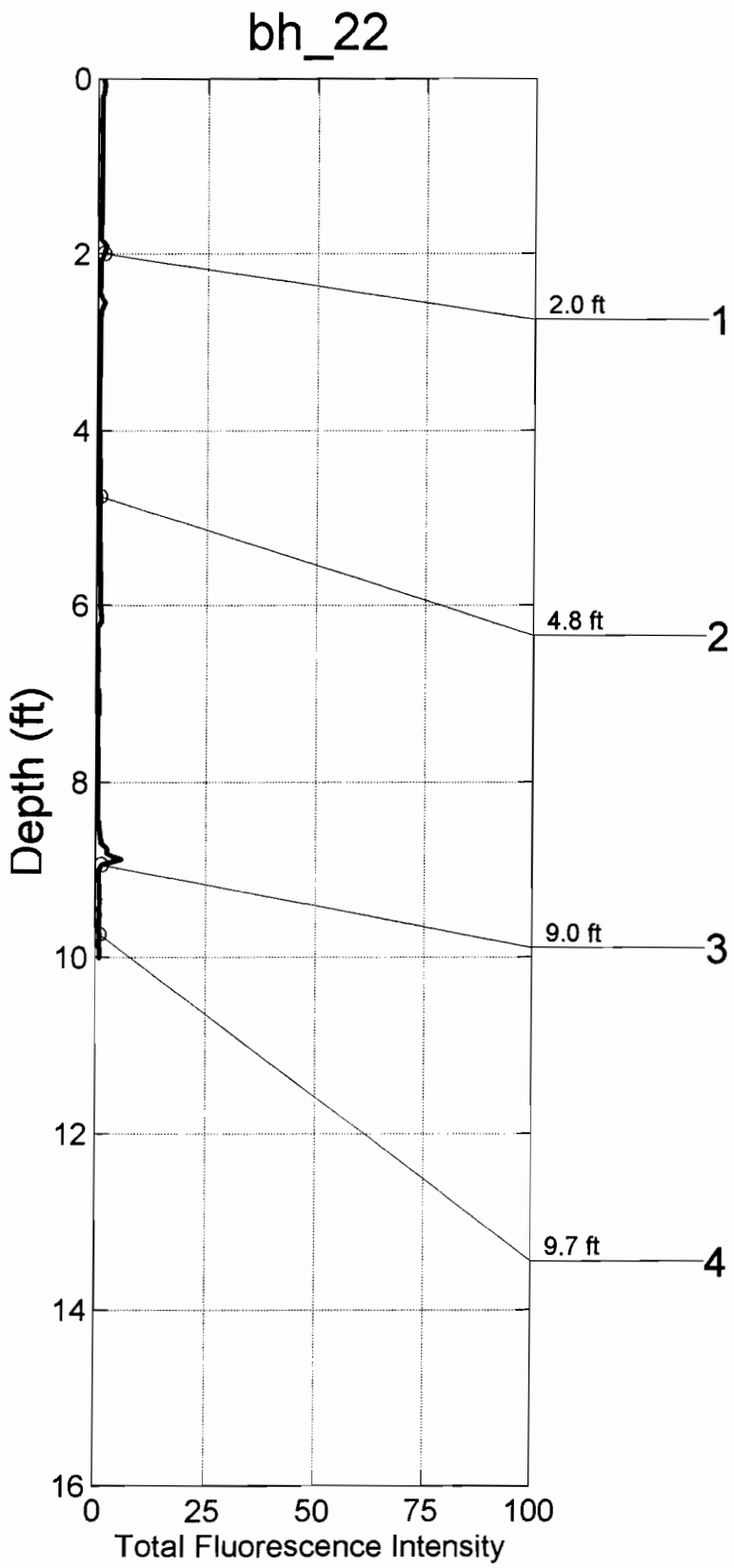
Measured LIF End Depth
10.01 ft
Measured Peak Fluorescence
21.03%

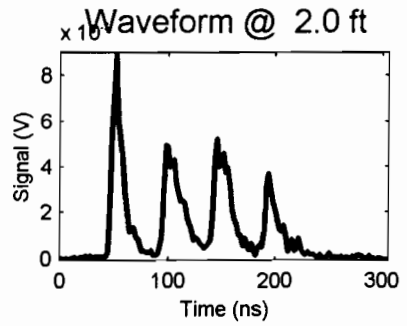


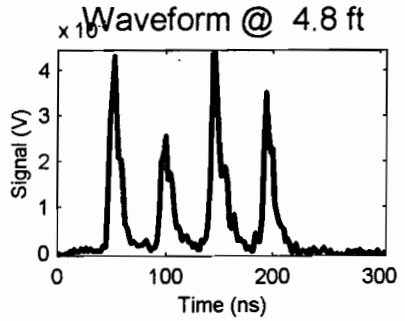

bh_21
Depth (ft)
Total Fluorescence Intensity
4.0 ft
6.8 ft
8.8 ft
9.7 ft
1
2
3
4
Waveform @ 4.0 ft
Waveform @ 6.8 ft
Waveform @ 8.8 ft
Waveform @ 9.7 ft
Signal (V)
Time (ns)

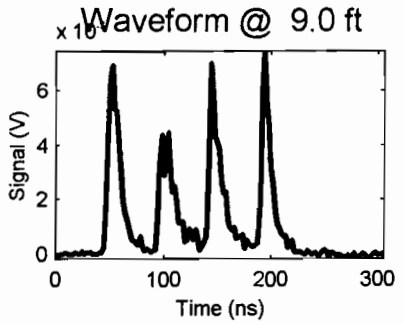
Measured LIF End Depth
10.01 ft
Measured Peak Fluorescence
5.981%

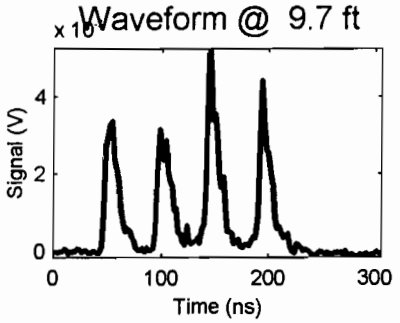



bh_22
Depth (ft)
Total Fluorescence Intensity
0
2
4
6
8
10
12
14
16
0
25
50
75
100
2.0 ft
4.8 ft
9.0 ft
9.7 ft
1
2
3
4

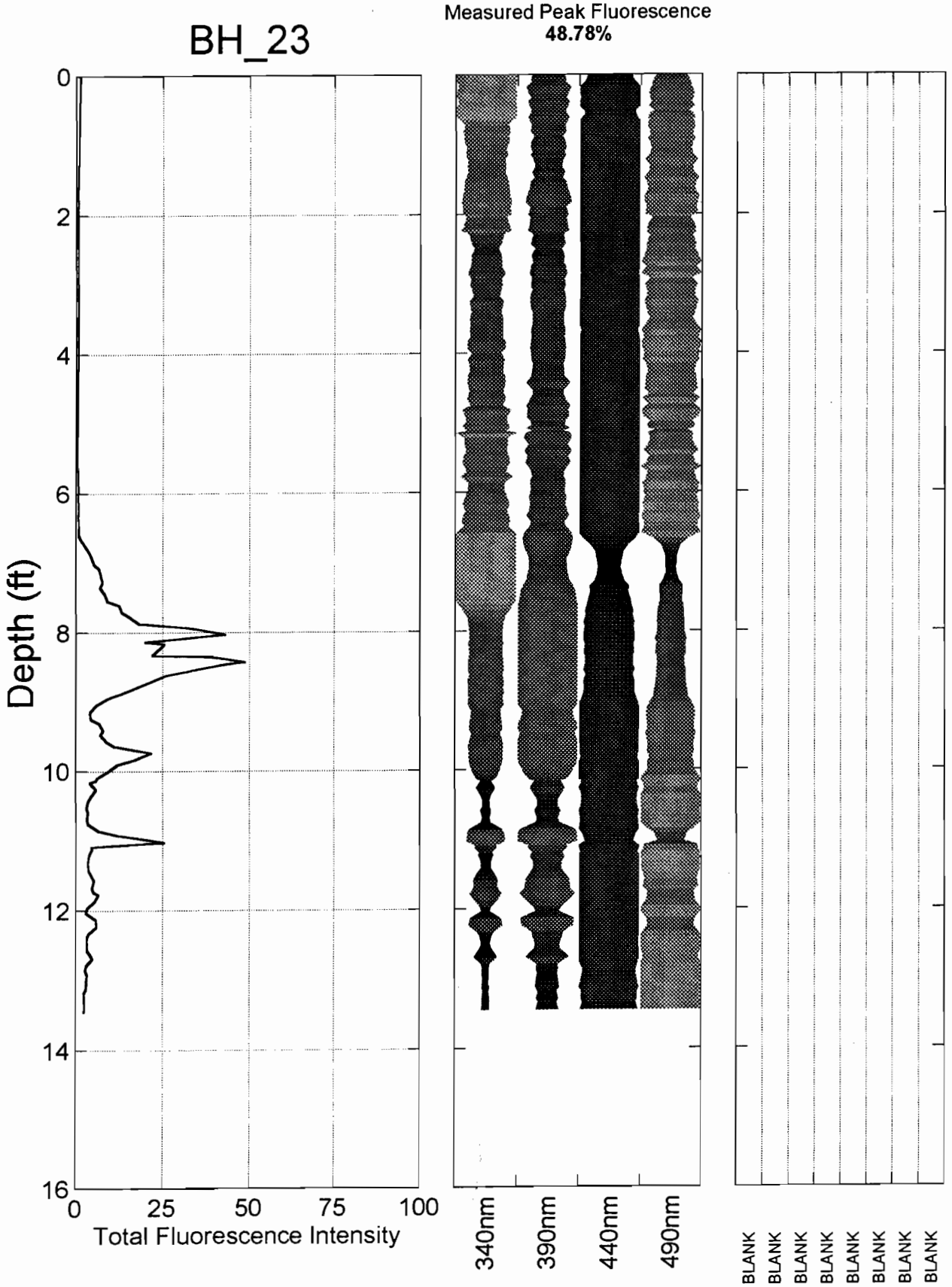

Waveform @ 2.0 ft
x 10
Signal (V)
Time (ns)
0
100
200
300

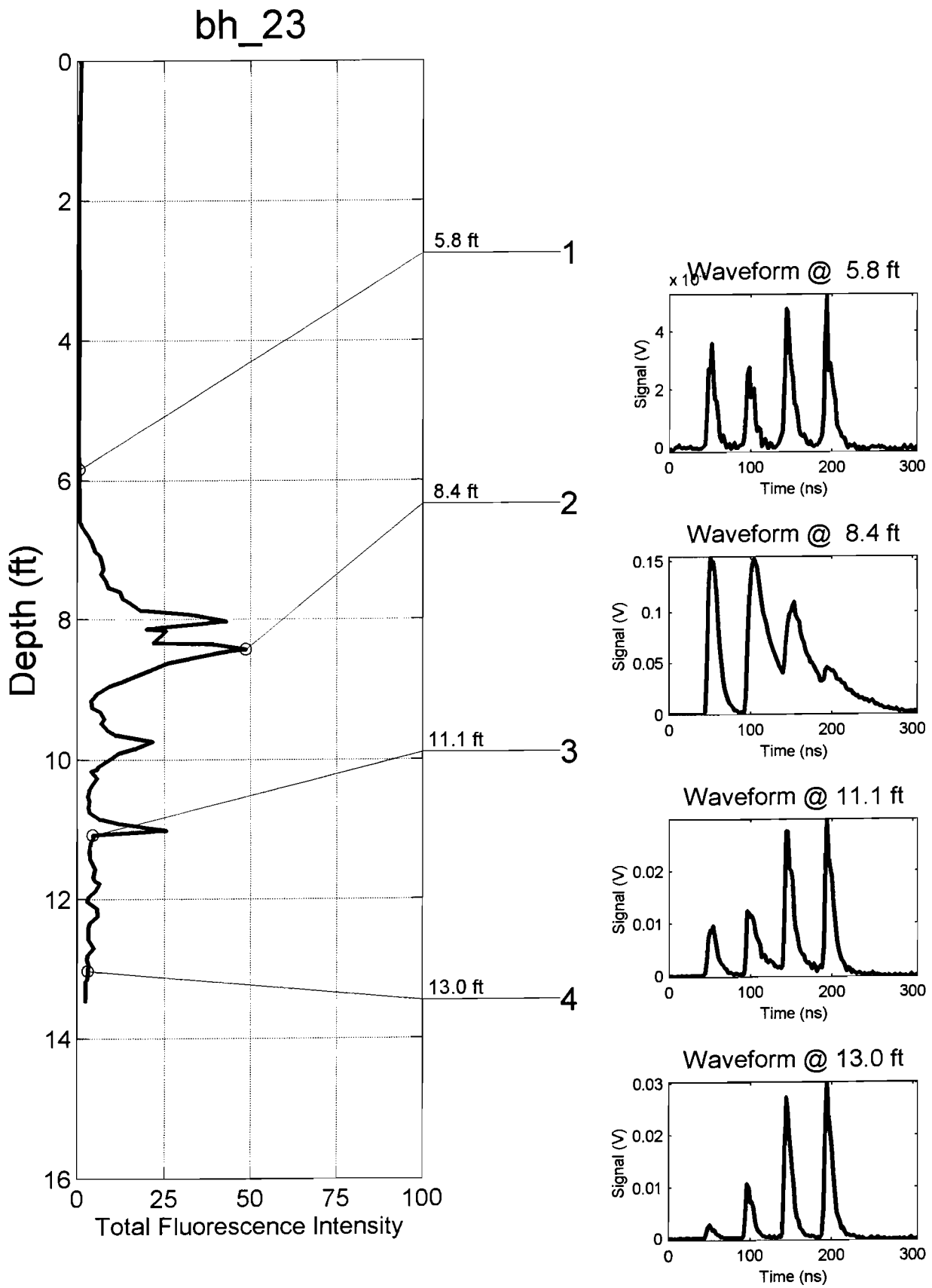

Waveform @ 4.8 ft
x 10
Signal (V)
Time (ns)
0
100
200
300


Waveform @ 9.0 ft
x 10
Signal (V)
Time (ns)
0
100
200
300


Waveform @ 9.7 ft
x 10
Signal (V)
Time (ns)
0
100
200
300

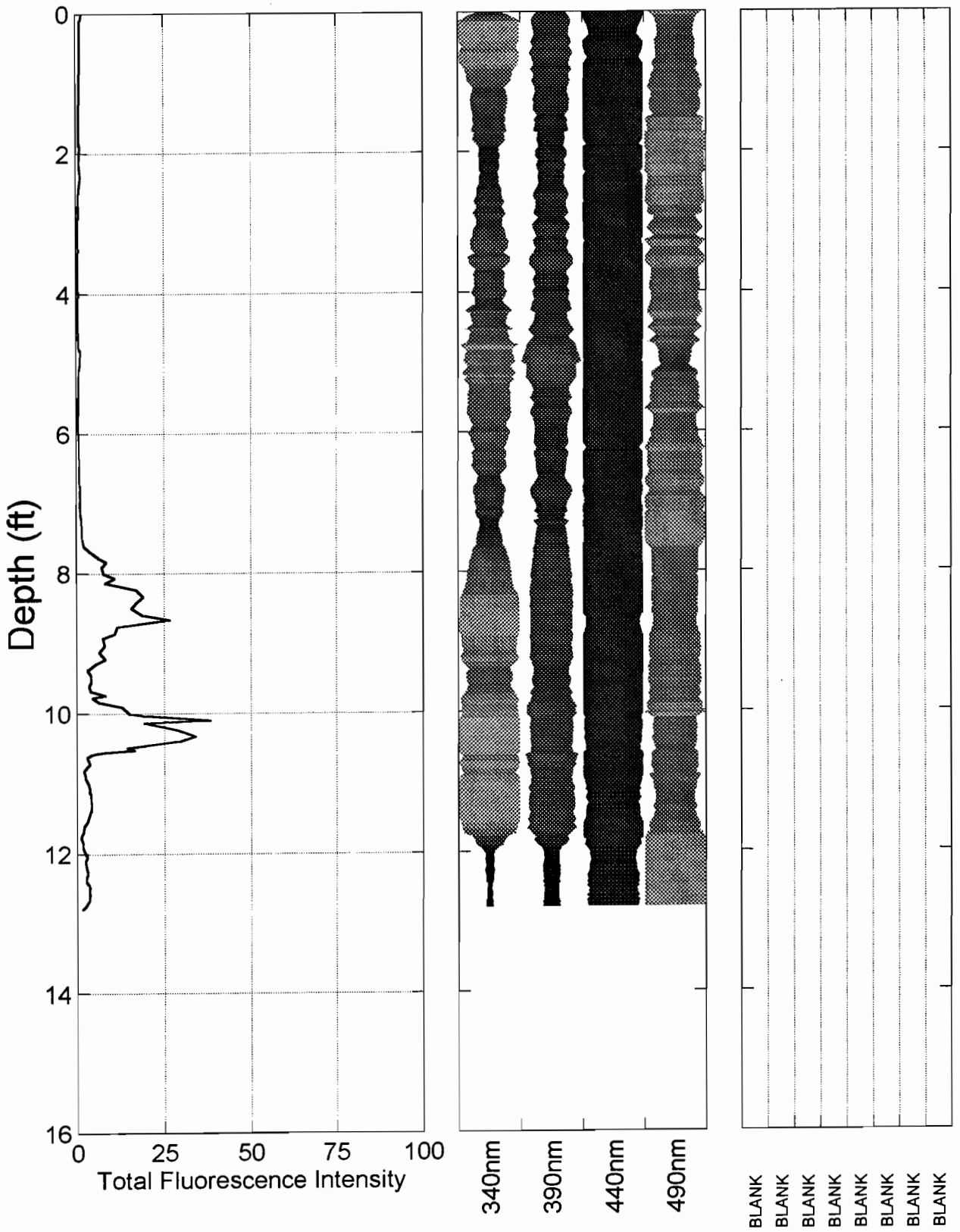
Measured LIF End Depth
13.45 ft
Measured Peak Fluorescence
48.78%

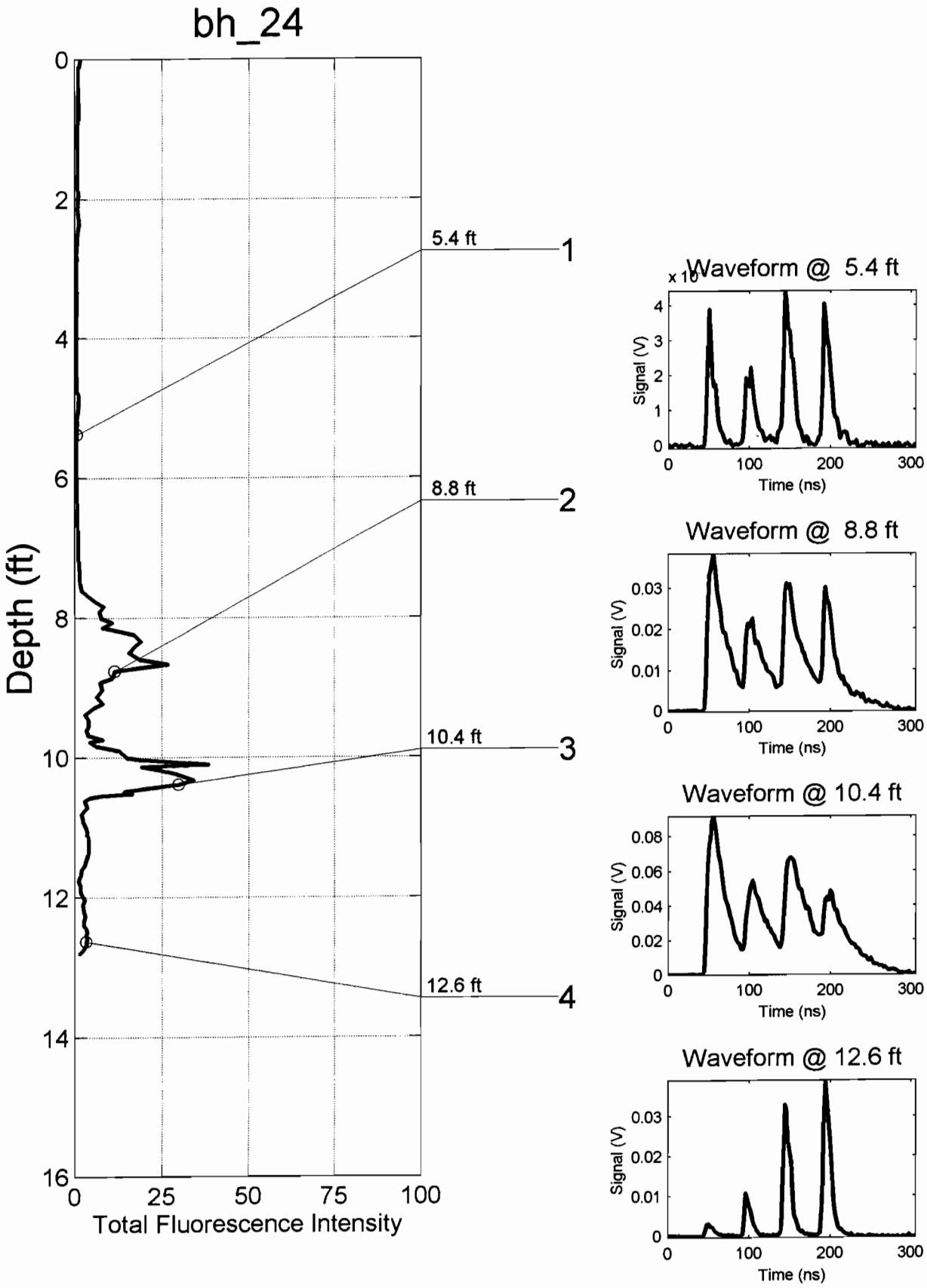



bh_23
Depth (ft)
Total Fluorescence Intensity
5.8 ft
8.4 ft
11.1 ft
13.0 ft
1
2
3
4
Waveform @ 5.8 ft
Waveform @ 8.4 ft
Waveform @ 11.1 ft
Waveform @ 13.0 ft
Signal (V)
Time (ns)

Measured LIF End Depth
12.8 ft
Measured Peak Fluorescence
38.49%

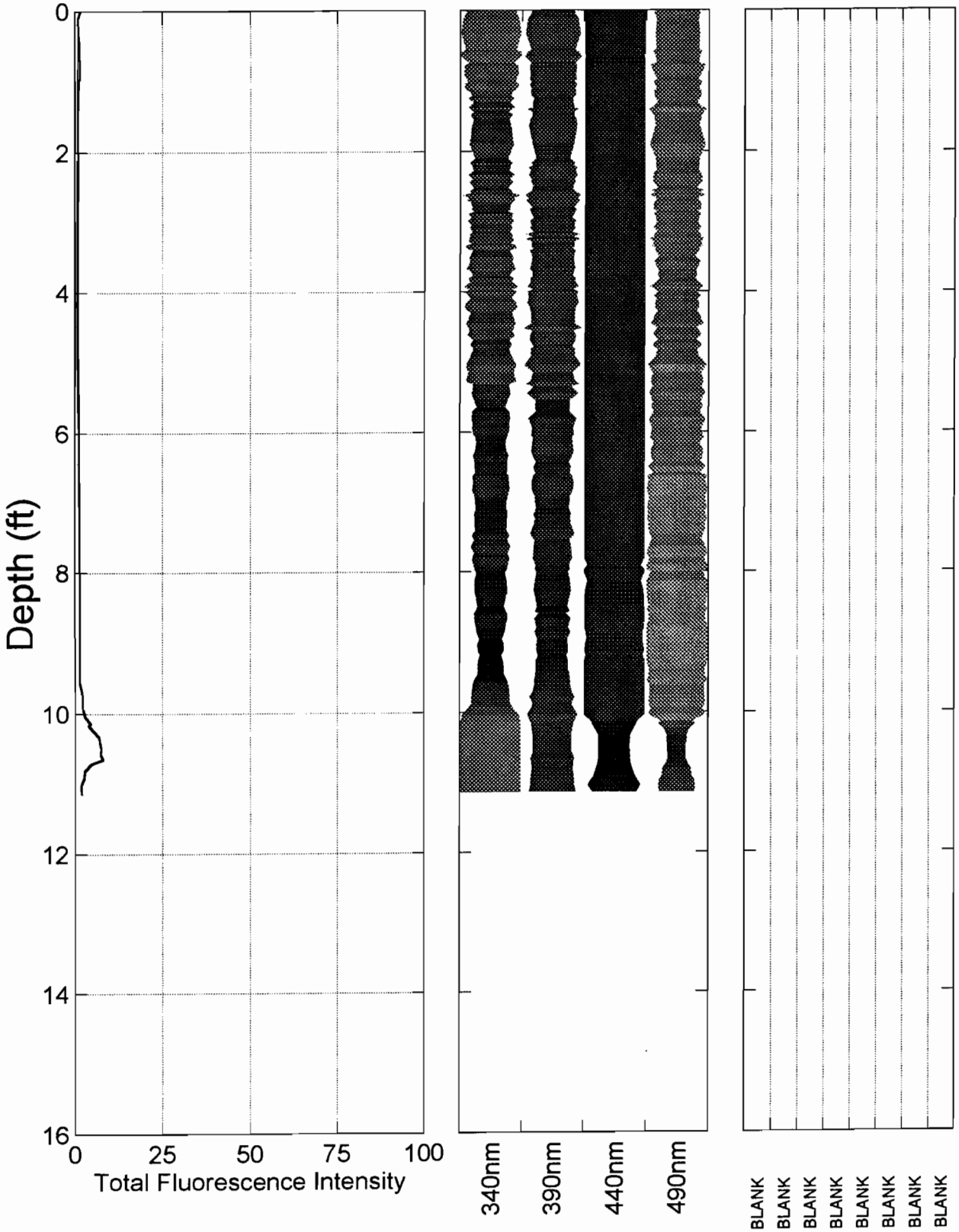
BH_24

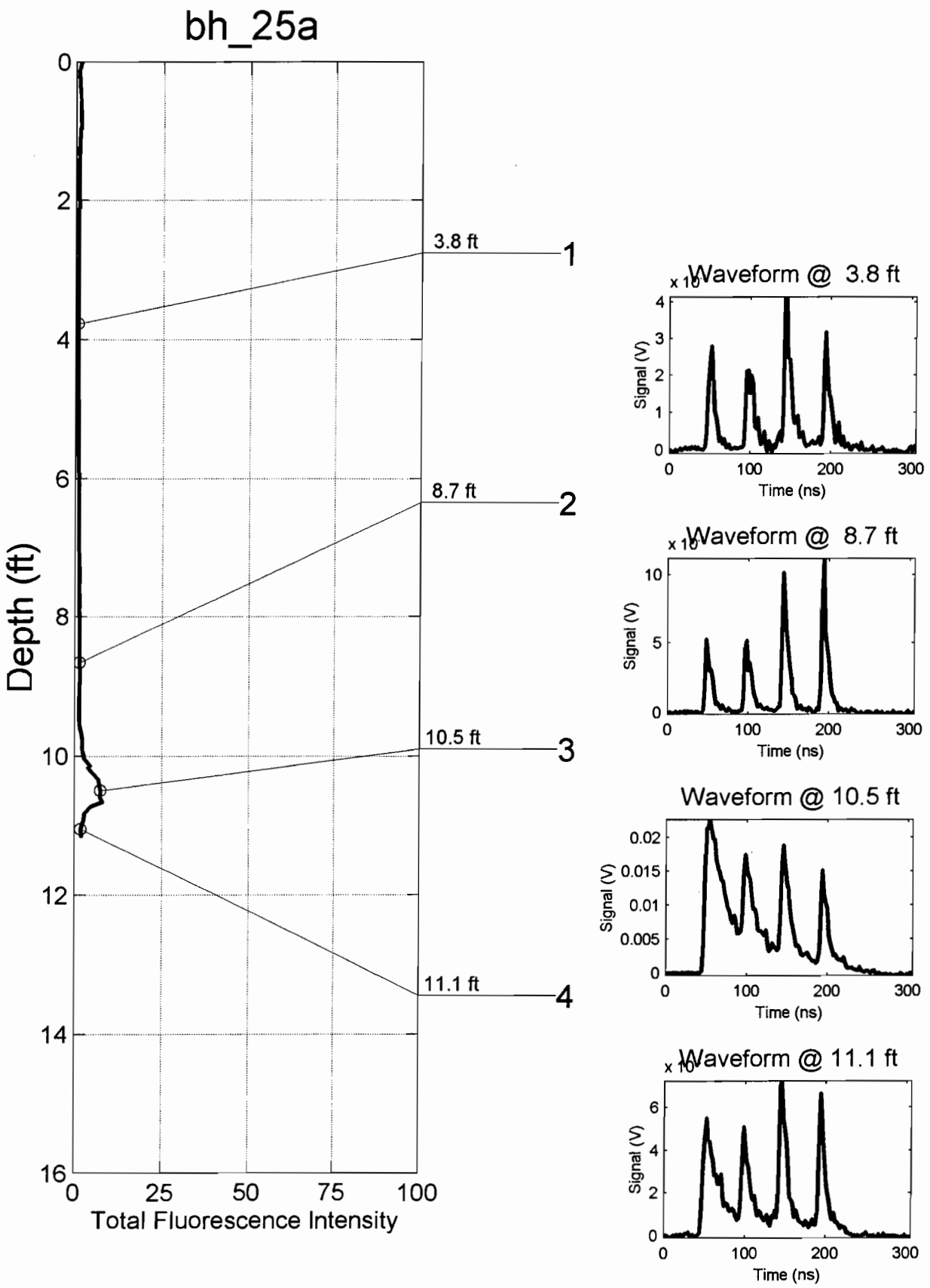


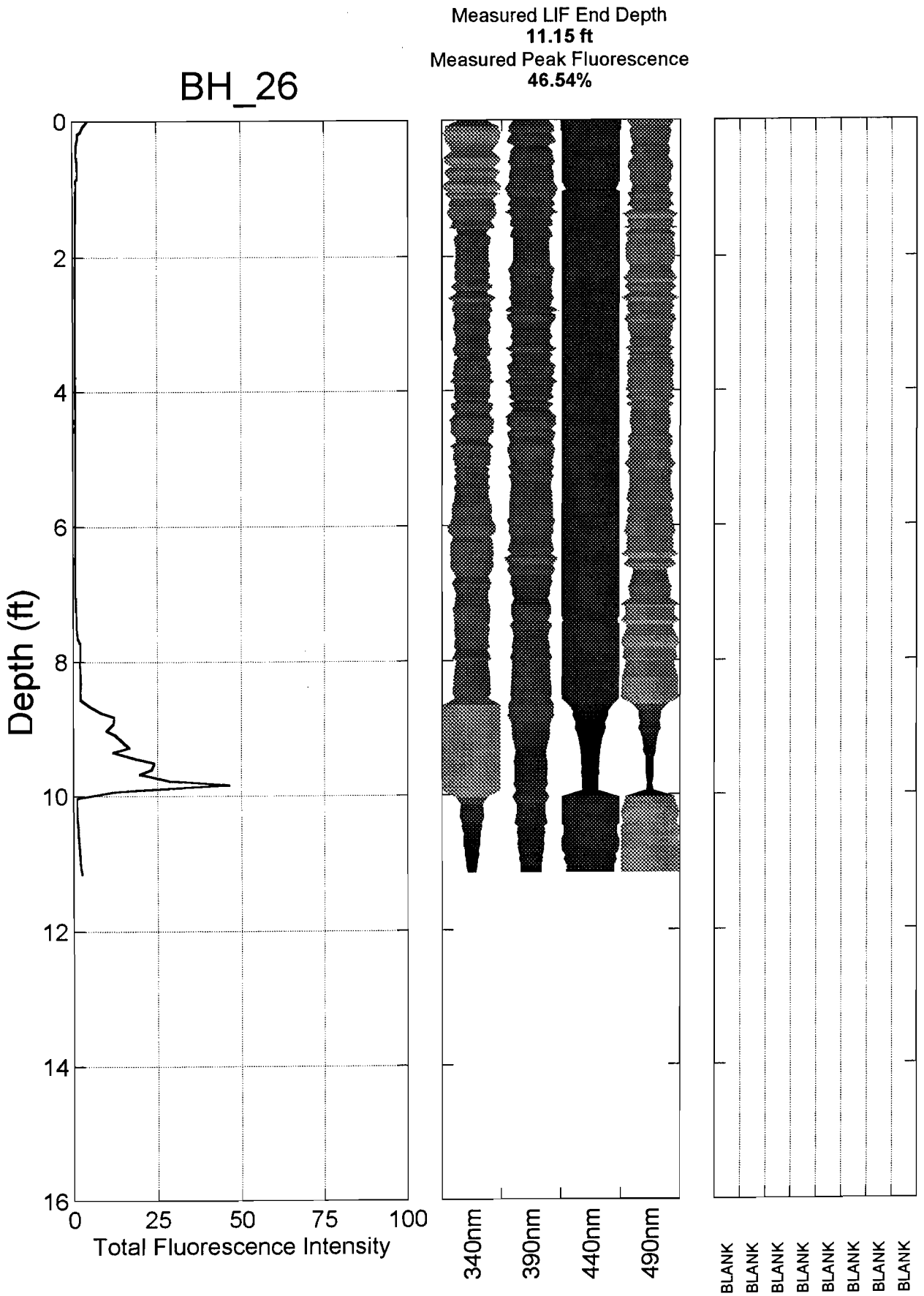

bh_24
Depth (ft)
Total Fluorescence Intensity
5.4 ft
8.8 ft
10.4 ft
12.6 ft
1
2
3
4
Waveform @ 5.4 ft
Waveform @ 8.8 ft
Waveform @ 10.4 ft
Waveform @ 12.6 ft
Signal (V)
Time (ns)

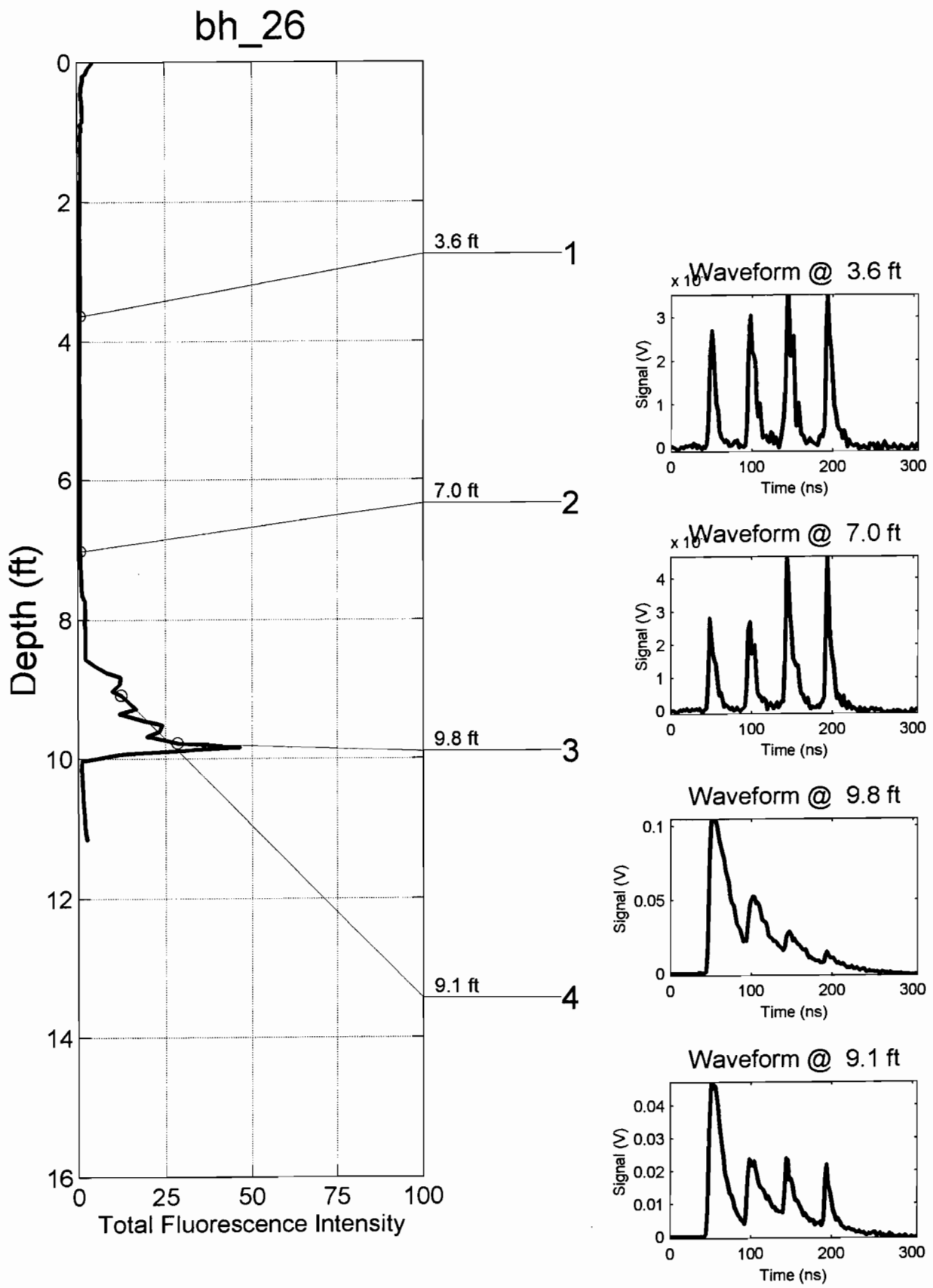
Measured LIF End Depth
11.15 ft
Measured Peak Fluorescence
8.086%

BH_25A



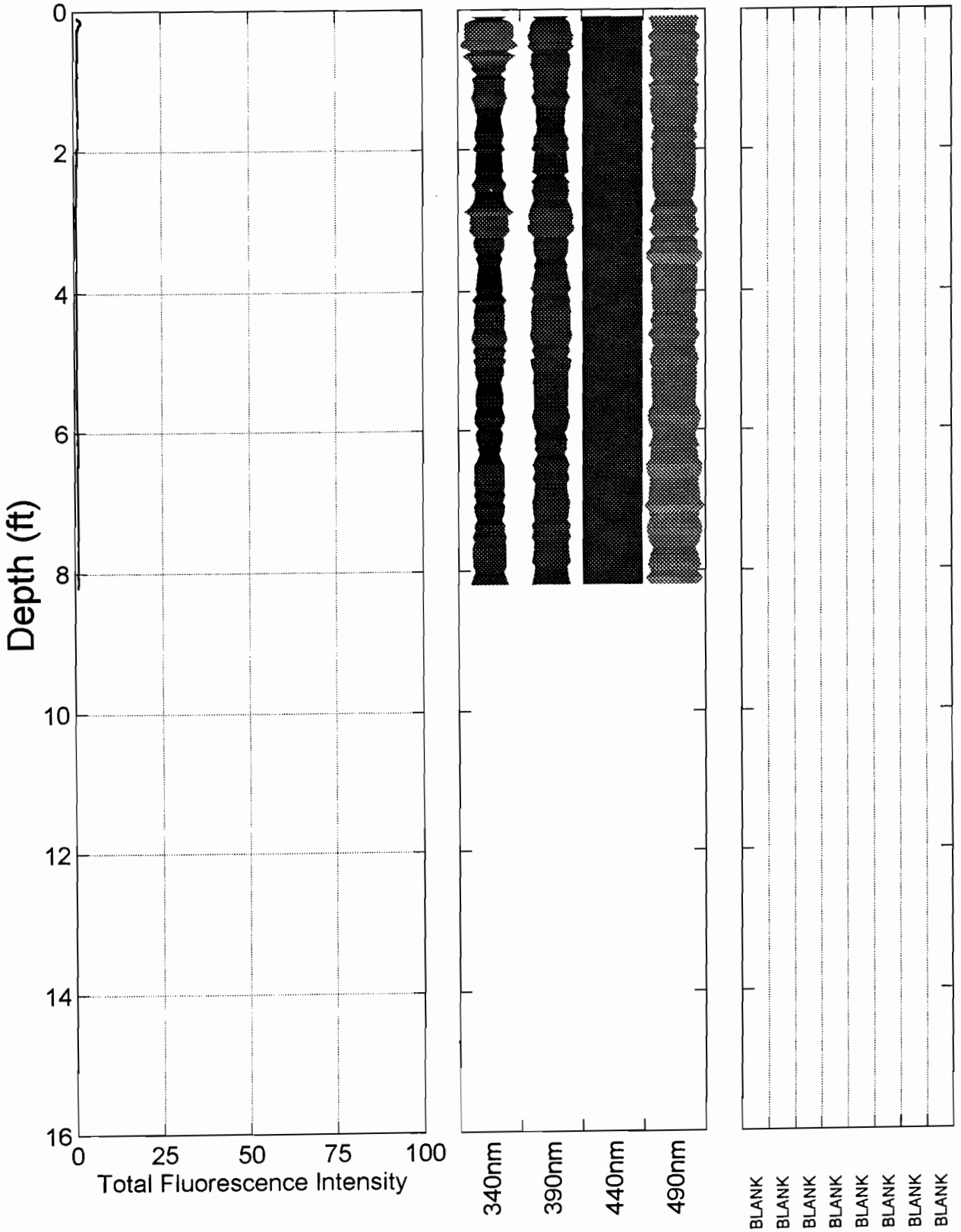

bh_25a
Depth (ft)
Total Fluorescence Intensity
3.8 ft
8.7 ft
10.5 ft
11.1 ft
1
2
3
4
Waveform @ 3.8 ft
Waveform @ 8.7 ft
Waveform @ 10.5 ft
Waveform @ 11.1 ft
Signal (V)
Time (ns)

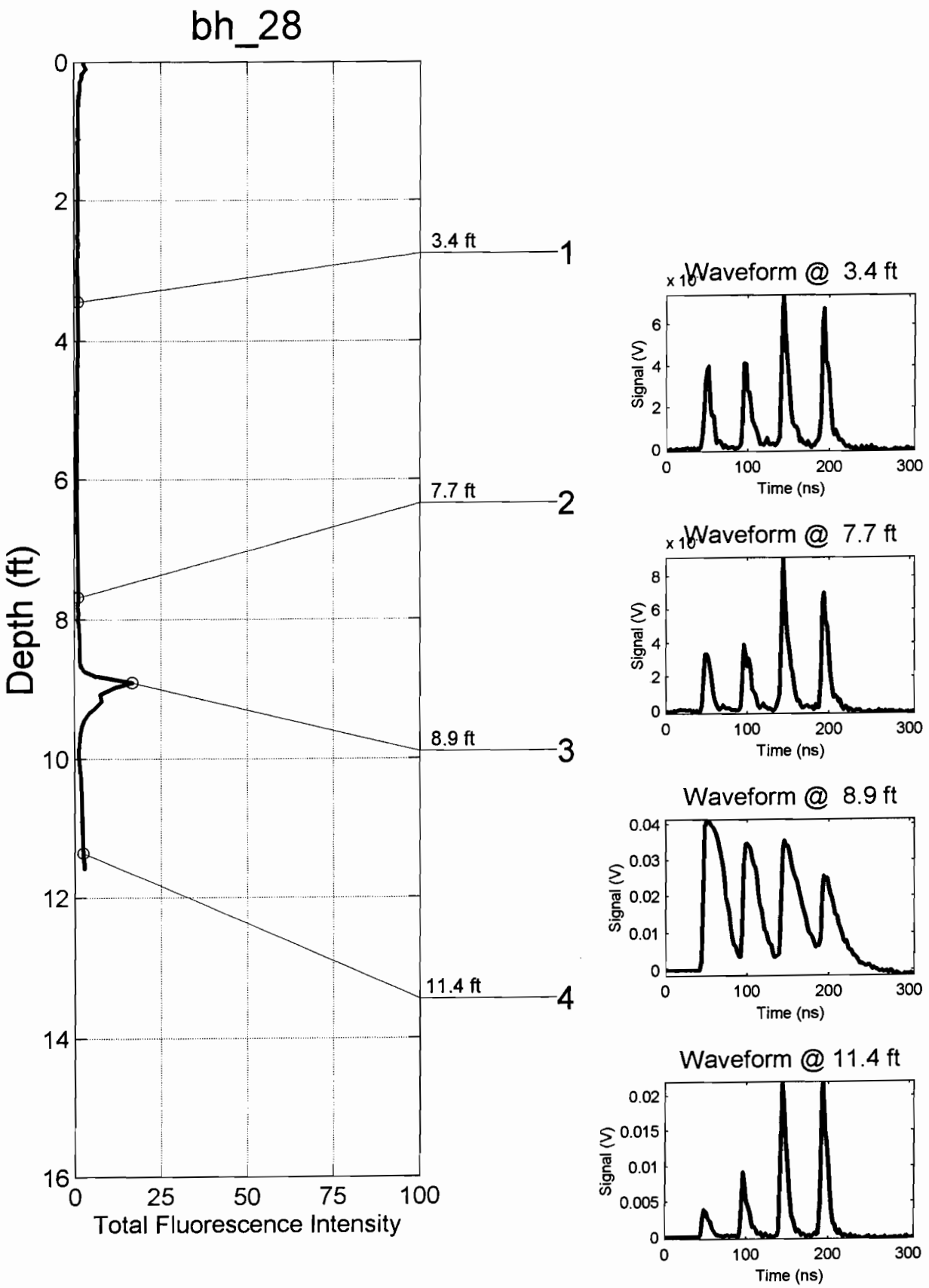

Measured LIF End Depth
11.15 ft
Measured Peak Fluorescence
46.54%
BH_26
Depth (ft)
0
2
4
6
8
10
12
14
16
0
25
50
75
100
Total Fluorescence Intensity
340nm
390nm
440nm
490nm
BLANK
BLANK
BLANK
BLANK
BLANK
BLANK
BLANK
BLANK


bh_26
Depth (ft)
Total Fluorescence Intensity
3.6 ft
7.0 ft
9.8 ft
9.1 ft
1
2
3
4
Waveform @ 3.6 ft
Waveform @ 7.0 ft
Waveform @ 9.8 ft
Waveform @ 9.1 ft
Signal (V)
Time (ns)

Measured LIF End Depth
8.202 ft
Measured Peak Fluorescence
2.25%

BH_27B

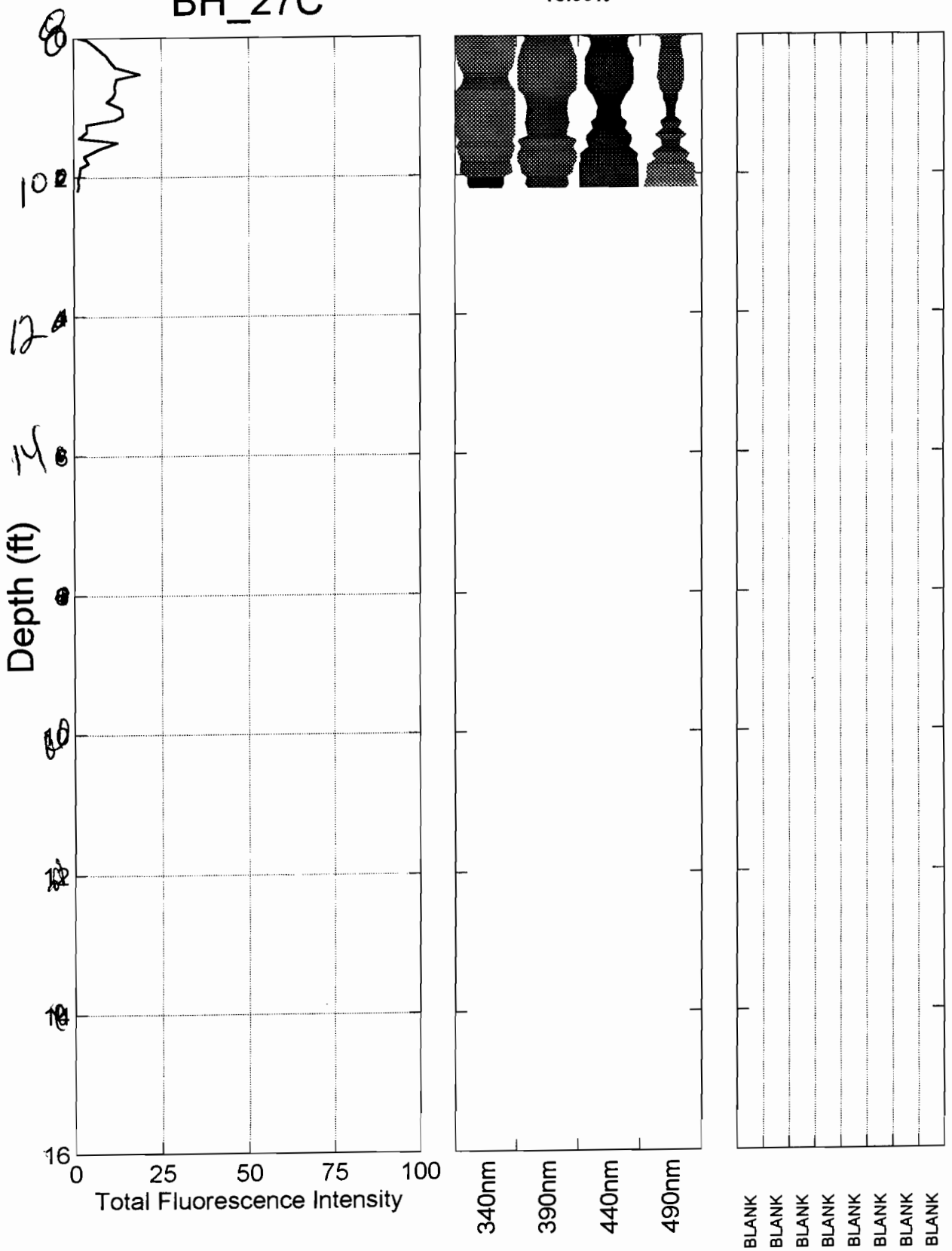



bh_28
Depth (ft)
Total Fluorescence Intensity
3.4 ft
7.7 ft
8.9 ft
11.4 ft
1
2
3
4
Waveform @ 3.4 ft
Waveform @ 7.7 ft
Waveform @ 8.9 ft
Waveform @ 11.4 ft
Signal (V)
Time (ns)

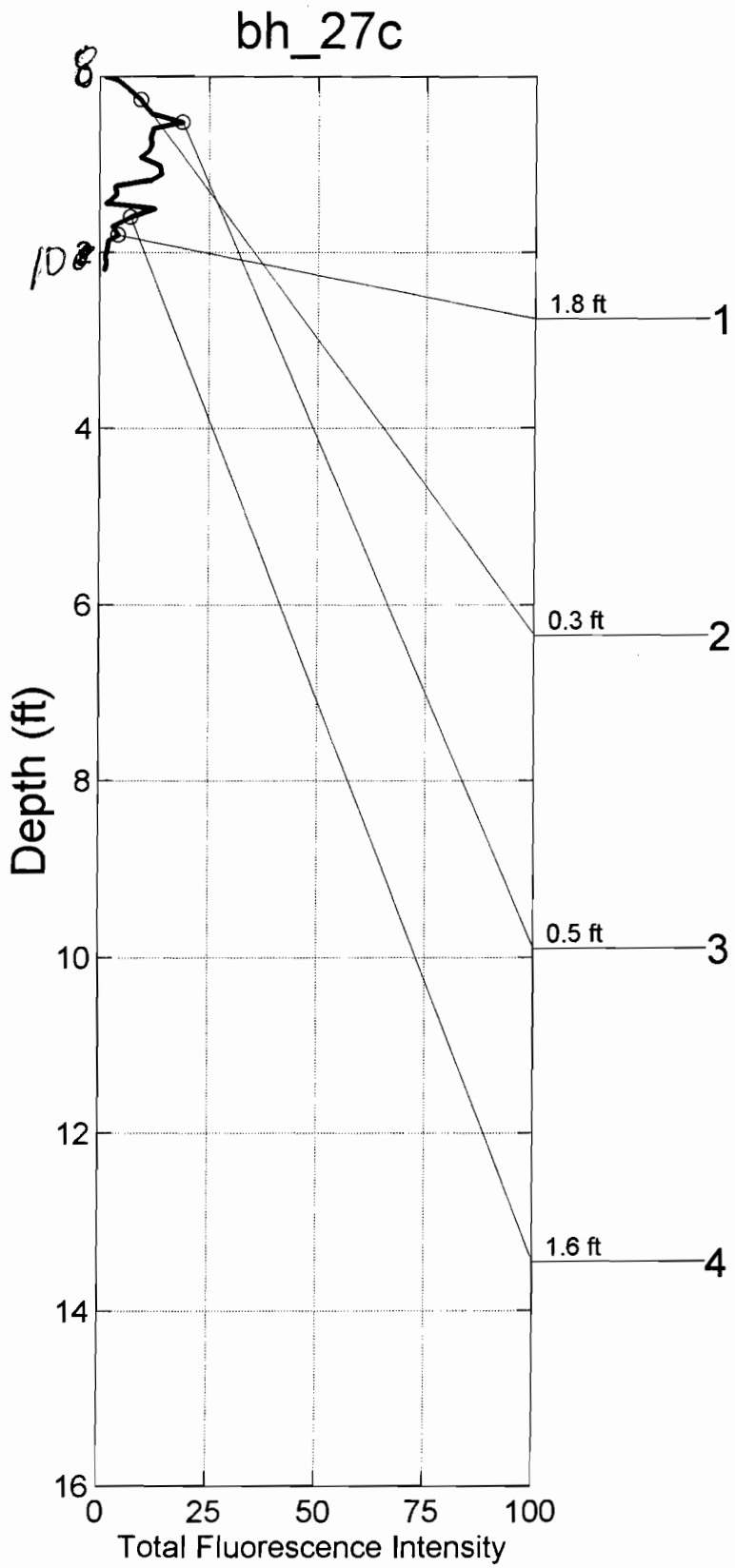
CONTINUATION OF 27B

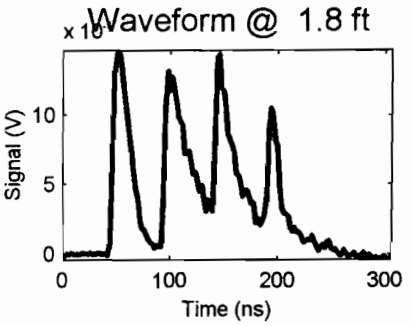
BH_27C

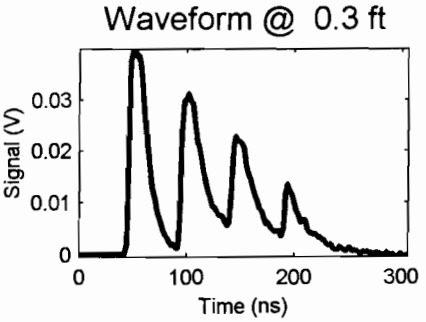
Measured LIF End Depth
2.198 ft
Measured Peak Fluorescence
18.99%

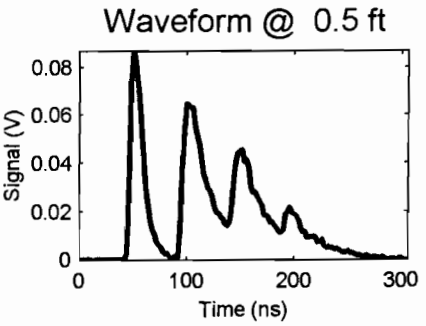


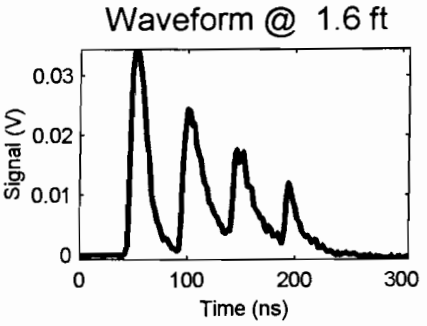
CONTINUATION OF 27B





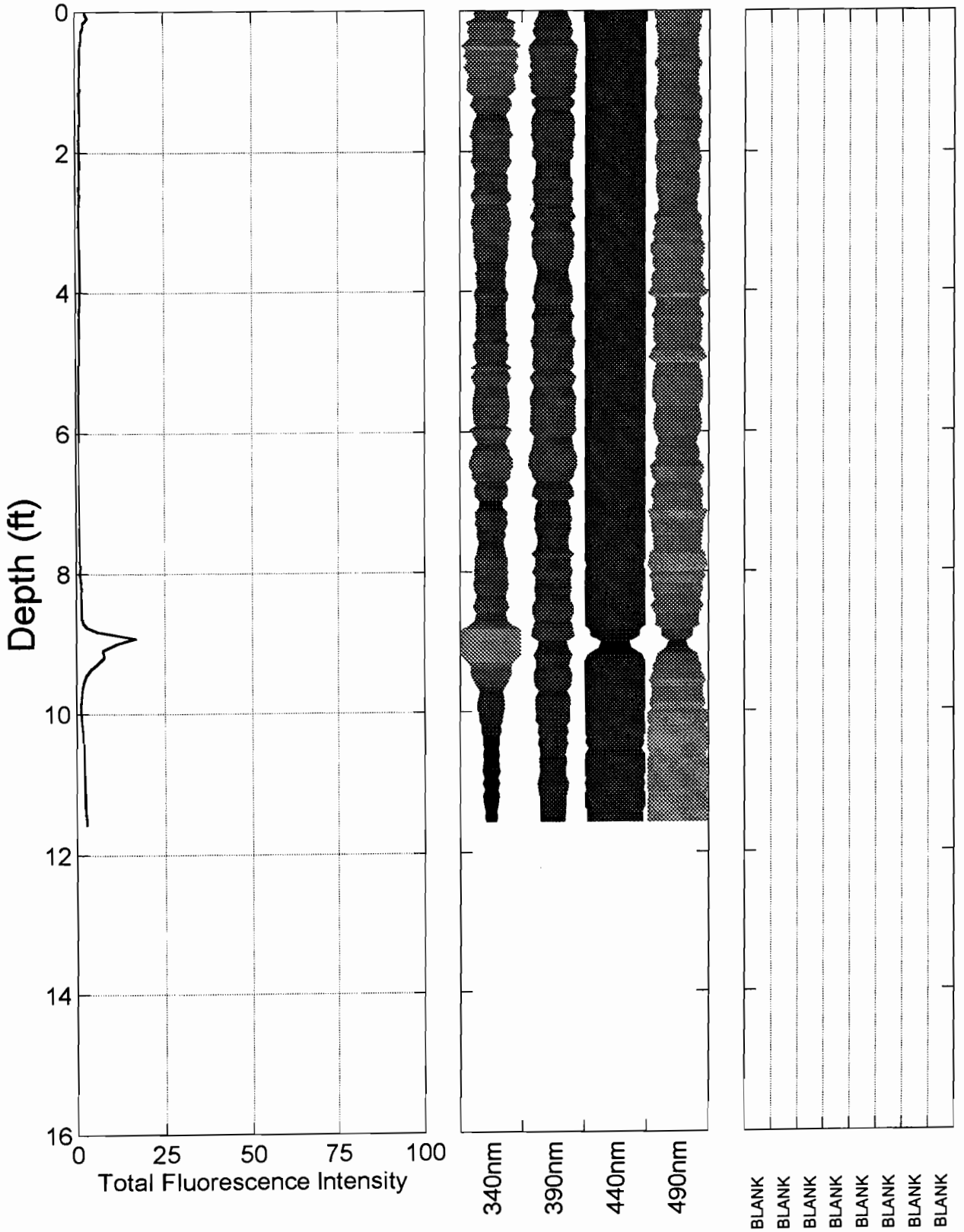






Measured LIF End Depth
11.58 ft
Measured Peak Fluorescence
16.86%

BH_28



APPENDIX G

RISING HEAD TESTS DATA - HYDRAULIC CONDUCTIVITY CALCULATIONS

JOB: KOCH NORTH COMPUTED BY: SAT DATE: 4/9/00

DESCRIPTION: Aquifer Calculations CHECKED BY: _____ DATE: _____

AVERAGE GROUND WATER LINEAR FLOW VELOCITY CALCULATIONS

$$V_{AVG} = (K_{AVG}/Ne)\ (dh/dl)$$

Where:

V_{AVG} = Average Ground Water Linear Flow Velocity (ft/day)

K_{AVG} = Average Hydraulic Conductivity (ft/day) from Slug Tests performed on wells MW-9 (19.03) , MW-15 (4.22)

dh = Change in Hydraulic Head (ft) between wells MW-10 (31.93 ft) and MW-13 (24.89 ft) on February 28, 2000 = 7.04 feet

dl = Horizontal Distance (ft) between wells MW-4 and MW-2 = 305 feet

Ne = Effective Porosity = medium sand from Table 2.1 of Ground Water Hydrology, D. R. Todd; 1980, p. 28

Using:

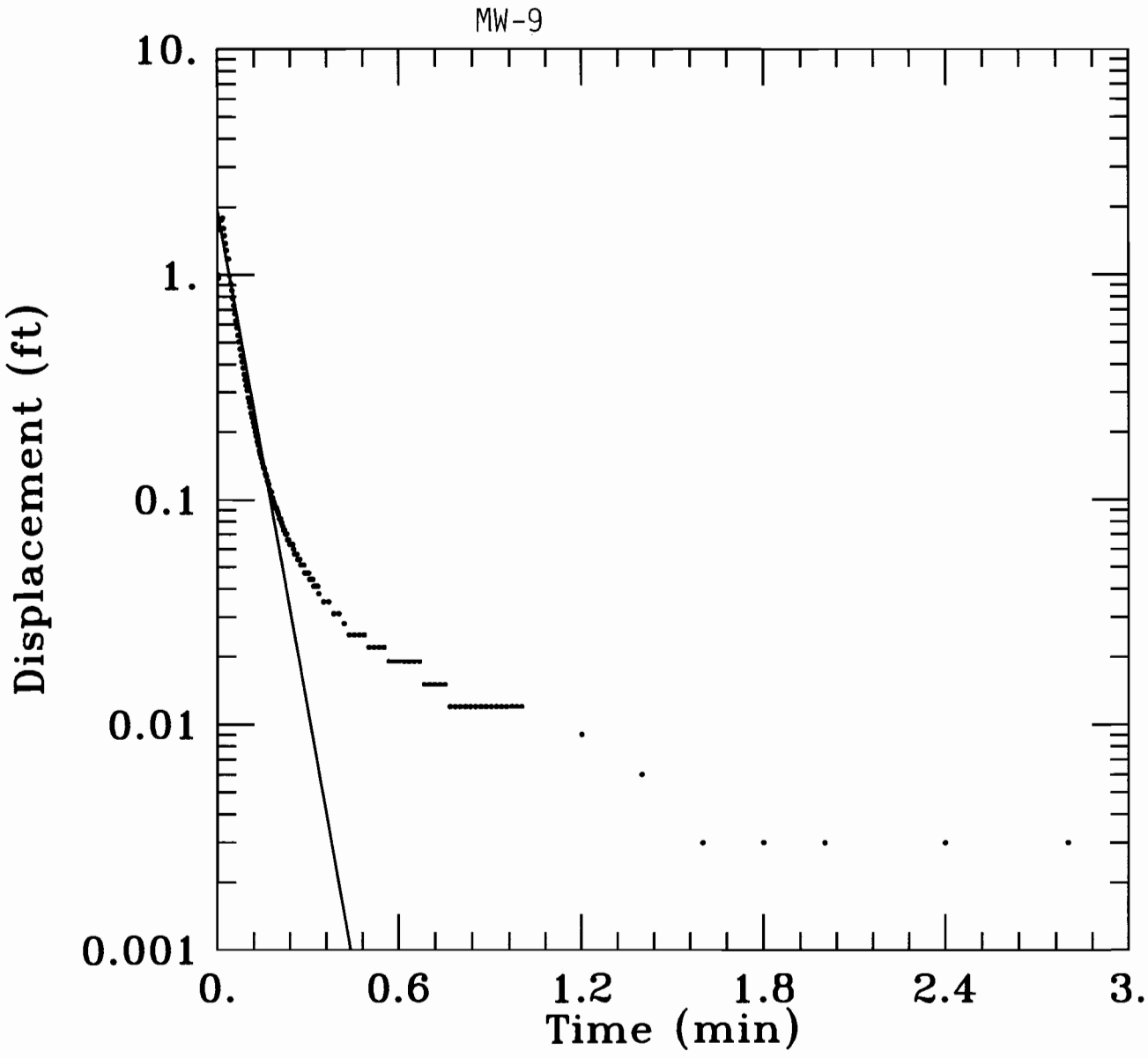
K_{AVG} = 11.62 ft/day

dh/dl = Hydraulic Gradient = 7.04 ft/ 305 ft = 0.02

Ne = 0.39

$$V_{AVG} = \frac{11.62 \text{ ft/day}}{0.39} (0.02)$$

V_{AVG} = 0.59 ft/day
217.5 ft/year



DATA SET:
991609.DAT
07/18/00

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

PROJECT DATA:
test date: 3/27/00

TEST DATA:
H0 = 1. ft
rc = 0.08333 ft
rw = 0.3333 ft
L = 9.8 ft
b = 20. ft
H = 9.28 ft

PARAMETER ESTIMATES:
K = 19.03 ft/day
y0 = 1.913 ft

AQTESOLV

SE1000C
Environmental Logger
03/28 15:29

Unit# 30422 Test 0

Setups:	INPUT 1
Type	Level (F)
Mode	TOC
I.D.	00009
Reference	0.000
Linearity	0.040
Scale factor	10.070
Offset	0.040
Delay mSEC	50.000

Step 0 03/28 12:45:06

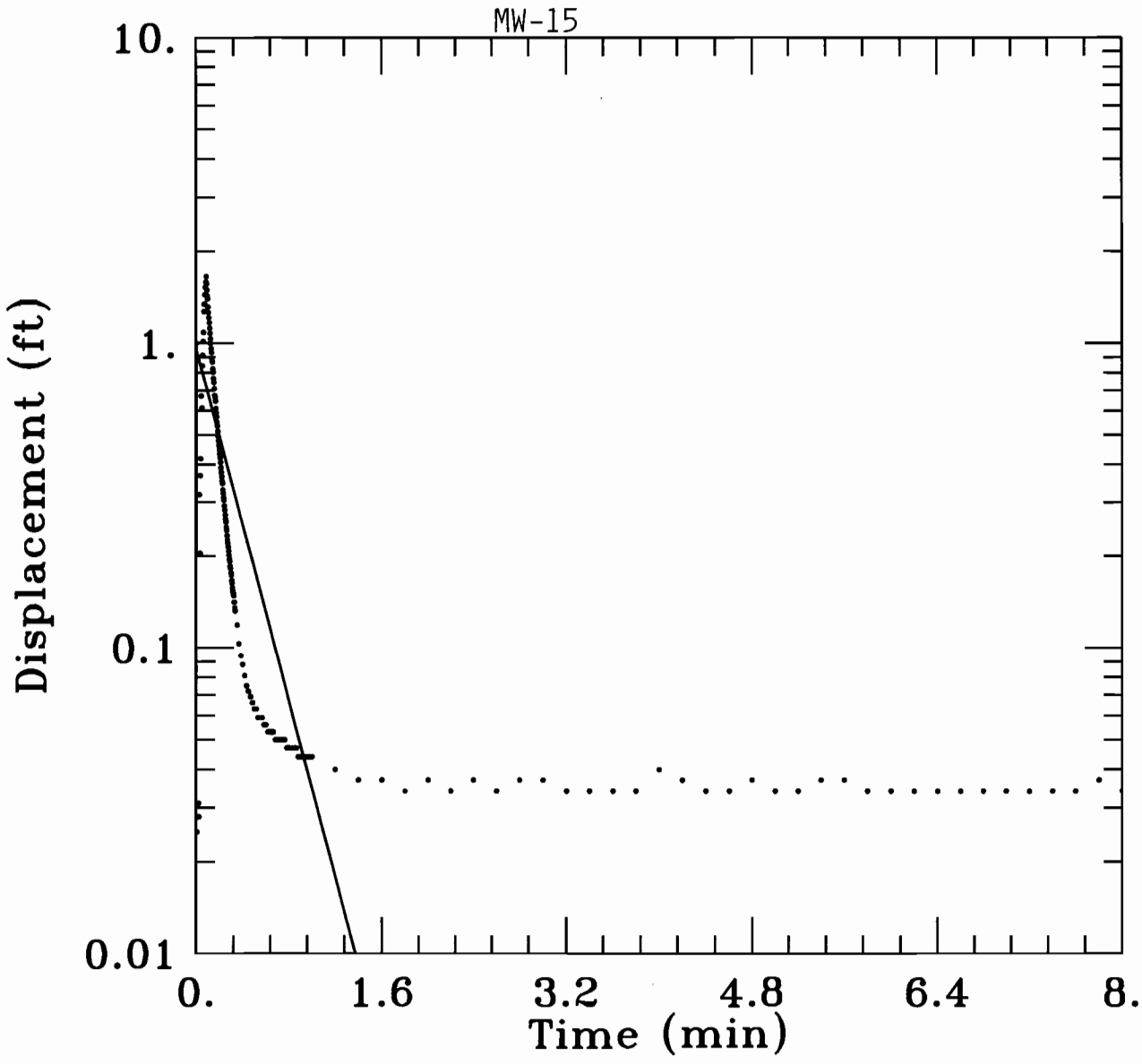
Elapsed Time	INPUT 1
0.0000	1.453
0.0033	0.966
0.0066	1.594
0.0100	1.753
0.0133	1.750
0.0166	1.785
0.0200	1.606
0.0233	1.492
0.0266	1.377
0.0300	1.284
0.0333	1.173
0.0366	1.176
0.0400	0.988
0.0433	0.911
0.0466	0.851
0.0500	0.784
0.0533	0.730
0.0566	0.672
0.0600	0.624
0.0633	0.580
0.0666	0.538
0.0700	0.503
0.0733	0.468
0.0766	0.436
0.0800	0.411
0.0833	0.385
0.0866	0.360
0.0900	0.341
0.0933	0.322

0.0966	0.306
0.1000	0.283
0.1033	0.271
0.1066	0.258
0.1100	0.242
0.1133	0.232
0.1166	0.220
0.1200	0.210
0.1233	0.200
0.1266	0.191
0.1300	0.181
0.1333	0.175
0.1366	0.165
0.1400	0.159
0.1433	0.153
0.1466	0.146
0.1500	0.140
0.1533	0.137
0.1566	0.130
0.1600	0.127
0.1633	0.121
0.1666	0.117
0.1700	0.111
0.1733	0.108
0.1766	0.108
0.1800	0.102
0.1833	0.098
0.1866	0.095
0.1900	0.092
0.1933	0.092
0.1966	0.089
0.2000	0.086
0.2033	0.082
0.2066	0.082
0.2100	0.079
0.2133	0.076
0.2166	0.073
0.2200	0.073
0.2233	0.070
0.2266	0.070
0.2300	0.066
0.2333	0.066
0.2366	0.063
0.2400	0.063
0.2433	0.063
0.2466	0.063
0.2500	0.060
0.2533	0.057
0.2566	0.057
0.2600	0.057
0.2633	0.054
0.2666	0.054

0.2700	0.054
0.2733	0.051
0.2766	0.051
0.2800	0.051
0.2833	0.051
0.2866	0.047
0.2900	0.047
0.2933	0.047
0.2966	0.047
0.3000	0.047
0.3033	0.044
0.3066	0.044
0.3100	0.044
0.3133	0.044
0.3166	0.041
0.3200	0.041
0.3233	0.041
0.3266	0.041
0.3300	0.041
0.3333	0.038
0.3500	0.035
0.3666	0.035
0.3833	0.031
0.4000	0.031
0.4166	0.028
0.4333	0.025
0.4500	0.025
0.4666	0.025
0.4833	0.025
0.5000	0.022
0.5166	0.022
0.5333	0.022
0.5500	0.022
0.5666	0.019
0.5833	0.019
0.6000	0.019
0.6166	0.019
0.6333	0.019
0.6500	0.019
0.6666	0.019
0.6833	0.015
0.7000	0.015
0.7166	0.015
0.7333	0.015
0.7500	0.015
0.7666	0.012
0.7833	0.012
0.8000	0.012
0.8166	0.012
0.8333	0.012
0.8500	0.012
0.8666	0.012

0.8833	0.012
0.9000	0.012
0.9166	0.012
0.9333	0.012
0.9500	0.012
0.9666	0.012
0.9833	0.012
1.0000	0.012
1.2000	0.009
1.4000	0.006
1.6000	0.003
1.8000	0.003
2.0000	0.003
2.2000	0.000
2.4000	0.003
2.6000	0.000
2.8000	0.003
3.0000	0.000
3.2000	0.000
3.4000	0.000
3.6000	0.000
3.8000	0.000
4.0000	-0.003
4.2000	0.000
4.4000	-0.003
4.6000	0.000
4.8000	-0.003
5.0000	0.000
5.2000	0.000
5.4000	0.000
5.6000	0.000
5.8000	0.000
6.0000	-0.003
6.2000	0.000
6.4000	-0.003
6.6000	0.000
6.8000	0.000
7.0000	0.000
7.2000	0.000
7.4000	0.000
7.6000	0.000
7.8000	0.000
8.0000	-0.003
8.2000	-0.003
8.4000	0.000
8.6000	0.000
8.8000	0.000
9.0000	0.000
9.2000	-0.003
9.4000	-0.003
9.6000	-0.003
9.8000	0.000

10.0000	0.000



DATA SET:
9916015.DAT
07/18/00

AQUIFER MODEL:
Unconfined

SOLUTION METHOD:
Bouwer-Rice

PROJECT DATA:
test date: 3/23/00

TEST DATA:
H0 = 1. ft
rc = 0.08333 ft
rw = 0.3333 ft
L = 7.6 ft
b = 20. ft
H = 7.06 ft

PARAMETER ESTIMATES:
K = 4.22 ft/day
y0 = 0.9455 ft

AQTESOLV

KOCH NORTH
compny
CATLIN ENG. AND SCI.
projno
99160
client
KOCH
locsit
WILMINGTON, NC
tstdat
3/23/00
units
1
0
0
slugt5
1
0.08333
0.33333
20
7.6
7.06
0
1
173
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0.0066 0.025 1
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0.0133 0.028 1
0.0166 0.028 1
0.02 0.031 1
0.0233 0.028 1
0.0266 0.318 1
0.03 0.204 1
0.0333 0.368 1
0.0366 0.418 1
0.04 0.67 1
0.0466 0.613 1
0.05 0.843 1
0.0533 0.913 1
0.0566 1.013 1
0.06 1.086 1
0.0633 1.268 1
0.0666 1.341 1
0.07 1.344 1
0.0733 1.441 1
0.0766 1.523 1
0.08 1.583 1
0.0833 1.652 1
0.0866 1.564 1
0.09 1.492 1
0.0933 1.426 1
0.0966 1.396 1
0.1 1.312 1
0.1033 1.259 1
0.1066 1.212 1
0.11 1.168 1

0.1133	1.12	1
0.1166	1.076	1
0.12	1.032	1
0.1233	0.998	1
0.1266	0.96	1
0.13	0.931	1
0.1333	0.891	1
0.1366	0.868	1
0.14	0.824	1
0.1433	0.802	1
0.1466	0.765	1
0.15	0.743	1
0.1533	0.708	1
0.1566	0.673	1
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0.1633	0.645	1
0.1666	0.61	1
0.17	0.591	1
0.1733	0.573	1
0.1766	0.551	1
0.18	0.535	1
0.1833	0.513	1
0.1866	0.494	1
0.19	0.478	1
0.1933	0.462	1
0.1966	0.447	1
0.2	0.434	1
0.2033	0.421	1
0.2066	0.406	1
0.21	0.39	1
0.2133	0.377	1
0.2166	0.365	1
0.22	0.352	1
0.2233	0.346	1
0.2266	0.33	1
0.23	0.321	1
0.2333	0.311	1
0.2366	0.305	1
0.24	0.292	1
0.2433	0.283	1
0.2466	0.273	1
0.25	0.264	1
0.2533	0.258	1
0.2566	0.248	1
0.26	0.242	1
0.2633	0.233	1
0.2666	0.226	1
0.27	0.22	1
0.2733	0.214	1
0.2766	0.207	1
0.28	0.201	1
0.2833	0.195	1
0.2866	0.192	1
0.29	0.185	1
0.2933	0.182	1
0.2966	0.176	1
0.3	0.173	1

0.3033	0.166	1
0.3066	0.163	1
0.31	0.157	1
0.3133	0.154	1
0.3166	0.151	1
0.32	0.148	1
0.3233	0.141	1
0.3266	0.141	1
0.33	0.135	1
0.3333	0.132	1
0.35	0.119	1
0.3666	0.103	1
0.3833	0.094	1
0.4	0.088	1
0.4166	0.081	1
0.4333	0.075	1
0.45	0.072	1
0.4666	0.069	1
0.4833	0.066	1
0.5	0.063	1
0.5166	0.063	1
0.5333	0.059	1
0.5666	0.059	1
0.5833	0.056	1
0.6	0.056	1
0.6166	0.053	1
0.6333	0.053	1
0.65	0.053	1
0.6666	0.053	1
0.6833	0.05	1
0.7	0.05	1
0.7166	0.05	1
0.7333	0.05	1
0.75	0.05	1
0.7666	0.05	1
0.7833	0.047	1
0.8	0.047	1
0.8166	0.047	1
0.8333	0.047	1
0.85	0.047	1
0.8666	0.047	1
0.8833	0.044	1
0.9	0.044	1
0.9166	0.044	1
0.9333	0.044	1
0.95	0.044	1
0.9666	0.044	1
0.9833	0.044	1
1	0.044	1
1.2	0.04	1
1.4	0.037	1
1.6	0.037	1
1.8	0.034	1
2	0.037	1
2.2	0.034	1
2.4	0.037	1
2.6	0.034	1

```
2.8   0.037   1
3   0.037   1
3.2   0.034   1
3.4   0.034   1
3.6   0.034   1
3.8   0.034   1
4   0.04   1
4.2   0.037   1
4.4   0.034   1
4.6   0.034   1
4.8   0.037   1
5   0.034   1
5.2   0.034   1
5.4   0.037   1
5.6   0.037   1
5.8   0.034   1
6   0.034   1
6.2   0.034   1
6.4   0.034   1
6.6   0.034   1
6.8   0.034   1
7   0.034   1
7.2   0.034   1
7.4   0.034   1
7.6   0.034   1
7.8   0.037   1
8   0.034   1
<end>
```

APPENDIX H

CONTAMINATION VELOCITY CALCULATIONS

JOB: Koch North COMPUTED BY: SAT DATE: 7/14/00

DESCRIPTION: Contamination Migration Calculations CHECKED BY: KB DATE: 8/5/00

GROUND WATER CONTAMINATION VELOCITY CALCULATIONS

$$V_c = \frac{V_{max}}{R_d}$$

Where: V_c = Velocity of contaminant

V_{max} = Velocity of ground water (0.59 ft/day) (Appendix F)

R_d = Retardation factor (chemical specific)

PARA-XYLENE RETARDATION FACTOR CALCULATION

$$R_d = 1 + (R_d \; {}^{pb}/n)$$

Where: R_d = Distribution coefficient (ml/g) calculated
Pb = Bulk density (g/m^3) [1] 1.89 uniform sand loose
n = Porosity (unitless) [2] 0.39 medium sand

R_d = ROC · foc^s

Where: Koc = Organic carbon particition coeffcient (ml/g) [3] 870 para-xylene
foc^s = Organic fraction of sand 0.025% (assumed)
R_d (Para-xylene) = 870 x 0.025 = 21.75

Therefore: R_d (para-xylene) = 1 + [21.75 (1.89:0.39] = 106.40

And: V_c (para-xylene) = 0.59 (ft./day : 106.40 = 0.0055 ft/day

[1]= Bolz, Ray E.; CRC Handbook of Tables for Applied Engineering Science; 1973
[2]= Todd, David K.; Ground Water Hydrology, Second Edition; 1980
[3]= US EPA/600/8-90/003 Basic of Pump-and-Treat Ground Water Remediation Technology, 1990