REPORT ON RCRA APPENDIX IX SAMPLING AT LOS ALAMOS NATIONAL LABORATORY LOS ALAMOS, NEW MEXICO

NOVEMBER 1990

Prepared by

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Introduction

On November 1 and 2, 1990, ground-water sampling of six RCRA ground-water monitoring wells at Los Alamos National Laboratory (LANL), in Los Alamos, NM, took place. Sampling was performed by IT-Albuquerque personnel Barbara Matz, Jon Saavedra, and Kurt Schmidt, with Peggy Reneau of IT-Los Alamos observing and assisting. Sampling was conducted in accordance with the RCRA Ground Water Monitoring Technical Enforcement Guidance Document (EPA, 1986) (TEGD). Observers from LANL were Steve McLin on November 1, and Max Maes on November 2.

Sample Collection

Monitor wells sampled were MCO-4B, MCO-6B and MCO-7A in Mortandad Canyon; LAO-3A and LAO-4.5C in Los Alamos Canyon; and well APCO-1 in Acid Pueblo Canyon. Samples were collected for analysis for RCRA Appendix IX parameters, including: volatile organic compounds, base/neutral/acid-extractable semivolatile organic compounds, organochlorine pesticides, herbicides, PCBs, Dioxins and Furans, total metals, cyanide, and sulfide.

Clean, empty sample bottles were shipped from IT-Knoxville Analytical Services to IT-Albuquerque. The 40-ml glass vials used for volatile organic compound analyses were pre-prepared with hydrochloric acid preservative, but sample bottles for metals, cyanide and sulfide analyses required laboratory preparation prior to sampling. The sampling team prepared sample bottles with preservatives in the laboratory at LANL TA-50, as directed by EPA document SW-846 (Test Methods for Evaluating Solid Waste, Physical/Chemical Methods). [Although the title refers to solid waste, this document contains all the test methods called for in the RCRA Appendix IX constituent list, all of which are applicable to analysis of water samples.]

IT sampling personnel wore Level D protective clothing, with additional PVC raingear and latex surgical gloves whenever in contact with ground water. Upon opening each wellhead in the field, organic vapors were monitored, using a HNu Photo-Ionic Detector, and found to be non-detectable. Additionally, the wellhead, surrounding area, and ground water withdrawn from the wells were monitored for beta and gamma radiation, using a hand-held ion chamber. No radiation was detected at any measurement point above normal background levels.

Each well was measured, using a Solinst Water Level Indicator, for fluid level and total depth, prior to sampling activities. The field measurements are listed in Table 1. Each well's casing volume was calculated in the field, and approximately three casing volumes of ground water were purged from each well immediately prior to sampling. This was done to insure that samples collected represented formation water, and were not affected by stagnation within the well casing. All wells recharged continuously during purging, and did not go dry. A PVC double-check bailer was used to purge the wells, tied onto LANL's dedicated nylon ropes. The bailer was decontaminated between wells with a non-phosphate detergent wash and a deionized water rinse. Well measurement and purge data are summarized in Table 1. Field sample collection logs are included in Appendix A of this report.

Purge water was containerized in 5-gallon plastic containers with screw-on lids, and marked legibly as to contents and purge date. Filled and sealed purge water containers were left

next to each wellhead by IT personnel for appropriate disposal by LANL personnel.

A clear teflon double-check bailer was used for actual sampling of the wells. The sampling bailer was decontaminated between wells with a non-phosphate detergent wash followed by a deionized water rinse. Ground water was poured directly from the bailer into prepared and pre-labelled sample bottles. Sample bottles and preservatives are summarized in Table 2. Sample fractions were collected in the following order: 1) volatile organic compounds, 2) semi-volatile organic compounds, 3) metals, 4) cyanide, and 5) sulfide.

Sample Handling and Shipment

IT personnel prepared all Chain-of-Custody and Request for Analysis documentation for the sampling effort. As each sample was collected in the field, IT custody tape was applied over the closed lid, and the sample was packaged in a resealable plastic bag. All sample bottles were then stored on ice, in coolers. Samples were packed with vermiculite and ice for shipment, and transported to the Federal Express facility in Santa Fe for shipment to IT-Oak Ridge analytical laboratory. All sample fractions were shipped on the same day they were collected. Upon receipt at Oak Ridge, the organophosphorus pesticide samples were then shipped to the IT analytical laboratory in San Jose, CA, for preparation and analysis.

Field copies of Chain-of-custody and Request for Analysis forms are included in Appendix B of this report.

Sample Analysis

Samples were analyzed by U.S. Environmental Protection Agency (EPA) methods described in EPA SW-846. Analytical results are summarized in Tables 3 through 10; laboratory analytical data sheets are included in Appendix C. The laboratory also performed required internal QC analyses concurrently with the environmental samples.

Analytical Results

Volatile organic compounds were not detected in any environmental samples, nor in any field blank or trip blank samples.

Semivolatile organic compounds were not detected in any environmental samples, with the exception of N-nitrosomorpholine, which was detected in samples from wells MCO-4B and MCO-6B at estimated concentrations lower than the method reporting limit.
Pesticides, PCBs, herbicides, dioxins and furans were not detected in any environmental samples.

Some metals (barium, beryllium, chromium, cobalt, copper, lead, nickel, silver, vanadium, and zinc) were detected in some or all of the environmental samples. Table 9 summarizes all metals analyses.

Cyanide was undetected in all environmental samples.

Sulfide was detected in all environmental samples, at concentrations ranging between 1.0 and 2.8 milligrams per liter (mg/L).

Field QC Results

A duplicate sample was collected from monitor well MCO-6B, and labelled as MCO-10, in order to be a blind duplicate. Table 11 compares results of the duplicate samples. All analyses show either no relative percent difference (RPD), or are within allowable ranges, with the exception of sulfide.

Laboratory QC Results

Quality control methods employed by the analytical laboratory included analysis of method blanks concurrent with each sample analysis, and the measurement of surrogate recovery. Laboratory QC results are acceptable with two exceptions.

The method blank for metals analysis contained 0.17 mg/L of zinc. The laboratory report indicates that environmental sample analytical results were blank-corrected; that is, the zinc concentration in the method blank was subtracted from analytical results for environmental samples, and the corrected concentration was reported.

Surrogate recoveries for some organochlorine pesticides were not within acceptable limits. The LANL laboratory-prepared QC sample (APCO-2) required dilution prior to analysis, thereby making surrogate recovery impossible. Dilution is required when one or more constituents in a sample are present in such concentrations as to mask other constituents. Additionally, the surrogate recovery for environmental sample LAO-4.5C fell below EPA-recommended limits.

With the exception of the cases mentioned above, all laboratory and field QC results are acceptable.

Summary and Conclusions

Analysis of environmental samples showed virtually no Appendix IX parameters present in the ground-water, with the exception of some metals and sulfide. QC results were generally in control, indicating that analytical results are reliable.

It may be useful to compare the list of constituents detected with materials that have been discharged into the canyons, as well as the geochemistry of rocks and soil in the canyons.

TABLE 1

WELL PARAMETERS DURING SAMPLING ACTIVITIES
LOS ALAMOS NATIONAL LABORATORY

NOVEMBER 1990

WELL LOCATION AND IDENTIFICATION	DEPTH TO WATER, FT.	TOTAL WELL DEPTH, FT.	TOTAL VOLUME PURGED, GALS.	NO. OF CASING VOLS. PURGED
MORTANDAD CANYON				
MCO-4B	17.40	34.85	8.5	2.96
MCO-6B	35.10	46.90	5.0	2.78
MCO-7A	37.68	45.60	4.0	3.08
LOS ALAMOS CANYON				
LAO-3A	8.64	14.84	3.0	2.94
LAO-4.5C	10.67	24.50	7.0	3.07
PUEBLO CANYON				
APCO-1	8.19	20.21	6.0	3.03

TABLE 2

SAMPLE BOTTLES AND PRESERVATIVES FOR RCRA APPENDIX IX SAMPLES
LOS ALAMOS NATIONAL LABORATORY
NOVEMBER 1990

ANALYSIS	CONTAINER	NO./VOLUME	PRESERVATIVE
Volatile Organic Compounds	glass	2 X 40 ml	HCl
Semivolatile Organic Compounds, including pesticides, herbicides, dioxins, furans.	amber glass	7 X 1 liter	none
Metals	plastic	1 X 1 liter	HNO_3
Cyanide	plastic	1 X 1 liter	NaOH
Sulfide	plastic	1 X 1 liter	Zinc acetate + NaOH

TABLE 3

SUMMARY OF ANALYTICAL RESULTS FOR BACKGROUND SAMPLING
LOS ALAMOS NATIONAL LABORATORY
NOVEMBER 1990

VOLATILE ORGANIC COMPOUNDS

WELL I.D./SAMPLE #:		APCO-1	APCO-2	LAO-3A	LAO-4.5C
SAMPLE TYPE:		ENV	QC	ENV	ENV
PARAMETER	REPORTING LIMIT µg/L				
Acetone	10	ND	ND	ND	ND
Acetonitrile	100	ND	ND	ND	ND
Acrolein	10	ND	ND	ND	ND
Acrylonitrile	10	ND	ND	ND	ND
Benzene	5	ND	**74**	ND	ND
Bromodichloromethane	5	ND	ND	ND	ND
Bromoform	5	ND	ND	ND	ND
Bromomethane	10	ND	ND	ND	ND
2-Butanone	10	ND	**53**	ND	ND
Carbon disulfide	5	ND	ND	ND	ND
Carbon tetrachloride	5	ND	**100**	ND	ND
Chlorobenzene	5	ND	**81**	ND	ND
Chloroethane	10	ND	ND	ND	ND
3-Chloro-1-propene	5	ND	ND	ND	ND
Chloroform	5	ND	ND	ND	ND
Chloromethane	10	ND	ND	ND	ND
Chloroprene	5	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane	10	ND	ND	ND	ND
Dibromochloromethane	5	ND	ND	ND	ND
1,2-Dibromoethane	5	ND	ND	ND	ND
Dibromomethane	5	ND	ND	ND	ND
trans-1,4-Dichloro-2-butene	20	ND	ND	ND	ND
Dichlorodifluoromethane	20	ND	ND	ND	ND
1,1-Dichloroethane	5	ND	**69**	ND	ND
1,2-Dichloroethane	5	ND	**90**	ND	ND
1,1-Dichloroethene	5	ND	ND	ND	ND
trans-1,2-Dichloroethene	5	ND	ND	ND	ND

NOTES:
ENV = field environmental sample from well indicated
QC = LANL laboratory-prepared QC sample
ND = Not detected at reporting limit indicated

TABLE 3, CONTINUED

SUMMARY OF ANALYTICAL RESULTS FOR BACKGROUND SAMPLING
LOS ALAMOS NATIONAL LABORATORY
NOVEMBER 1990

VOLATILE ORGANIC COMPOUNDS

WELL I.D./SAMPLE #:		APCO-1	APCO-2	LAO-3A	LAO-4.5C
SAMPLE TYPE:		ENV	QC	ENV	ENV
PARAMETER	REPORTING LIMIT µg/L				
1,2-Dichloropropane	5	ND	ND	ND	ND
cis-1,3-Dichloropropene	5	ND	ND	ND	ND
trans-1,3-Dichloropropene	5	ND	ND	ND	ND
1,4-Dioxane	1000	ND	ND	ND	ND
Ethyl Benzene	5	ND	**85**	ND	ND
Ethyl Cyanide	100	ND	ND	ND	ND
Ethyl methacrylate	10	ND	ND	ND	ND
2-Hexanone	10	ND	**67**	ND	ND
Iodomethane	5	ND	ND	ND	ND
Isobutyl Alcohol	2000	ND	ND	ND	ND
Methacrylonitrile	10	ND	ND	ND	ND
Methyl methacrylate	10	ND	ND	ND	ND
4-Methyl-2-pentanone	10	ND	ND	ND	ND
Methylene chloride	5	ND	ND	ND	ND
Pyridine	20000	ND	ND	ND	ND
Styrene	5	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	5	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	5	ND	ND	ND	ND
Tetrachloroethene	5	ND	**83**	ND	ND
Toluene	5	ND	**86**	ND	ND
1,1,1-Trichloroethane	5	ND	**97**	ND	ND
1,1,2-Trichloroethane	5	ND	**110**	ND	ND
Trichloroethene	5	ND	**86**	ND	ND
Trichlorofluoromethane	5	ND	ND	ND	ND
1,2,3-Trichloropropane	20	ND	ND	ND	ND
Vinyl acetate	10	ND	ND	ND	ND
Vinyl chloride	10	ND	ND	ND	ND
Xylenes (total)	5	ND	ND	ND	ND

NOTES:
ENV = field environmental sample from well indicated
QC = LANL laboratory-prepared QC sample
ND = Not detected at reporting limit indicated

TABLE 3, CONTINUED

SUMMARY OF ANALYTICAL RESULTS FOR BACKGROUND SAMPLING
LOS ALAMOS NATIONAL LABORATORY
NOVEMBER 1990

VOLATILE ORGANIC COMPOUNDS

WELL I.D./SAMPLE #:		MCO-4B	MCO-6B	MCO-10	MCO-7A
SAMPLE TYPE:		ENV	ENV	DUP	ENV
PARAMETER	REPORTING LIMIT µg/L				
Acetone	10	ND	ND	ND	ND
Acetonitrile	100	ND	ND	ND	ND
Acrolein	10	ND	ND	ND	ND
Acrylonitrile	10	ND	ND	ND	ND
Benzene	5	ND	ND	ND	ND
Bromodichloromethane	5	ND	ND	ND	ND
Bromoform	5	ND	ND	ND	ND
Bromomethane	10	ND	ND	ND	ND
2-Butanone	10	ND	ND	ND	ND
Carbon disulfide	5	ND	ND	ND	ND
Carbon tetrachloride	5	ND	ND	ND	ND
Chlorobenzene	5	ND	ND	ND	ND
Chloroethane	10	ND	ND	ND	ND
3-Chloro-1-propane	5	ND	ND	ND	ND
Chloroform	5	ND	ND	ND	ND
Chloromethane	10	ND	ND	ND	ND
Chloroprene	5	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane	10	ND	ND	ND	ND
Dibromochloromethane	5	ND	ND	ND	ND
1,2-Dibromoethane	5	ND	ND	ND	ND
Dibromomethane	5	ND	ND	ND	ND
trans-1,4-Dichloro-2-butene	20	ND	ND	ND	ND
Dichlorodifluoromethane	20	ND	ND	ND	ND
1,1-Dichloroethane	5	ND	ND	ND	ND
1,2-Dichloroethane	5	ND	ND	ND	ND
1,1-Dichloroethene	5	ND	ND	ND	ND
trans-1,2-Dichloroethene	5	ND	ND	ND	ND

NOTES:
ENV = field environmental sample from well indicated
DUP = environmental duplicate sample from well MCO-6B
ND = Not detected at reporting limit indicated

TABLE 3, CONTINUED

SUMMARY OF ANALYTICAL RESULTS FOR BACKGROUND SAMPLING
LOS ALAMOS NATIONAL LABORATORY
NOVEMBER 1990

VOLATILE ORGANIC COMPOUNDS

WELL I.D./SAMPLE #:		MCO-4B	MCO-6B	MCO-10	MCO-7A
SAMPLE TYPE:		ENV	ENV	DUP	ENV
PARAMETER	REPORTING LIMIT µg/L				
1,2-Dichloropropane	5	ND	ND	ND	ND
cis-1,3-Dichloropropene	5	ND	ND	ND	ND
trans-1,3-Dichloropropene	5	ND	ND	ND	ND
1,4-Dioxane	1000	ND	ND	ND	ND
Ethyl Benzene	5	ND	ND	ND	ND
Ethyl Cyanide	100	ND	ND	ND	ND
Ethyl methacrylate	10	ND	ND	ND	ND
2-Hexanone	10	ND	ND	ND	ND
Iodomethane	5	ND	ND	ND	ND
Isobutyl Alcohol	2000	ND	ND	ND	ND
Methacrylonitrile	10	ND	ND	ND	ND
Methyl methacrylate	10	ND	ND	ND	ND
4-Methyl-2-pentanone	10	ND	ND	ND	ND
Methylene chloride	5	ND	ND	ND	ND
Pyridine	20000	ND	ND	ND	ND
Styrene	5	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	5	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	5	ND	ND	ND	ND
Tetrachloroethene	5	ND	ND	ND	ND
Toluene	5	ND	ND	ND	ND
1,1,1-Trichloroethane	5	ND	ND	ND	ND
1,1,2-Trichloroethane	5	ND	ND	ND	ND
Trichloroethene	5	ND	ND	ND	ND
Trichlorofluoromethane	5	ND	ND	ND	ND
1,2,3-Trichloropropane	20	ND	ND	ND	ND
Vinyl acetate	10	ND	ND	ND	ND
Vinyl chloride	10	ND	ND	ND	ND
Xylenes (total)	5	ND	ND	ND	ND

NOTES:
ENV = field environmental sample from well indicated
DUP = environmental duplicate sample from well MCO-6B
ND = Not detected at reporting limit indicated

TABLE 3, CONTINUED

SUMMARY OF ANALYTICAL RESULTS FOR BACKGROUND SAMPLING
LOS ALAMOS NATIONAL LABORATORY
NOVEMBER 1990

VOLATILE ORGANIC COMPOUNDS

WELL I.D./SAMPLE #:		FIELD BLANKS		
		APCO-11	LAO-11	MCO-11
PARAMETER	REPORTING LIMIT µg/L			
Acetone	10	ND	ND	ND
Acetonitrile	100	ND	ND	ND
Acrolein	10	ND	ND	ND
Acrylonitrile	10	ND	ND	ND
Benzene	5	ND	ND	ND
Bromodichloromethane	5	ND	ND	ND
Bromoform	5	ND	ND	ND
Bromomethane	10	ND	ND	ND
2-Butanone	10	ND	ND	ND
Carbon disulfide	5	ND	ND	ND
Carbon tetrachloride	5	ND	ND	ND
Chlorobenzene	5	ND	ND	ND
Chloroethane	10	ND	ND	ND
3-Chloro-1-propene	5	ND	ND	ND
Chloroform	5	ND	ND	ND
Chloromethane	10	ND	ND	ND
Chloroprene	5	ND	ND	ND
1,2-Dibromo-3-chloropropane	10	ND	ND	ND
Dibromochloromethane	5	ND	ND	ND
1,2-Dibromoethane	5	ND	ND	ND
Dibromomethane	5	ND	ND	ND
trans-1,4-Dichloro-2-butene	20	ND	ND	ND
Dichlorodifluoromethane	20	ND	ND	ND
1,1-Dichloroethane	5	ND	ND	ND
1,2-Dichloroethane	5	ND	ND	ND
1,1-Dichloroethene	5	ND	ND	ND
trans-1,2-Dichloroethene	5	ND	ND	ND

NOTES:
ENV = field environmental sample from well indicated
QC = LANL laboratory-prepared QC sample
ND = Not detected at reporting limit indicated

TABLE 3, CONTINUED

SUMMARY OF ANALYTICAL RESULTS FOR BACKGROUND SAMPLING
LOS ALAMOS NATIONAL LABORATORY
NOVEMBER 1990

VOLATILE ORGANIC COMPOUNDS

WELL I.D./SAMPLE #:		FIELD BLANKS		
		APCO-11	LAO-11	MCO-11
PARAMETER	REPORTING LIMIT µg/L			
1,2-Dichloropropane	5	ND	ND	ND
cis-1,3-Dichloropropene	5	ND	ND	ND
trans-1,3-Dichloropropene	5	ND	ND	ND
1,4-Dioxane	1000	ND	ND	ND
Ethyl Benzene	5	ND	ND	ND
Ethyl Cyanide	100	ND	ND	ND
Ethyl methacrylate	10	ND	ND	ND
2-Hexanone	10	ND	ND	ND
Iodomethane	5	ND	ND	ND
Isobutyl Alcohol	2000	ND	ND	ND
Methacrylonitrile	10	ND	ND	ND
Methyl methacrylate	10	ND	ND	ND
4-Methyl-2-pentanone	10	ND	ND	ND
Methylene chloride	5	ND	ND	ND
Pyridine	20000	ND	ND	ND
Styrene	5	ND	ND	ND
1,1,1,2-Tetrachloroethane	5	ND	ND	ND
1,1,2,2-Tetrachloroethane	5	ND	ND	ND
Tetrachloroethene	5	ND	ND	ND
Toluene	5	ND	ND	ND
1,1,1-Trichloroethane	5	ND	ND	ND
1,1,2-Trichloroethane	5	ND	ND	ND
Trichloroethene	5	ND	ND	ND
Trichlorofluoromethane	5	ND	ND	ND
1,2,3-Trichloropropane	20	ND	ND	ND
Vinyl acetate	10	ND	ND	ND
Vinyl chloride	10	ND	ND	ND
Xylenes (total)	5	ND	ND	ND

NOTES:
ND = Not detected at reporting limit indicated

TABLE 3, CONTINUED

SUMMARY OF ANALYTICAL RESULTS FOR BACKGROUND SAMPLING
LOS ALAMOS NATIONAL LABORATORY
NOVEMBER 1990

VOLATILE ORGANIC COMPOUNDS

WELL I.D./SAMPLE #:		TRIP BLANKS		
		APCO-TB	LAO-TB	MCO-TB
PARAMETER	REPORTING LIMIT µg/L			
Acetone	10	ND	ND	ND
Acetonitrile	100	ND	ND	ND
Acrolein	10	ND	ND	ND
Acrylonitrile	10	ND	ND	ND
Benzene	5	ND	ND	ND
Bromodichloromethane	5	ND	ND	ND
Bromoform	5	ND	ND	ND
Bromomethane	10	ND	ND	ND
2-Butanone	10	ND	ND	ND
Carbon disulfide	5	ND	ND	ND
Carbon tetrachloride	5	ND	ND	ND
Chlorobenzene	5	ND	ND	ND
Chloroethane	10	ND	ND	ND
3-Chloro-1-propene	5	ND	ND	ND
Chloroform	5	ND	ND	ND
Chloromethane	10	ND	ND	ND
Chloroprene	5	ND	ND	ND
1,2-Dibromo-3-chloropropane	10	ND	ND	ND
Dibromochloromethane	5	ND	ND	ND
1,2-Dibromoethane	5	ND	ND	ND
Dibromomethane	5	ND	ND	ND
trans-1,4-Dichloro-2-butene	20	ND	ND	ND
Dichlorodifluoromethane	20	ND	ND	ND
1,1-Dichloroethane	5	ND	ND	ND
1,2-Dichloroethane	5	ND	ND	ND
1,1-Dichloroethene	5	ND	ND	ND
trans-1,2-Dichloroethene	5	ND	ND	ND

NOTES:
ND = Not detected at reporting limit indicated

TABLE 3, CONTINUED

SUMMARY OF ANALYTICAL RESULTS FOR BACKGROUND SAMPLING
LOS ALAMOS NATIONAL LABORATORY
NOVEMBER 1990

VOLATILE ORGANIC COMPOUNDS

WELL I.D./SAMPLE #:		TRIP BLANKS		
		APCO-TB	LAO-TB	MCO-TB
PARAMETER	REPORTING LIMIT µg/L			
1,2-Dichloropropane	5	ND	ND	ND
cis-1,3-Dichloropropene	5	ND	ND	ND
trans-1,3-Dichloropropene	5	ND	ND	ND
1,4-Dioxane	1000	ND	ND	ND
Ethyl Benzene	5	ND	ND	ND
Ethyl Cyanide	100	ND	ND	ND
Ethyl methacrylate	10	ND	ND	ND
2-Hexanone	10	ND	ND	ND
Iodomethane	5	ND	ND	ND
Isobutyl Alcohol	2000	ND	ND	ND
Methacrylonitrile	10	ND	ND	ND
Methyl methacrylate	10	ND	ND	ND
4-Methyl-2-pentanone	10	ND	ND	ND
Methylene chloride	5	ND	ND	ND
Pyridine	20000	ND	ND	ND
Styrene	5	ND	ND	ND
1,1,1,2-Tetrachloroethane	5	ND	ND	ND
1,1,2,2-Tetrachloroethane	5	ND	ND	ND
Tetrachloroethene	5	ND	ND	ND
Toluene	5	ND	ND	ND
1,1,1-Trichloroethane	5	ND	ND	ND
1,1,2-Trichloroethane	5	ND	ND	ND
Trichloroethene	5	ND	ND	ND
Trichlorofluoromethane	5	ND	ND	ND
1,2,3-Trichloropropane	20	ND	ND	ND
Vinyl acetate	10	ND	ND	ND
Vinyl chloride	10	ND	ND	ND
Xylenes (total)	5	ND	ND	ND

NOTES:
ND = Not detected at reporting limit indicated

TABLE 4

SUMMARY OF ANALYTICAL RESULTS FOR BACKGROUND SAMPLING
LOS ALAMOS NATIONAL LABORATORY
NOVEMBER 1990

SEMIVOLATILE ORGANIC COMPOUNDS

WELL I.D./SAMPLE #:		APCO-1	APCO-2	LAO-3A	LAO-4.5C
SAMPLE TYPE:		ENV	QC	ENV	ENV
PARAMETER	REPORTING LIMIT µg/L				
Acenaphthene	10	ND	ND	ND	ND
Acenaphthylene	10	ND	ND	ND	ND
Acetophenone	10	ND	ND	ND	ND
2-Acetylaminofluorene	10	ND	ND	ND	ND
4-Aminobiphenyl	50	ND	ND	ND	ND
Aniline	50	ND	ND	ND	ND
Anthracene	10	ND	ND	ND	ND
Aramite	10	ND	ND	ND	ND
Benzo(a)Anthracene	10	ND	ND	ND	ND
Benzo(b)Fluoranthene	10	ND	ND	ND	ND
Benzo(k)Fluoranthene	10	ND	ND	ND	ND
Benzoic Acid	50	ND	ND	ND	ND
Benzo(g,h,i)Perylene	10	ND	ND	ND	ND
Benzo(a)Pyrene	10	ND	ND	ND	ND
Benzyl Alcohol	10	ND	ND	ND	ND
bis(2-Chloroethoxy) Methane	10	ND	ND	ND	ND
bis(2-Chloroethyl) Ether	10	ND	ND	ND	ND
bis(2-Chloroisopropyl) Ether	10	ND	ND	ND	ND
bis(2-Ethylhexyl) phthalate	10	ND	ND	ND	ND
4-Bromophenyl-phenyl ether	10	ND	ND	ND	ND
Butylbenzylphthalate	10	ND	ND	ND	ND
4-Chloroaniline	10	ND	ND	ND	ND
4-Chloro-3-Methylphenol	10	ND	ND	ND	ND
2-Chloronaphthalene	10	ND	ND	ND	ND
2-Chlorophenol	10	ND	ND	ND	ND
4-Chlorophenyl-phenyl ether	10	ND	ND	ND	ND
Chrysene	10	ND	ND	ND	ND
Diallate	10	ND	ND	ND	ND
Dibenz(a,h)Anthracene	10	ND	ND	ND	ND

NOTES:
ENV = field environmental sample from well indicated
QC = LANL laboratory-prepared QC sample
ND = Not detected at reporting limit indicated

TABLE 4, CONTINUED

SUMMARY OF ANALYTICAL RESULTS FOR BACKGROUND SAMPLING
LOS ALAMOS NATIONAL LABORATORY
NOVEMBER 1990

SEMIVOLATILE ORGANIC COMPOUNDS

WELL I.D./SAMPLE #:		APCO-1	APCO-2	LAO-3A	LAO-4.5C
SAMPLE TYPE:		ENV	QC	ENV	ENV
PARAMETER	REPORTING LIMIT µg/L				
Dibenzofuran	10	ND	ND	ND	ND
Di-n-butylphthalate	10	ND	ND	ND	ND
1,2-Dichlorobenzene	10	ND	ND	ND	ND
1,3-Dichlorobenzene	10	ND	ND	ND	ND
1,4-Dichlorobenzene	10	ND	ND	ND	ND
3,3'-Dichlorobenzidine	20	ND	ND	ND	ND
2,4-Dichlorophenol	10	ND	ND	ND	ND
2,6-Dichlorophenol	10	ND	ND	ND	ND
Diethyl phthalate	10	ND	ND	ND	ND
p-(Dimethylamino)azobenzene	30	ND	ND	ND	ND
7,12-Dimethylbenz(a)anthracene	20	ND	ND	ND	ND
3,3'-Dimethylbenzidine	80	ND	ND	ND	ND
a,a-Dimethylphenethylamine	10	ND	ND	ND	ND
2,4-Dimethylphenol	10	ND	ND	ND	ND
Dimethyl phthalate	10	ND	ND	ND	ND
m-Dinitrobenzene	10	ND	ND	ND	ND
4,6-Dinitro-2-Methylphenol	50	ND	ND	ND	ND
2,4-Dinitrophenol	50	ND	ND	ND	ND
2,4-Dinitrotoluene	10	ND	ND	ND	ND
2,6-Dinitrotoluene	10	ND	ND	ND	ND
Dinoseb	20	ND	ND	ND	ND
Di-n-Octyl phthalate	10	ND	ND	ND	ND
Diphenylamine	10	ND	ND	ND	ND
Ethyl methanesulfonate	10	ND	ND	ND	ND
Fluoranthene	10	ND	ND	ND	ND
Fluorene	10	ND	ND	ND	ND
Hexachlorobenzene	10	ND	ND	ND	ND
Hexachlorobutadiene	10	ND	ND	ND	ND

NOTES:
ENV = field environmental sample from well indicated
QC = LANL laboratory-prepared QC sample
ND = Not detected at reporting limit indicated

TABLE 4, CONTINUED

SUMMARY OF ANALYTICAL RESULTS FOR BACKGROUND SAMPLING
LOS ALAMOS NATIONAL LABORATORY
NOVEMBER 1990

SEMIVOLATILE ORGANIC COMPOUNDS

WELL I.D./SAMPLE #:		APCO-1	APCO-2	LAO-3A	LAO-4.5C
SAMPLE TYPE:		ENV	QC	ENV	ENV
PARAMETER	REPORTING LIMIT µg/L				
Hexachlorocyclopentadiene	10	ND	ND	ND	ND
Hexachloroethane	10	ND	ND	ND	ND
Hexachlorophene	50	ND	ND	ND	ND
Hexachloropropene	20	ND	ND	ND	ND
Indeno(1,2,3-cd)Pyrene	10	ND	ND	ND	ND
Isophorone	10	ND	ND	ND	ND
Isosafrole	10	ND	ND	ND	ND
Methapyrilene	40	ND	ND	ND	ND
3-Methylcholanthrene	30	ND	ND	ND	ND
Methyl methanesulfonate	10	ND	ND	ND	ND
2-Methylnaphthalene	10	ND	ND	ND	ND
2-Methylphenol	10	ND	ND	ND	ND
3-Methylphenol	10	ND	ND	ND	ND
4-Methylphenol	10	ND	ND	ND	ND
Naphthalene	10	ND	ND	ND	ND
1,4-Naphthoquinone	10	ND	ND	ND	ND
1-Naphthylamine	120	ND	ND	ND	ND
2-Naphthylamine	170	ND	ND	ND	ND
2-Nitroaniline	50	ND	ND	ND	ND
3-Nitroaniline	50	ND	ND	ND	ND
4-Nitroaniline	50	ND	ND	ND	ND
Nitrobenzene	10	ND	ND	ND	ND
2-Nitrophenol	10	ND	ND	ND	ND
4-Nitrophenol	50	ND	ND	ND	ND
4-Nitroquinoline-1-oxide	10	ND	ND	ND	ND
N-Nitrosodi-n-butylamine	20	ND	ND	ND	ND
N-Nitrosodiethylamine	10	ND	ND	ND	ND
N-Nitrosodimethylamine	10	ND	ND	ND	ND
N-Nitrosodiphenylamine	10	ND	ND	ND	ND
N-Nitroso-Di-n-Propylamine	10	ND	ND	ND	ND
N-Nitrosomethylethylamine	10	ND	ND	ND	ND
N-Nitrosomorpholine	10	ND	ND	ND	ND
N-Nitrosopiperidine	10	ND	ND	ND	ND

NOTES:
ENV = field environmental sample from well indicated
QC = LANL laboratory-prepared QC sample
ND = Not detected at reporting limit indicated

TABLE 4, CONTINUED

SUMMARY OF ANALYTICAL RESULTS FOR BACKGROUND SAMPLING
LOS ALAMOS NATIONAL LABORATORY
NOVEMBER 1990

SEMIVOLATILE ORGANIC COMPOUNDS

WELL I.D./SAMPLE #:		APCO-1	APCO-2	LAO-3A	LAO-4.5C
SAMPLE TYPE:		ENV	QC	ENV	ENV
PARAMETER	REPORTING LIMIT µg/L				
N-Nitrosopyrrolidine	10	ND	ND	ND	ND
5-Nitro-o-toluidine	20	ND	ND	ND	ND
Pentachlorobenzene	20	ND	ND	ND	ND
Pentachloroethane	20	ND	ND	ND	ND
Pentachloronitrobenzene	20	ND	ND	ND	ND
Pentachlorophenol	50	ND	ND	ND	ND
Phenacetin	10	ND	ND	ND	ND
Phenanthrene	10	ND	ND	ND	ND
Phenol	10	ND	ND	ND	ND
p-Phenylenediamine	50	ND	ND	ND	ND
2-Picoline	70	ND	ND	ND	ND
Pronamide	30	ND	ND	ND	ND
Pyrene	10	ND	ND	ND	ND
Safrole	10	ND	ND	ND	ND
1,2,4,5-Tetrachlorobenzene	10	ND	ND	ND	ND
2,3,4,6-Tetrachlorophenol	10	ND	ND	ND	ND
Tetraethyl dithiopyrophosphate	10	ND	ND	ND	ND
o-Toluidine	10	ND	ND	ND	ND
1,2,4-Trichlorobenzene	10	ND	ND	ND	ND
2,4,5-Trichlorophenol	50	ND	ND	ND	ND
2,4,6-Trichlorophenol	10	ND	ND	ND	ND
O,O,O-Triethylphosphorothioate	10	ND	ND	ND	ND
sym-Trinitrobenzene	10	ND	ND	ND	ND

NOTES:
ENV = field environmental sample from well indicated
QC = LANL laboratory-prepared QC sample
ND = Not detected at reporting limit indicated

TABLE 4, CONTINUED

SUMMARY OF ANALYTICAL RESULTS FOR BACKGROUND SAMPLING
LOS ALAMOS NATIONAL LABORATORY
NOVEMBER 1990

SEMIVOLATILE ORGANIC COMPOUNDS

WELL I.D./SAMPLE #:		MCO-4B	MCO-6B	MCO-10	MCO-7A
SAMPLE TYPE:		ENV	ENV	DUP	ENV
PARAMETER	REPORTING LIMIT µg/L				
Acenaphthene	10	ND	ND	ND	ND
Acenaphthylene	10	ND	ND	ND	ND
Acetophenone	10	ND	ND	ND	ND
2-Acetylaminofluorene	10	ND	ND	ND	ND
4-Aminobiphenyl	50	ND	ND	ND	ND
Aniline	50	ND	ND	ND	ND
Anthracene	10	ND	ND	ND	ND
Aramite	10	ND	ND	ND	ND
Benzo(a)Anthracene	10	ND	ND	ND	ND
Benzo(b)Fluoranthene	10	ND	ND	ND	ND
Benzo(k)Fluoranthene	10	ND	ND	ND	ND
Benzoic Acid	50	ND	ND	ND	ND
Benzo(g,h,i)Perylene	10	ND	ND	ND	ND
Benzo(a)Pyrene	10	ND	ND	ND	ND
Benzyl Alcohol	10	ND	ND	ND	ND
bis(2-Chloroethoxy)Methane	10	ND	ND	ND	ND
bis(2-Chloroethyl)Ether	10	ND	ND	ND	ND
bis(2-Chloroisopropyl)Ether	10	ND	ND	ND	ND
bis(2-Ethylhexyl)phthalate	10	ND	ND	ND	ND
4-Bromophenyl-phenylether	10	ND	ND	ND	ND
Butylbenzylphthalate	10	ND	ND	ND	ND
4-Chloroaniline	10	ND	ND	ND	ND
4-Chloro-3-Methylphenol	10	ND	ND	ND	ND
2-Chloronaphthalene	10	ND	ND	ND	ND
2-Chlorophenol	10	ND	ND	ND	ND
4-Chlorophenyl-phenylether	10	ND	ND	ND	ND
Chrysene	10	ND	ND	ND	ND
Diallate	10	ND	ND	ND	ND
Dibenz(a,h)Anthracene	10	ND	ND	ND	ND

NOTES:
ENV = field environmental sample from well indicated
DUP = environmental duplicate sample from well MCO-6B
ND = Not detected at reporting limit indicated

TABLE 4, CONTINUED

SUMMARY OF ANALYTICAL RESULTS FOR BACKGROUND SAMPLING
LOS ALAMOS NATIONAL LABORATORY
NOVEMBER 1990

SEMIVOLATILE ORGANIC COMPOUNDS

WELL I.D./SAMPLE #:		MCO-4B	MCO-6B	MCO-10	MCO-7A
SAMPLE TYPE:		ENV	ENV	DUP	ENV
PARAMETER	REPORTING LIMIT µg/L				
Dibenzofuran	10	ND	ND	ND	ND
Di-n-butylphthalate	10	ND	ND	ND	ND
1,2-Dichlorobenzene	10	ND	ND	ND	ND
1,3-Dichlorobenzene	10	ND	ND	ND	ND
1,4-Dichlorobenzene	10	ND	ND	ND	ND
3,3'-Dichlorobenzidine	20	ND	ND	ND	ND
2,4-Dichlorophenol	10	ND	ND	ND	ND
2,6-Dichlorophenol	10	ND	ND	ND	ND
Diethyl phthalate	10	ND	ND	ND	ND
p-(Dimethylamino)azobenzene	30	ND	ND	ND	ND
7,12-Dimethylbenz(a)anthracene	20	ND	ND	ND	ND
3,3'-Dimethylbenzidine	80	ND	ND	ND	ND
a,a-Dimethylphenethylamine	10	ND	ND	ND	ND
2,4-Dimethylphenol	10	ND	ND	ND	ND
Dimethyl phthalate	10	ND	ND	ND	ND
m-Dinitrobenzene	10	ND	ND	ND	ND
4,6-Dinitro-2-Methylphenol	50	ND	ND	ND	ND
2,4-Dinitrophenol	50	ND	ND	ND	ND
2,4-Dinitrotoluene	10	ND	ND	ND	ND
2,6-Dinitrotoluene	10	ND	ND	ND	ND
Dinoseb	20	ND	ND	ND	ND
Di-n-Octyl phthalate	10	ND	ND	ND	ND
Diphenylamine	10	ND	ND	ND	ND
Ethyl methanesulfonate	10	ND	ND	ND	ND
Fluoranthene	10	ND	ND	ND	ND
Fluorene	10	ND	ND	ND	ND
Hexachlorobenzene	10	ND	ND	ND	ND
Hexachlorobutadiene	10	ND	ND	ND	ND

NOTES:
ENV = field environmental sample from well indicated
DUP = environmental duplicate sample from well MCO-6B
ND = Not detected at reporting limit indicated

TABLE 4, CONTINUED

SUMMARY OF ANALYTICAL RESULTS FOR BACKGROUND SAMPLING
LOS ALAMOS NATIONAL LABORATORY
NOVEMBER 1990

SEMIVOLATILE ORGANIC COMPOUNDS

WELL I.D./SAMPLE #:		MCO-4B	MCO-6B	MCO-10	MCO-7A
SAMPLE TYPE:		ENV	ENV	DUP	ENV
PARAMETER	REPORTING LIMIT µg/L				
Hexachlorocyclopentadiene	10	ND	ND	ND	ND
Hexachloroethane	10	ND	ND	ND	ND
Hexachlorophene	50	ND	ND	ND	ND
Hexachloropropene	20	ND	ND	ND	ND
Indeno(1,2,3-cd)Pyrene	10	ND	ND	ND	ND
Isophorone	10	ND	ND	ND	ND
Isosafrole	10	ND	ND	ND	ND
Methapyrilene	40	ND	ND	ND	ND
3-Methylcholanthrene	30	ND	ND	ND	ND
Methyl methanesulfonate	10	ND	ND	ND	ND
2-Methylnaphthalene	10	ND	ND	ND	ND
2-Methylphenol	10	ND	ND	ND	ND
3-Methylphenol	10	ND	ND	ND	ND
4-Methylphenol	10	ND	ND	ND	ND
Naphthalene	10	ND	ND	ND	ND
1,4-Naphthoquinone	10	ND	ND	ND	ND
1-Naphthylamine	120	ND	ND	ND	ND
2-Naphthylamine	170	ND	ND	ND	ND
2-Nitroaniline	50	ND	ND	ND	ND
3-Nitroaniline	50	ND	ND	ND	ND
4-Nitroaniline	50	ND	ND	ND	ND
Nitrobenzene	10	ND	ND	ND	ND
2-Nitrophenol	10	ND	ND	ND	ND
4-Nitrophenol	50	ND	ND	ND	ND
4-Nitroquinoline-1-oxide	10	ND	ND	ND	ND
N-Nitrosodi-n-butylamine	20	ND	ND	ND	ND
N-Nitrosodiethylamine	10	ND	ND	ND	ND
N-Nitrosodimethylamine	10	ND	ND	ND	ND
N-Nitrosodiphenylamine	10	ND	ND	ND	ND
N-Nitroso-Di-n-Propylamine	10	ND	ND	ND	ND
N-Nitrosomethylethylamine	10	ND	ND	ND	ND
N-Nitrosomorpholine	10	3 J	2 J	ND	ND
N-Nitrosopiperidine	10	ND	ND	ND	ND

NOTES:
ENV = field environmental sample from well indicated
DUP = environmental duplicate sample from well MCO-6B
ND = Not detected at reporting limit indicated
J = Estimated at concentration below reporting limit

TABLE 4, CONTINUED

SUMMARY OF ANALYTICAL RESULTS FOR BACKGROUND SAMPLING
LOS ALAMOS NATIONAL LABORATORY
NOVEMBER 1990

SEMIVOLATILE ORGANIC COMPOUNDS

WELL I.D./SAMPLE #:		MCO-4B	MCO-6B	MCO-10	MCO-7A
SAMPLE TYPE:		ENV	ENV	DUP	ENV
PARAMETER	REPORTING LIMIT µg/L				
N-Nitrosopyrrolidine	10	ND	ND	ND	ND
5-Nitro-o-toluidine	20	ND	ND	ND	ND
Pentachlorobenzene	20	ND	ND	ND	ND
Pentachloroethane	20	ND	ND	ND	ND
Pentachloronitrobenzene	20	ND	ND	ND	ND
Pentachlorophenol	50	ND	ND	ND	ND
Phenacetin	10	ND	ND	ND	ND
Phenanthrene	10	ND	ND	ND	ND
Phenol	10	ND	ND	ND	ND
p-Phenylenediamine	50	ND	ND	ND	ND
2-Picoline	70	ND	ND	ND	ND
Pronamide	30	ND	ND	ND	ND
Pyrene	10	ND	ND	ND	ND
Safrole	10	ND	ND	ND	ND
1,2,4,5-Tetrachlorobenzene	10	ND	ND	ND	ND
2,3,4,6-Tetrachlorophenol	10	ND	ND	ND	ND
Tetraethyl dithiopyrophosphate	10	ND	ND	ND	ND
o-Toluidine	10	ND	ND	ND	ND
1,2,4-Trichlorobenzene	10	ND	ND	ND	ND
2,4,5-Trichlorophenol	50	ND	ND	ND	ND
2,4,6-Trichlorophenol	10	ND	ND	ND	ND
O,O,O-Triethylphosphorothioate	10	ND	ND	ND	ND
sym-Trinitrobenzene	10	ND	ND	ND	ND

NOTES:
ENV = field environmental sample from well indicated
DUP = environmental duplicate sample from well MCO-6B
ND = Not detected at reporting limit indicated

TABLE 5

SUMMARY OF ANALYTICAL RESULTS FOR BACKGROUND SAMPLING
LOS ALAMOS NATIONAL LABORATORY
NOVEMBER 1990

ORGANOCHLORINE PESTICIDES

WELL I.D./SAMPLE #:		APCO-1	APCO-2*	LAO-3A	LAO-4.5C
SAMPLE TYPE:		ENV	QC	ENV	ENV
PARAMETER	REPORTING LIMIT µg/L				
α-BHC	0.050	ND	ND<0.25	ND	ND
β-BHC	0.050	ND	ND<0.25	ND	ND
δ-BHC	0.050	ND	ND<0.25	ND	ND
γ-BHC (lindane)	0.050	ND	ND<0.25	ND	ND
heptachlor	0.050	ND	ND<0.25	ND	ND
aldrin	0.050	ND	ND<0.25	ND	ND
heptachlor epoxide	0.050	ND	ND<0.25	ND	ND
endosulfan I	0.050	ND	ND<0.25	ND	ND
dieldrin	0.10	ND	ND<0.50	ND	ND
4,4'-DDE	0.10	ND	ND<0.50	ND	ND
endrin	0.10	ND	**0.51**	ND	ND
endosulfan II	0.10	ND	ND<0.50	ND	ND
4,4'-DDD	0.10	ND	**0.37 J**	ND	ND
endosulfan sulfate	0.10	ND	ND<0.50	ND	ND
4,4'-DDT	0.10	ND	**0.18 J**	ND	ND
methoxychlor	0.50	ND	**1.0 J**	ND	ND
chlordane	0.50	ND	ND<2.5	ND	ND
toxaphene	1.0	ND	ND<5.0	ND	ND
Aroclor 1016	0.50	ND	ND<2.5	ND	ND
Aroclor 1221	0.50	ND	ND<2.5	ND	ND
Aroclor 1232	0.50	ND	ND<2.5	ND	ND
Aroclor 1242	0.50	ND	ND<2.5	ND	ND
Aroclor 1248	0.50	ND	ND<2.5	ND	ND
Aroclor 1254	1.0	ND	ND<5.0	ND	ND
Aroclor 1260	1.0	ND	ND<5.0	ND	ND
endrin aldehyde	0.10	ND	ND<0.50	ND	ND
isodrin	0.050	ND	ND<0.25	ND	ND
kepone	0.10	ND	ND<0.50	ND	ND
chlorobenzilate	0.50	ND	ND<2.5	ND	ND

NOTES:
ENV = field environmental sample from well indicated
QC = LANL laboratory-prepared QC sample
* = Dilution factor of 5X for APCO2, causing increased reporting limits indicated
ND = Not detected at reporting limit indicated
J = Estimated concentration below reporting limit

TABLE 5, CONTINUED

SUMMARY OF ANALYTICAL RESULTS FOR BACKGROUND SAMPLING
LOS ALAMOS NATIONAL LABORATORY
NOVEMBER 1990

ORGANOCHLORINE PESTICIDES

WELL I.D./SAMPLE #:		MCO-4B	MCO-6B	MCO-10	MCO-7A
SAMPLE TYPE:		ENV	ENV	DUP	ENV
PARAMETER	REPORTING LIMIT µg/L				
α-BHC	0.050	ND	ND	ND	ND
β-BHC	0.050	ND	ND	ND	ND
δ-BHC	0.050	ND	ND	ND	ND
γ-BHC (lindane)	0.050	ND	ND	ND	ND
heptachlor	0.050	ND	ND	ND	ND
aldrin	0.050	ND	ND	ND	ND
heptachlor epoxide	0.050	ND	ND	ND	ND
endosulfan I	0.050	ND	ND	ND	ND
dieldrin	0.10	ND	ND	ND	ND
4,4'-DDE	0.10	ND	ND	ND	ND
endrin	0.10	ND	ND	ND	ND
endosulfan II	0.10	ND	ND	ND	ND
4,4'-DDD	0.10	ND	ND	ND	ND
endosulfan sulfate	0.10	ND	ND	ND	ND
4,4'-DDT	0.10	ND	ND	ND	ND
methoxychlor	0.50	ND	ND	ND	ND
chlordane	0.50	ND	ND	ND	ND
toxaphene	1.0	ND	ND	ND	ND
Aroclor 1016	0.50	ND	ND	ND	ND
Aroclor 1221	0.50	ND	ND	ND	ND
Aroclor 1232	0.50	ND	ND	ND	ND
Aroclor 1242	0.50	ND	ND	ND	ND
Aroclor 1248	0.50	ND	ND	ND	ND
Aroclor 1254	1.0	ND	ND	ND	ND
Aroclor 1260	1.0	ND	ND	ND	ND
endrin aldehyde	0.10	ND	ND	ND	ND
isodrin	0.050	ND	ND	ND	ND
kepone	0.10	ND	ND	ND	ND
chlorobenzilate	0.50	ND	ND	ND	ND

NOTES:
ENV = field environmental sample from well indicated
DUP = environmental duplicate sample from well MCO-6B
ND = Not detected at reporting limit indicated

TABLE 6

SUMMARY OF ANALYTICAL RESULTS FOR BACKGROUND SAMPLING
LOS ALAMOS NATIONAL LABORATORY
NOVEMBER 1990

ORGANOPHOSPHORUS PESTICIDES

WELL I.D./SAMPLE #:		APCO-1	APCO-2	LAO-3A	LAO-4.5C
SAMPLE TYPE:		ENV	QC	ENV	ENV
PARAMETER	REPORTING LIMIT µg/L				
Dimethoate	1.0	ND	ND	ND	ND
Disulfoton	0.5	ND	ND	ND	ND
Famphur	1.5	ND	ND	ND	ND
Parathion ethyl	1.0	ND	ND	ND	ND
Parathion methyl	1.0	ND	ND	ND	ND
Phorate	1.0	ND	ND	ND	ND
Sulfotepp	0.5	ND	ND	ND	ND
Thionazin	0.5	ND	ND	ND	ND
0,0,0-Triethylphosphorothioate	0.25	ND	ND	ND	ND

ORGANOPHOSPHORUS PESTICIDES

WELL I.D./SAMPLE #:		MCO-4B	MCO-6B	MCO-10	MCO-7A
SAMPLE TYPE:		ENV	ENV	DUP	ENV
PARAMETER	REPORTING LIMIT µg/L				
Dimethoate	1.0	ND	ND	ND	ND
Disulfoton	0.5	ND	ND	ND	ND
Famphur	1.5	ND	ND	ND	ND
Parathion ethyl	1.0	ND	ND	ND	ND
Parathion methyl	1.0	ND	ND	ND	ND
Phorate	1.0	ND	ND	ND	ND
Sulfotepp	0.5	ND	ND	ND	ND
Thionazin	0.5	ND	ND	ND	ND
0,0,0-Triethylphosphorothioate	0.25	ND	ND	ND	ND

NOTES:
ENV = field environmental sample from well indicated
QC = LANL laboratory-prepared QC sample
DUP = environmental duplicate sample from well MCO-6B
ND = Not detected at reporting limit indicated

TABLE 7

SUMMARY OF ANALYTICAL RESULTS FOR BACKGROUND SAMPLING
LOS ALAMOS NATIONAL LABORATORY
NOVEMBER 1990

HERBICIDES

WELL I.D./SAMPLE #:		APCO-1	APCO-2	LAO-3A	LAO-4.5C
SAMPLE TYPE:		ENV	QC	ENV	ENV
PARAMETER	REPORTING LIMIT mg/L				
2,4-D	0.0002	ND	ND	ND	ND
silvex	0.0001	ND	ND	ND	ND
2,4,5-T	0.0001	ND	ND	ND	ND

HERBICIDES

WELL I.D./SAMPLE #:		MCO-4B	MCO-6B	MCO-10	MCO-7A
SAMPLE TYPE:		ENV	ENV	DUP	ENV
PARAMETER	REPORTING LIMIT mg/L				
2,4-D	0.0002	ND	ND	ND	ND
silvex	0.0001	ND	ND	ND	ND
2,4,5-T	0.0001	ND	ND	ND	ND

NOTES:
ENV = field environmental sample from well indicated
QC = LANL laboratory-prepared QC sample
DUP = environmental duplicate sample from well MCO-6B
ND = Not detected at reporting limit indicated

TABLE 8

SUMMARY OF ANALYTICAL RESULTS FOR BACKGROUND SAMPLING
LOS ALAMOS NATIONAL LABORATORY
NOVEMBER 1990

DIOXINS and FURANS

WELL I.D./SAMPLE #:	APCO-1	APCO-2	LAO-3A	LAO-4.5C
SAMPLE TYPE:	ENV	QC	ENV	ENV
PARAMETER	Units = ng/L			
2,3,7,8-TCDD	ND<1.6	ND<1.8	ND<1.3	ND<1.4
Total TCDD	ND<0.23	ND<0.26	ND<0.13	ND<0.20
Total PeCDD	ND<0.60	ND<0.51	ND<0.71	ND<0.65
Total HxCDD	ND<0.49	ND<0.35	ND<0.51	ND<0.92
Total TCDF	ND<0.14	ND<0.11	ND<0.11	ND<0.11
Total PeCDF	ND<0.15	ND<0.095	ND<0.13	ND<0.18
Total HxCDF	ND<0.23	ND<0.15	ND<0.24	ND<0.22

DIOXINS and FURANS

WELL I.D./SAMPLE #:	MCO-4B	MCO-6B	MCO-10	MCO-7A
SAMPLE TYPE:	ENV	ENV	DUP	ENV
PARAMETER	Units = ng/L			
2,3,7,8-TCDD	ND<3.0	ND<1.8	ND<0.62	ND<0.99
Total TCDD	ND<0.44	ND<0.26	ND<0.11	ND<0.15
Total PeCDD	ND<1.1	ND<0.88	ND<0.59	ND<0.84
Total HxCDD	ND<1.1	ND<0.95	ND<0.48	ND<0.40
Total TCDF	ND<0.17	ND<0.13	ND<0.098	ND<0.13
Total PeCDF	ND<0.17	ND<0.28	ND<0.22	ND<0.14
Total HxCDF	ND<0.27	ND<0.32	ND<0.18	ND<0.22

NOTES:
ENV = field environmental sample from well indicated
QC = LANL laboratory-prepared QC sample
DUP = environmental duplicate sample from well MCO-6B
ND = Not detected at reporting limit indicated

TABLE 9

SUMMARY OF ANALYTICAL RESULTS FOR BACKGROUND SAMPLING
LOS ALAMOS NATIONAL LABORATORY
NOVEMBER 1990

APPENDIX IX METALS

WELL I.D./SAMPLE #:		APCO-1	APCO-2	LAO-3A	LAO-4.5C
SAMPLE TYPE:		ENV	QC	ENV	ENV
PARAMETER	REPORTING LIMIT mg/L				
Antimony	0.03	ND	ND	ND	ND
Arsenic	0.04	ND	ND	ND	ND
Barium	0.002	**0.97**	**5.6**	**0.18**	**0.095**
Beryllium	0.001	**0.004**	ND	**0.002**	ND
Cadmium	0.005	ND	**0.83**	ND	ND
Chromium	0.01	**0.03**	**1.1**	**0.02**	**0.01**
Cobalt	0.02	**0.04**	ND	ND	ND
Copper	0.01	**0.12**	**0.03**	**0.03**	**0.03**
Lead	0.03	**0.08**	**0.74**	**0.04**	ND
Mercury	0.001	ND	ND	ND	ND
Nickel	0.02	**0.05**	ND	ND	ND
Selenium	0.06	ND	ND	ND	ND
Silver	0.005	ND	**1.4**	ND	ND
Thallium	0.04	ND	ND	ND	ND
Tin	0.02	ND	ND	ND	ND
Vanadium	0.01	**0.07**	ND	**0.01**	ND
Zinc	0.005	**0.20**	**0.054**	**0.054**	**0.052**

NOTES:
ENV = field environmental sample from well indicated
QC = LANL laboratory-prepared QC sample
ND = Not detected at reporting limit indicated

TABLE 9, CONTINUED

SUMMARY OF ANALYTICAL RESULTS FOR BACKGROUND SAMPLING
LOS ALAMOS NATIONAL LABORATORY
NOVEMBER 1990

APPENDIX IX METALS

WELL I.D./SAMPLE #:		MCO-4B	MCO-6B	MCO-10	MCO-7A
SAMPLE TYPE:		ENV	ENV	DUP	ENV
PARAMETER	REPORTING LIMIT mg/L				
Antimony	0.03	ND	ND	ND	ND
Arsenic	0.04	ND	ND	ND	ND
Barium	0.002	**0.19**	**0.69**	**0.67**	**0.42**
Beryllium	0.001	ND	**0.004**	**0.004**	**0.003**
Cadmium	0.005	ND	ND	ND	ND
Chromium	0.01	ND	**0.03**	**0.03**	**0.02**
Cobalt	0.02	ND	ND	ND	ND
Copper	0.01	**0.01**	**0.03**	**0.03**	**0.03**
Lead	0.03	ND	**0.07**	**0.07**	**0.05**
Mercury	0.001	ND	ND	ND	ND
Nickel	0.02	ND	ND	ND	**0.03**
Selenium	0.06	ND	ND	ND	ND
Silver	0.005	ND	ND	ND	ND
Thallium	0.04	ND	ND	ND	ND
Tin	0.02	ND	ND	ND	ND
Vanadium	0.01	ND	**0.03**	**0.03**	**0.04**
Zinc	0.005	**0.081**	**0.15**	**0.17**	**0.10**

NOTES:
ENV = field environmental sample from well indicated
DUP = environmental duplicate sample from well MCO-6B
ND = Not detected at reporting limit indicated

TABLE 10

SUMMARY OF ANALYTICAL RESULTS FOR BACKGROUND SAMPLING
LOS ALAMOS NATIONAL LABORATORY
NOVEMBER 1990

CYANIDE and SULFIDE

WELL I.D./SAMPLE #:		APCO-1	APCO-2	LAO-3A	LAO-4.5C
SAMPLE TYPE:		ENV	QC	ENV	ENV
PARAMETER	REPORTING LIMIT mg/L				
Cyanide	0.01	ND	**0.33**	ND	ND
Sulfide	0.2	**1.6**	ND	**2.8**	**2.2**

CYANIDE and SULFIDE

WELL I.D./SAMPLE #:		MCO-4B	MCO-6B	MCO-10	MCO-7A
SAMPLE TYPE:		ENV	ENV	DUP	ENV
PARAMETER	REPORTING LIMIT mg/L				
Cyanide	0.01	**0.01**	ND	ND	ND
Sulfide	0.2	**2.0**	**1.0**	**2.0**	**1.6**

NOTES:
ENV = field environmental sample from well indicated
QC = LANL laboratory-prepared QC sample
DUP = environmental duplicate sample from well MCO-6B
ND = Not detected at reporting limit indicated

TABLE 11

COMPARISON OF ANALYTICAL RESULTS FROM DUPLICATE SAMPLES
LOS ALAMOS NATIONAL LABORATORY

NOVEMBER 1990

PARAMETER	SAMPLE NUMBER MCO-6B	SAMPLE NUMBER MCO-10	RPD	ACCEPTABLE?*
Volatile Organic Compounds	ND	ND	NC	yes
Semivolatile Org. Comp.	ND	ND	NC	yes
Pesticides	ND	ND	NC	yes
Herbicides	ND	ND	NC	yes
Dioxins and Furans	ND	ND	NC	yes
Metals, mg/L				
Barium	0.69	0.67	3	yes
Beryllium	0.004	0.004	0	yes
Chromium	0.03	0.03	0	yes
Copper	0.03	0.03	0	yes
Lead	0.07	0.07	0	yes
Vanadium	0.03	0.03	0	yes
Zinc	0.15	0.17	12.5	yes
Cyanide	ND	ND	NC	yes
Sulfide, mg/L	1.0	2.0	67	no

RPD = Relative Percent Difference = $\frac{|\text{Env. sample conc. - Env. dup. conc.}|}{(\text{Env. sample conc. + Env. dup. conc.})/2} \times 100$

* = Acceptance limit for RPD is generally considered to be 20%.
ND = Not detected at method reporting limit (see analytical results)
NC = Not calculable

APPENDIX A

WATER SAMPLE COLLECTION FORM

JOB NAME: LANL ER Sampling JOB NUMBER: 301215.03.04
SAMPLE LOCATION: Mortandad Canyon WELL NUMBER: MCO4B

PURGE CALCULATIONS

		DATE	TIME	INITIALS
MEASURED WELL DEPTH (FT):	34.85	11-2-90	1040	BM
WATER LEVEL DEPTH (FT):	17.40			BM
STATIC WATER HEIGHT (FT):	17.45	↓	↓	BM

CASED WELL VOLUME = Static Water Height (ft) * Area of Well (ft sq) * 7.48 gal/ft sq.
2.87 (gal) = 17.45 (ft) * 0.022 (ft sq) * 7.48 gal/ft sq.

REQUIRED PURGE VOLUME = CASED WELL VOLUME (gal) * 3
8.6 (gal)= 2.87 (gal) * 3

Rad (β+γ) = ND
HNU = ND (0.4)
56ppm @ 9.81 (calib.)

	DATE	TIME	INITIALS
START PURGE	11-2-90	1045	BM
STOP PURGE	11-2-90	1107	BM

	DATE	TIME	INITIALS
ACTUAL PURGE VOLUME: 8.5 (gal)	11-2-90	1125	BM

PURGED DRY no

PURGE METHOD: ___Dedicated Pump ___Portable Pump X Bailer ___Stainless X PVC

DESCRIPTION OF PURGE WATER: Silty
WEATHER: o/c, fog, cool, calm

PURGE MEASUREMENTS

DATE	TIME	VOLUME(gal)	TEMP(C)	pH(s.u.)	Conductivity(umohs/cm)	Turbidity(NTU)	INITIALS
11-2-90		1	9.5	6.13	0625	Silty	BM
	1057	2	9.5	6.57	0642	Silty	BM
	1054	3	9.5	6.66	633	Silty	BM
	1056	4	9.3	6.85	636	Silty	BM
	1058	5	9.3	6.96	634	Silty	BM
	1101	6	9.2	7.10	641	Silty	BM
	1104	7	9.2	7.02	657	Silty	BM
	1106	8	9.2	7.09	620	Silty	BM
	1107	8.5	9.3	7.10	643	Silty	BM
→	1125	—	9.3	7.15	640	Silty	BM

post sampling

PRINT NAME OF SAMPLER: B. Matz
SIGNATURE OF SAMPLER: BMatz DATE: 11-2-90

SAMPLING DATA

SAMPLING METHOD: ___Dedicated Pump ___Portable Pump X Teflon Bailer ___Stainless ___PVC

FIELD INSTRUMENTS	BRAND/MODEL	SERIAL NUMBER	CALIBRATION DATE
pH	Orion		11-2-90
Temperature			
Conductivity			
Turbidity			
PID			

SAMPLING MEASUREMENTS (Minimum of 4 at 5 minute interval)

DATE	TIME	VOLUME(gal)	TEMP(C)	pH(s.u.)	Conductivity(umohs/cm)	Turbidity(NTU)	INITIALS

SAMPLING HANDLING

	TIME	DATE	INITIALS
BEGIN SAMPLING	1110	11-2-90	BM
END SAMPLING	1125	11-2-90	BM

SAMPLE NUMBER	SAMPLE VOLUME	CONTAINER TYPE	PRESERVATIVES	FILTERED	PARAMETERS
MC04B	2x40ml	G	HCl	no	VOA
	7x1l	AG	—	no	SVOA
	1x1l	P	HNO3	no	T. Metals
	1x1l	P	NaOH	no	T. CN
	1x1l	P	ZnAc + NaOH	no	Sulfide

CHAIN OF CUSTODY NUMBER: 195437 REQUEST FOR ANALYSIS NUMBER: 230961

PRINT NAME OF SAMPLER: B. Matz

SIGNATURE OF SAMPLER: BMatz DATE: 11-2-90

SNL:F-0420/2

WATER SAMPLE COLLECTION FORM

JOB NAME: LANL ER Sampling JOB NUMBER: 30125.03.04
SAMPLE LOCATION: Mortandad Canyon WELL NUMBER: MCOCB

PURGE CALCULATIONS

		DATE	TIME	INITIALS
MEASURED WELL DEPTH (FT):	46.90	11-1-90	1415	BM
WATER LEVEL DEPTH (FT):	35.10	↓	↓	BM
STATIC WATER HEIGHT (FT):	11.80	↓	↓	BM

CASED WELL VOLUME = Static Water Height (ft) * Area of Well (ft sq) * 7.48 gal/ft sq.
1.8 (gal) = 11.08 (ft) * 0.022 (ft sq) * 7.48 gal/ft sq.

REQUIRED PURGE VOLUME = CASED WELL VOLUME (gal) * 3
5.5 (gal)= 1.8 (gal) * 3

HNU=ND.

	DATE	TIME	INITIALS
START PURGE	11-1-90	1420	BM
STOP PURGE	11-1-90	1500	BM

	DATE	TIME	INITIALS
ACTUAL PURGE VOLUME: 5.0 gal. (gal)	11-1-90	1500	BM

PURGED DRY no

PURGE METHOD: ___Dedicated Pump ___Portable Pump X Bailer ___Stainless X PVC

DESCRIPTION OF PURGE WATER: Silty
WEATHER: Cloudy, occasional rain, cool.

PURGE MEASUREMENTS

DATE	TIME	VOLUME(gal)	TEMP(C)	pH(s.u.)	Conductivity(umoho/cm)	Turbidity(NTU)	INITIALS
11-1	1425	1.0	10.0	6.2	0.674	Silty	BM
		2.0	10.0	6.59	0.644	"	BM
		3.0	9.4	6.75	0.643	"	BM
		4.0	9.8	6.78	0.624	"	BM
		5.0	9.8	6.80	0.644	"	BM
	1530			6.82	0.660	"	BM

PRINT NAME OF SAMPLER: B. Matz
SIGNATURE OF SAMPLER: BMatz DATE: 11-1-90

SNL:F-0420/1

SAMPLING DATA

SAMPLING METHOD: ___Dedicated Pump ___Portable Pump X Teflon Bailer ___Stainless ___PVC

FIELD INSTRUMENTS	BRAND/MODEL	SERIAL NUMBER	CALIBRATION DATE
pH	Orion		11-1-90
Temperature			
Conductivity			
Turbidity			
PID			

SAMPLING MEASUREMENTS (Minimum of 4 at 5 minute interval)

DATE	TIME	VOLUME(gal)	TEMP(C)	pH(s.u.)	Conductivity(umohs/cm)	Turbidity(NTU)	INITIALS

SAMPLING HANDLING

	TIME	DATE	INITIALS
BEGIN SAMPLING	1500	11-1-90	BM
END SAMPLING	1530	11-1-90	BM

SAMPLE NUMBER	SAMPLE VOLUME	CONTAINER TYPE	PRESERVATIVES	FILTERED	PARAMETERS
MC06B	2X40ml	G	HCl	no	VOA
	7X1l.	AG	—	no	SVOA
	1X1l	P	HNO3	no	T.Metals
	1X1l	P	NaOH	no	T.CN
	1X1l	P	ZnAc+NaOH	no	Sulfide
MC010	Duplicate of above				

CHAIN OF CUSTODY NUMBER: 195436 REQUEST FOR ANALYSIS NUMBER: 230959 230960

PRINT NAME OF SAMPLER: B. Matz

SIGNATURE OF SAMPLER: BMatz DATE: 11-1-90

SNL:F-0420/2

WATER SAMPLE COLLECTION FORM

JOB NAME: LANL ER Sampling JOB NUMBER: 301215.03.04
SAMPLE LOCATION: Mortandad Canyon WELL NUMBER: MCO7A

PURGE CALCULATIONS

		DATE	TIME	INITIALS
MEASURED WELL DEPTH (FT):	45.60	11-1-90	1300	BM
WATER LEVEL DEPTH (FT):	37.68	↓	↓	BM
STATIC WATER HEIGHT (FT):	7.92	↓	↓	BM

CASED WELL VOLUME = Static Water Height (ft) * Area of Well (ft sq) * 7.48 gal/ft sq.
1.30 (gal) = 7.92 (ft) * 0.022 (ft sq) * 7.48 gal/ft sq.

REQUIRED PURGE VOLUME = CASED WELL VOLUME (gal) * 3
3.90 (gal)= 1.30 (gal) * 3

HNu = bkgd. (1.5) = ND.

	DATE	TIME	INITIALS
START PURGE	1305	11-1-90	BM
STOP PURGE	1325	11-1-90	BM

	DATE	TIME	INITIALS
ACTUAL PURGE VOLUME: 4.0 (gal)	11-1-90	1325	BM
PURGED DRY no.			

PURGE METHOD: ___Dedicated Pump ___Portable Pump X Bailer ___Stainless X PVC

DESCRIPTION OF PURGE WATER: silty
WEATHER: cloudy, occasional rain, cool.

PURGE MEASUREMENTS

DATE	TIME	VOLUME(gal)	TEMP(C)	pH(s.u.)	Conductivity(umohs/cm)	Turbidity(NTU)	INITIALS
11-1-90		0.0	8.6	6.8	0.342	Silty	BM
		~~0.5~~ 1.0	10.0	7.0	0.314	Silty	BM
		2.0	9.7	6.92	0.337	Silty	BM
	1318	2.5	9.8	6.84	0.337	Silty	BM
	1320	3.0	10.0	6.90	0.323	Silty	BM
	1323	3.5	10.0	6.79	0.327	Silty	BM
	1325	4.0	10.0	6.87	0.334	Silty	BM

PRINT NAME OF SAMPLER: Barbara Matz
SIGNATURE OF SAMPLER: BMatz DATE: 11-1-90

SNL:F-0420/1

SAMPLING DATA

SAMPLING METHOD: ___Dedicated Pump ___Portable Pump X Teflon Bailer ___Stainless ___PVC

FIELD INSTRUMENTS	BRAND/MODEL	SERIAL NUMBER	CALIBRATION DATE
pH	Orion		11-1-90
Temperature			
Conductivity			
Turbidity			
PID			

SAMPLING MEASUREMENTS (Minimum of 4 at 5 minute interval)

DATE	TIME	VOLUME(gal)	TEMP(C)	pH(s.u.)	Conductivity(umohs/cm)	Turbidity(NTU)	INITIALS

SAMPLING HANDLING

	TIME	DATE	INITIALS
BEGIN SAMPLING	1330	11-1-90	BMW
END SAMPLING	1350	11-1-90	BMW

SAMPLE NUMBER	SAMPLE VOLUME	CONTAINER TYPE	PRESERVATIVES	FILTERED	PARAMETERS
MC07A	2x40ml	G	HCl	no	VOA
	7x1l	AG	—	no	SVOA
	1x1l	P	HNO3	no	T. Metals
	1x1l	P	NaOH	no	T. CN
	1x1l	P	ZnAc+NaOH	no	Sulfide

CHAIN OF CUSTODY NUMBER: 195436 REQUEST FOR ANALYSIS NUMBER: 230959

PRINT NAME OF SAMPLER: Barbara Matz

SIGNATURE OF SAMPLER: BMatz DATE: 11-1-90

SNL:F-0420/2

WATER SAMPLE COLLECTION FORM

JOB NAME: LANL ER Sampling JOB NUMBER: 301215.03.04
SAMPLE LOCATION: Los Alamos Canyon WELL NUMBER: LAC-3A

PURGE CALCULATIONS

		DATE	TIME	INITIALS
MEASURED WELL DEPTH (FT):	14.84	11-2-90	1350	[illegible]
WATER LEVEL DEPTH (FT):	8.64	↓	↓	[illegible]
STATIC WATER HEIGHT (FT):	6.2	↓	↓	[illegible]

CASED WELL VOLUME = Static Water Height (ft) * Area of Well (ft sq) * 7.48 gal/ft sq.
1.02 (gal) = 6.2 (ft) * 0.022 (ft sq) * 7.48 gal/ft sq.

REQUIRED PURGE VOLUME = CASED WELL VOLUME (gal) * 3
3.06 (gal) = 1.02 (gal) * 3

HNu = ND
Br ✗ = ND

	DATE	TIME	INITIALS
START PURGE	1315	11-2-90	[illegible]
STOP PURGE	1322	11-2-90	[illegible]

	DATE	TIME	INITIALS
ACTUAL PURGE VOLUME: 3.0 (gal)	11-2-90	1322	[illegible]

PURGED DRY NO

PURGE METHOD: ___Dedicated Pump ___Portable Pump X Bailer ___Stainless X PVC

DESCRIPTION OF PURGE WATER: Silty
WEATHER: Cloudy, cool, occ. rain

PURGE MEASUREMENTS

DATE	TIME	VOLUME(gal)	TEMP(C)	pH(s.u.)	Conductivity(umohs/cm)	Turbidity(NTU)	INITIALS
11-2-90	1317	1.0	12.7	6.60	239	Slitty	[illegible]
	1319	1.5	12.3	6.63	247	"	[illegible]
	1320	2.0	12.2	6.62	250	"	[illegible]
	1321	2.5	12.2	6.62	246	"	[illegible]
	1322	3.0	12.0	6.58	249	"	[illegible]

PRINT NAME OF SAMPLER: B Matz
SIGNATURE OF SAMPLER: [signature] DATE: 11-2-90

SNL:F-0420/1

SAMPLING DATA

SAMPLING METHOD: ___Dedicated Pump ___Portable Pump X Bailer (teflon) ___Stainless ___ PVC

FIELD INSTRUMENTS	BRAND/MODEL	SERIAL NUMBER	CALIBRATION DATE
pH	Orion		11-1-90
Temperature			
Conductivity			
Turbidity			
PID			

SAMPLING MEASUREMENTS (Minimum of 4 at 5 minute interval)

DATE	TIME	VOLUME(gal)	TEMP(C)	pH(s.u.)	Conductivity(umoha/cm)	Turbidity(NTU)	INITIALS

SAMPLING HANDLING

	TIME	DATE	INITIALS
BEGIN SAMPLING	1325	11-2-90	BM
END SAMPLING	1350	11-2-90	BM

SAMPLE NUMBER	SAMPLE VOLUME	CONTAINER TYPE	PRESERVATIVES	FILTERED	PARAMETERS
LA0-3A	2x40ml	G	HCl	no	VOA
	7x1l	AG	—	no	SVOA
	1x1l	P	HNO3	no	T. Metals
	1x1l	P	NaOH	no	T. CN
	1x1l	P	ZnAc + NaOH	no	Sulfide

CHAIN OF CUSTODY NUMBER: 195438 REQUEST FOR ANALYSIS NUMBER: 230962

PRINT NAME OF SAMPLER: B. Mattz

SIGNATURE OF SAMPLER: BMattz DATE: 11-2-90

SNL:F-0420/2

WATER SAMPLE COLLECTION FORM

JOB NAME: LANL ER Sampling JOB NUMBER: 30215.03.04
SAMPLE LOCATION: Los Alamos Canyon WELL NUMBER: LAC-4.5C

PURGE CALCULATIONS

		DATE	TIME	INITIALS
MEASURED WELL DEPTH (FT):	24.50	11-2-90	1400	BM
WATER LEVEL DEPTH (FT):	10.67	↓	↓	BM
STATIC WATER HEIGHT (FT):	13.83			BM

CASED WELL VOLUME = Static Water Height (ft) * Area of Well (ft sq) * 7.48 gal/ft sq.
2.28 (gal) = 13.83 (ft) * 0.022 (ft sq) * 7.48 gal/ft sq.

REQUIRED PURGE VOLUME = CASED WELL VOLUME (gal) * 3
6.83 (gal)= 2.28 (gal) * 3

HNu = ND
β+γ = ND.

	DATE	TIME	INITIALS
START PURGE	1403	11-2-90	BM
STOP PURGE	1414	11-2-90	BM

	DATE	TIME	INITIALS
ACTUAL PURGE VOLUME: 7.0 (gal)	11-2-90	1414	BM

PURGED DRY no.

PURGE METHOD: ___Dedicated Pump ___Portable Pump X Bailer ___Stainless X PVC

DESCRIPTION OF PURGE WATER: sl. silty.
WEATHER: o/c, breez, cool, occ. rain.

PURGE MEASUREMENTS

DATE	TIME	VOLUME(gal)	TEMP(C)	pH(s.u.)	Conductivity(umohs/cm)	Turbidity(NTU)	INITIALS
	1405	1.0	12.0	6.69	196	sl. silty	BM
	1407	2.0	11.5	6.61	202	"	BM
	1408	3.0	11.5	6.62	192	"	BM
	1410	4.0	11.5	6.63	181	"	BM
	1411	5.0	11.5	6.60	201	"	BM
	1413	6.0	11.5	6.61	197	"	BM
	1414	7.0	11.5	6.59	204	"	BM
	1430	—	12.2	6.83	072	"	BM

PRINT NAME OF SAMPLER: B. Matz
SIGNATURE OF SAMPLER: BMatz DATE: 11-2-90

SAMPLING DATA

SAMPLING METHOD: ___Dedicated Pump ___Portable Pump X Teflon Bailer ___Stainless ___PVC

FIELD INSTRUMENTS	BRAND/MODEL	SERIAL NUMBER	CALIBRATION DATE
pH	Orion		11-1-90
Temperature			
Conductivity			
Turbidity			
PID			

SAMPLING MEASUREMENTS (Minimum of 4 at 5 minute interval)

DATE	TIME	VOLUME(gal)	TEMP(C)	pH(s.u.)	Conductivity(umohs/cm)	Turbidity(NTU)	INITIALS

SAMPLING HANDLING

	TIME	DATE	INITIALS
BEGIN SAMPLING	1415	11-2-90	DM
END SAMPLING	1430	11-2-90	DM

SAMPLE NUMBER	SAMPLE VOLUME	CONTAINER TYPE	PRESERVATIVES	FILTERED	PARAMETERS
LAD-452	2X40ml	G	HCl	no	VOA
	7X1l	AG	—	no	SVOA
	1X1l	P	HNO3	no	T. Metals
	1X1l	P	NaOH	no	T. CN
	1X1l	P	ZnAc+NaOH	no	Sulfide

CHAIN OF CUSTODY NUMBER: 195438 REQUEST FOR ANALYSIS NUMBER: 230962

PRINT NAME OF SAMPLER: B. Matz

SIGNATURE OF SAMPLER: B. Matz DATE: 11-2-90

SNL:F-0420/2

WATER SAMPLE COLLECTION FORM

JOB NAME: LANL ER Sampling JOB NUMBER: 301215.03.04
SAMPLE LOCATION: Pajarito Canyon WELL NUMBER: A-PC01

PURGE CALCULATIONS

		DATE	TIME	INITIALS
MEASURED WELL DEPTH (FT):	20.21	11-2-90	1450	[illegible]
WATER LEVEL DEPTH (FT):	8.19	↓	↓	[illegible]
STATIC WATER HEIGHT (FT):	12.02	↓	↓	[illegible]

CASED WELL VOLUME = Static Water Height (ft) * Area of Well (ft sq) * 7.48 gal/ft sq.
1.98 ~~1.35~~ (gal) = 12.02 (ft) * 0.022 (ft sq) * 7.48 gal/ft sq.

REQUIRED PURGE VOLUME = CASED WELL VOLUME (gal) * 3
5.9 ~~4.0~~ ~~6.0~~ (gal)= 1.98 ~~1.35~~ (gal) * 3

	DATE	TIME	INITIALS
START PURGE	1500	11-2-90	[illegible]
STOP PURGE	1515	11-2-90	[illegible]

	DATE	TIME	INITIALS
ACTUAL PURGE VOLUME: 6.0 (gal)	11-2-90	~1515	[illegible]
PURGED DRY NO			

PURGE METHOD: ___Dedicated Pump ___Portable Pump X Bailer ___Stainless X PVC

DESCRIPTION OF PURGE WATER: sl. silty
WEATHER: HAIL! Cool, overcast

PURGE MEASUREMENTS

DATE	TIME	VOLUME(gal)	TEMP(C)	pH(s.u.)	Conductivity(umohs/cm)	Turbidity(NTU)	INITIALS
	1500	1.0	14.0	6.76	345	sl. silty	[illegible]
		2.0	14.9	6.78	363		[illegible]
		3.0	14.9	6.81	369		[illegible]
		4.0	14.9	6.84	366		[illegible]
		5.0	14.9	6.85	354		[illegible]
		6.0	14.9	6.85	355		[illegible]
	1531	—	15.0	6.94	385	↓	[illegible]

PRINT NAME OF SAMPLER: B. Matz
SIGNATURE OF SAMPLER: BMatz DATE: 11-2-90

SNL:F-0420/1

SAMPLING DATA

SAMPLING METHOD: ___Dedicated Pump ___Portable Pump X Teflon Bailer ___Stainless ___PVC

FIELD INSTRUMENTS	BRAND/MODEL	SERIAL NUMBER	CALIBRATION DATE
pH	Orion		11-1-90
Temperature			
Conductivity			
Turbidity			
PID			

SAMPLING MEASUREMENTS (Minimum of 4 at 5 minute interval)

DATE	TIME	VOLUME(gal)	TEMP(C)	pH(s.u.)	Conductivity(umohs/cm)	Turbidity(NTU)	INITIALS

SAMPLING HANDLING

	TIME	DATE	INITIALS
BEGIN SAMPLING	1515	11-2-90	BM
END SAMPLING	1530	11-2-90	BM

SAMPLE NUMBER	SAMPLE VOLUME	CONTAINER TYPE	PRESERVATIVES	FILTERED	PARAMETERS
AP001	2x40ml	G	HCl	no	VOA
	1x1 l	AG	—	no	SVOA
	1x1 l	P	HNO3	no	T. Metals
	1x1 l	P	NaOH	no	T. CN
	1x1 l	P	ZnAc+NaOH	no	Sulfide

CHAIN OF CUSTODY NUMBER: 195437 REQUEST FOR ANALYSIS NUMBER: 230961

PRINT NAME OF SAMPLER: B. Matz

SIGNATURE OF SAMPLER: BMatz DATE: 11-2-90

SNL:F-0420/2

APPENDIX B

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 230960
C/C Control No. 195436

PROJECT NAME: LANL ER Sampling
PROJECT NUMBER: 301215.03.04
PROFIT CENTER NUMBER: 3515
PROJECT MANAGER: Kelly Bitner
BILL TO: IT Albq.

PURCHASE ORDER NO.: bill to project no.

DATE SAMPLES SHIPPED: 11-1-90
LAB DESTINATION: IT Oak Ridge
LABORATORY CONTACT: Janice Sterrett
SEND LAB REPORT TO: Barb Matz
IT-Albq.

DATE REPORT REQUIRED: NOV. 30, 1990
PROJECT CONTACT: Barb Matz
PROJECT CONTACT PHONE NO.: 505/262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MC010	Water	2x40 ml	HCl	App. IX Volatile org.	Method 8240
↓	↓	7x1 l	—	Semivolatiles	Meth-various
		1x1 l	HNO3	T. Metals	Method 6010
		1x1 l	NaOH	T. Cyanide	Method 9010
		1x1 l	ZnAc+NaOH	Sulfide	Method 9030
MC011	Water	2x40 ml	HCl	Volatile org.	Method 8240
MC0TB	Water	2x40 ml	HCl	Volatile org.	Method 8240

TURNAROUND TIME REQUIRED: (Rush must be approved by the Laboratory Project Manager.)
Normal ____ Rush ____ (Subject to rush surcharge.)

QC LEVEL: (Levels II and III subject to surcharge; project-specific requirements must be submitted to lab before beginning work.)
I X II ____ III ____ Project Specific ____

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances.)
Non-hazard ____ Flammable ____ Skin Irritant preservatives Highly Toxic ____ Other ____ (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, archive and disposal.)
Return to Client ____ Disposal by Lab X Archive ____ (Indicate number of months.)

FOR LAB USE ONLY
Received by A. Robbins Date/Time 11-2-90 1030

WHITE - Original, to accompany samples
YELLOW - First copy

126A-10-85

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 230959
C/C Control No. 195436

PROJECT NAME: LANL ER Sampling
PROJECT NUMBER: 301215.03.04
PROFIT CENTER NUMBER: 3515
PROJECT MANAGER: Kelly Bitner
BILL TO: IT Albq.

PURCHASE ORDER NO.: bill to project no.

DATE SAMPLES SHIPPED: 11-1-90
LAB DESTINATION: IT Oak Ridge
LABORATORY CONTACT: Janice Sterrett
SEND LAB REPORT TO: ~~Mark Lyon~~ Barb Matz IT Corp. ~~5~~, Albq. NM.

DATE REPORT REQUIRED: Nov. 29, 1990
PROJECT CONTACT: Barb Matz
PROJECT CONTACT PHONE NO.: 505/262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MC0-7A	~~GW~~ water	2 x 40ml	HCl	App. IX Volatile Org.	Method 8240.
↓	↓	7 x 1 l.	—	App. IX Semivolatiles	various methods
		1 x 1 l.	HNO3	Total Metals	Method 6010
		1 x 1 l.	NaOH	Total Cyanide	Method 9010
		1 x 1 l	ZnAc + NaOH	Sulfide	Method 9030
~~MC04B~~ MC06B	water	2 x 40ml	HCl	App. IX Volatile Org.	Method 8240
↓	↓	7 x 1 l	—	Semivolatiles	Various
		1 x 1 l	HNO3	Total Metals	Method 6010
		1 x 1 l	NaOH	Total Cyanide	Method 9010
		1 x 1 l	ZnAc + NaOH	Sulfide	Method 9030

TURNAROUND TIME REQUIRED: (Rush must be approved by the Laboratory Project Manager.)
Normal ____ Rush ____ (Subject to rush surcharge.)

QC LEVEL: (Levels II and III subject to surcharge; project-specific requirements must be submitted to lab before beginning work.)
I X II ____ III ____ Project Specific ____

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances.)
Non-hazard ____ Flammable ____ Skin Irritant preservatives Highly Toxic ____ Other ____ (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, archive and disposal.)
Return to Client ____ Disposal by Lab X Archive ____ (Indicate number of months.)

FOR LAB USE ONLY
Received by A. Robbins 11-2-90 1030 Date/Time ____

WHITE - Original, to accompany samples
YELLOW - Field copy

26A 10-85

ITNA 470.1

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 230962
C/C Control No. 195438

PROJECT NAME: LANL ER Sampling
PROJECT NUMBER: 301215.03,04
PROFIT CENTER NUMBER: 3515
PROJECT MANAGER: Kelly Bitner
BILL TO: IT Albq.

DATE SAMPLES SHIPPED: 11-2-90
LAB DESTINATION: IT Oak Ridge
LABORATORY CONTACT: Janice Sterlett
SEND LAB REPORT TO: Barb Matz, IT Albq.

DATE REPORT REQUIRED *: NOV. 30, 1990
PROJECT CONTACT: Barb Matz
PROJECT CONTACT PHONE NO.: 505/262-8800

PURCHASE ORDER NO.: bill to project no.

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
LA03A	water	2x40ml G	HCl	App.IX Volatile organics	Method 8240
		7x1l AG	—	Semivolatiles	Various methods
		1x1l P	HNO3	Total Metals	Method 6010
		1x1l P	NaOH	Total Cyanide	Method 9010
		1x1l P	ZnAc+NaOH	Sulfide	Method 9030
LA04.5CV	water	2x40ml G	HCl	App.IX Volatile organics	Method 8240
		7x1l AG	—	Semivolatiles	Various methods
		1x1l P	HNO3	Total Metals	Method 6010
		1x1l P	NaOH	Total Cyanide	Method 9010
		1x1l P	ZnAc+NaOH	Sulfide	Method 9030

TURNAROUND TIME REQUIRED: (Rush must be approved by the Laboratory Project Manager.)
Normal ____ * Rush ____ (Subject to rush surcharge.)

QC LEVEL: (Levels II and III subject to surcharge; project-specific requirements must be submitted to lab before beginning work.)
I X II ____ III ____ Project Specific ____

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances.)
Non-hazard ____ Flammable ____ Skin Irritant preservatives Highly Toxic ____ Other ____ (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, archive and disposal.)
Return to Client ____ Disposal by Lab X Archive ____ (Indicate number of months.)

FOR LAB USE ONLY
Received by ____ Date/Time ____

WHITE - Original, to accompany samples
YELLOW - Field copy

126A-10-85

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 230964
C/C Control No. 195440

PROJECT NAME: LANL ER Sampling
PROJECT NUMBER: 301215.03.04
PROFIT CENTER NUMBER: 3515
PROJECT MANAGER: Kelly Bitner
BILL TO: IT Albq.

PURCHASE ORDER NO.: bill to project no.

DATE SAMPLES SHIPPED: 11-2-90
LAB DESTINATION: IT Oak Ridge
LABORATORY CONTACT: Janice Stewart
SEND LAB REPORT TO: Barb Matz, IT Albq.

DATE REPORT REQUIRED: * NOV. 30, 1990
PROJECT CONTACT: Barb Matz
PROJECT CONTACT PHONE NO.: 505/262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
~~LA020~~ BM	Water	2x40 ml G	HCl	App. IX volatile organics	Method 8240
APC023		7x1 l AG	—	Semivolatiles	various methods
		1x1 l P	HNO_3	Total Metals	Method 6010
		1x1 l P	NaOH	Total Cyanide	Method 9010
		1x1 l P	$ZnAc_2$ + NaOH	Sulfide	Method 9030

TURNAROUND TIME REQUIRED: (Rush must be approved by the Laboratory Project Manager.)
Normal * Rush ____ (Subject to rush surcharge.)

QC LEVEL: (Levels II and III subject to surcharge; project-specific requirements must be submitted to lab before beginning work.)
I X II ____ III ____ Project Specific ____

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances.)
Non-hazard ____ Flammable ____ Skin Irritant preservatives Highly Toxic ____ Other ____ (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, archive and disposal.)
Return to Client ____ Disposal by Lab X Archive ____ (Indicate number of months.)

FOR LAB USE ONLY
Received by [signature] - ITORL Date/Time 11/3/90 1230

WHITE - Original, to accompany samples
YELLOW - Field copy

126A 10-85

ITNA 0727

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 230961
C/C Control No. 195437

PROJECT NAME: LANL ER Sampling
PROJECT NUMBER: 301215.03.04
PROFIT CENTER NUMBER: 3615
PROJECT MANAGER: Kelly Bitner
BILL TO: IT Albq.

PURCHASE ORDER NO.: bill to project no.

DATE SAMPLES SHIPPED: 11-2-90
LAB DESTINATION: IT Oak Ridge
LABORATORY CONTACT: Janice Sterrett
SEND LAB REPORT TO: Barb Matz, IT Albq.

DATE REPORT REQUIRED: * Nov. 30, 1990.
PROJECT CONTACT: Barb Matz
PROJECT CONTACT PHONE NO.: 505/262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MC04BX	water	2x40ml G	HCl	App. IX volatile organics	Method 8240.
		7x1L AG	—	semivolatiles	various methods
		1x1L P	HNO_3	Total Metals	Method 6010
		1x1L P	NaOH	Total Cyanide	Method 9010
		1x1L P	ZnAc+NaOH	Sulfide	Method 9030
APC01	water	2x40ml G	HCl	App. IX volatile organics	Method 8240
		7x1L AG	—	semivolatiles	various methods
		1x1L P	HNO_3	Total Metals	Method 6010
		1x1L P	NaOH	Total Cyanide	Method 9010
		1x1L P	ZnAc+NaOH	Sulfide	Method 9030

TURNAROUND TIME REQUIRED (Rush must be approved by the Laboratory Project Manager.)
Normal ____ * Rush ____ (Subject to rush surcharge.)

QC LEVEL: (Levels II and III subject to surcharge; project-specific requirements must be submitted to lab before beginning work.)
I X II ____ III ____ Project Specific ____

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances.)
Non-hazard ____ Flammable ____ Skin Irritant Preservatives Highly Toxic ____ Other ____ (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, archive and disposal.)
Return to Client ____ Disposal by Lab X Archive ____ (Indicate number of months.)

FOR LAB USE ONLY
Received by [illegible] IT ORL Date/Time 11/3/90 1230

WHITE - Original, to accompany samples
YELLOW - Field copy

126A 10 85

ITNA 117.1

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 230963
C/C Control No. 195439

PROJECT NAME: LANL ER Sampling
PROJECT NUMBER: 301215.03.04
PROFIT CENTER NUMBER: 3515
PROJECT MANAGER: Kelly Bitner
BILL TO: IT Albq.

PURCHASE ORDER NO.: bill to project no.

DATE SAMPLES SHIPPED: 11-2-90
LAB DESTINATION: IT Oak Ridge
LABORATORY CONTACT: Janice Stewart
SEND LAB REPORT TO: Barb Matz, IT Albq.

DATE REPORT REQUIRED: * Nov. 30, 1990
PROJECT CONTACT: Barb Matz
PROJECT CONTACT PHONE NO.: 505/262-8800

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
MC07A ✓	Water	1x1 l P.	ZnAc + NaOH	App. IX Sulfide **	Method 9030
MC06B ✓	↓	↓	↓ ↓	↓ ↓ **	↓
MC010 ✓	↓	↓	↓ ↓	↓ ↓ **	↓
LA011 ✓	↓	2x40 ml G	HCl	App. IX volatile org.	Method 8240
APC011 ✓	↓	"	HCl	" " "	" "
APC07B ✓	"	"	"	" " "	" "
				** to replace sulfide fractions	from 11-1-90.
				(Coc: 195436, RFA: 230959)	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Laboratory Project Manager.)
Normal ____ * Rush ____ (Subject to rush surcharge.)

QC LEVEL: (Levels II and III subject to surcharge; project-specific requirements must be submitted to lab before beginning work.)
I X II ____ III ____ Project Specific ____

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances.)
Non-hazard ____ Flammable ____ Skin Irritant preservatives Highly Toxic ____ Other ____ (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, archive and disposal.)
Return to Client ____ Disposal by Lab X Archive ____ (Indicate number of months.)

FOR LAB USE ONLY
Received by [illegible] ITOKC Date/Time 11/3/90 1830

WHITE - Original, to accompany samples
YELLOW - Field copy

126A-10-85

ITNA 4[illegible]

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 230962

C/C Control No. 195438

PROJECT NAME/NUMBER LANL ER Sampling

LAB DESTINATION IT Oak Ridge

SAMPLE TEAM MEMBERS Matz, Schmidt, Saavedra, Reneau

CARRIER/WAYBILL NO. Fed. Exp. 8095848843

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
LA03A	LANL well	11-2-90, 1320	water	2x40ml G	Rec'd 4°C OK	
↓	↓	↓ ↓	↓	7x1 l AG(4)		
↓	↓	↓ ↓	↓	3x1 l P	Rec'd ok	
LA04.5C	LANL well	11-2-90, 1410	water	2x40ml G	ITMS. sale	
↓	↓	↓ ↓	↓	7x1 l AG (4)	@ 11-6-90	
↓	↓	↓ ↓	↓	3x1 l P.		

Special Instructions:

Possible Sample Hazards: preservatives

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: B. Matz, B Matz, ITCorp, 11-2-90, 1730
   Received By: [illegible] ITORL 1830
2. Relinquished By: Steve Faughlin ITORL 11-6-90 16:00
   Received By: SA Kennedy, ITMS, 11-6-90 1800
3. Relinquished By:
   Received by:
4. Relinquished By:
   Received By:

WHITE - To accompany samples
YELLOW - Field copy

ITNA 4706.

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 230961

C/C Control No. 195437

PROJECT NAME/NUMBER LANL ER / 301215.03.04

LAB DESTINATION IT Oak Ridge

SAMPLE TEAM MEMBERS Matz, Schmidt, Saavedra, Reneau ~~[illegible]~~

CARRIER/WAYBILL NO. Fed. Exp. 8095848843

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MC04B	LANL well	11-2-90, 1100	water	2x40ml G	REC'd 4°C OK	
↓	↓	↓ ↓	↓	7x1 l AG (4)		
↓	↓	↓ ↓	↓	3x1 l P.	pH OK	
APC01	LANL well	11-2-90, 1510	water	2x40ml G	@ ITMS, 11/6/90	
↓	↓	↓ ↓	↓	7x1 l AG (4)		
↓	↓	↓ ↓	↓	3x1 l P.		

Special Instructions:

Possible Sample Hazards: preservatives

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: B. Matz, BMatz, ITCorp, 11-2-90, 1730
   Received By: [illegible] 11/3/90 1830 IT Ork
2. Relinquished By: Steve Tamplin IT/ORL 11/6/90 16:00
   Received By: SA Kennedy, ITMS, 11-6-90 1500
3. Relinquished By:
   Received by:
4. Relinquished By:
   Received By:

WHITE - To accompany samples
YELLOW - Field copy

ITNA 070.1

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 230964

C/C Control No. 195440

PROJECT NAME/NUMBER LANL ER

LAB DESTINATION IT Oak Ridge

SAMPLE TEAM MEMBERS Matz, Schmidt, Reneau, Saavedra

CARRIER/WAYBILL NO. Fed. Exp. 8095848843

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
~~LA020~~ ↑	LANL well	11-2-90 1600	water	2X40ml G ✓	Rec'd 5°C OK	
APC02				7X1 ~~L~~ G (4) ✓	pH ok	
↓	↓	↓	↓	3X1 L P. ✓	@ ITAS, sak 11-6-90	

Special Instructions:

Possible Sample Hazards: preservatives

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: B. Matz, BMatz, IT Corp, 11-2-90, 1730
   Received By: [illegible] ITIOAL 11-3-90 1250
2. Relinquished By: Steve Zaugglin ITIOAL 11-6-90 16:00
   Received By: SA Kennedy, ITAS, 11-6-90 1800
3. Relinquished By:
   Received by:
4. Relinquished By:
   Received By:

WHITE - To accompany samples
YELLOW - Field copy

ITNA 4[illegible]61

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 230960 230959

C/C Control No. 195436

PROJECT NAME/NUMBER LANL ER / 301215.03.04

LAB DESTINATION IT Oak Ridge

SAMPLE TEAM MEMBERS Matz, Schmidt, Saavedra, Reneau

CARRIER/WAYBILL NO. Fed. Exp. 8095848806

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MC07A	LANL well	11-1-90, 1330	water	2x40ml G	ok 6°C AC 11-2-90	
↓	↓	11-1-90, 1340	↓	7x1l AG		
↓	↓	11-1-90 1340	↓	3x1l P		
~~MC04B~~ MC06B	LANL well	11-1-90 1450	water	2x40ml G		
↓	↓	↓ ↓	↓	7x1l AG		
↓	↓	↓ ↓	↓	3x1l P.		
MC0-10	LANL well	11-1-90 1450	water	~~3~~2x40ml G	Did not receive any but VOA containers on this COC. SOK 11/6/90	
↓	↓	↓ ↓	↓	7x1l AG		
↓	↓	↓ ↓	↓	3x1l P		
MC0-11	LANL well	11-1-90 1530	↓	2x40ml G		
plus MC0TB	Trip Blank	Lab prep.	water	2x40ml G.		

Special Instructions:

Possible Sample Hazards: preservatives.

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: [signature] IT-ABQ 11-1-90 1730
   Received By: A. Robbins 11-2-90 1030
2. Relinquished By: [signature] IT-ABQ 11-1-90 16:00
   Received By: SA Kennedy, ITAS, 11-6-90 1800
3. Relinquished By:
   Received by:
4. Relinquished By:
   Received By:

WHITE - To accompany samples
YELLOW - Field copy

ITNA 470-1

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. 230963

C/C Control No. 195439

PROJECT NAME/NUMBER LANL ER /301215.03.04

LAB DESTINATION IT Oak Ridge

SAMPLE TEAM MEMBERS Matz, Schmidt, Saavedra, Renear

CARRIER/WAYBILL NO. Fed Exp. 8095848843

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
MC07A	LANL well	11-2-90 0940	water	1x1 lP	Rec'd 4 Cokel	
MC06B	↓	↓ 1015	↓	↓	did not rec. @ ITAS sat 11/6/90	
MC010	↓	↓ 1020	↓	↓		
LA011	"	↓ 1410	↓	2x40mlG	Rec'd ok, sat 11/6/90	
APC011	"	↓ 1530	↓	"		
APC07B	TRIP BLANK	11-2-90 "	"	"		

Special Instructions:

Possible Sample Hazards: preservatives.

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: B. Matz, Matz, IT Corp, 11-2-90, 1730

   Received By: [illegible] 11/3/90 1230

2. Relinquished By: Steve Zumpfelin IT/ORL 11-6-90 16:00

   Received By: Sh Kennedy, ITAS, 11-6-90 1800

3. Relinquished By:

   Received by:

4. Relinquished By:

   Received By:

WHITE - To accompany samples
YELLOW - Field copy

ITNA 470 1