

ENGINEERS  
AND  
CONSTRUCTORS



**MORRISON KNUDSEN CORPORATION**

**MK-FERGUSON GROUP**

WELDON SPRING SITE REMEDIAL ACTION PROJECT  
7295 HIGHWAY 94 SOUTH  
ST. CHARLES, MISSOURI 63304  
PHONE: (314) 441-8086

March 11, 1994

U. S. Department of Energy  
Weldon Spring Site Remedial Action Project  
Attn: Mr. Stephen H. McCracken  
Project Manager  
7295 Highway 94 South  
St. Charles, MO 63304

SUBJECT: Contract No. DE-AC05-86OR21548  
SAINT CHARLES COUNTY WELL FIELD RESULTS  
FOURTH QUARTER, 1993

Dear Mr. McCracken:

Enclosed are the results of quarterly monitoring of the Saint Charles County Well Field for the fourth quarter of 1993. Parameters included for the production wells in the monitoring plan are total uranium, gross alpha, nitroaromatic compounds, and metals (As and Ba). Monitoring Locations GW-PW02 and GW-PW09 are also sampled for additional metals and inorganic anions as part of a geochemical study initiated in this calendar year's monitoring program. The analytical laboratory results for each well are contained in Attachment A of this letter. A copy of a draft letter is contained in Attachment B for your review. Both are ready for transmittal to the St. Charles County consultant.

Detectable concentrations of total uranium (less than or equal to 0.5 pCi/l) were observed for the fourth quarter but were within background for Missouri River alluvium. The detectable concentrations for gross alpha were within historic ranges and are representative of background levels in the Missouri River alluvium. No detectable concentrations of nitroaromatic compounds were observed in any of the production wells. The results for the remaining parameters were within expected ranges for this quarter.

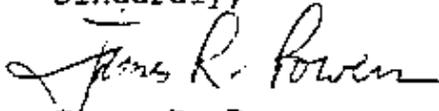
**MK-FERGUSON COMPANY**  
A MORRISON KNUDSEN COMPANY

PAGE 2: SAINT CHARLES COUNTY WELL FIELD RESULTS  
FOURTH QUARTER, 1993

Due to the 1993 flooding of the St. Charles County Well Field, four of the county's production wells (PW04, PW06, PW07, and PW08) have not been operational since the second quarter. Due to water damage to the pumps, these production wells could not be sampled. The county's RMW-series groundwater monitoring wells were also inundated during the flood in July and September and the wells have not been redeveloped due to minor damages to the permanent pumps. The RMW-series wells are presently being repaired and are to be sampled for the first quarter of 1994.

If you have any questions or comments regarding the well field results for the second and third quarters, please contact Rebecca Cato-Johnston of my staff.

Sincerely,



James R. Powers  
Project Director

JRP/rcj/jan

Enclosures: as stated

cc: Walker K. Love

ATTACHMENT A  
Analytical Results

# BARRINGER LABORATORIES INC.

15000 W. 6TH AVE., SUITE 300 GOLDEN, CO 80401 (303) 277-1687 FAX (303) 277-1689

28-Dec-93

Brian L. Claytor  
MK-FERGUSON (MO)  
Weldon Spring Site  
7295 Hwy 94 South  
St. Charles, MO 63303

Attn:  
Project: WSSRAP

Received: 10-Dec-93 09:05  
PO #: 3589-0002-5881 #350

Job: 939223E

Status: Final

## ANALYTICAL REPORT PACKAGE

CASE NARRATIVE.....1  
ANALYTICAL RESULTS.....R-1  
QUALITY CONTROL REPORT.....Q-1



# BARRINGER LABORATORIES INC.

15000 W. 6TH AVE., SUITE 300 GOLDEN, CO 80401 (303) 277-1687 FAX (303) 277-1689

28-Dec-93

Brian L. Claytor  
MK-FERGUSON (MO)  
Weldon Spring Site  
7295 Hwy 94 South  
St. Charles, MO 63303

Page: 1  
Copy: 1 of 2

Attn:  
Project: WSSRAP

Received: 10-Dec-93 09:05  
PO #: 3589-0002-5881 #350

Job: 939223E

Status: Final

## CASE NARRATIVE

A total of 9 Water samples were received on 10-Dec-93. All were properly preserved and in good condition. As stated in the chain of custody, the samples were run for the following analyses: Gross Alpha, Gross Beta and U. A table, to cross reference your sample ID to ours, is attached. Our procedures are summarized on the Quality Control Data Sheet. All samples were extracted and analyzed within the proper holding times.

Quality control standards for organic and inorganic analyses followed the appropriate SW-846 or EPA methodology. For radiochemistry, the acceptance criteria for spikes and laboratory control standards is fifteen percent, plus the counting error. Duplicates will pass if the Replicate Error Ratio (RER) is 1.00 or less. The RER is defined as follows:

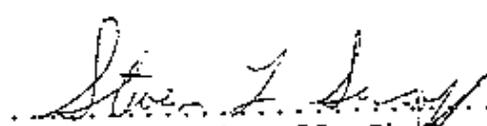
$$RER = \frac{ABS(R2 - R1)}{\sqrt{ERROR1^2 + ERROR2^2}}$$

where: R1/R2 = original/duplicate sample result  
ERROR1/ERROR2 = total 2 sigma uncertainty of R1/R2

All QC checks, including duplicates, spikes, and blanks, passed.

This report is amended to reflect the reanalysis of sample GW-RAWW-Q493.

Signed:

  
Steven L. Sincoff, Ph.D.  
Director of Operations

# BARRINGER LABORATORIES INC.

15000 W. 6TH AVE., SUITE 300 GOLDEN, CO 80401 (303) 277-1687 FAX (303) 277-1689

26-Dec-93

Brian L. Claytor  
MK-FERGUSON (MO)  
Weldon Spring Site  
7295 Hwy 94 South  
St. Charles, MO 63303

Page: ii  
Copy: 1 of 2

Attn:  
Project: WSSRAP

Received: 10-Dec-93 09:05  
PO #: 3589-0002-5881 #350

Job: 939223E Status: Final

Lab-ID	Matrix	Client Sample ID	Sampled
939223-1	Water	GW-1027-1293	8-Dec-93
939223-2	Water	GW-3024-120993	9-Dec-93
939223-3	Water	GW-3025-120993	9-Dec-93
939223-4	Water	GW-FINW-Q493	9-Dec-93
939223-5	Water	GW-PW02-Q493	9-Dec-93
939223-6	Water	GW-PW03-Q493 (MS/DC)	9-Dec-93
939223-7	Water	GW-PW05-Q493	9-Dec-93
939223-8	Water	GW-PW09-Q493	9-Dec-93
939223-9	Water	GW-RAWW-Q493	9-Dec-93

# BARRINGER LABORATORIES INC.

15000 W. 5TH AVE., SUITE 300 GOLDEN, CO 80401 (303) 277-1687 FAX (303) 277-1659

21-Dec-93

Page: Q-1

Copy: 1 of 2

Status: Final

MK-FERGUSON (MO)

## QUALITY CONTROL REPORT

Sample Id	Gross Alpha Total		Gross Beta Total	
	pCi/l	+ 2 $\sigma$	pCi/l	+ 2 $\sigma$
Duplicate	3.3	$\pm 2.2$	8.2	$\pm 2.1$
Duplicate	3.7	$\pm 2.2$	7.6	$\pm 2.1$
RPD	0.0		0.0	
Std (found value)	201	$\pm 6$	106	$\pm 2$
Std (true value)	206		101	
Std % rec.	96		105	
Blank	0.0	$\pm 0.1$	0.0	$\pm 0.3$
Spike % rec.	97		101	
LCS (found value)	252	$\pm 7$	189	$\pm 3$
LCS (true value)	312		202	
LCS % rec.	83		93	

Sample Id	U Total	
	pCi/l	
Duplicate	0.5	
Duplicate	0.5	
RPD	0.0	
Std (found value)	31.7	
Std (true value)	34.0	
Std % rec.	93	
Blank	<0.2	
Spike % rec.	99	
LCS (found value)	22.5	
LCS (true value)	23.1	
LCS % rec.	98	

# BARRINGER LABORATORIES INC.

15000 W. 6TH AVE., SUITE 300 GOLDEN, CO 80401 (303) 277-1687 FAX (303) 277-1689

21-Dec-93

Brian L. Claytor  
MK-FERGUSON (MO)  
Weldon Spring Site  
7295 Hwy 94 South  
St. Charles, MO 63303

Page: Q-2  
Copy: 1 of 2

Attn:  
Project: WSSRAP

Received: 10-Dec-93 09:05  
PO #: 3589-0002-5881 #350

Job: 939223E

Status: Final

Abbreviations:

Parameters:

U

: Uranium

Units:

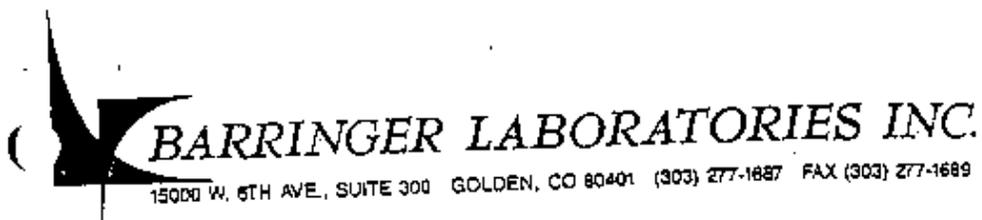
pCi/l

: picroCuries per liter

Quality codes:

NR

: Not Requested



21-Dec-93

Brian L. Claytor  
MK-FERGUSON (MO)  
Weldon Spring Site  
7295 Hwy 94 South  
St. Charles, MO 63303

Page: Q-3  
Copy: 1 of 2

Attn:  
Project: WSSRAP

Received: 10-Dec-93 09:05  
PO #: 3589-0002-5881 #350

Job: 939223E Status: Final

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QUALITY CONTROL REPORT

QUALITY CONTROL DATA SHEET

Received by: rc Via: Fed Ex

Sample Container Type: 500ml pl, 1L pl  
Additional Lab Preparation: None

Parameter	Method	Preservative	Analyst	Analysis Dates
Gross Alpha	900.0	HNO3	Knock	12/15-12/16
Gross Beta	900.0	HNO3	Knock	12/15-12/16
U	ASTM D2907	HNO3	Meyer	12/17-12/20

# BARRINGER LABORATORIES INC.

15000 W. 6TH AVE., SUITE 300 GOLDEN, CO 80401 (303) 277-1687 FAX (303) 277-1689

21-Dec-93

Brian L. Claytor  
MK-FERGUSON (MO)  
Weldon Spring Site  
7295 Hwy 94 South  
St. Charles, MO 63303

Page: Q-4  
Copy: 1 of 2

Attn:  
Project: WSSRAP

Received: 10-Dec-93 09:05  
PO #: 3589-0002-5881 #350

Job: 939223E

Status: Final

Signed:

*William G. Hunt*  
.....  
Radiochemistry Manager

Barringer Laboratories, Inc. will return or dispose of your samples 30 days from the date your final report is mailed, unless otherwise specified by contract. Barringer Laboratories, Inc. reserves the right to return samples prior to the 30 days if radioactive levels exceed our license.



LABORATORY ANALYTICAL ELECTRONIC DATA DELIVERABLE  
 FILE: K:\DATA\VER\BA\BA350.OBF  
 PRINTED: 01/06/94 14:59

YSSRAP Sample ID **GW-FINW-Q493**      Sample Matrix **GROUNDWATER**      Sample Date **12/09/93**      Lab ID **9392234**

Category	Parameter	Conc.	±Err	Units	DL	Ext. Date	Acq. Date	Method	Comments	Qualifier
RADIOCHEMICAL	GROSS ALPHA	0.7	1.2	PCI/L	2		12/15/93	EPA 900.0		M
	GROSS BETA	5.7	2.0	PCI/L	4		12/15/93	EPA 900.0		M
	URANIUM, TOTAL	0.5		PCI/L	0.2		12/17/93	ASTM D2907		M

Lab ID: 9392235

Sample Date: 12/09/93

Sample Matrix: GROUNDWATER

WSSRAP Sample ID: GW-PW02-Q493

Qualifier: H  
 N  
 H

Comments:

Method: EPA 900.0  
 EPA 900.0  
 ASTM D2907

Ans. Date: 12/15/93  
 12/15/93  
 12/17/93

Ext. Date:

DL: 2  
 4  
 0.2

Units: PC1/L  
 PC1/L  
 PC1/L

±Err: 2.0  
 2.1  
 0.3

Conc: 2.6  
 5.5  
 0.3

Parameter: GROSS ALPHA  
 GROSS BETA  
 URANIUM, TOTAL

Category: RADIOCHEMICAL

LABORATORY ANALYTICAL ELECTRONIC DATA DELIVERABLE  
 FILE: K:\DATA\ER\04\BA350.DBF  
 PRINTED: 01/06/94 14:59

USSRAP Sample ID: **GM-PW03-Q493**      Sample Matrix: **GROUNDWATER**      Lab ID: **9392236**  
 Sample Date: **12/09/93**

Category	Parameter	Conc.	±Err	Units	DL	Ext. Date	Ans. Date	Method	Comments	Qualifier
RADIOCHEMICAL	GROSS ALPHA	3.3	2.2	PCI/L	2		12/15/93	EPA 900.0		H
	GROSS BETA	8.2	2.1	PCI/L	4		12/15/93	EPA 900.0		K
	URANIUM, TOTAL	0.5		PCI/L	0.2		12/17/93	ASTM D2907		H

LABORATORY ANALYTICAL IRONIC DATA DELIVERABLE  
 FILE: K:\DATA\VER\BA\BA550.DBF  
 PRINTED: 01/06/94 14:59

VSSRAP Sample ID **GW-PW03-Q493-DU**      Sample Matrix **GROUNDWATER**      Sample Date **12/09/93**      Lab ID **93922311**

Category	Parameter	Conc.	#Err	Units	DL	Ext. Date	Ann. Date	Method	Comments	Qualifier
RADIOCHEMICAL	GROSS ALPHA	3.7	2.2	PCI/L	2		12/15/93	EPA 900.0	DU RPD=0.0X	N
	GROSS BETA	7.6	2.1	PCI/L	4		12/15/93	EPA 900.0	DU RPD=0.0X	M
	URANIUM, TOTAL	0.5		PCI/L	0.2		12/17/93	ASTM D2907	DU RPD=0.0X	H

LABORATORY ANALYTICAL ELECTRONIC DATA DELIVERABLE  
 FILE: K:\DATA\VER\81\8A350.DBF  
 PRINTED: 01/06/94 14:59

U5SRAP Sample ID **GW-PW03-Q493-MB**      Sample Matrix **GROUNDWATER**      Lab ID **93922310**  
 Sample Date **12/09/93**

Category	Parameter	Conc.	Units	DL	Ext. Date	Ana. Date	Method	Comments	Qualifier
RADIOCHEMICAL	GROSS ALPHA	1010	PCI/L	2		12/15/93	EPA 900.0	MS X REC=97%	N
	GROSS BETA	516	PCI/L	4		12/15/93	EPA 900.0	MS X REC=101%	N
	URANIUM, TOTAL	19.6	PCI/L	0.2		12/17/93	ASTM D2907	MS X REC=99%	M

LABORATORY ANALYTICAL IRONIC DATA DELIVERABLE  
 FILE: K:\DATA\VA\VA\BA350.DBF  
 PRINTED: 01/06/94 14:59

USERAP Sample ID **GW-PW05-Q493**      Sample Matrix **GROUNDWATER**      Lab ID: **9392237**  
 Sample Date **12/09/93**

Category	Parameter	Conc.	Units	DL	Ext. Date	Ana. Date	Method	Comments	Qualifier
ADICHEMICAL	GROSS ALPHA	7.1	PC/L	2		12/15/93	EPA 900.0		N
	GROSS BETA	10	PC/L	4		12/15/93	EPA 900.0		N
	URANIUM, TOTAL	0.6	PC/L	0.2		12/17/93	ASTM D2907		N

LABORATORY ANALYTICAL ELECTRONIC DATA DELIVERABLE  
 FILE: K:\DATA\ER\B\B350.DBF  
 PRINTED: 01/06/94 14:59

Lab ID  
**9392238**

Sample Date  
**12/09/93**

Sample Matrix  
**GROUNDWATER**

USSRAP Sample ID  
**GW-PW09-Q493**

Qualifier  
 H  
 H  
 N

Comments

Method  
 EPA 900.0  
 EPA 900.0  
 ASTM D2907

ANA Date  
 12/15/93  
 12/15/93  
 12/17/93

EXL Date

DL  
 2  
 4  
 0.2

±Err Units  
 3.0 / PCT/L  
 2.6 / PCT/L  
 PCT/L

Conc.  
 5.3 /  
 8.6 /  
 0.3 /

parameter  
 GROSS ALPHA  
 GROSS BETA  
 URANIUM, TOTAL

Category  
 RADIOCHEMICAL

MSSRAP Sample ID **GW-RAWW-Q493**      Sample Matrix **GROUNDWATER**      Sample Date **12/09/93**      Lab ID **9392239**

PROPERTY	Conc.	Units	DL	Ext. Date	Ans. Date	Method	Qualifier
PERFORMER	0.9	PC/L	2	12/15/93	12/15/93	EPA 900.0	N
GROSS ALPHA	5.1	PC/L	4	12/15/93	12/15/93	EPA 900.0	N
GROSS BETA	0.3	PC/L	0.2	12/17/93	12/17/93	ASTM D2907	N
URANIUM, TOTAL							

Comments  
 (5) (C)  
 (1) (C)



DEPARTMENT OF THE ARMY  
U. S. ARMY ENVIRONMENTAL HYGIENE AGENCY  
ABERDEEN PROVING GROUND, MARYLAND 21010-5422



REPLY TO  
ATTENTION OF

JAN 24 1994

HSHB-ML-O

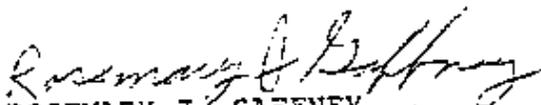
19 Jan 94

MEMORANDUM FOR Weldon Spring Remedial Action Project, 7295  
Highway 94 South, St. Charles, Missouri 63304

SUBJECT: Analysis of Ground Water from Weldon Spring Site  
Remedial Action Project for Nitroaromatic Compounds

Results of water samples covered under requests #416 and #418  
taken from the Weldon Spring Remedial Action Project are  
enclosed.

Encl

  
ROSEMARY J. GAFFNEY  
Chief, Chromatographic Analysis Branch  
Organic Environmental Chemistry Division

SUBJECT: Analysis of Ground Water from Weldon Spring Site  
Remedial Action Project for Nitroaromatic Compounds

DATE: 19 January 1994

1. SUMMARY OF RESULTS:

a. Provided are the results obtained from the analyses of 9 water samples submitted under request #416. The samples were collected 8 and 9 December. Three of the samples had analytical results that were above the analytical detection limits listed below.

<u>COMPOUND</u>	<u>DETECTION LIMIT</u>
nitrobenzene (NB)	0.030 ug/L
1,3-dinitrobenzene (1,3-DNB)	0.090 ug/L
2,4-dinitrotoluene (2,4-DNT)	0.030 ug/L
2,6-dinitrotoluene (2,6-DNT)	0.010 ug/L
2,4,6-trinitrotoluene (TNT)	0.030 ug/L
1,3,5-trinitrobenzene (TNB)	0.030 ug/L

b. The sample and control results are tabulated in the Data Summary Sheet.

2. DISCUSSION OF RESULTS:

a. Procedure:

(1) All water samples were extracted within seven days of their collection date and analyzed using the same procedure employed for previous samples from Weldon Spring.

(2) The analytical procedure included the following steps:

- (a) A 100 ml water sample was brought to volume in a 100 ml volumetric flask.
- (b) A measured amount of 3,4-dinitrotoluene (12 ug) was added as an internal standard.
- (c) 0.5 ml toluene was added to the flask.
- (d) The flask was agitated on a rotary shaker 30 minutes.
- (e) The toluene extract was then analyzed by gas

chromatography using an electron capture detector.

(3) The analysis was conducted using two different chromatographic columns. The "primary" column, a DB1, was used for the analysis of most samples and matrix spikes. A "confirmation" column, a DB210, was used to confirm those samples where interfering compounds co-elute with analytes on the primary column.

#### b. Quality Control

(1) A duplicate 100 ml portion of samples from locations not previously sampled was treated as described above except that a spike containing each of the six nitroaromatics at eight times the detection level, plus the internal standard, was added to the water sample prior to the toluene extraction. This sample was designated as the matrix spiked sample and the recovery data obtained for each of these samples are reported on the sample result sheets.

(2) Standards containing all the nitroaromatic compounds were extracted from a water matrix and analyzed in duplicate to establish calibration curves and response factors relative to the internal standard for each compound of interest. During sample analysis, one of these standards was reanalyzed after every fifth sample to monitor for shifts in the calibration.

(3) Blind controls were independently submitted by the quality control coordinator for the Chromatographic Analysis Branch to be analyzed along with actual samples. A laboratory water "blank" was also carried through the entire analytical procedure to compensate for spurious chromatographic peaks arising from impurities in reagents and or carrier gas etc.

#### c. Results.

(1) As stated before, three of the samples contained nitroaromatics above the reported detection limits.

(2) In an attempt to normalize matrix spike data, all calibration standards were extracted from a water matrix. These recoveries provide a indication of the true matrix effect of each sample. Mean values were achieved ranging from 103% for 1,3-DNB, NB and 2,6-DNT to 109% for 2,4,6-TNT.

(3) The results of the blind control samples submitted by the Chromatographic Analysis Branch quality control coordinator were acceptable for all analytes. Recoveries of the six analytes ranged from 87% for 2,6-DNT and 2,4-DNT to 103% for 1,3,5-TNB.

(4) A summary sheet of the sample results is included in this report, followed by the individual sample data sheets listed by increasing USAEHA sample number which contains any pertinent information or comments applicable to the individual sample. The summary of the matrix spike data is also included in this report. Pertinent chromatograms representing the sample and the sample matrix spikes run on both the primary and the confirmation columns are included.

Analyst:

CURTIS G. OLIVER  
Chemist

Reviewed by:

Beth Curtis  
BETH CURTIS  
Chemist

Rosemary J. Gaffney  
ROSEMARY J. GAFFNEY  
Branch Chief, CAB

MATRIX RECOVERY DATA SUMMARY SHEET

SAMPLE	NE	1,3-DNB	2,4-DNT	2,6-DNT	2,4,6-TNT	1,3,5-TNB
RS166	104	101	94	***	100	108
RS167	108	112	119	***	117	100
RS170	104	103	106	105	112	112
RS170MD	100	100	106	100	108	108
WS-3040	100	101	106	105	108	108
AVERAGE % RECOVERY	103	103	106	103	109	107

\*\*\* Data unavailable due to dilution.

ANALYSTS: LCO, JBS

REVIEWED: CJK

REVIEWED: JBS

ANALYSIS OF NITROAROMATICS IN WATER FROM WELDON SPRINGS  
DEPARTMENT OF ENERGY, STATE OF MISSOURI SAMPLES

SAMPLE INFORMATION:

=====

USAEMA SAMPLE NUMBER: R5168  
FIELD NUMBER: GW-FINW-Q493  
REQUEST NUMBER: 416  
COLLECTION DATE: 09 DEC 93

Analyzed by AEMA SOP 87.3

ANALYSIS INFORMATION:

=====

EXTRACTION DATE: 13 DEC 93  
ANALYSIS DATE: 15 DEC 93

PRIMARY COLUMN ANALYSIS:

(All results reported as ug/l)

	NE	1,3-DNB	2,4-DNT	2,6-DNT	2,4,6-TNT	1,3,5-TNB
=====	=====	=====	=====	=====	=====	=====
AVG. RESULTS	< 0.03	< 0.03	< 0.03	< 0.01	< 0.03	< 0.03
=====	=====	=====	=====	=====	=====	=====

Note: Location sampled previously, matrix monitor not necessary.

ANALYSTS: LCO, JBS

REVIEWED: *EMC*

REVIEWED: *RK*

ANALYSIS OF NITROAROMATICS IN WATER FROM WELDON SPRINGS  
DEPARTMENT OF ENERGY, STATE OF MISSOURI SAMPLES

SAMPLE INFORMATION:

=====

USAHA SAMPLE NUMBER: R5169  
FIELD NUMBER: GW-PW02-Q493  
REQUEST NUMBER: 416  
COLLECTION DATE: 09 DEC 93

ANALYSIS INFORMATION:

=====

EXTRACTION DATE: 13 DEC 93  
ANALYSIS DATE: 16 DEC 93

Analyzed by ACHA SCP 87.3

PRIMARY COLUMN ANALYSIS:

(All results reported as ug/L)

	NE	1,3-DNB	2,4-DNT	2,6-DNT	2,4,6-TNT	1,3,5-TNB
AVG. RESULTS	< 0.03	< 0.03	< 0.03	< 0.01	< 0.03	< 0.03

Note: Location sampled previously, matrix monitor not necessary.

ANALYSTS: *GO, JBS*

REVIEWED: *BMC*

REVIEWED: *ELL*

ANALYSIS OF NITROAROMATICS IN WATER FROM WELDON SPRINGS  
 DEPARTMENT OF ENERGY, STATE OF MISSOURI SAMPLES

SAMPLE INFORMATION:

=====

USAEHA SAMPLE NUMBER: RS170  
 FIELD NUMBER: GW-PW03-Q493  
 REQUEST NUMBER: 416  
 COLLECTION DATE: 09 DEC 93

ANALYSIS INFORMATION:

=====

EXTRACTION DATE: 13 DEC 93  
 ANALYSIS DATE: 16 DEC 93

Analyzed by AEHA SOP 87.3

PRIMARY COLUMN ANALYSIS:

(All results reported as ug/L)

	NE	1,3-DNB	2,4-DNT	2,6-DNT	2,4,6-TNT	1,3,5-TNB
AVG. RESULTS	< 0.03	< 0.03	< 0.03	< 0.01	< 0.03	< 0.03

MATRIX SPIKE SAMPLE

(All results reported as ug/L)

	NE	1,3-DNB	2,4-DNT	2,6-DNT	2,4,6-TNT	1,3,5-TNB
AMT ADDED	0.24	0.72	0.16	0.082	0.24	0.24
AVG. RESULTS	0.25	0.74	0.17	0.084	0.27	0.27
% RECOVERY	104	103	106	105	113	112

ANALYSTS: (L-C, JBS)

REVIEWED: BMC

REVIEWED: RLA

ANALYSIS OF NITROAROMATICS IN WATER FROM WELDON SPRINGS  
 DEPARTMENT OF ENERGY, STATE OF MISSOURI SAMPLES

SAMPLE INFORMATION:

=====

USAEHA SAMPLE NUMBER: R5170ND  
 FIELD NUMBER: GW-PW03-Q493  
 REQUEST NUMBER: 416  
 COLLECTION DATE: 09 DEC 93

ANALYSIS INFORMATION:

=====

EXTRACTION DATE: 13 DEC 93  
 ANALYSIS DATE: 16 DEC 93

Analyzed by AEHA SOP 87.3

PRIMARY COLUMN ANALYSIS:

(All results reported as ug/L)

	NE	2,3-DNE	2,4-DNT	2,6-DNT	2,4,6-TNT	2,3,6-TNB
AVG. RESULTS	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03

MATRIX SPIKE SAMPLE

(All results reported as ug/L)

	NE	2,3-DNE	2,4-DNT	2,6-DNT	2,4,6-TNT	2,3,6-TNB
AMT ADDED	0.24	0.72	0.16	0.080	0.24	0.24
AVG. RESULTS	0.24	0.72	0.17	0.080	0.26	0.26
% RECOVERY	100	100	106	100	108	108

ANALYSTS: *GO, JBS*

REVIEWED: *BMC*

REVIEWED: *[Signature]*

ANALYSIS OF NITROAROMATICS IN WATER FROM WELDON SPRINGS  
DEPARTMENT OF ENERGY, STATE OF MISSOURI SAMPLES

SAMPLE INFORMATION:

=====

USAEHA SAMPLE NUMBER: R5171  
FIELD NUMBER: GW-PW05-Q493  
REQUEST NUMBER: 416  
COLLECTION DATE: 09 DEC 93

ANALYSIS INFORMATION:

=====

EXTRACTION DATE: 13 DEC 93  
ANALYSIS DATE: 16 DEC 93

Analyzed by AEHA SOP 87.3

PRIMARY COLUMN ANALYSIS:

(All results reported as ug/l)

	NS	1,3-DNB	2,4-DNB	2,6-DNB	2,4,6-TNB	1,3,5-TNB
=====						
AVG. RESULTS	< 0.03	< 0.03	< 0.03	< 0.02	< 0.03	< 0.03
=====						

Note: Location sampled previously, matrix monitor not necessary.

ANALYSTS: (GO), JBS

REVIEWED: BTK

REVIEWED: *[Signature]*

USAEHA Form 14a, 15 Mar 90

ANALYSIS OF NITROAROMATICS IN WATER FROM WELDON SPRINGS  
DEPARTMENT OF ENERGY, STATE OF MISSOURI SAMPLES

SAMPLE INFORMATION:

=====

USAEHA SAMPLE NUMBER: RS172  
FIELD NUMBER: GW-PW09-Q493  
REQUEST NUMBER: 416  
COLLECTION DATE: 09 DEC 93

ANALYSIS INFORMATION:

=====

EXTRACTION DATE: 13 DEC 93  
ANALYSIS DATE: 16 DEC 93

Analyzed by ASHA SOP 87.3

PRIMARY COLUMN ANALYSIS:

(All results reported as ug/L)

	NB	1,3-DNB	2,4-DNB	2,6-DNB	2,4,6-TNB	1,3,5-TNB
=====	=====	=====	=====	=====	=====	=====
AVG. RESULTS	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
=====	=====	=====	=====	=====	=====	=====

Note: Location sampled previously, matrix monitor not necessary.

ANALYSTS: GO, JBS

REVIEWED: JSMC

REVIEWED: *[Signature]*

ANALYSIS OF NITROAROMATICS IN WATER FROM WELDON SPRINGS  
DEPARTMENT OF ENERGY, STATE OF MISSOURI SAMPLES

SAMPLE INFORMATION:

=====

USAEHA SAMPLE NUMBER: RS173  
FIELD NUMBER: GW-RAWW-Q493  
REQUEST NUMBER: 416  
COLLECTION DATE: 09 DEC 93

Analyzed by AEHA SOP 27.3

ANALYSIS INFORMATION:

=====

EXTRACTION DATE: 13 DEC 93  
ANALYSIS DATE: 16 DEC 93

PRIMARY COLUMN ANALYSIS:

(All results reported as ug/l)

	NE	1,3-DNE	1,4-DNT	2,6-DNT	2,4,6-TNT	1,3,5-TNB
=====						
AVG. RESULTS	< 0.03	< 0.09	< 0.03	< 0.01	< 0.03	< 0.03
=====						

Note: Location sampled previously, matrix monitor not necessary.

ANALYSTS: LGO, JBS

REVIEWED: *BTM*

REVIEWED: *RL*

USAEHA Form 14a, 15 Mar 90

ANALYSIS OF NITROAROMATICS IN WATER FROM WELDON SPRINGS  
 DEPARTMENT OF ENERGY, STATE OF MISSOURI SAMPLES

SAMPLE INFORMATION:

=====

USAEMA SAMPLE NUMBER: WS-3340  
 FIELD NUMBER: INTERNAL Q.C. CHECK  
 REQUEST NUMBER: 416  
 COLLECTION DATE: N/A

ANALYSIS INFORMATION:

=====

EXTRACTION DATE: 13 DEC 93  
 ANALYSIS DATE: 14 DEC 93

Analyzed by AEMA SOP 87.3

(All results reported as ug/L)

Sample Results:	Theoretical Amt. Added:	Percent Recovery:
NB	0.087	0.090 97 %
1,3-DNB	0.25	0.27 93 %
2,4-DNT	0.052	0.060 87 %
2,6-DNT	0.026	0.030 87 %
2,4,6-TNT	0.085	0.090 94 %
1,3,5-TNB	0.093	0.090 103 %

Matrix Spike Results:	Theoretical Amt. Added:	Percent Recovery:
NB	0.33	0.24 100 %
1,3-DNB	0.98	0.72 101 %
2,4-DNT	0.22	0.16 106 %
2,6-DNT	0.11	0.080 105 %
2,4,6-TNT	0.35	0.24 105 %
1,3,5-TNB	0.35	0.24 108 %

ANALYSTS: CGO, JBS

REVIEWED: BMC

REVIEWED: AE

**ENVIRONMENTAL SAMPLE CHAIN-OF-CUSTODY / AUTHORIZATION FORM**  
**WELDON SPRING SITE REMED. / ACTION PROJECT (WSSRAP)**  
 7295 HIGHWAY 94 SOUTH, ST. CHARLES, MO 63304  
 TELEPHONE (314) 441-8086 TELEX (314) 447-0803

EST-ESAP 4.1.2.1 Rev. 2. Effective 07/18/93

Validation Documentation:  CAM  
 WSSRAP Contact: BRIAN CLAYTON  
 Phone Number: (314) 441-8086 ext. 3703  
 Request Number: 416.0

Lab/PO#: USAEHA / A105-900R21913  
 Shipped By: QUINONEZ, N  
 Turnaround time:  Standard  Accelerated  Priority  Urgent  Emergency

#	Sample ID	Q C *	Date Sampled	WBS Code	Medium	Container Size	Container Type	Preserv.	Parameter	A F C
1	GU-1027-1293		12/08/93	EMP	WATER	1 LITER	GLASS, AMBER NH	COOL (ICE)	NITROAROMATICS	No
2A	GU-3024-120993		12/09/93	EMP	WATER	1 LITER	GLASS, AMBER NH	COOL (ICE)	NITROAROMATICS	No
3A	GU-3025-120993		12/09/93	EMP	WATER	1 LITER	GLASS, AMBER NH	COOL (ICE)	NITROAROMATICS	No
4C	GU-F11M-0493		12/09/93	EMP	WATER	1 LITER	GLASS, AMBER NH	COOL (ICE)	NITROAROMATICS	No
5A	GU-P402-0493		12/09/93	EMP	WATER	1 LITER	GLASS, AMBER NH	COOL (ICE)	NITROAROMATICS	No
6C	GU-P403-0493		12/09/93	EMP	WATER	1 LITER	GLASS, AMBER NH	COOL (ICE)	NITROAROMATICS	No
7C	GU-P405-0493		12/09/93	EMP	WATER	1 LITER	GLASS, AMBER NH	COOL (ICE)	NITROAROMATICS	No
8A	GU-P409-0493		12/09/93	EMP	WATER	1 LITER	GLASS, AMBER NH	COOL (ICE)	NITROAROMATICS	No
9C	GU-R4M-0493		12/09/93	EMP	WATER	1 LITER	GLASS, AMBER NH	COOL (ICE)	NITROAROMATICS	No

Checked by: *Clasobly*  
 Technical Reviewer: *Jean Pieg, Jim Meier*

Sampler's Signature	Received By	Date	Time	Reason For Transfer	Seal Intact? (Y/N)	Cooler Temp
<i>T. Seib</i>	<i>Miller</i>	12/15/93	14:00	Pack	Y/N	7°C
<i>Miller</i>	<i>Seib</i>	12/15/93	16:00	Sup	Y	7°C
<i>Miller</i>	<i>Miller</i>	12/15/93	16:15	Cub	Y	4°C

Signature: *T. Seib* Date: *12-15-93*  
 Signature: *Miller* Date: *12-15-93*  
 Signature: *Miller* Date: *12-15-93*  
 AUTHORIZATION: *Quinonez* Date: *12-15-93*  
 Date site Shipping Officer: *12-15-93*  
 Date ES&H: *12-15-93*  
 Date ES&H: *12-15-93*



LIONVILLE ANALYTICAL LABORATORY  
208 WELSH POOL ROAD  
LIONVILLE, PA 19341-1313  
215-524-6100 • FAX: 215-524-6141

January 6, 1994

Mr. Brian Claytor  
MK Ferguson Company  
Weldon Spring Site Remedial Action Project  
7295 Highway 94 South  
St. Charles, MO 63303

Re: Order 3589-0002-5885

Dear Mr. Claytor:

Enclosed is the diskette, two (2) hardcopy printouts and the data validation packages for the following requests:

<u>Request #</u>	<u>Batch Number</u>
534	9312L929
536	9312L956 → NO DATA INCLUDED
537	9312L999

Please call me at (215) 524-7360 if you have any questions.

Very truly yours,

ROY F. WESTON, INC.

Carol Schrenkel  
Project Manager



/clk

Enclosure:





**ENVIRONMENTAL SAMPLE CHAIN-OF-CUSTODY / AUTHORIZATION FORM**  
**WELDON SPRING SITE REMEDIAL ACTION PROJECT (WSSRAP)**  
 7295 HIGHWAY 94 SOUTH, ST. CHARLES, MO 63304  
 TELEPHONE (314) 441-8086 TELEX (314) 447-0803

Validation Documentation:  Standard  Urgent  Emergency

WSSRAP Contact: BRIAN CLAYTOR  
 Phone Number: (314) 441-8086 ext. 3703  
 Request Number: 536.0  
 Lab/PO#: WESTON / 3589-0002-5885  
 Shipped By: QUINONEZ, M  
 Turnaround Time:  Standard  Accelerated  Priority  Urgent  Emergency

#	Sample ID	Q	C	Date Sampled	WBS Code	Medium	Container Size	Container Type	Preserv.	Parameter	A	F	C
4D	GM-P402-0493		*	12/09/93	EMP	WATER	500 ML	PLASTIC, BOTTLE	H2SO4 PH < 2	PHOSPHORUS, TOTAL	No		
E							1 LITER	PLASTIC, BOTTLE	COOL (ICE)	ALKALINITY	No		
E							1 LITER	PLASTIC, BOTTLE	COOL (ICE)	SILICA, DISSOLVED	No		
5A	GM-P403-0493		*	12/09/93	EMP	WATER	1 LITER	PLASTIC, BOTTLE	HNO3 PH < 2	ARSENIC (GEO)	No		
A							1 LITER	PLASTIC, BOTTLE	HNO3 PH < 2	BARIUM (GEO)	No		
6A	GM-P405-0493			12/09/93	EMP	WATER	1 LITER	PLASTIC, BOTTLE	HNO3 PH < 2	ARSENIC (GEO)	No		
A							1 LITER	PLASTIC, BOTTLE	HNO3 PH < 2	BARIUM (GEO)	No		
7B	GM-P409-0493			12/09/93	EMP	WATER	1 LITER	PLASTIC, BOTTLE	COOL (ICE)	BROMIDE	No		
A							1 LITER	PLASTIC, BOTTLE	COOL (ICE)	CHLORIDE	No		
B							1 LITER	PLASTIC, BOTTLE	COOL (ICE)	NITRATE-N	No		
U							1 LITER	PLASTIC, BOTTLE	COOL (ICE)	NITRITE-N	No		
B							1 LITER	PLASTIC, BOTTLE	COOL (ICE)	SULFATE	No		
B							1 LITER	PLASTIC, BOTTLE	HNO3 PH < 2	METALS, HSL+LI+MO (CLP)	No		
C							1 LITER	PLASTIC, BOTTLE	HNO3 PH < 2	STRONTIUM (GEO)	No		
C							500 ML	PLASTIC, BOTTLE	H2SO4 PH < 2	PHOSPHORUS, TOTAL	No		
D													

Relinquished By: *[Signature]* Date: 12-7-93 1445  
 Received By: *[Signature]* Date: 12-7-93 1130  
*[Signature]* Date: 12-10-93 07:20  
*[Signature]* Date: *[Blank]*

Checked by: *[Signature]* Date: *[Blank]*  
 Reason For Transfer: *[Blank]*  
 Seal Intact? (Y/N): *[Blank]*  
 Cooler Temp: *[Blank]*

Technical Reviewer: *[Signature]*  
 AUTHORIZATION: *[Signature]* Date: 12-9-93  
 Site Shipping Officer: *[Signature]* Date: *[Blank]*  
 MK-F Procurement: *[Signature]* Date: *[Blank]*





LABORATORY ANALYTICAL -- ELECTRONIC DATA DELIVERABLE  
 FILE: K:\DATA\AVR\MS\MS556.DBF  
 PRINTED: 01/10/96 09:50

VSSRP Sample ID **GW-FINW-Q493**      Sample Matrix **GROUNDWATER**      Sample Date **12/09/93**      Lab ID **12L956003**

Category	Parameter	Conc.	zERI	Units	DL	Ext. Date	Anal. Date	Method	Comments	Qualifier
METALS	ARSENIC	ND		UG/L	2.00 ✓	12/15/93	12/19/93	EPA CLP		N
	BARIUM	86.4 ✓		UG/L	6.00 ✓	12/15/93	12/21/93	EPA CLP		N

USSRAP Sample ID **GW-PW02-0493**      Sample Matrix **GROUNDWATER**      Sample Date **12/09/93**      Lab ID **12L956004**

Category	Parameter	Conc.	±Err	Units	DL	Ext. Date	App. Date	Method	Comments	Qualifier
IONS	BROMIDE	ND	✓	MG/L	0.38	12/14/93	12/14/93	EPA 300.0		N
	CHLORIDE	13.5	✓	MG/L	1.00	12/14/93	12/14/93	EPA 300.1	DF 4.00	N
	NITRATE-N	ND	✓	MG/L	0.02	12/10/93	12/10/93	EPA 353.1		N
	NITRITE-N	ND	✓	MG/L	0.02	12/10/93	12/10/93	EPA 353.1		N
	SULFATE	48.4	✓	MG/L	2.50	12/14/93	12/14/93	EPA 300.0	DF 10.00	N

Category	Parameter	Conc.	±Err	Units	DL	Ext. Date	App. Date	Method	Comments	Qualifier
METALS	ALUMINUM	ND	✓	UG/L	48.0	12/15/93	12/21/93	EPA CLP		N
	ANTIMONY	ND	✓	UG/L	46.0	12/15/93	12/21/93	EPA CLP		N
	ARSENIC	329	✓	UG/L	2.00	12/15/93	12/19/93	EPA CLP		N
	BARIUM	ND	✓	UG/L	6.00	12/15/93	12/21/93	EPA CLP		N
	BERYLLIUM	ND	✓	UG/L	1.00	12/15/93	12/21/93	EPA CLP		N
	CADMIUM	ND	✓	UG/L	5.00	12/15/93	12/21/93	EPA CLP		N
	CALCIUM	62400	✓	UG/L	28.0	12/15/93	12/21/93	EPA CLP		N
	CHROMIUM	ND	✓	UG/L	6.00	12/15/93	12/21/93	EPA CLP		N
	COBALT	ND	✓	UG/L	7.00	12/15/93	12/21/93	EPA CLP		N
	COPPER	3810	✓	UG/L	7.00	12/15/93	12/21/93	EPA CLP		N
	IRON	ND	✓	UG/L	7.00	12/15/93	12/21/93	EPA CLP		N
	LEAD	ND	✓	UG/L	2.00	12/15/93	12/21/93	EPA CLP		N
	LITHIUM	ND	✓	UG/L	28.0	12/15/93	12/21/93	EPA CLP		N
	MAGNESIUM	15200	✓	UG/L	58.0	12/15/93	12/21/93	EPA CLP		N
	MANGANESE	394	✓	UG/L	2.00	12/15/93	12/21/93	EPA CLP		N
	MERCURY	ND	✓	UG/L	0.10	12/20/93	12/20/93	EPA CLP		N
	MOLYBDENUM	ND	✓	UG/L	39.0	12/15/93	12/21/93	EPA CLP		N
	NICKEL	ND	✓	UG/L	12.0	12/15/93	12/21/93	EPA CLP		N
	POTASSIUM	4270	✓	UG/L	905	12/15/93	12/21/93	EPA CLP		N
	SELENIUM	ND	✓	UG/L	2.00	12/15/93	12/17/93	EPA CLP		N
SILVER	ND	✓	UG/L	7.00	12/15/93	12/21/93	EPA CLP		N	
SODIUM	21200	✓	UG/L	47.0	12/15/93	12/21/93	EPA CLP		N	
STRONTIUM	370	✓	UG/L	6.00	12/15/93	12/21/93	EPA CLP		N	
THALLIUM	ND	✓	UG/L	2.00	12/15/93	12/17/93	EPA CLP		N	
VANADIUM	ND	✓	UG/L	3.00	12/15/93	12/21/93	EPA CLP		N	
ZINC	11.4	✓	UG/L	3.00	12/27/93	12/29/93	EPA CLP		N	

Category	Parameter	Conc.	±Err	Units	DL	Ext. Date	App. Date	Method	Comments	Qualifier
HISC.	ALKALINITY	230	✓	MG/L	10.0	12/17/93	12/17/93	EPA 310.1		N
	PHOSPHOROUS	0.38	✓	MG/L	0.05	12/16/93	12/16/93	EPA 365.2		N
	SILICA, DISSOLVED	7.40	✓	MG/L	2.00	12/15/93	12/15/93	EPA 370.1	DF 10.00	N

LABORATORY ANALYTICAL L. - ITRONIC DATA DELIVERABLE  
 FILE: K:\DATA\AVRUS\SS36.DBF  
 PRINTED: 01/10/94 09:50

MSRAP Sample ID	Sample Matrix	Sample Date	Lab ID
<b>GW-PW03-Q493</b>	<b>GROUNDWATER</b>	<b>12/09/93</b>	<b>12L956005</b>

Parameter  
 ARSENIC  
 BARIUM

Conc.  
 MD  
 299 ✓

Units  
 UG/L  
 UG/L

DL  
 2.00 ✓  
 6.00 ✓

Ext. Date  
 12/15/93  
 12/15/93

Ana. Date  
 12/19/93  
 12/21/93

Method  
 EPA CLP  
 EPA CLP

Comments

Qualifier  
 H  
 N

Category  
 TALS

LABORATORY ANALYTICAL ELECTRONIC DATA DELIVERABLE  
 FILE: X:\DATA\AVR\MS\5536.D8F  
 PRINTED: 01/10/94 09:50

MSRAP Sample ID: **GW-PW03-0493-DU**      Sample Matrix: **GROUNDWATER**      Sample Date: **12/09/93**      Lab ID: **12L956005**

Conc. NO	DL	Units	Ext. Date	Ana. Date	Method	Comments	Qualifier
310 ✓	2.00 ✓	UG/L	12/15/93	12/19/93	EPA CLP	REP, X DIFF=NC	N
	6.00 ✓	UG/L	12/15/93	12/21/93	EPA CLP	REP, X DIFF=3.50	N

Parameter: ARSENIC  
 BARLIUM

LABORATORY ANALYTICAL - ELECTRONIC DATA DELIVERABLE  
 FILE: K:\DATA\AVR\MS\MS36.DBF  
 PRINTED: 01/10/94 09:50

MSRAP Sample ID: **GW-PW03-Q493-MB**      Sample Matrix: **GROUNDWATER**      Sample Date: **12/09/93**      Lab ID: **12L956005**

Category	Conc.	±EFF	Units	DL	Ext. Date	Ans. Date	Method	Comments	Qualifier
PERMETALS	36.6 ✓		UG/L	2.00 ✓	12/15/93	12/19/93	EPA CLP	MS, X REC=91.50	N
ARSENIC	2240 ✓		UG/L	6.00 ✓	12/15/93	12/21/93	EPA CLP	MS, X REC=97.20	N
BARIUM									

LABORATORY ANALYTICAL ELECTRONIC DATA DELIVERABLE

FILE: K:\DATA\VER1\MS\WSS36.DBF

PRINTED: 01/10/94 09:50

WSSRAP Sample ID **GW-PW05-Q493**      Sample Matrix **GROUNDWATER**      Sample Date **12/09/93**      Lab ID **121956006**

Category	Parameter	Conc.	Units	DL	Ext. Date	App. Date	Method	Comments	Qualifier
METALS	ARSENIC	ND	UG/L	2.00 ✓	12/15/93	12/19/93	EPA CLP		N
	BARIUM	512 ✓	UG/L	6.00 ✓	12/15/93	12/21/93	EPA CLP		N

Lab 10  
 12L956007

Sample Date  
 12/09/93

Sample Matrix  
 GROUNDWATER

VSSRAP Sample ID  
 GW-PW09-Q493

Category	Parameter	Conc.	Unit	DL	Ext. Date	Anal. Date	Method	Comments	Qualifier
IONS	BROMIDE	ND	MG/L	0.38	12/14/93	12/14/93	EPA 300.0		N
	CHLORIDE	7.50	MG/L	0.25	12/14/93	12/14/93	EPA 300.1		N
	NITRATE-N	ND	MG/L	0.02	12/10/93	12/10/93	EPA 353.1		N
	NITRITE-N	ND	MG/L	0.02	12/10/93	12/10/93	EPA 353.1		N
	SULFATE	37.5	MG/L	2.50	12/14/93	12/14/93	EPA 300.0	DF 10.00	N
METALS	ALUMINUM	ND	UG/L	48.0	12/15/93	12/21/93	EPA CLP		N
	ANTIMONY	ND	UG/L	46.0	12/15/93	12/21/93	EPA CLP		N
	ARSENIC	3.90	UG/L	2.00	12/15/93	12/19/93	EPA CLP		N
	BARIUM	500	UG/L	6.00	12/15/93	12/21/93	EPA CLP		N
	BERYLLIUM	ND	UG/L	1.00	12/15/93	12/21/93	EPA CLP		N
	CADMIUM	ND	UG/L	5.00	12/15/93	12/21/93	EPA CLP		N
	CALCIUM	108000	UG/L	28.0	12/15/93	12/21/93	EPA CLP		N
	CHROMIUM	ND	UG/L	6.00	12/15/93	12/21/93	EPA CLP		N
	COBALT	ND	UG/L	7.00	12/15/93	12/21/93	EPA CLP		N
	COPPER	ND	UG/L	7.00	12/15/93	12/21/93	EPA CLP		N
	IRON	6110	UG/L	7.00	12/15/93	12/17/93	EPA CLP		N
	LEAD	ND	UG/L	2.00	12/15/93	12/21/93	EPA CLP		N
	LITHIUM	ND	UG/L	28.0	12/15/93	12/21/93	EPA CLP		N
	MAGNESIUM	26400	UG/L	58.0	12/15/93	12/21/93	EPA CLP		N
	MANGANESE	383	UG/L	2.00	12/15/93	12/21/93	EPA CLP		N
	MERCURY	ND	UG/L	0.10	12/20/93	12/20/93	EPA CLP		N
	MOLYBDENUM	ND	UG/L	39.0	12/15/93	12/21/93	EPA CLP		N
	NICKEL	ND	UG/L	12.0	12/15/93	12/21/93	EPA CLP		N
	POTASSIUM	3690	UG/L	905	12/15/93	12/21/93	EPA CLP		N
	SELENIUM	ND	UG/L	2.00	12/15/93	12/17/93	EPA CLP		N
SILVER	ND	UG/L	7.00	12/15/93	12/21/93	EPA CLP		N	
SODIUM	7540	UG/L	47.0	12/15/93	12/21/93	EPA CLP		N	
STRONTIUM	569	UG/L	6.00	12/15/93	12/21/93	EPA CLP		N	
THALLIUM	ND	UG/L	2.00	12/15/93	12/17/93	EPA CLP		N	
THORIUM	9.00	UG/L	3.00	12/15/93	12/21/93	EPA CLP		N	
ZINC	50.9	UG/L	3.00	12/27/93	12/29/93	EPA CLP		N	
MISC.	ALKALINITY	350	MG/L	10.0	12/17/93	12/17/93	Method EPA 310.1		N
	PHOSPHOROUS	0.40	MG/L	0.05	12/16/93	12/16/93	EPA 365.2		N
	SILICA, DISSOLVED	8.30	MG/L	2.00	12/15/93	12/15/93	EPA 370.1	DF 10.00	N

ATTACHMENT B  
Draft Summary Letter

DRAFT LETTER

Mr. Stanley Remington  
Consulting Hydrologist  
919 Broadmoor Lane  
St. Charles, MO 63301

Dear Mr. Remington:

**ST. CHARLES COUNTY WELL FIELD RESULTS, FOURTH QUARTER 1993**

Enclosed are the results of quarterly monitoring of the Saint Charles County Well Field for the fourth quarter of 1993. Parameters included for the production wells in the monitoring plan are total uranium, gross alpha, nitroaromatic compounds, and metals (As and Ba). Monitoring Locations GW-PW02 and GW-PW09 are also sampled for additional metals and inorganic anions as part of a geochemical study initiated in this calendar year's monitoring program. The analytical laboratory results for each well are attached.

Detectable concentrations of total uranium (less than or equal to 0.5 pCi/l) were observed for the fourth quarter but were within background for Missouri River alluvium. The detectable concentrations for gross alpha were within historic ranges and are representative of background levels in the Missouri River alluvium. No detectable concentrations of nitroaromatic compounds were observed in any of the production wells. The results for the remaining parameters were within expected ranges for this quarter.

Due to the 1993 flooding of the St. Charles County Well Field, four of the county's production wells (PW04, PW06, PW07, and PW08) have not been operational since the second quarter. Due to water damage to the pumps, these production wells could not be sampled. The county's RMW-series groundwater monitoring wells were also inundated during the flood in July and September and the wells have not been

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redeveloped due to minor damages to the permanent pumps. The  
RMW-series wells are presently being repaired and are to be  
sampled for the first quarter of 1994.

If you have any questions or comments regarding the Well  
Field results for the fourth quarter, please contact Tom  
Paulings of my staff.

Sincerely,

Stephen H. McCracken  
Project Manager  
Weldon Spring Site  
Remedial Action Project