U-005-303.4

2266

A D V A N C E D S C I E N C E S INCORPORATED/INTERNATIONAL TECHNOLOGY WORK PLAN ADDENDUM FEED MATERIALS PRODUCTION CENTER PLANT 8 CORE SAMPLING

09-01-91

ASI/DOE-FSO
36
REPORT

AR File

RI/FS
CONFIGURATION CONTROL CHANGE REQUEST

CC #: 91-030	**DATE: 08/19/91**	**REQUESTED BY: WEMCO**

ASI/IT OU/TASK MANAGER: D F Smith **DATE:** 16 Sep 91
DOE OU MANAGER CONCURRENCE: Robert J Janke **DATE:** 9/17/91
WEMCO OU MANAGER: R S Shirley **DATE:** 17 Sep 91
WEMCO PROJECT CONTROL: Andrea Georgopoulos **DATE:** 9/18/91

Requested Change:

A Work Plan Addendum to cover field operations and support activities related to WEMCO's installation of a sump and crusher in Plant 8.

FY 1991: $ 25,995.00
FY 1992: ~~556,536.00~~ 607,035.00 RSS 9/18/91
Est. Cost: ~~$582,531.00~~ 633,029.00

Est. Schedule ~~8~~ 5½ **months** 6 months RSS 9/18/91

Justification:

The attached Work Plan identifies field operations and support activities to be performed by ASI/IT necessary to characterize soils for disposal during WEMCO's installation of a sump and crusher in Plant 8.

Impacts: **WBS**____ **Budget** X **Milestone/Schedule** X **Technical Scope** X
Safety____ **Project Documents**____

FY 1991: $ 25,995.00
FY 1992: ~~556,536.00~~ 607,035.00 RSS 9/18/91
Baseline Cost Change: $~~582,531.00~~ 633,029.00
Milestone Schedule Requested Completion: February 28, 199~~1~~2

[redacted]

2266

ADVANCED SCIENCES INCORPORATED/INTERNATIONAL TECHNOLOGY

WORK PLAN ADDENDUM

FEED MATERIALS PRODUCTION CENTER

PLANT 8 CORE SAMPLING

WESTINGHOUSE MATERIALS COMPANY OF OHIO

Prepared by:

Advanced Sciences Incorporated/International Technology (ASI/IT)

for the

Department of Energy

under contract

No. DE-AC05-860R216959 (602:91-030)

September 1991

PLANT 8 CORE SAMPLING

WORK PLAN ADDENDUM

SECTION I

1.0 INTRODUCTION

This addendum has been prepared in order to support the Department of Energy (DOE) and Westinghouse Environmental Management Company of Ohio (WEMCO) in subsurface soil characterization at the Feed Materials Production Center (FMPC). This subsurface soil characterization will support WEMCO's sump and crusher project within Plant 8. Additionally, this addendum outlines field operations and support activities related to the coring and sampling to be performed by Advanced Sciences, Inc./International Technology Corporation (ASI/IT) and WEMCO.

2.0 CORE BORING, SAMPLE COLLECTION, SHIPPING, AND ANALYTICAL REQUIREMENTS

In order to identify the presence of hazardous and radiological substances and to support foundation design, ASI/IT will complete twelve core borings at locations specified by WEMCO. These locations are shown on WEMCO drawings Diagram A, B, and C. Core boring procedures and specifications will be as outlined in the Remedial Investigation/Feasibility Study (RI/FS) Work Plan Addendum, "Production and Additional Suspect Areas Work Plan," dated October 4, 1989, Section 2.0, unless specifically altered in this addendum.

Soil samples submitted for RI/FS laboratory analysis will be collected, documented, packaged, and shipped in accordance with the FMPC RI/FS Work Plan, Volume V, Sections 6.4, 6.8, and 7.0 dated March, 1988. Samples will be collected at locations specified by WEMCO.

Soil analyses will be performed to evaluate the potential presence of Hazardous Substance List (HSL) and radiological constituents. Geotechnical analyses will be performed to support foundation design. The HSL, full radiological, TCLP, total Uranium, total Thorium, and geotechnical analyses will be performed at the approved RI/FS contract laboratories.

The HSL and full radiological analyses will be as defined in Revision 1 of the RI/FS Work Plan Addendum, "Production and Additional Suspect Areas Work Plan," Table 3-2, page 3-6. A copy of this table is attached to this addendum.

The detection limits for all HSL and radiological analyses will be those stated in the FMPC RI/FS Work Plan Volume V, Section 4.0, Table 4-1 through 4-3. Any variance from the RI/FS detection limits will require written approval by the DOE.

The Plant 8 core sampling will be supported by the following field efforts:

- The ASI/IT team, as requested by WEMCO, will examine the proposed core locations to insure that sufficient lateral and vertical clearance is available to complete the core borings at the specified locations. Preliminary locations will be marked and surveyed.

- Core boring locations that deviate from those specified on WEMCO's drawing due to a physical obstruction, will be approved in writing by the WEMCO project manager before initiation of the project.

- Drilling in and around Plant 8 will be limited to Monday through Friday from 5:00 pm to 7:00 am and weekends from Saturday 5:00 pm to Monday 7:00 am. During times of rainfall, all drilling activities will be suspended for Plant 8 water processing. When drilling is prevented by Plant 8 waste and/or water processing, crew and rig standby charges will be billed to this task.

- Twelve core borings will be completed at WEMCO specified locations. Table 1 shows WEMCO and RI/FS designators and approximate total depths.

TABLE 1
RI/FS CORE BORING DESIGNATORS

WEMCO DESIGNATOR*	RI/FS DESIGNATOR	APPROXIMATE TOTAL DEPTH (FT)
1	1796	16
2	1797	20
3	1798	20
4	1799	20
5	1800	3
6	1801	3
7	1802	20
8	1803	3
9	1804	3
10	1805	3
11	1806	3
12	1807	3

* See WEMCO Drawings Diagram A, B, and C for Locations

- Samples from all drummed materials resulting from core borings will be collected and undergo TCLP analysis and total uranium analysis. These analyses will be completed in order to characterize the cuttings for disposal.

- Collection, shipment, and analysis of soil samples will be performed by ASI/IT. Concrete will be collected from all cores except the sixteen foot core. The concrete will be removed in a solid plug approximately 8 to 10 inches in diameter with variable thicknesses. The concrete will then be ground and/or crushed with the use of a WEMCO Milwaukee rotary hammer. The rotary hammer will remove a 3 inch plug which will then

be broken up into pea size gravel through the use of a sledge hammer. The estimated numbers of samples are:

		Soils	Concrete
-	HSL Parameters	10	4
-	Full Radiological Parameters	13	12
-	TCLP	38	24
-	Geotechnical	19	0
-	Total Uranium	56	0
-	Total Thorium	51	0

Specific analyses and sample depths are outlined in Table 2. Figures 1, 2, and 3 outline sample locations within each core boring. The number of samples listed above includes rinsate, lab QA/QC, and trip blanks samples. The quantity of sample required for the concrete analyses is 100 g for TCLP; 100 g for HSL; 750 g for full radiological; 650 g for total Uranium; and 50 g for total Thorium. The concrete must be pulverized to the size of pea gravel or smaller.

- The depths of the twenty and sixteen foot borings will be determined by the ASI/IT geologist. If a water bearing zone is encountered, drilling and sampling will stop at whichever occurs first: A clay zone or the boring reaches its designated depth (16 or 20 feet).

- Samples for geotechnical tests will be collected with a Shelby Tube at depths specified by the on site ASI/IT geologist and WEMCO project engineer. Samples are expected to be taken of intervals differentiated by stratigraphic appearance or composition. The geotechnical tests include:

  - ASTM D2216-80 (Moisture Content)
  - ASTM D422-63 (Grain Size/Hydrometer Analysis)
  - ASTM D4318-84 (Atterberg Limits)
  - ASTM D2166-85 (Unconfined Compression)
  - ASTM D2850-82 (Unconsolidated Undrained Triaxial Test)
  - ASTM D2974-87 (Organic Content)

  The sample for the Unconfined Compression and the Unconsolidated Undrained Triaxial Test should be undisturbed soil and the sample volume will be a 3 foot Shelby Tube. For the remainder of the Geotechnical test an additional 2 kilograms of sample will be necessary.

- After sample completion, the cores will be backfilled with volclay grout and covered with a 1 foot concrete cap flush with the surface.

3.0 RESPONSIBILITIES

ASI/IT personnel will be responsible for the following relative to the FMPC Plant 8 core sampling actions:

- Develop this addendum and the associated Configuration Control Board (CCB) package

- Develop a health and safety plan addendum that addresses the needs of core sampling inside and outside of Plant 8
- Survey boring locations and complete twelve core borings per RI/FS specifications, as outlined in this addendum
- Coordinate collection, shipment, and analysis of samples for HSL, full radiological, TCLP, total Uranium, total Thorium, and geotechnical parameters
- Provide sample bottles as required
- Coordinate with the RI/FS contract laboratory concerning sample receipt and tracking
- Pulverize the concrete to a size of pea gravel or smaller for analysis
- Ship to and have analyzed at the RI/FS contract laboratory the samples for HSL, full radiological, TCLP, total Uranium, total Thorium, and geotechnical parameters
- Provide WEMCO with the copies of the sample collection logs, chain of custody, and other additional RI/FS-required paperwork associated with the field sampling effort
- Validate and enter the sample results into the RI/FS database.

WEMCO personnel will be responsible for the following duties concerning Plant 8 core sampling actions:

- Insure that a contact is designated and available to resolve in a timely manner any WEMCO correctable hindrances to ASI/IT in accomplishing the field work associated with this Work Plan
- Provide a contact for coordination of Plant 8 waste processing activities
- Insure that all boring locations are clearly marked and identified
- Provide ASI/IT with completed Penetration Permits, ERA Subsurface Hazard Assessment, and any other site required permits deemed necessary by the WEMCO project engineer. These permits are to be provided to ASI/IT prior to initiation of the core borings
- Evaluate the results of the sampling program.

TABLE 2
SPECIFIC ANALYSIS AND SAMPLE DEPTH

DEPTH*	3 FOOT BORINGS	16 FOOT BORINGS	20 FOOT BORINGS
0.0 to 0.75 Feet (Concrete)	TCLP Full Radiological	—	TCLP HSL** Full Radiological
0.0 to 0.5 Feet (Soil)	TCLP Full Radiological	TCLP HSL Full Radiological	TCLP HSL Full Radiological
1.0 to 1.5 Feet (Soil)	Total Uranium Total Thorium	Total Uranium Total Thorium	Total Uranium Total Thorium
2.0 to 2.5 Feet (Soil)	Total Uranium Total Thorium	Total Uranium Total Thorium	Total Uranium Total Thorium
3.0 to 3.5 Feet (Soil)		Total Uranium Total Thorium	Total Uranium Total Thorium
4.0 to 8.0 Feet (Soil)		Total Uranium Total Thorium Geotechnical***	Total Uranium Total Thorium Geotechnical***
8.0 to 12.0 Feet (Soil)		Total Uranium Total Thorium Geotechnical***	Total Uranium Total Thorium Geotechnical***
12.0 to 16.0 Feet (Soil)		Total Uranium Total Thorium Geotechnical***	Total Uranium Total Thorium Geotechnical***
16.0 to 20.0 Feet (Soil)			Total Uranium Total Thorium Geotechnical***

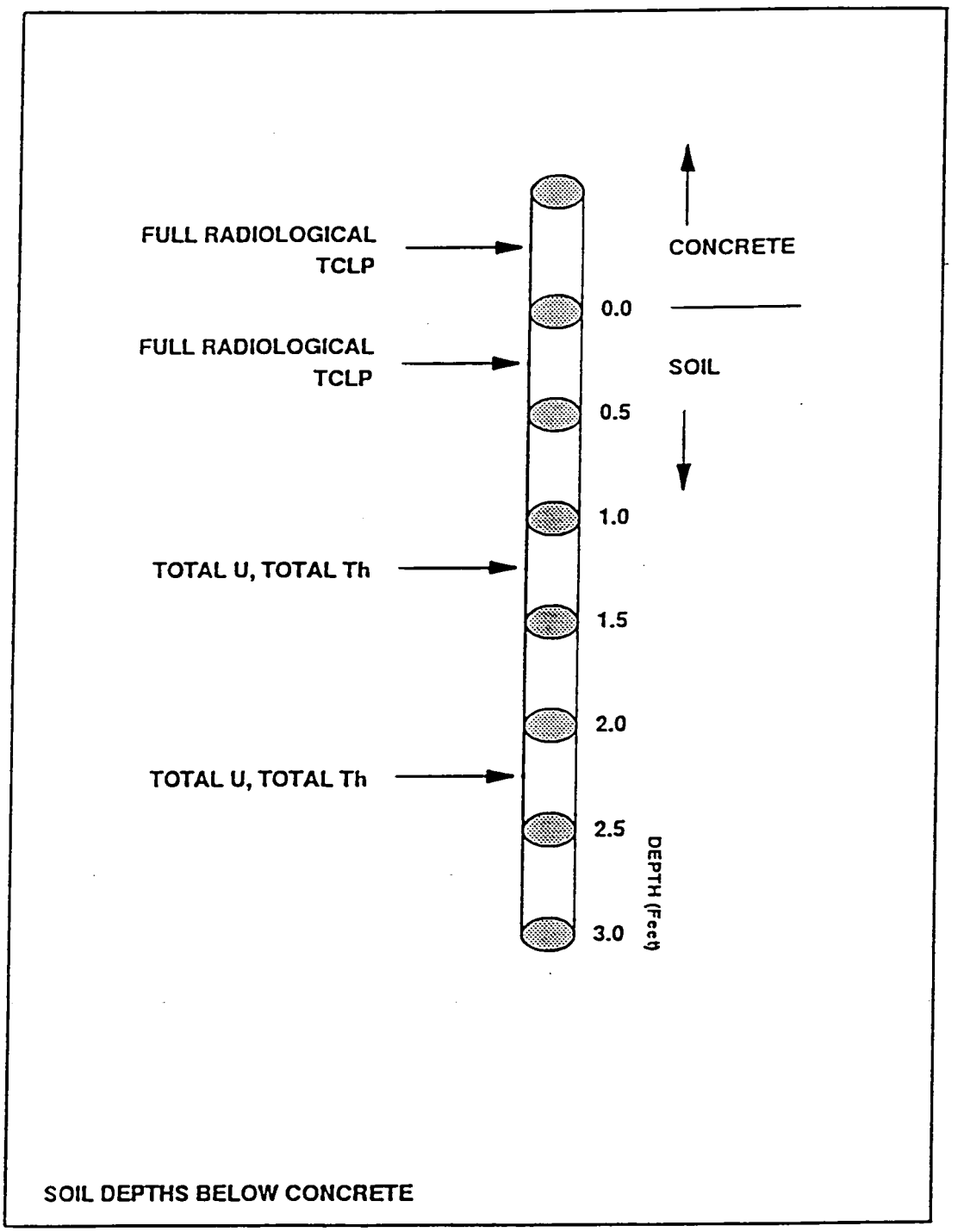
-- No concrete to be sampled

* Soil depths below concrete

** Wells 1798 and 1802 only

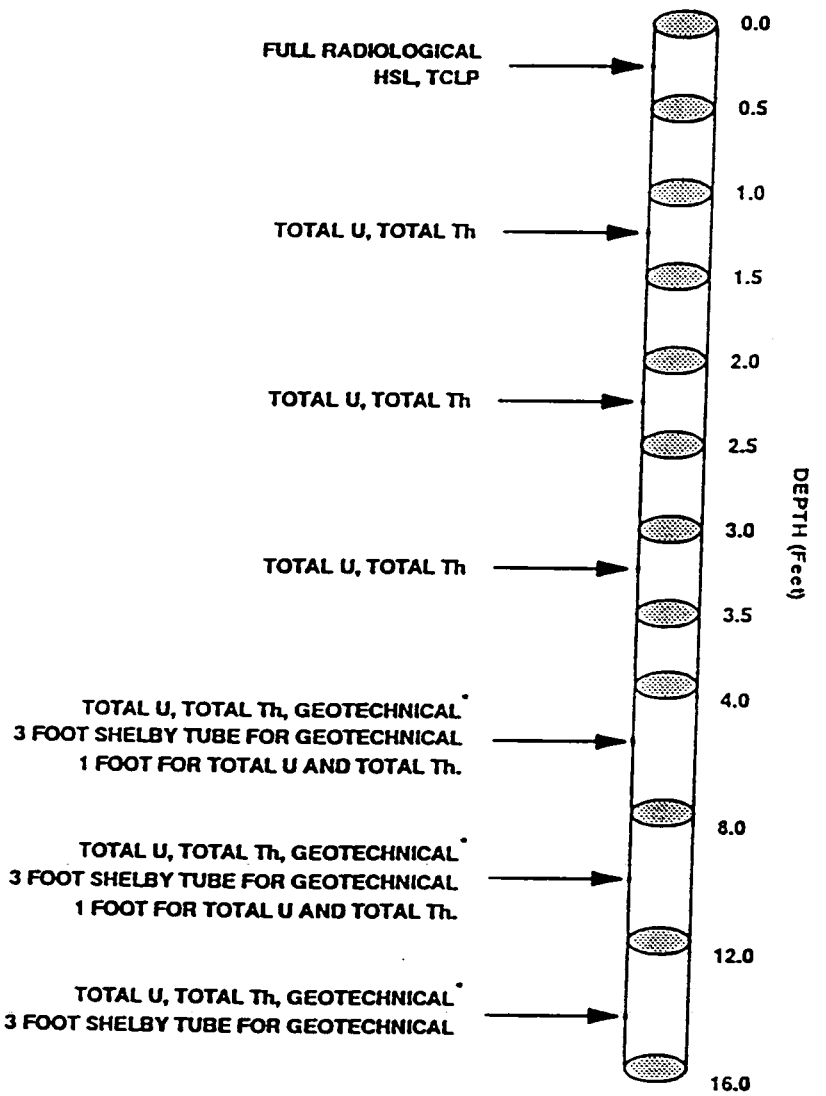
*** Samples are expected to be taken of intervals differentiated by stratigraphic appearance or composition

FIGURE 1
TYPICAL 3 FOOT BOREHOLE SAMPLE SEQUENCE FOR THE PLANT 8 CORE SAMPLING



MORA_OU3PSA.DRW_ASIFND_08-22-91_REV000

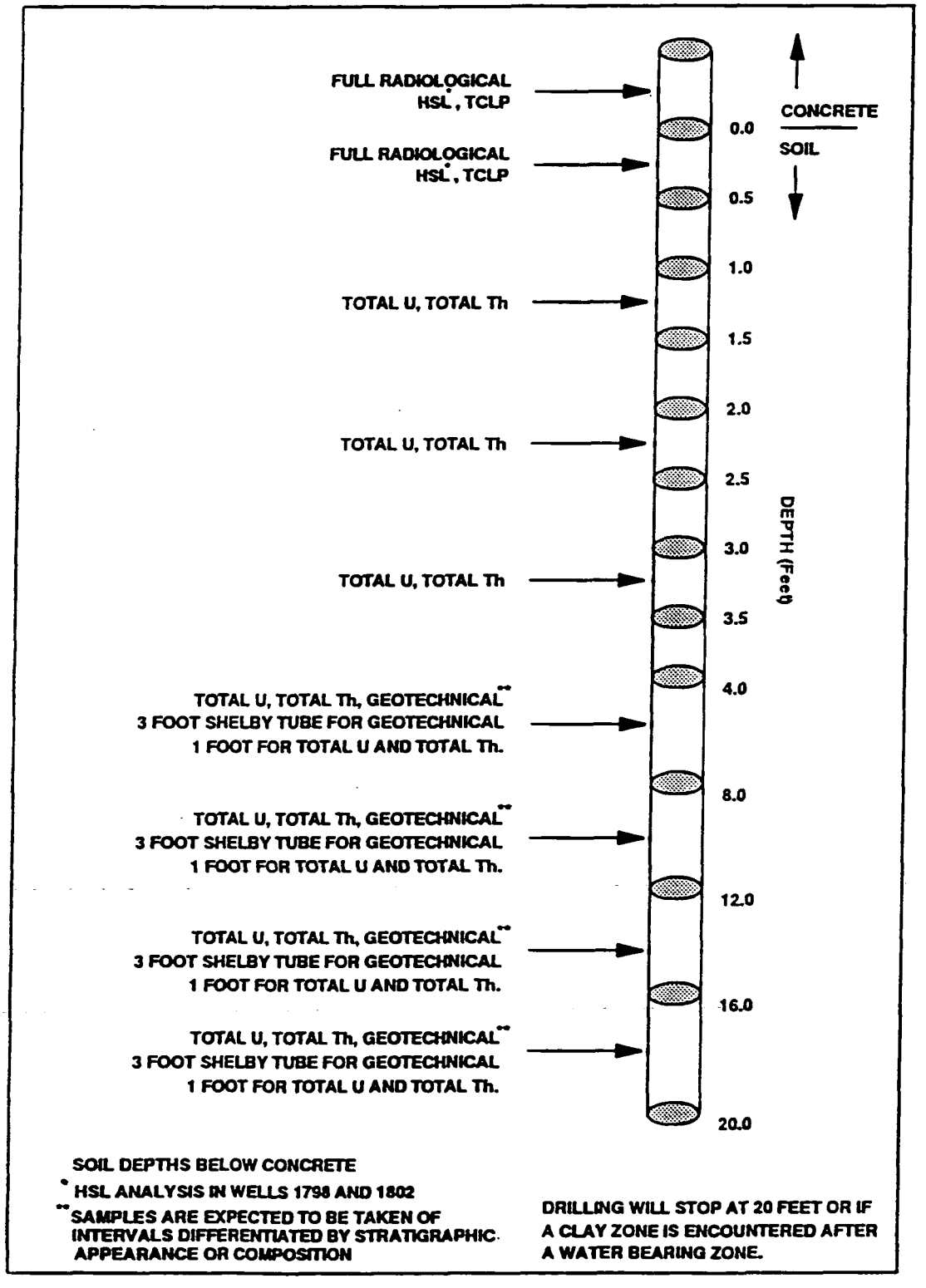
FIGURE 2
TYPICAL 16 FOOT BOREHOLE SAMPLE SEQUENCE FOR THE PLANT 8 CORE SAMPLING



* SAMPLES ARE EXPECTED TO BE TAKEN OF INTERVALS DIFFERENTIATED BY STRATIGRAPHIC APPEARANCE OR COMPOSITION

DRILLING WILL STOP AT 16 FEET OR IF A CLAY ZONE IS ENCOUNTERED AFTER A WATER BEARING ZONE.

FIGURE 3
TYPICAL 20 FOOT BOREHOLE SAMPLE SEQUENCE FOR THE PLANT 8 CORE SAMPLING



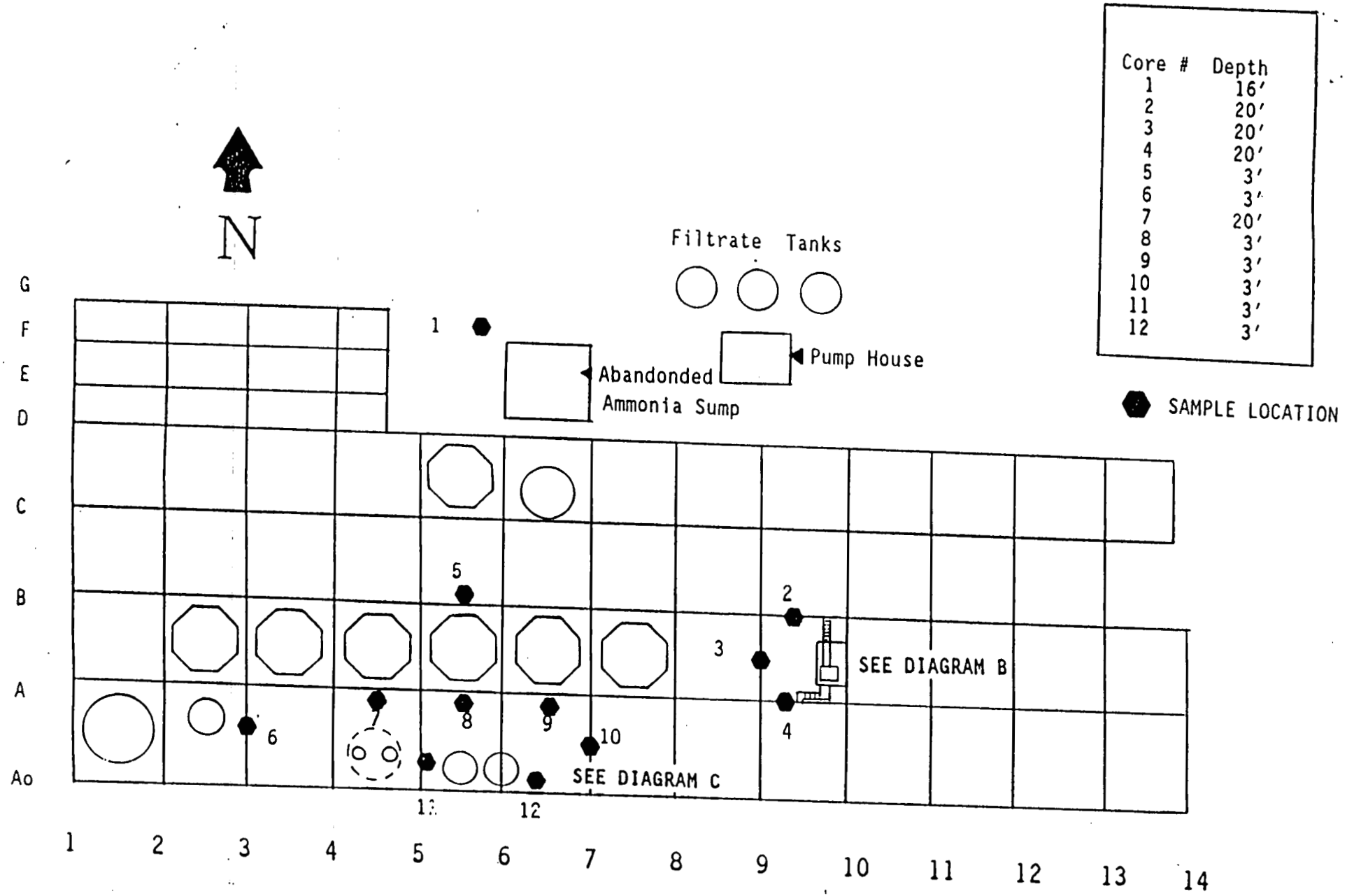
SOIL DEPTHS BELOW CONCRETE

* HSL ANALYSIS IN WELLS 1798 AND 1802

** SAMPLES ARE EXPECTED TO BE TAKEN OF INTERVALS DIFFERENTIATED BY STRATIGRAPHIC APPEARANCE OR COMPOSITION

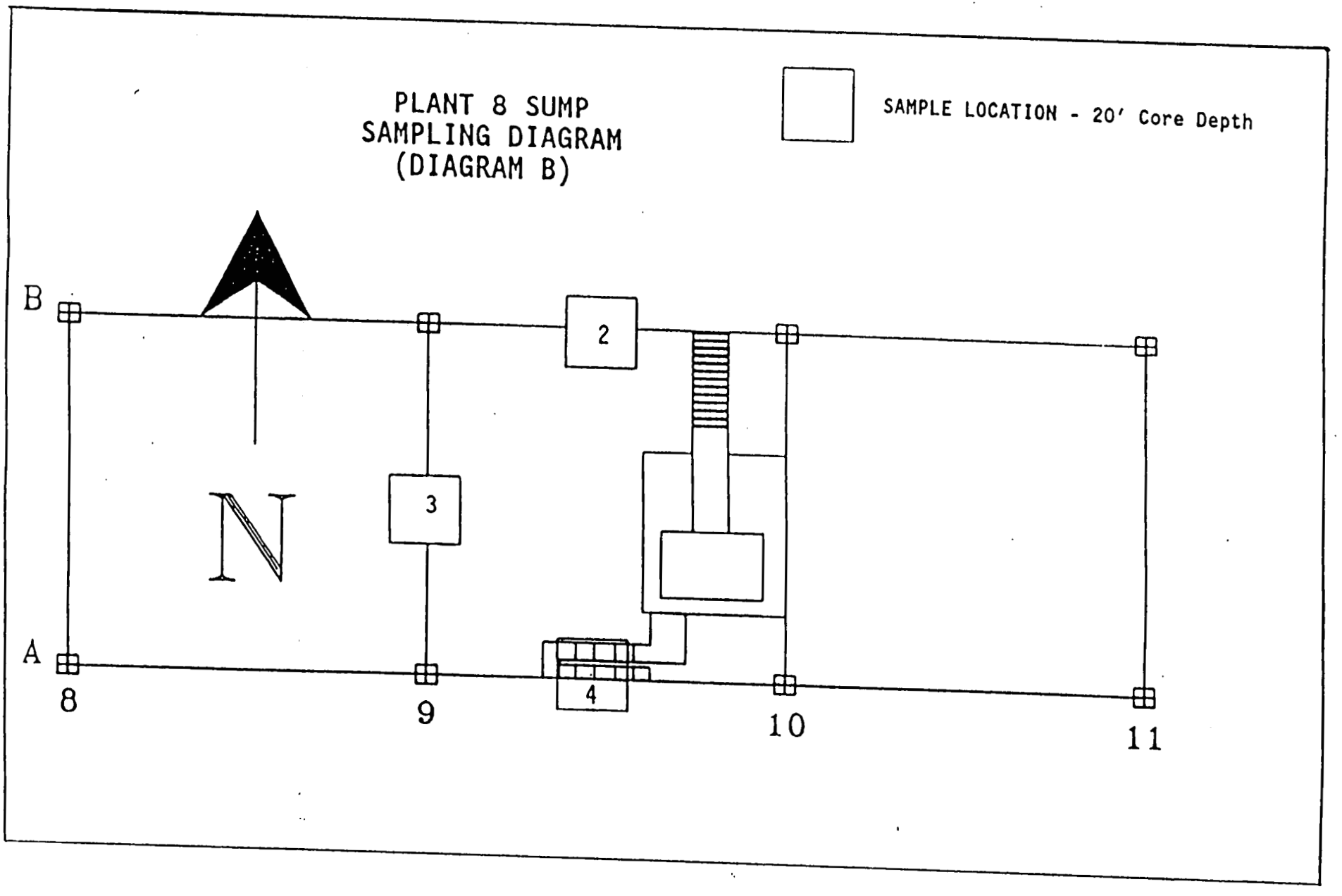
DRILLING WILL STOP AT 20 FEET OR IF A CLAY ZONE IS ENCOUNTERED AFTER A WATER BEARING ZONE.

MORA_OU3PSC.DRW_ASIFND_09-22-91_REV000



Core #	Depth
1	16′
2	20′
3	20′
4	20′
5	3′
6	3′
7	20′
8	3′
9	3′
10	3′
11	3′
12	3′

PLANT 8 SUMP
SAMPLING LOCATIONS
(DIAGRAM A)



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Revision 1 8/8/91

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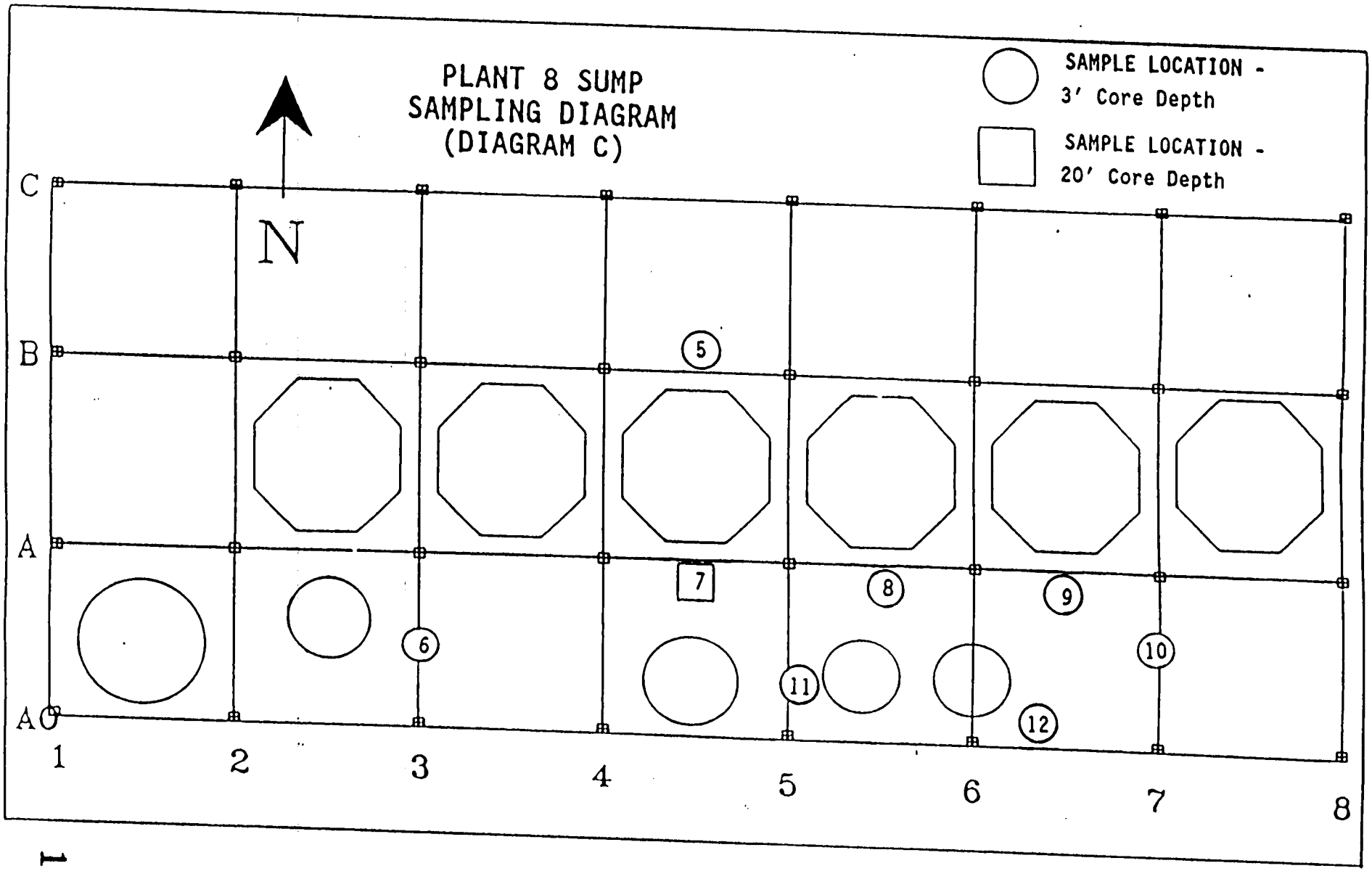

PLANT 8 SUMP
SAMPLING DIAGRAM
(DIAGRAM C)
N
SAMPLE LOCATION -
3' Core Depth
SAMPLE LOCATION -
20' Core Depth
C
B
A
A0
1
2
3
4
5
6
7
8
5
6
7
8
9
10
11
12

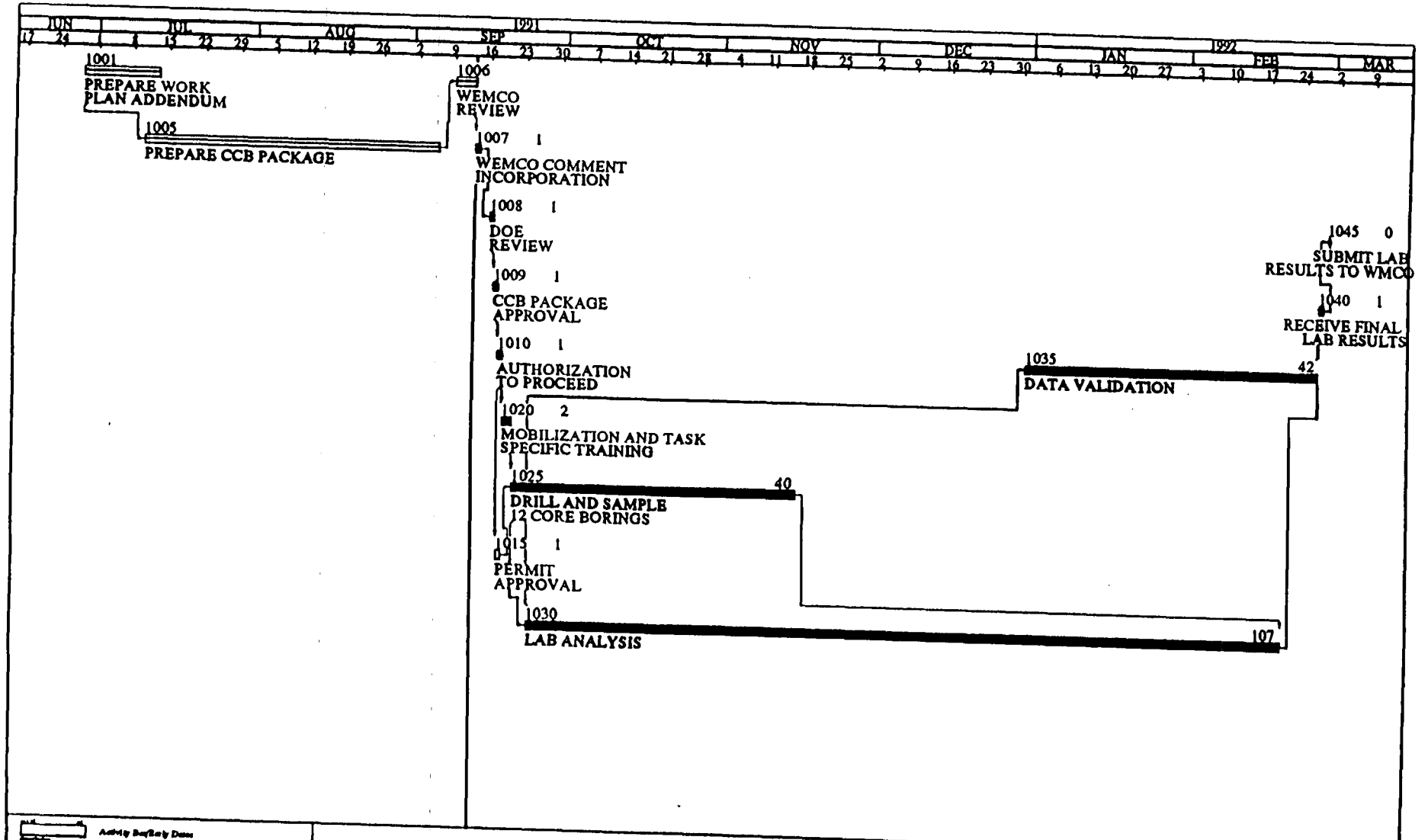
TABLE 3-2
ANALYTICAL PARAMETERS

ANALC'L GROUP	ANALYTICAL PARAMETERS	VOLUME, CONTAINER	PRESERVATION
Water	HSL		
	• HSL Organics		
	- Volatiles	2-40 ml vial (with teflon septum cap)	Cool 4° C
	• Semivolatiles	4 liter, amber glass (with teflon-lined cap)	Cool 4° C
	• HSL Inorganics		
	- Metals (plus molybdenum)	2-1 liter, plastics	HNO_3, ph<2 filtered
	- Mercury	500 ml, glass	HNO_3, ph<2
	- Cyanide	1 liter, plastic	Cool 4° C NaOH, pH>12
	Full HSL is the above and:		
	• HSL Pesticides/PCB	4 liter, amber glass (with teflon-lined cup)	Cool 4° C None
	HSL+ is all the above and:		
	• Organophosphorus Pesticides		
	• Dioxin, Furans		
Soil	Same as for Water	500 ml, glass wide-mouth jar with teflon lid liner	None
Water	Full Radiological		
	• Total Uranium	4 liter plastic	HNO_3, pH<2
	• Isotopic Uranium		
	• Isotopic Plutonium		
	• Radium-226		
	• Radium-228		
	• Neptunium-237		
	• Total Thorium		
	• Isotopic Thorium		
	• Technetium		
	• Cesium-137		
	• Strontium-90		
	• Ruthenium-106		
Soil	Same as Water	500 ml, glass or plastic container	None

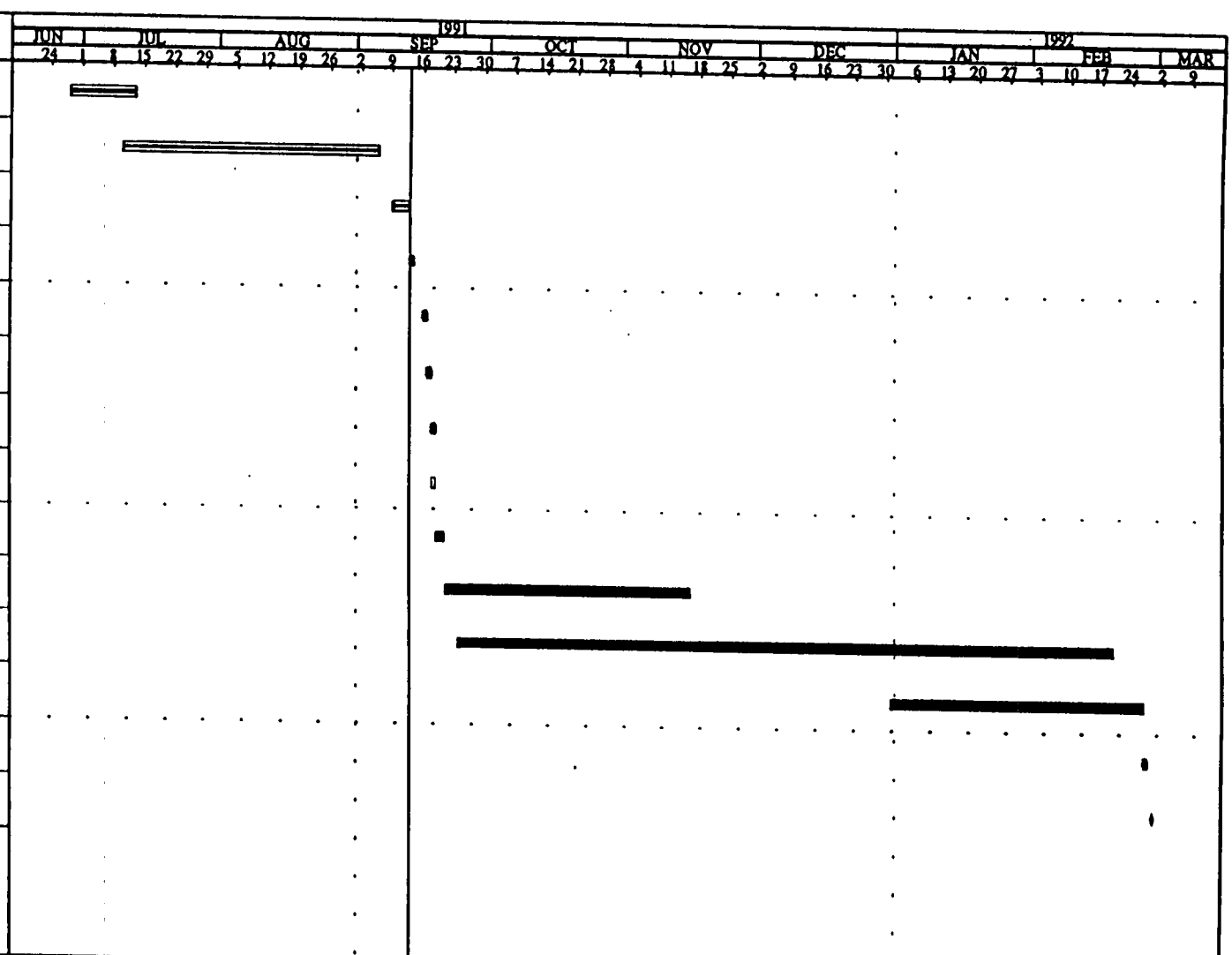
PLANT 8 CORE SAMPLING

SCHEDULE

SECTION II


1991
1992
JUN
JUL
AUG
SEP
OCT
NOV
DEC
JAN
FEB
MAR
1001
PREPARE WORK PLAN ADDENDUM
1005
PREPARE CCB PACKAGE
1006
WEMCO REVIEW
1007 1
WEMCO COMMENT INCORPORATION
1008 1
DOE REVIEW
1009 1
CCB PACKAGE APPROVAL
1010 1
AUTHORIZATION TO PROCEED
1020 2
MOBILIZATION AND TASK SPECIFIC TRAINING
1025
40
DRILL AND SAMPLE 12 CORE BORINGS
1015 1
PERMIT APPROVAL
1030
107
LAB ANALYSIS
1035
42
DATA VALIDATION
1045 0
SUBMIT LAB RESULTS TO WMCO
1040 1
RECEIVE FINAL LAB RESULTS
Activity Bar/Early Dates
Critical Activity
Progress Bar
Primavera Systems, Inc. 1984-1991
Project Start : 28JUN91
Project Finish: 28FEB92
ASI/IT
PLANT 8 CORE SAMPLING
TIME-SCALED LOGIC
Sheet 1 of 1
Data Date: 13SEP91
Plot Date: 13SEP91
Date
Revision
Checked
Approved

PREPARE WORK PLAN ADDENDUM 1001 OD 9 AS 28JUN91 AF 12JUL91	
PREPARE CCB PACKAGE 1005 OD 35 AS 10JUL91 AF 5SEP91	
WEMCO REVIEW 1006 OD 4 AF 12SEP91	
WEMCO COMMENT INCORPORATION 1007 OD 1 ES 13SEP91 EF 13SEP91	
DOE REVIEW 1008 OD 1 ES 16SEP91 EF 16SEP91	
CCB PACKAGE APPROVAL 1009 OD 1 ES 17SEP91 EF 17SEP91	
AUTHORIZATION TO PROCEED 1010 OD 1 ES 18SEP91 EF 18SEP91	
PERMIT APPROVAL 1015 OD 1 ES 18SEP91 EF 18SEP91	
MOBILIZATION AND TASK SPECIFIC TRAINING 1020 OD 2 ES 19SEP91 EF 20SEP91	
DRILL AND SAMPLE 12 CORE BORINGS 1025 OD 40 ES 21SEP91 EF 15NOV91	
LAB ANALYSIS 1030 OD 107 ES 24SEP91 EF 19FEB92	
DATA VALIDATION 1035 OD 42 ES 31DEC91 EF 26FEB92	
RECEIVE FINAL LAB RESULTS 1040 OD 1 ES 27FEB92 EF 27FEB92	
SUBMIT LAB RESULTS TO WMCO 1045 OD 0 EF 28FEB92	



Activity Bar/Early Dates
Critical Activity
Program Bar

Primavera Systems, Inc. 1984-1991

Project Start : 28JUN91
Project Finish: 28FEB92

ASI/IT
PLANT 8 CORE SAMPLING
BAR-CHART

Sheet 1 of 1

Data Date: 13SEP91
Plot Date: 13SEP91

Date	Revision	Checked	Approved

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PLANT 8 CORE SAMPLING

COST ACCOUNT PLAN

SECTION III

COST ACCOUNT PLAN

CONTRACT NUMBER: 602
WBS TASK: 27.97
FISCAL YEAR: 1991

TITLE: FEMP REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
TASK TITLE: Plant 8 Core Sampling
CONTRACT NUMBER: DE-AC05-86OR21659

CLIENT: DOE
PROJECT DIRECTOR: J. D. WOOD
TASK LEADER: D. F. SMITH

LABOR DESCRIPTION	COST ELEMENT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	HOURS	$
ASI ONSITE:															
Project Director	A01	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Project Manager	A03	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Senior Eng./Sci.	A04	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Senior Eng./Sci.	A05	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Engineer/Scientist	A06	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Junior Eng./Sci.	A08	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Senior Technician	A010	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Secretary	A011	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CLIENT ONSITE:															
Project Director	C01	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Project Manager	C03	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Senior Eng./Sci.	C04	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Senior Eng./Sci.	C05	0	0	0	0	0	0	0	0	0	0	0	15	15	341
Engineer/Scientist	C06	0	0	0	0	0	0	0	0	0	0	40	40	80	1,538
Junior Eng./Sci.	C08	0	0	0	0	0	0	0	0	0	0	0	70	70	1,178
Senior Technician	C010	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Secretary	C011	0	0	0	0	0	0	0	0	0	0	0	70	70	843
TOTAL LABOR HOURS		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Labor Dollars		0	0	0	0	0	0	0	0	0	0	40	195	235	3,900
Fringe OH at 32.00%		0	0	0	0	0	0	0	0	0	0	769	3,131		3,900
ASI Onsite OH at 67.00%		0	0	0	0	0	0	0	0	0	0	246	1,002		1,248
Client Onsite OH at 32.00%		0	0	0	0	0	0	0	0	0	0	0	0		0
TOTAL LABOR COSTS		0	0	0	0	0	0	0	0	0	0	325	1,323		1,648
ODC TOTAL (Page 2)		0	0	0	0	0	0	0	0	0	0	1,340	5,456		6,796
TOTAL COSTS		0	0	0	0	0	0	0	0	0	0	2,656	12,668		15,324
G&A AT 11.00%		0	0	0	0	0	0	0	0	0	0	3,996	18,124		22,120
FEE AT 5.87%		0	0	0	0	0	0	0	0	0	0	440	1,994		2,434
TOTAL COSTS AND FEE		0	0	0	0	0	0	0	0	0	0	260	1,181		1,441
												4,696	21,299		25,995

MS #	MILESTONE DESCRIPTION	DUE DATE

COST ACCOUNT PLAN

WBS TASK: 27.97
FISCAL YEAR: 1991

TASK TITLE: Plant 8 Core Sampling
CONTRACT NUMBER: DE-AC05-86OR21659

OTHER DIRECT COST DESCRIPTION	COST ELEMENT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	$
Data Processing/Statis.	DPS	0	0	0	0	0	0	0	0	0	0	0	0	0
Field Office	FLD	0	0	0	0	0	0	0	0	0	0	0	0	0
Expend. Field Supplies	ESF	0	0	0	0	0	0	0	0	0	0	0	0	0
IT Engineering Services	ITC	0	0	0	0	0	0	0	0	0	0	2656	3082	5738
IT Analytical Services	LAB	0	0	0	0	0	0	0	0	0	0	0	0	0
Penn Drill	MWD	0	0	0	0	0	0	0	0	0	0	0	9586	9586
Onsite Support	OSS	0	0	0	0	0	0	0	0	0	0	0	0	0
Special Testing/Equip.	XST	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Subcontractors	SUB	0	0	0	0	0	0	0	0	0	0	0	0	0
Travel	TRA	0	0	0	0	0	0	0	0	0	0	0	0	0
Employee Relocation	EMR	0	0	0	0	0	0	0	0	0	0	0	0	0
														0
														0
														0
														0
TOTAL OTHER DIRECT COSTS		0	0	0	0	0	0	0	0	0	0	2656	12668	15324

TASK DESCRIPTION:

COST ACCOUNT PLAN

CONTRACT NUMBER: 602
WBS TASK: 27.97
FISCAL YEAR: 1992

TITLE: FMPC REMEDIAL INVESTIGATION AND FEASIBILITY STUDY
TASK TITLE: Plant 8 Core Sampling
CONTRACT NUMBER: DE-AC05-86OR21659

CLIENT: DOE
PROJECT DIRECTOR: J. D. WOOD
TASK LEADER: D. F. SMITH

LABOR DESCRIPTION	COST ELEMENT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	HOURS	$
ASI ONSITE:															
Project Director	A01	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Project Manager	A03	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Senior Eng./Sci.	A04	0	0	0	160	160	0	0	0	0	0	0	0	320	7,572
Senior Eng./Sci.	A05	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Engineer/Scientist	A06	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Junior Eng./Sci.	A08	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Senior Technician	A010	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Secretary	A011	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CLIENT ONSITE:															
Project Director	C01	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Project Manager	C03	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Senior Eng./Sci.	C04	20	25	0	50	50	0	0	0	0	0	0	0	145	3,431
Senior Eng./Sci.	C05	40	20	0	0	0	0	0	0	0	0	0	0	60	1,202
Engineer/Scientist	C06	230	120	0	0	0	0	0	0	0	0	0	0	350	6,136
Junior Eng./Sci.	C08	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Senior Technician	C010	230	120	0	0	0	0	0	0	0	0	0	0	350	4,389
Secretary	C011	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL LABOR HOURS		520	285	0	210	210	0	0	0	0	0	0	0	1225	22,730
Labor Dollars		8,190	4,602	0	4,969	4,969	0	0	0	0	0	0	0		22,730
Fringe OH at 34.00%		2,785	1,565	0	1,689	1,689	0	0	0	0	0	0	0		7,728
ASI Onsite OH at 65.00%		0	0	0	3,298	3,298	0	0	0	0	0	0	0		6,596
Client Onsite OH at 31.00%		3,402	1,912	0	491	491	0	0	0	0	0	0	0		6,296
TOTAL LABOR COSTS		14,377	8,079	0	10,447	10,447	0	0	0	0	0	0	0		43,350
ODC TOTAL (Page 2)		121,905	111,340	80,609	80,609	80,609	0	0	0	0	0	0	0		475,074
TOTAL COSTS		136,282	119,419	80,609	91,056	91,056	0	0	0	0	0	0	0		518,424
G&A AT 10.60%		14,446	12,658	8,545	9,652	9,652	0	0	0	0	0	0	0		54,953
FEE AT 5.87%		8,848	7,753	5,233	5,912	5,912	0	0	0	0	0	0	0		33,658
TOTAL COSTS AND FEE		159,576	139,830	94,387	106,620	106,620	0	0	0	0	0	0	0		607,035

MS #	MILESTONE DESCRIPTION	DUE DATE

2266

21

COST ACCOUNT PLAN

WBS TASK: 27.97
FISCAL YEAR: 1992

TASK TITLE: Plant 8 Core Sampling
CONTRACT NUMBER: DE-AC05-86OR21659

OTHER DIRECT COST DESCRIPTION	COST ELEMENT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	$
Data Processing/Statis.	DPS	0	0	0	0	0	0	0	0	0	0	0	0	0
Field Office	FLD	0	0	0	0	0	0	0	0	0	0	0	0	0
Expend. Field Supplies	ESF	0	0	0	0	0	0	0	0	0	0	0	0	0
IT Engineering Services	ITC	8430	4712	0	0	0	0	0	0	0	0	0	0	13142
IT Analytical Services	LAB	80609	80609	80609	80609	80609	0	0	0	0	0	0	0	403047
Penn Drill	MWD	32866	26019	0	0	0	0	0	0	0	0	0	0	58884
Onsite Support	OSS	0	0	0	0	0	0	0	0	0	0	0	0	0
Special Testing/Equip.	XST	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Subcontractors	SUB	0	0	0	0	0	0	0	0	0	0	0	0	0
Travel	TRA	0	0	0	0	0	0	0	0	0	0	0	0	0
Employee Relocation	EMR	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL OTHER DIRECT COSTS		121905	111340	80609	80609	80609	0	0	0	0	0	0	0	475074

TASK DESCRIPTION:

TASK TITLE: Plant 8 Core Sampling
CONTRACT NUMBER: DE-AC05-86OR21659

ADVANCED SCIENCES, INCORPORATED
WBS TASK: 27.97
Summarized Estimate of Direct Costs:

	FY91 Total	FY92 Total	Task Total
Direct Labor Hours	235	1,225	1,460
Direct Labor	3,900	22,730	26,630
Overhead	2,896	20,620	23,516
Total Direct Labor Costs	6,796	43,350	50,146
Other Direct Costs			
Data Processing/Statis.	0	0	0
Field Office	0	0	0
Expend. Field Supplies	0	0	0
IT Engineering Services	5,738	13,142	18,880
IT Analytical Services	0	403,047	403,047
Penn Drill	9,586	58,884	68,470
Onsite Support	0	0	0
Special Testing/Equip.	0	0	0
Other Subcontractors	0	0	0
Travel	0	0	0
Employee Relocation	0	0	0
Total Other Direct Costs	15,324	475,074	490,397
General & Administration	2,434	54,953	57,387
Total Contract Costs	24,554	573,377	597,930
Fee	1,441	33,658	35,099
Total Contract Value	25,995	607,035	633,029

IT Corporation - FMPC RI/FS (Contract No. 866A21602-02) - CAPS

Task No. 03.07.23 - Plant 8 Core Sampling
Summary of Estimated Total Direct Cost by Month - FY91

		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Labor Hours		0	0	0	0	0	0	0	0	0	0	50	100	150
Direct Labor		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$950	$1,103	$2,053
Overhead	125.00%	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,188	$1,379	$2,567
Total Labor Cost		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$2,138	$2,482	$4,620
Other Direct Costs														
Total Travel Costs		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Other ODC		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total ODC's		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Direct Costs		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$2,138	$2,482	$4,620
General & Admin	15.00%	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$321	$372	$693
Subtotal		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$2,459	$2,854	$5,313
Fee	8.00%	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$197	$228	$425
Total		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$2,656	$3,082	$5,738
IT Laboratory		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
IT Equipment		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
IT Materials		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
FY91 Total IT		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$2,656	$3,082	$5,738

15-Sep-91

IT Corporation - FMPC RI/FS (Contract No. 866A21602-02) - CAPS

Task No. 03.07.23 - Plant 8 Core Sampling
Summary of Estimated Total Direct Cost by Month - FY92

		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Labor Hours		270	150	0	0	0	0	0	0	0	0	0	0	420
Direct Labor		$3,017	$1,686	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$4,703
Overhead	125.00%	$3,771	$2,108	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$5,879
Total Labor Cost		$6,788	$3,794	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$10,582
Other Direct Costs														
Total Travel Costs		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Other ODC		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total ODC's		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Direct Costs		$6,788	$3,794	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$10,582
General & Admin	15.00%	$1,018	$569	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,587
Subtotal		$7,806	$4,363	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$12,169
Fee	8.00%	$624	$349	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$973
Total		$8,430	$4,712	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$13,142
IT Laboratory		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
IT Equipment		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
IT Materials		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
FY92 Total IT		$8,430	$4,712	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$13,142

IT Corporation - FMPC RI/FS (Contract No. 866A21602-02) - CAPS

Task No. 03.07.23 - Plant 8 Core Sampling
Estimate of Hours by Month - FY91 (October, 1990 to September, 1991)

Position Title	E-/N-Grade	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Proj. Director	E-13													0
Proj. Mgr. III	E-12													0
Proj. Mgr. II	E-11													0
Proj. Manager I	E-10													0
Staff Consult	E-09													0
Managing Eng/Sc	E-08													0
Eng/Sci V	E-07											40		40
Eng/Sci IV	E-06													0
Eng/Sci III	E-05													0
Eng/Sci II	E-04											10		10
Eng/Sci I	E-03													0
Asst Eng/Sci	E-02													0
Sec/Tech IV	N-12												30	30
Sec/Tech III	N-11													0
Sec/Tech II	N-09												70	70
Sec/Tech I	N-08													0
Clerical	N-06													0
FY91 Labor Hours		0	0	0	0	0	0	0	0	0	0	50	100	150

IT Corporation - FMPC RI/FS (Contract No. 866A21602-02) - CAPS

Task No. 03.07.23 - Plant 8 Core Sampling
Estimate of Hours by Month - FY92 (October, 1991 to September, 1992)

Position Title	E-/N-Grade	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Proj. Director	E-13													0
Proj. Mgr. III	E-12													0
Proj. Mgr. II	E-11													0
Proj. Manager I	E-10													0
Staff Consult	E-09													0
Managing Eng/Sc	E-08													0
Eng/Sci V	E-07													0
Eng/Sci IV	E-06													0
Eng/Sci III	E-05													0
Eng/Sci II	E-04													0
Eng/Sci I	E-03													0
Asst Eng/Sci	E-02													0
Sec/Tech IV	N-12	40	30											70
Sec/Tech III	N-11													0
Sec/Tech II	N-09	230	120											350
Sec/Tech I	N-08													0
Clerical	N-06													0
FY92 Labor Hours		270	150	0	0	0	0	0	0	0	0	0	0	420

IT Corporation - FMPC RI/FS (Contract No. 866A21602-02) - CAPS

Task No. 03.07.23 - Plant 8 Core Sampling
Direct Labor Cost Calculation

Position Title	E-/N-Grade	August 1990 Hourly Rate	Escalation % = FY91 Escal. Hourly Rate	Total FY91 Hours	0.442% Total FY91 Direct Labor	Escalation % = FY92 Escalated Hourly Rate	Total FY92 Hours	3.6500% Total FY92 Direct Labor	Escalation % = FY93 Escalated Hourly Rate	Total FY93 Hours	5.725% Total FY93 Direct Labor	Total Task Direct Labor
Proj. Director	E-13	42.5770	$42.7650	0	$0	$44.1311	0	$0	$46.6576	0	$0	$0
Proj. Mgr. III	E-12	36.0507	$36.2099	0	$0	$37.3666	0	$0	$39.5058	0	$0	$0
Proj. Mgr. II	E-11	31.2184	$31.3563	0	$0	$32.3579	0	$0	$34.2104	0	$0	$0
Proj. Manager I	E-10	27.0916	$27.2113	0	$0	$28.0804	0	$0	$29.6880	0	$0	$0
Staff Consult	E-09	23.3751	$23.4783	0	$0	$24.2283	0	$0	$25.6154	0	$0	$0
Managing Eng/Sc	E-08	22.3475	$22.4462	0	$0	$23.1632	0	$0	$24.4893	0	$0	$0
Eng/Sci V	E-07	19.9914	$20.0797	40	$803	$20.7211	0	$0	$21.9074	0	$0	$803
Eng/Sci IV	E-06	18.1646	$18.2448	0	$0	$18.8276	0	$0	$19.9055	0	$0	$0
Eng/Sci III	E-05	16.5270	$16.6000	0	$0	$17.1302	0	$0	$18.1109	0	$0	$0
Eng/Sci II	E-04	14.6086	$14.6731	10	$147	$15.1418	0	$0	$16.0087	0	$0	$147
Eng/Sci I	E-03	12.9842	$13.0415	0	$0	$13.4581	0	$0	$14.2286	0	$0	$0
Asst Eng/Sci	E-02	11.5926	$11.6438	0	$0	$12.0157	0	$0	$12.7036	0	$0	$0
Sec/Tech IV	N-12	11.8737	$11.9261	30	$358	$12.3071	70	$861	$13.0117	0	$0	$1,219
Sec/Tech III	N-11	11.1292	$11.1784	0	$0	$11.5354	0	$0	$12.1958	0	$0	$0
Sec/Tech II	N-09	10.5911	$10.6379	70	$745	$10.9777	350	$3,842	$11.6062	0	$0	$4,587
Sec/Tech I	N-08	9.9108	$9.9546	0	$0	$10.2725	0	$0	$10.8606	0	$0	$0
Clerical	N-06	8.5433	$8.5810	0	$0	$8.8551	0	$0	$9.3621	0	$0	$0
Total			FY90	150	$2,053	FY91	420	$4,703	FY92	0	$0	$6,756
			Rounding Adjust		$0	Rounding Adjust		$0	Rounding Adjust		$0	$0
Total Estimated Direct Labor					$2,053			$4,703			$0	$6,756

15-Sep-91

Task No. 03.07.23 - Plant 8 Core Sampling
Estimate of Other Direct Costs - FY91

Travel

From	To	# of Trips	Air-fare	Length of Stay (Nights)	Per day: Per Diem	Per day: Rental Car	Per day: Hotel	Per day: Misc.*	TOTALS: Airfare	TOTALS: Per Diem	TOTALS: Rental Car	TOTALS: Misc.	TOTALS: Hotel
Pittsburgh	Cincinnati	0	$303	3	$26	$42	$50	$0	$0	$0	$0	$0	$0
Pittsburgh	Cincinnati	0	$303	5	$26	$42	$50	$0	$0	$0	$0	$0	$0
Cincinnati	Pittsburgh	0	$303	3	$26	$42	$60	$0	$0	$0	$0	$0	$0
Pittsburgh	Knoxville	0	$330	3	$26	$42	$49	$0	$0	$0	$0	$0	$0
Albuquerque	Knoxville	0	$892	3	$26	$42	$49	$0	$0	$0	$0	$0	$0
Knoxville	Cincinnati	0	$476	2	$26	$42	$50	$0	$0	$0	$0	$0	$0
Pittsburgh	Albuquerque	0	$768	3	$26	$42	$59	$0	$0	$0	$0	$0	$0
								Travel Subtotals	$0	$0	$0	$0	$0
								TDY Subtotal	$0	$0			
								Travel Totals	$0	$0	$0	$0	$0

TDY	# of People	Travel Allow.	Total # of Mos.	TDY Amt Per Mo.
Total # of Mos. = All TDY	0	$300	0	$1,200

Total Travel Costs	$0
Relocation	$0
Special Equipment	$0
On-Site Support	$0
Other Purchased Service	$0
Data Management	$0
Health & Safety Eqiup.	$0
Total Other Direct Costs	$0
IT Laboratory	$0
IT Equipment	$0 Computer and WP Equipment
IT Materials	$0
Total Other IT	$0

* Miscellaneous Costs =
$18.00 Mileage
$6.00 Parking

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For each itemized cost provide written documentation confirming estimate, i.e., prior invoice, catalog price list, written vendor quote.
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Task No. 03.07.23 - Plant 8 Core Sampling
Estimate of Other Direct Costs - FY92

Travel

From	To	# of Trips	Air-fare	Length of Stay (Nights)	Per day: Per Diem	Per day: Rental Car	Per day: Hotel	Per day: Misc.*	TOTALS: Airfare	TOTALS: Per Diem	TOTALS: Rental Car	TOTALS: Misc.	TOTALS: Hotel
Pittsburgh	Cincinnati	0	$303	3	$26	$42	$50	$0	$0	$0	$0	$0	$0
Pittsburgh	Cincinnati	0	$303	5	$26	$42	$50	$0	$0	$0	$0	$0	$0
Cincinnati	Pittsburgh	0	$303	3	$26	$42	$60	$0	$0	$0	$0	$0	$0
Pittsburgh	Knoxville	0	$330	3	$26	$42	$49	$0	$0	$0	$0	$0	$0
Albuquerque	Knoxville	0	$892	3	$26	$42	$49	$0	$0	$0	$0	$0	$0
Knoxville	Cincinnati	0	$496	5	$26	$42	$50	$0	$0	$0	$0	$0	$0
Pittsburgh	Albuquerque	0	$768	3	$26	$42	$59	$0	$0	$0	$0	$0	$0

TDY	# of People	Travel Allow.	Total # of Mos.	TDY Amt Per Mo.						
					Travel Subtotals	$0	$0	$0	$0	$0
					TDY Subtotal	$0	$0			
Total # of Mos. = All TDY	0	$300	0	$1,200	Travel Totals	$0	$0	$0	$0	$0

* Miscellaneous Costs =
$18.00 Mileage
$6.00 Parking

Total Travel Costs	$0
Relocation	$0
Special Equipment	$0
On-Site Support	$0
Other Purchased Service	$0
Data Management	$0
Health & Safety	$0
Total Other Direct Costs	$0
IT Laboratory	$0
IT Equipment	$0 Computer and WP Equipment
IT Materials	$0
Total Other IT	$0

<----------
For each itemized cost provide written documentation confirming estimate, i.e., prior invoice, catalog price list, written vendor quote.
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IT Corporation - FMPC RI/FS (Contract No. 866A21602-02) - CAPS

Task No. 03.07.23 - Plant 8 Core Sampling
Estimate of Direct Costs

		FY91 Total	FY92 Total	FY93 Total	TASK TOTAL
Direct Labor Hours		150	420	0	570
Direct Labor		$2,053	$4,703	$0	$6,756
Overhead	125.00%	$2,567	$5,879	$0	$8,446
Total Labor Cost		$4,620	$10,582	$0	$15,202
Other Direct Costs					
Total Travel Costs		$0	$0	$0	$0
Relocation		$0	$0	$0	$0
Special Equipment		$0	$0	$0	$0
On-Site Support		$0	$0	$0	$0
Other Purchased Service		$0	$0	$0	$0
Data Management		$0	$0	$0	$0
Health & Safety		$0	$0	$0	$0
Total ODC's		$0	$0	$0	$0
Total Direct Costs		$4,620	$10,582	$0	$15,202
General & Adm	15.00%	$693	$1,587	$0	$2,280
Subtotal		$5,313	$12,169	$0	$17,482
Fee	8.00%	$425	$973	$0	$1,398
Total		$5,738	$13,142	$0	$18,880
IT Laboratory		$0	$0	$0	$0
IT Equipment		$0	$0	$0	$0
IT Materials		$0	$0	$0	$0
Total IT		$5,738	$13,142	$0	$18,880
Rounding Errors		$0	$0	$0	$0

PLANT 8 CORE SAMPLING

ANALYSIS	NO. OF SAMPLES	UNIT PRICE	TOTAL
HSL (Soil) 3 samples 1 rinsate 3 lab QA/QC 3 trip blanks	10	$2,569	$25,690
HSL (Concrete) 2 samples 1 rinsate 1 lab QA/QC	4	$6,456	$25,824
Full Radiological (Soil) 5 samples	5	$1,042	$5,210
Full Radiological (Soil) - Rush 7 samples 1 rinsate	8	$1,303	$10,424
Full Radiological (Concrete) 4 samples	4	$5,370	$21,480
Full Radiological (Concrete) - Rush 7 samples 1 rinsate	8	$6,713	$53,704
TCLP (Soil) 10 samples 1 rinsate 11 lab QA/QC	22	$2,625	$57,750
TCLP (Soil) - Rush 7 samples 1 rinsate 8 lab QA/QC	16	$3,282	$52,512
TCLP (Concrete) 4 samples 4 lab QA/QC	8	$5,685	$45,480
TCLP (Concrete) - Rush 7 samples 1 rinsate 8 lab QA/QC	16	$7,107	$113,712
Total Uranium (Soil) 39 samples 2 rinsate	41	$66	$2,706

ANALYSIS	NO. OF SAMPLES	UNIT PRICE	TOTAL
Total Uranium (Soil) - Rush 14 samples 1 rinsate	15	$83	$1,245
Total Thorium (Soil) 34 samples 2 rinsate	36	$138	$4,968
Total Thorium (Soil) - Rush 14 samples 1 rinsate	15	$173	$2,595
Moisture Content (ASTM D2216-80) 19 samples	19	$8	$152
Grain Size/Hydrometer Analysis (ASTM D422-63) 19 samples	19	$55	$1,045
Atterberg Limits (ASTM D4318-84) 19 samples	19	$80	$1,520
Unconfined Compression (ASTM D2166-85) 19 samples	19	$110	$2,090
Unconsolidated Undrained Triaxial Test (ASTM D2850-82) 19 samples	19	$125	$2,375
Organic Content (ASTM D2974-87) 19 Samples	19	$17	$323
Radiological Screening	60	$83	$4,980
CLP Packages	14	$165	$2,310
Subtotal			$438,095
Less 8% Discount			$35,048
Total			$403,047

PENNSYLVANIA DRILLING COMPANY

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800-245-4420
FAX 412-771-3167

August 16, 1991

Advanced Sciences, Inc.
120 S. Jefferson Cr., Suite 101
Oak Ridge, TN 37830

Attention: Mr. James Ransone

Dear Jim:

Enclosed please find our estimate for twelve borings to establish the pertinent engineering data for the installation of a sump and crusher in Place 8.

ITEM	SUPPLIES/SERVICES	QTY.	UNIT	PRICE	AMOUNT
1a	Mob/Demob - Rig	0	EACH	$15000.	
1b	Mob/Demob - Truck, Dozer	0	EACH	$3000.	
2a*	Drill & Sample-Cable Tool	0	L.F.	$50.00	
3.	Training	60	PER/HR	$45.00	$2,700.00
4a*	Standby time/drilling rig and crew	100	HR	$110.00	11,000.00
5a	Site Clearing	0	HR	$110.00	
6.	Shelby Tubes	0	EA	$80.00	
7.*	Permeability Testing	0	EA	$110.00	
9a*	Well Const. Labor/Equip	0	HR	$120.00	
10a	Well Casing, 4" SSTL	0	L.F.	$30.00	

10b	Well Casing, PVC (2")	0	L.F.	$1.60	
10c	Well Casing, PVC (4")	0	L.F.	$2.88	
10d	Well Casing, 2" SSTL	0	L.F.	$23.47	
10e	Well Casing, 6" SSTL	0	L.F.	$61.32	
11a	Well Screen, 4" SSTL	0	L.F.	$47.55	
11b	Well Screen, PVC (2")	0	L.F.	$3.00	
11c	Well Screen, PVC (4")	0	L.F.	$7.76	
11d	Well Screen, 2" SSTL	0	L.F.	$38.59	
11e	Well Screen, 6" SSTL	0	L.F.	$72.68	
12	Top/Bottom Caps, 4" SSTL	0	EACH	$45.00	
12a	Top/Bottom Caps, 2" PVC	0	EACH	$22.05	
12b	Top/Bottom Caps, 4" PVC	0	EACH	$32.20	
12c	Top/Bottom Caps, 2" SSTL	0	EACH	$103.50	
12d	Top/Bottom Caps, 6" SSTL	0	Per Well	$165.60	
13a	Sand or Gravel Pack	0	BAGS	$5.75	
14.	Bentonite Pellets	0	BKT	$75.00	
15a	Volclay Grout	4300	LBS	$0.40	1,720.00
16.	Locking Caps, (10")	0	EA	$150.00	
16a	Locking Caps (4")	0	EA	$104.62	
17.	Steel Guard Posts	0	EA	$10.00	
18*	Borehole Sealing	0	L.F.	$15.00	
19a*	Well Development	0	HR	$120.00	
20a*	Personnel Decon	60	HR	$110.00	6,600.00
21a*	Equipment Decontamination	20	HR	$115.00	2,300.00

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August 16, 1991
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22.	Portable Steam Generator	15	DAY	$10.00	150.00
23.	Water Truck	15	DAY	$20.00	300.00
24.	Drum Handling	10	EA	$20.00	200.00
25.	Site Restoration	0	EA	$200.00	
26a	Per Diem	100	PER/DAY	$50.00	5,000.00
27.	Support Vehicles	50	DAY	$20.00	1,000.00
28.	Mob/Demob-Auger	0	EA	$6000.00	
29*	Drill & Sample-Auger	300	HR	$125.00	37,500.00
					$68,470.00

If you have any questions or desire additional information, please contact us. As always, it is a pleasure doing business with you.

Very truly yours,

PENNSYLVANIA DRILLING COMPANY

William D. Lutz

William D. Lutz,
Chief Estimator