



energy fuels nuclear, inc.

p.o. box 787 • blanding, utah 84511

May 6, 1997

Mr. Joseph J. Holonich, Branch Chief  
High Level Waste and Uranium Recovery Projects Branch  
Division of Waste Management  
Office of Nuclear Materials Safety and Safeguards  
U. S. Nuclear Regulatory Commission  
2 White Flint North, Mail Stop T-7J9  
11545 Rockville Pike  
Rockville, MD 20852

Re: Energy Fuels Nuclear, Inc.  
SUA-1358, Docket No. 40-8681  
Supplemental Data for Amendment Request Submitted April 3, 1997

Dear Mr. Holonich:

This letter transmits supplemental radiochemical and method 8260 analytical results for samples of the uranium material for which EFN requested an NRC license amendment on April 3, 1997. EFN does not request that these data be treated as confidential.

Should you have any questions or comments regarding this information, you can reach me or our Radiation Safety Officer, Ron Berg, at (801) 678-2221, or Michelle Rehmann, Corporate Environmental Manager at (303) 389-4131.

Sincerely,

William N. Deal  
Manager, White Mesa Mill

9705130338 970506  
PDR ADOCK 04008681  
C PDR

WND/gp  
Attachment

xc: Ronald E. Berg  
Earl E. Hoellen  
Richard A. Munson  
James Park (NRC)  
Michelle R. Rehmann  
Harold R. Roberts

130018



NLOS  
1/1

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**LABORATORY ANALYSIS REPORT - ENERGY FUELS NUCLEAR, INC.**

Page 1 of 2

Sample ID:  
Laboratory ID:  
Sample Matrix:  
Sample Date/Time:  
Date Received:  
Report Date:

97-21383
Soil
03-28-97
03-28-97
April 8, 1997

Radiometric		Method	Detection Limit	Units	Results	Date Analyzed
234 Uranium	<sup>234</sup> U	907.0	0.02	pCi/g	126	04-07-97
Uranium Precision ±					4.9	
235 Uranium	<sup>235</sup> U	907.0	0.02	pCi/g	5.3	04-07-97
Uranium Precision ±					1.0	
238 Uranium	<sup>238</sup> U	907.0	0.02	pCi/g	129	04-07-97
Uranium Precision ±					4.9	
228 Thorium	<sup>228</sup> Th	907.0	0.02	pCi/g	4.6	04-08-97
Thorium Precision ±					0.4	
230 Thorium	<sup>230</sup> Th	907.0	0.02	pCi/g	4.8	04-08-97
Thorium Precision ±					0.8	
232 Thorium	<sup>232</sup> Th	907.0	0.02	pCi/g	4.1	04-08-97
Thorium Precision ±					0.4	

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## RADIOCHEMICAL QUALITY ASSURANCE REPORT - ENERGY FUELS NUCLEAR, INC.

Page 2 of 2

Laboratory I.D.:  
Sample Matrix:  
Sample Date / Time:  
Date Received:  
Report Date:

97-21383
Soil
03-28-97
03-28-97
April 8, 1997

	Method	Duplicate Precision (Percent)	Spike Recovery (Percent)	LCS Recovery (Percent)	Method Blank (pCi/g)	Date Analyzed	Analyst
Laboratory #: 234 Uranium:	907.0	97-21383 105	97-21383 87	U-2 117	U-2 <0.02	04-07-97	PH
Laboratory #: 235 Uranium:	907.0	97-21383 83	97-21383 95	U-2 103	U-2 <0.02	04-07-97	PH
Laboratory #: 238 Uranium:	907.0	97-21383 106	97-21383 117	U-2 109	U-2 <0.02	04-07-97	PH
Laboratory #: 228 Thorium:	907.0	n/a -	97-21383 83	AS-36 109	AS-36 <0.02	04-08-97	PH
Laboratory #: 230 Thorium:	907.0	n/a -	n/a -	AS-36 -	AS-36 <0.02	04-08-97	PH
Laboratory #: 232 Thorium:	907.0	n/a -	n/a -	AS-36 -	AS-36 <0.02	04-08-97	PH

Report approved By:

imb: E:\Reports\Clients 97\97-21383\Soil\rc21383.xls

Reviewed By:

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E-mail: [energy@trib.com](mailto:energy@trib.com) • FAX: (307) 234 - 1639 • PHONE: (307) 235 - 0515 • TOLL FREE: (888) 235 - 0515**EPA METHOD 8260**

Client: **Energy Fuels Nuclear**  
Sample ID:  
Laboratory ID: C97-21383  
Matrix: Soil  
Dilution Factor: 200

Date Sampled: 03/28/97  
Date Received: 03/28/97  
Date Extracted: 04/03/97  
Date Analyzed: 04/03/97  
Date Reported: April 8, 1997

C.A.S. #	TARGET COMPOUNDS	CONCENTRATION	LIMIT OF
		(mg/kg)	DETECTION (mg/kg)
75-71-8	Dichlorodifluoromethane	ND	0.20
74-87-3	Chloromethane	ND	0.20
75-01-4	Vinyl chloride	ND	0.20
74-83-9	Bromomethane	ND	0.20
75-00-3	Chloroethane	ND	0.20
75-69-4	Trichlorofluoromethane	ND	0.20
75-35-4	1,1 - Dichloroethene	ND	0.20
75-09-2	Methylene chloride	ND	0.20
156-60-5	trans - 1, 2 - Dichloroethene	ND	0.20
75-34-3	1,1 - Dichloroethane	ND	0.20
156-59-2	cis - 1,2 - Dichloroethene	ND	0.20
74-97-5	Bromochloromethane	ND	0.20
67-86-3	Chloroform	ND	0.20
594-20-7	2,2 - Dichloropropane	ND	0.20
71-55-6	1,1,1 - Trichloroethane	ND	0.20
107-06-2	1,2 - Dichloroethane	ND	0.20
563-58-6	1,1 - Dichloropropene	ND	0.20
56-23-5	Carbon tetrachloride	ND	0.20
71-43-2	Benzene	ND	0.20
74-95-3	Dibromomethane	ND	0.20
78-87-5	1,2 - Dichloropropane	ND	0.20
79-01-6	Trichloroethene	ND	0.20
75-27-4	Bromodichloromethane	ND	0.20
10061-01-5	cis - 1,3 - Dichloropropene	ND	0.20
10061-02-6	trans - 1,3 - Dichloropropene	ND	0.20
79-00-5	1,1,2 - Trichloroethane	ND	0.20
108-88-3	Toluene	ND	0.20
106-93-4	1,2 - Dibromoethane (EDB)	ND	0.20
142-28-9	1,3 - Dichloropropane	ND	0.20
124-48-1	Dibromochloromethane	ND	0.20
127-18-4	Tetrachloroethene	ND	0.20
630-20-6	1,1,1,2 - Tetrachloroethane	ND	0.20
108-90-7	Chlorobenzene	ND	0.20
100-41-4	Ethylbenzene	ND	0.20
108-38-3	m,p - Xylenes	ND	0.40
75-25-2	Bromoform	ND	0.20
100-42-5	Styrene	ND	0.20
95-47-6	o - Xylene	ND	0.20
79-34-5	1,1,2,2 - Tetrachloroethane	ND	0.20
96-18-4	1,2,3 - Trichloropropane	ND	0.20

ND - Analyte not detected at stated limit of detection



# EPA METHOD 8260

Client: Energy Fuels Nuclear  
Sample ID:  
Laboratory ID: C97-21383

Date Sampled: 03/28/97  
Date Analyzed: 04/03/97  
Date Reported: April 8, 1997

C.A.S. #	TARGET COMPOUNDS	CONCENTRATION (mg/kg)	LIMIT OF DETECTION (mg/kg)
98-82-8	Isopropylbenzene	ND	0.20
108-86-1	Bromobenzene	ND	0.20
103-65-1	n - Propylbenzene	ND	0.20
95-49-8	2 - Chlorotoluene	ND	0.20
106-43-4	4 - Chlorotoluene	ND	0.20
108-67-8	1,3,5 - Trimethylbenzene	ND	0.20
98-06-6	tert - Butylbenzene	ND	0.20
95-63-6	1,2,4 - Trimethylbenzene	ND	0.20
135-98-8	sec - Butylbenzene	ND	0.20
541-73-1	1,3 - Dichlorobenzene	ND	0.20
106-46-7	1,4 - Dichlorobenzene	ND	0.20
99-87-6	4-Isopropyltoluene	ND	0.20
95-50-1	1,2 - Dichlorobenzene	ND	0.20
104-51-8	n - Butylbenzene	ND	0.20
96-12-8	1,2 - Dibromo - 3 - chloropropane (DBCP)	ND	1.00
120-82-1	1,2,4 - Trichlorobenzene	ND	0.20
91-20-3	Naphthalene	ND	0.20
87-68-3	Hexachlorobutadiene	ND	0.20
87-61-6	1,2,3 - Trichlorobenzene	ND	0.20

ND - Analyte not detected at stated limit of detection

## RUNTIME QUALITY ASSURANCE REPORT

INTERNAL STANDARDS		ICAL / CCAL	PERCENT RECOVERY	ACCEPTANCE RANGE
	AREA	AREA		
Pentafluorobenzene	622861	915137	68.1%	50 - 200 %
Fluorobenzene	1490430	2067119	72.1%	50 - 200 %
1,4 - Difluorobenzene	1145312	1706534	67.1%	50 - 200 %
Chlorobenzene - d5	823478	1166679	70.6%	50 - 200 %
1,4 - Dichlorobenzene - d4	312498	443457	70.5%	50 - 200 %
SYSTEM MONITORING COMPOUNDS		CONCENTRATION	PERCENT RECOVERY	ACCEPTANCE RANGE
Dibromofluoromethane		10.5	105%	86 - 118 %
Toluene - d8		10.3	103%	88 - 110 %
4 - Bromofluorobenzene		10.3	103%	86 - 115 %
1,2 - Dichlorobenzene - d4		9.99	99.9%	80 - 120 %

## REFERENCES

Method 8260: Volatile Organics by Gas Chromatography/Mass Spectrometry (GC/MS): Capillary Technique  
Test Methods for Evaluating Solid Waste, SW-846, Third Edition, USEPA, November 1990

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Client: Energy Fuels Nuclear  
Sample ID: MeOH Extraction Blank  
Laboratory ID: MB0403  
Matrix: Methanol / Water  
Dilution Factor: 200

Date Sampled: N/A  
Date Received: N/A  
Date Analyzed: 04/03/97  
Date Reported: April 8, 1997

C.A.S. #	TARGET COMPOUNDS	CONCENTRATION	LIMIT OF
		(mg/kg)	DETECTION (mg/kg)
75-71-8	Dichlorodifluoromethane	ND	0.20
74-87-3	Chloromethane	ND	0.20
75-01-4	Vinyl chloride (Chloroethene)	ND	0.20
74-83-9	Bromomethane	ND	0.20
75-00-3	Chloroethane	ND	0.20
75-69-4	Trichlorofluoromethane	ND	0.20
75-35-4	1,1 - Dichloroethene	ND	0.20
75-09-2	Methylene chloride (Dichloromethane)	ND	0.20
156-60-5	trans - 1, 2 - Dichloroethene	ND	0.20
75-34-3	1,1 - Dichloroethane	ND	0.20
156-59-2	cis - 1,2 - Dichloroethene	ND	0.20
74-97-5	Bromochloromethane	ND	0.20
67-66-3	Chloroform (Trichloromethane)	ND	0.20
594-20-7	2,2 - Dichloropropane	ND	0.20
71-55-6	1,1,1 - Trichloroethane	ND	0.20
107-06-2	1,2 - Dichloroethane	ND	0.20
563-58-6	1,1 - Dichloropropene	ND	0.20
56-23-5	Carbon tetrachloride (Tetrachloromethane)	ND	0.20
71-43-2	Benzene	ND	0.20
74-95-3	Dibromomethane	ND	0.20
78-87-5	1,2 - Dichloropropane	ND	0.20
79-01-6	Trichloroethene	ND	0.20
75-27-4	Bromodichloromethane	ND	0.20
10061-01-5	cis - 1,3 - Dichloropropene	ND	0.20
10061-02-6	trans - 1,3 - Dichloropropene	ND	0.20
79-00-5	1,1,2 - Trichloroethane	ND	0.20
108-88-3	Toluene	ND	0.20
106-93-4	1,2 - Dibromoethane	ND	0.20
142-28-9	1,3 - Dichloropropane	ND	0.20
124-48-1	Dibromochloromethane	ND	0.20
127-18-4	Tetrachloroethene	ND	0.20
630-20-6	1,1,1,2 - Tetrachloroethane	ND	0.20
108-90-7	Chlorobenzene	ND	0.20
100-41-4	Ethylbenzene	ND	0.20
108-38-3	m,p Xylenes (1,3- & 1,4-Dimethylbenzene)	ND	0.40
75-25-2	Bromoform (Tribromomethane)	ND	0.20
100-42-5	Styrene (Ethenylbenzene)	ND	0.20
95-47-6	o - Xylene (1,2-Dimethylbenzene)	ND	0.20
79-34-5	1,1,2,2 - Tetrachloroethane	ND	0.20
96-18-4	1,2,3 - Trichloropropane	ND	0.20

ND - Analyte not detected at stated limit of detection





# EPA METHOD 8260

Client: Energy Fuels Nuclear  
Sample ID: MeOH Extraction Blank  
Laboratory ID: MB0403

Date Sampled: N/A  
Date Analyzed: 04/03/97  
Date Reported: April 8, 1997

C.A.S. #	TARGET COMPOUNDS	CONCENTRATION (mg/kg)	LIMIT OF DETECTION (mg/kg)
98-82-8	Isopropylbenzene (1-Methylethylbenzene)	ND	0.20
108-88-1	Bromobenzene	ND	0.20
103-65-1	n - Propylbenzene	ND	0.20
95-49-8	2 - Chlorotoluene	ND	0.20
106-43-4	4 - Chlorotoluene	ND	0.20
108-67-8	1,3,5 - Trimethylbenzene	ND	0.20
98-06-6	tert - Butylbenzene	ND	0.20
95-63-6	1,2,4 - Trimethylbenzene	ND	0.20
135-98-8	sec - Butylbenzene	ND	0.20
541-73-1	1,3 - Dichlorobenzene	ND	0.20
106-46-7	1,4 - Dichlorobenzene	ND	0.20
99-87-6	4-Isopropyltoluene (1-Methyl-4-(1-methyl)-benzene)	ND	0.20
95-50-1	1,2 - Dichlorobenzene	ND	0.20
104-51-8	n - Butylbenzene	ND	0.20
96-12-8	1,2 - Dibromo - 3 - chloropropane	ND	1.00
120-82-1	1,2,4 - Trichlorobenzene	ND	0.20
91-20-3	Naphthalene	ND	0.20
87-68-3	Hexachlorobutadiene	ND	0.20
87-61-6	1,2,3 - Trichlorobenzene	ND	0.20

ND - Analyte not detected at stated limit of detection

## RUNTIME QUALITY ASSURANCE REPORT

INTERNAL STANDARDS		ICAL / CCAL	PERCENT RECOVERY	ACCEPTANCE RANGE
	AREA	AREA		
Pentafluorobenzene	773140	915137	84.5%	50 - 200 %
Fluorobenzene	1817248	2067119	87.9%	50 - 200 %
1,4 - Difluorobenzene	1472824	1706534	86.3%	50 - 200 %
Chlorobenzene - d5	986192	1166679	84.5%	50 - 200 %
1,4 - Dichlorobenzene - d4	367116	443457	82.8%	50 - 200 %
SYSTEM MONITORING COMPOUNDS		CONCENTRATION	PERCENT RECOVERY	ACCEPTANCE RANGE
Dibromofluoromethane		11.4	114%	86 - 118 %
Toluene - d8		10.0	100%	88 - 110 %
4 - Bromofluorobenzene		10.4	104%	86 - 115 %
1,2 - Dichlorobenzene - d4		10.1	101%	80 - 120 %

## REFERENCES

Method 8260: Volatile Organics by Gas Chromatography/Mass Spectrometry (GC/MS): Capillary Techniques  
Test Methods for Evaluating Solid Waste, SW-846, Third Edition, USEPA, November 1990

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QC RESULTS - MATRIX SPIKE**

Client: Energy Fuels Nuclear  
 Sample Set: C97-21383  
 Laboratory ID: C97-21598 S  
 Matrix: Soil  
 Dilution: 2,000

Date Sampled: 03/28/97  
 Date Received: 03/28/97  
 Date Extracted: 04/03/97  
 Date Analyzed: 04/03/97  
 Date Reported: April 8, 1997

**INTERNAL STANDARDS**

	ICAL / CCAL	SPIKED SAMPLE		SPIKE DUPLICATE		ACCEPTANCE
	AREA	AREA	%	AREA	%	RANGE
Pentafluorobenzene	915137	881999	96.4%	906939	99.1%	50 - 200 %
Fluorobenzene	2067119	2138039	103%	2138915	103%	50 - 200 %
1,4 - Difluorobenzene	1706534	1680543	98.5%	1709078	100%	50 - 200 %
Chlorobenzene - d5	1166679	1158128	99.3%	1155845	99.1%	50 - 200 %
1,4 - Dichlorobenzene-d4	443457	442795	99.9%	441603	99.6%	50 - 200 %

**SYSTEM MONITORING COMPOUNDS**

	SPIKED SAMPLE CONCENTRATION	PERCENT RECOVERY	SPIKE DUPLICATE CONCENTRATION	PERCENT RECOVERY	ACCEPTANCE RANGE
Dibromofluoromethane	10.8	108%	10.6	106%	86 - 118 %
Toluene - d8	10.1	101%	10.0	100%	88 - 110 %
4 - Bromofluorobenzene	10.2	102%	10.2	102%	86 - 115 %
1,2 - Dichlorobenzene-d4	10.2	102%	10.1	101%	80 - 120 %

**SPIKED SAMPLE RESULTS**

	SPIKED SAMPLE CONCENTRATION	ORIG. CONC. (mg/kg) *	SPIKE AMOUNT (mg/kg)	PERCENT RECOVERY	ACCEPTANCE RANGE
Vinyl chloride	8.54	ND	10.0	85.4%	80 - 120 %
1,1 - Dichloroethene	8.89	ND	10.0	88.9%	80 - 120 %
Chloroform	9.84	ND	10.0	98.4%	80 - 120 %
1,2 - Dichloroethane	10.5	ND	10.0	105%	80 - 120 %
Carbon tetrachloride	9.38	ND	10.0	93.8%	80 - 120 %
Benzene	9.38	ND	10.0	93.8%	80 - 120 %
Trichloroethene	9.55	ND	10.0	95.5%	80 - 120 %
Tetrachloroethene	9.03	ND	10.0	90.3%	80 - 120 %
Chlorobenzene	9.67	ND	10.0	96.7%	80 - 120 %
1,4 - Dichlorobenzene	9.17	ND	10.0	91.7%	80 - 120 %

**SPIKE DUPLICATE SAMPLE RESULTS**

	SPIKE DUP CONCENTRATION	ORIG. CONC. (mg/kg) *	SPIKE (mg/kg)	PERCENT RECOVERY	RPD	RPD LIMITS
Vinyl chloride	8.44	ND	10.0	84.4%	1.2%	10 %
1,1 - Dichloroethene	8.74	ND	10.0	87.4%	1.7%	10 %
Chloroform	9.79	ND	10.0	97.9%	0.5%	10 %
1,2 - Dichloroethane	10.3	ND	10.0	103%	2.3%	10 %
Carbon tetrachloride	9.53	ND	10.0	95.3%	1.6%	10 %
Benzene	9.41	ND	10.0	94.1%	0.3%	10 %
Trichloroethene	9.60	ND	10.0	96.0%	0.5%	10 %
Tetrachloroethene	9.31	ND	10.0	93.1%	3.1%	10 %
Chlorobenzene	9.93	ND	10.0	99.3%	2.7%	10 %
1,4 - Dichlorobenzene	9.48	ND	10.0	94.8%	3.4%	10 %

\* Concentration includes dilution correction

MATRIX SPIKE: 0 of 20 Matrix Spike results are outside of established QC Limits

MATRIX SPIKE DUPLICATE: 0 of 10 Matrix Spike Duplicate results are outside of established QC Limits

Report Approved By:

Report File: F:\REPORTS\CLIENTS\97E\_F\_N\_ORGANIC\CAS97\_21383.xls

 Analyzed:            yw  
 Reviewed:            sec