

3M**Environmental Technology
& Services**

FAX TRANSMITTAL

CON 12-15**Doc #12803****3 M Ames**

Bldg. 42-2E-27

900 Bush Avenue

P.O. Box 33331

St. Paul, MN 55133-3331

Phone #: 651/778-6442

Fax #: 651/778-7203

DATE:

2.14.02PAGES TO
FOLLOW:6

TO:

Cal LundbergFax Number: 515 281 8895Company: Iowa Department of Natural Resources

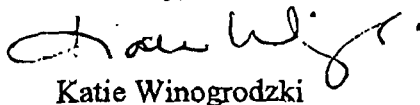
FROM:

Katie WinogradzkiPhone Number: 651 778 5393

Dear Mr. Lundberg,

Attached please find the laboratory results that were accidentally omitted from the report for the 3M Ames facility that was sent to your attention on February 1, 2002. If you have any question, please contact me at the number listed above.

Sincerely,



Katie Winogradzki

FAX MODELS: Lanier Fax 7550

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Morrow, M.S.
Yelena Aravkina, M.S.
Bradley T. Benson, B.S.
Kurt Johnson, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044
e-mail: fbi@isomedia.com

January 14, 2002

James Webber, Project Manager
3M
900 Dayton Avenue
Ames, IA 50010-6493

Dear Mr. Webber:

Included are the results from the testing of material submitted on January 10, 2002 from your GC Characterization project. The soil sample submitted for forensic evaluation arrived in good condition. Upon its arrival, the sample 3M Ames was assigned our laboratory project number 201051 and was placed in a refrigerator maintained at 4°C until removed for sample processing.

The sample 3M Ames was composited, extracted and analyzed using a gas chromatograph with a flame ionization detector (GC/FID) and an electron capture detector (ECD). The data generated yielded information on the boiling range and general chemical composition of the material present. The GC/FID and GC/ECD traces are enclosed. A GC/FID trace of a standard consisting of normal alkanes is also provided for reference purposes.

Please contact us if additional consultation is needed by our firm in the interpretation of the analytical results provided. We appreciate this opportunity to be of service to you and hope you will call if you should have any questions. We will hold your samples for 30 days before disposal unless directed otherwise.

Sincerely,

FRIEDMAN & BRUYA, INC.



Yelena Aravkina
Chemist

Enclosures
NAA0114R.DOC

ENVIRONMENTAL CHEMISTS

Date of Report: 01/14/02
Date Received: 01/10/02
Project: GC Characterization
Date Extracted: 01/10/02
Date Analyzed: 01/10/02

**RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLE
FOR FORENSIC EVALUATION
BY CAPILLARY GAS CHROMATOGRAPHY
USING A FLAME IONIZATION DETECTOR (FID)
AND ELECTRON CAPTURE DETECTOR (ECD)**

Sample IDGC Characterization

3M Ames

The GC trace using the flame ionization detector (FID) showed the presence of low boiling compounds. The patterns displayed by these peaks are indicative of a low boiling petroleum distillate such as petroleum solvent or similar material.

The low boiling compounds appear as an irregular pattern of peaks on top of a small hump or unresolved complex mixture. This material elutes from *n*-C₈ to *n*-C₁₂ showing a maximum near *n*-C₁₀. This correlates with a temperature range of approximately 130°C to 220°C with a maximum near 170°C.

The large peak seen near 25 minutes on the GC/FID trace is pentacosane, added as a quality assurance check for this GC analysis. There is a second surrogate present that is seen on the GC/ECD trace at about 26 minutes which is dibutyl chloroendate.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID: 3M Ames
 Date Received: 01/10/02
 Date Extracted: 01/15/02
 Date Analyzed: 01/16/02
 Matrix: Soil
 Units: ug/g (ppm)

Client: 3M
 Project: GC Characterization
 Lab ID: 201051-01
 Data File: 011529.D
 Instrument: 5972 -Ina
 Operator: YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	90	41	136
1,2-Dichloroethane-d4	90	41	135
Toluene-d8	70	36	134
4-Bromofluorobenzene	120	16	179

Compounds:	Concentration ug/g (ppm)	Compounds:	Concentration ug/g (ppm)
Dichlorodifluoromethane	<0.05	Chlorobenzene	<0.05
Chloromethane	<0.05	Ethylbenzene	<0.05
Vinyl chloride	<0.05	1,1,1,2-Tetrachloroethane	<0.05
Bromomethane	<0.05	m,p-Xylene	<0.05
Chloroethane	<0.05	o-Xylene	<0.05
Pentane	<0.5	Styrene	<0.05
Trichlorofluoromethane	<0.05	Isopropylbenzene	0.13
Acetone	<0.5	Bromoforn	<0.05
1,1-Dichloroethene	<0.05	n-Propylbenzene	0.59
Methylene chloride	<0.5	Bromobenzene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	1,3,5-Trimethylbenzene	1.0
trans-1,2-Dichloroethene	<0.05	1-Methyl-2-ethylbenzene	0.86
Diisopropyl ether (DIPE)	<0.05	1,1,2,2-Tetrachloroethane	<0.05
1,1-Dichloroethane	<0.05	1,2,3-Trichloropropane	<0.05
Ethyl t-butyl ether (ETBE)	<0.05	2-Chlorotoluene	<0.05
2,2-Dichloropropane	<0.05	4-Chlorotoluene	<0.05
cis-1,2-Dichloroethane	<0.05	tert-Butylbenzene	0.06
Chloroform	<0.05	1,2,4-Trimethylbenzene	3.4
2-Butanone (MEK)	<0.5	Isobutylbenzene	0.69
t-Amyl methyl ether (TAME)	<0.05	sec-Butylbenzene	0.78
1,2-Dichloroethane (EDC)	<0.05	p-Isopropyltoluene	0.71
1,1,1-Trichloroethane	<0.05	o-Isopropyltoluene	<0.05
Isooctane	<0.05	1,3-Dichlorobenzene	<0.05
1,1-Dichloropropene	<0.05	1,4-Dichlorobenzene	<0.05
Carbon Tetrachloride	<0.05	1,2-Dichlorobenzene	<0.05
Benzene	<0.05	1-Methyl-3-n-propylbenzene	2.6
Trichloroethene	<0.05	1-Methyl-4-n-propylbenzene	1.2
1,2-Dichloropropane	<0.05	n-Butylbenzene	0.24
Bromodichloromethane	<0.05	1,3-Dimethyl-5-ethylbenzene	1.3
Dibromomethane	<0.05	1,2-Diethylbenzene	0.14
4-Methyl-2-pentanone	<0.5	1-Methyl-2-n-propylbenzene	1.3
cis-1,3-Dichloropropene	<0.05	1,4-Dimethyl-2-ethylbenzene	0.75
Toluene	<0.05	1,2-Dimethyl-4-ethylbenzene	1.4
trans-1,3-Dichloropropene	<0.05	1,3-Dimethyl-2-ethylbenzene	0.23
1,1,2-Trichloroethane	<0.05	1,2-Dimethyl-3-ethylbenzene	0.31
2-Hexanone	<0.5	1,2-Dibromo-3-chloropropane	<0.05
1,3-Dichloropropane	<0.05	1,2,4-Trichlorobenzene	<0.05
Tetrachloroethene	<0.05	Hexachlorobutadiene	<0.05
Dibromochloromethane	<0.05	Naphthalene	<0.05
1,2-Dibromoethane (EDB)	<0.05	1,2,3-Trichlorobenzene	<0.05
Butane	<0.5 L		

L - The reported concentration was generated from a library search.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID: Method Blank
 Date Received: 01/10/02
 Date Extracted: 01/15/02
 Date Analyzed: 01/15/02
 Matrix: Soil
 Units: ug/g (ppm)

Client: 8M
 Project: GC Characterization
 Lab ID: 02-111 mb2
 Data File: 011527.D
 Instrument: 6972 -Ins
 Operator: YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	108	41	186
1,2-Dichloroethane-d4	107	41	135
Toluene-d8	95	36	134
4-Bromofluorobenzene	107	16	179

Compounds:	Concentration ug/g (ppm)	Compounds:	Concentration ug/g (ppm)
Dichlorodifluoromethane	<0.05	Chlorobenzene	<0.05
Chloromethane	<0.05	Ethylbenzene	<0.05
Vinyl chloride	<0.05	1,1,1,2-Tetrachloroethane	<0.05
Bromomethane	<0.05	m,p-Xylene	<0.05
Chloroethane	<0.05	o-Xylene	<0.05
Pentane	<0.5	Styrene	<0.05
Trichlorofluoromethane	<0.05	Isopropylbenzene	<0.05
Acetone	<0.5	Bromoform	<0.05
1,1-Dichloroethene	<0.05	n-Propylbenzene	<0.05
Methylene chloride	<0.5	Bromobenzene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	1,3,5-Trimethylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	1-Methyl-2-ethylbenzene	<0.05
Diisopropyl ether (DIPE)	<0.05	1,1,2,2-Tetrachloroethane	<0.05
1,1-Dichloroethane	<0.05	1,2,3-Trichloropropane	<0.05
Ethyl t-butyl ether (ETBE)	<0.05	2-Chlorotoluene	<0.05
2,2-Dichloropropane	<0.05	4-Chlorotoluene	<0.05
cis-1,2-Dichloroethene	<0.05	tert-Butylbenzene	<0.05
Chloroform	<0.05	1,2,4-Trimethylbenzene	<0.05
2-Butanone (MEK)	<0.5	Isobutylbenzene	<0.05
t-Amyl methyl ether (TAME)	<0.05	sec-Butylbenzene	<0.05
1,2-Dichloroethane (EDC)	<0.05	p-Isopropyltoluene	<0.05
1,1,1-Trichloroethane	<0.05	o-Isopropyltoluene	<0.05
Isooctane	<0.05	1,3-Dichlorobenzene	<0.05
1,1-Dichloropropene	<0.05	1,4-Dichlorobenzene	<0.05
Carbon Tetrachloride	<0.05	1,2-Dichlorobenzene	<0.05
Benzene	<0.05	1-Methyl-3-n-propylbenzene	<0.05
Trichloroethene	<0.05	1-Methyl-4-n-propylbenzene	<0.05
1,2-Dichloropropane	<0.05	n-Butylbenzene	<0.05
Bromodichloromethane	<0.05	1,3-Dimethyl-5-ethylbenzene	<0.05
Dibromomethane	<0.05	1,2-Diethylbenzene	<0.05
4-Methyl-2-pentanone	<0.5	1-Methyl-2-n-propylbenzene	<0.05
cis-1,3-Dichloropropene	<0.05	1,4-Dimethyl-2-ethylbenzene	<0.05
Toluene	<0.05	1,2-Dimethyl-4-ethylbenzene	<0.05
trans-1,3-Dichloropropene	<0.05	1,3-Dimethyl-2-ethylbenzene	<0.05
1,1,2-Trichloroethane	<0.05	1,2-Dimethyl-3-ethylbenzene	<0.05
2-Hexanone	<0.5	1,2-Dibromo-3-chloropropane	<0.05
1,3-Dichloropropane	<0.05	1,2,4-Trichlorobenzene	<0.05
Tetrachloroethene	<0.05	Hexachlorobutadiene	<0.05
Dibromochloromethane	<0.05	Naphthalene	<0.05
1,2-Dibromoethane (EDB)	<0.05	1,2,3-Trichlorobenzene	<0.05
Butane	<0.5 L		

L - The reported concentration was generated from a library search.

FRIEDMAN & BRUYA, INC.**ENVIRONMENTAL CHEMISTS**

Date of Report: 01/17/02

Date Received: 01/10/02

Project: GC Characterization

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES
FOR VOLATILES BY EPA METHOD 8260B**

Laboratory Code: 112038-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
1,1-Dichloroethene	µg/g (ppm)	<0.05	<0.05	nm
Benzene	µg/g (ppm)	<0.05	<0.05	nm
Trichloroethene	µg/g (ppm)	<0.05	<0.05	nm
Toluene	µg/g (ppm)	<0.05	<0.05	nm
Chlorobenzene	µg/g (ppm)	<0.05	<0.05	nm

Laboratory Code: 112088-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
1,1-Dichloroethene	µg/g (ppm)	2.5	<0.05	55	30-117
Benzene	µg/g (ppm)	2.5	<0.05	85	41-118
Trichloroethene	µg/g (ppm)	2.5	<0.05	74	35-115
Toluene	µg/g (ppm)	2.5	<0.05	76	34-114
Chlorobenzene	µg/g (ppm)	2.5	<0.05	78	41-113

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
1,1-Dichloroethene	µg/g (ppm)	2.5	65	57	43-136	13
Benzene	µg/g (ppm)	2.5	101	98	50-136	3
Trichloroethene	µg/g (ppm)	2.5	87	85	52-126	2
Toluene	µg/g (ppm)	2.5	90	87	57-121	3
Chlorobenzene	µg/g (ppm)	2.5	89	86	64-118	4

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 01/17/02

Date Received: 01/10/02

Project: GC Characterization

**QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF SOIL SAMPLES FOR ETHERS
USING EPA METHOD 8260B**

Laboratory Code: 112038-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Methyl t-butyl ether (MTBE)	µg/g (ppm)	<0.05	<0.05	nm
Diisopropyl ether (DIPE)	µg/g (ppm)	<0.05	<0.05	nm
Ethyl t-butyl ether (ETBE)	µg/g (ppm)	<0.05	<0.05	nm
t-Amyl methyl ether (TAME)	µg/g (ppm)	<0.05	<0.05	nm

Laboratory Code: 112038-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Methyl t-butyl ether (MTBE)	µg/g (ppm)	2.5	<0.05	72	58-100
Diisopropyl ether (DIPE)	µg/g (ppm)	2.5	<0.05	79	66-105
Ethyl t-butyl ether (ETBE)	µg/g (ppm)	2.5	<0.05	90	62-111
t-Amyl methyl ether (TAME)	µg/g (ppm)	2.5	<0.05	91	58-111

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	µg/g (ppm)	2.5	83	78	64-109	6
Diisopropyl ether (DIPE)	µg/g (ppm)	2.5	91	88	77-115	4
Ethyl t-butyl ether (ETBE)	µg/g (ppm)	2.5	109	106	71-125	3
t-Amyl methyl ether (TAME)	µg/g (ppm)	2.5	106	107	69-123	1

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.