

# THERMO NUtech

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Kerr McGee Corp. Data Package  
Work Order # 97-10-277D

Data Review by:

*Wm. H. H. H.*

Date: 12/29/97

QC Review by:

*Kathy Burman*

Date: 12/29/97

# COPY

9903080198 981106  
PDR ADOCK 07003073  
B PDR

RECEIVED  
JAN 05 1998  
Safety & Environ. Ctr.

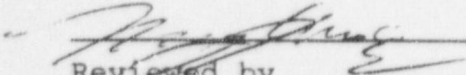
T H E R M O   N U T E C H  
K E R R   M C G E E

SDG/Ver 9710277E  
Contact Mary Kamoss

Client Kerr McGee  
Contract Shipping #971022207  
Case no \_\_\_\_\_

S U M M A R Y   D A T A   S E C T I O N

| T A B L E   O F   C O N T E N T S |   |   |   |   |   |
|-----------------------------------|---|---|---|---|---|
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Reviewed by \_\_\_\_\_

Lab id NUTECH ABQ  
Protocol -  
Version 1  
Form DVD-TOC  
Version 3.08  
Report date 12/29/97

## THERMO NUTECH

KERR MCGEE

9710277-04

CU3-41-006

## DATA SHEET

SDG/Version 9710277D

Client/Case no Kerr McGee

Contact Mary Kamoss

Contract Shipping #971022207

Lab sample id 9710277-04

Client sample id CU3-41-006

Dept sample id

Location/Matrix

WATER

Received 10/24/97

Collected/Volume/Basis 10/20/97 14:00 4100 ML

% moisture

Custody/SAS no/Level

| ANALYTE         | CAS NO | RESULT<br>pCi/l | 2σ ERR<br>(TOTAL) | NDA<br>pCi/l | RDL<br>pCi/l | QUALI-<br>FIERS | TEST |
|-----------------|--------|-----------------|-------------------|--------------|--------------|-----------------|------|
| Gross Alpha     |        | 44              | 17                | 14           |              |                 | GA   |
| Gross Beta      |        | 55              | 12                | 8.7          |              |                 | GB   |
| Radium 228      |        | 19              | 3.5               | 2.3          | 3.0          |                 | RA28 |
| Radium 226      |        | 3.8             | 0.58              | 0.081        | 0.50         |                 | R226 |
| Uranium 233/234 |        | 3.0             | 0.35              | 0.045        | 0.10         | B               | U    |
| Uranium 235     |        | 0.058           | 0.029             | 0.009        |              |                 | U    |
| Uranium 238     |        | 2.7             | 0.32              | 0.025        | 0.10         |                 | U    |
| Thorium 228     |        | 2.8             | 0.33              | 0.071        |              |                 | TH   |
| Thorium 230     |        | 2.2             | 0.27              | 0.022        | 0.10         |                 | TH   |
| Thorium 232     |        | 2.8             | 0.33              | 0.028        | 0.10         |                 | TH   |

| TEST | PLANCHET | SUFFIX | YIELD | ANALYZED | BY | METHOD     | REFERENCE     |
|------|----------|--------|-------|----------|----|------------|---------------|
| GA   |          |        | 100   | 11/17/97 | KP | EPA-600    | 900.0         |
| GB   |          |        | 100   | 11/17/97 | KP | EPA-600    | 900.0         |
| RA28 |          |        | 53    | 12/08/97 | KP | EPA,       | 1980b         |
| R226 |          |        | 87    | 12/18/97 | KP | EPA 1980,  | 903.1         |
| U    |          |        | 83    | 12/03/97 | NJ | DOE 1990,  | HASL-300 U-02 |
| TH   |          |        | 86    | 12/04/97 | NJ | LANL 1986, | ER200         |

## DATA SHEETS

Page 1

## SUMMARY DATA SECTION

Page 1

Lab id NUTECH ABQ

Protocol -

Version 1

Form DVD-DS

Version 3.08

Report date 12/29/97

## THERMO NUTech

KERR MCGEE

9711033-02

## METHOD BLANK

Method Blank

SDG/Version 9710277D

Client/Case no Kerr McGee

Contact Mary Kamoss

Contract Shipping #971022207

Lab sample id 9711033-02

Client sample id Method Blank

Dept sample id

Material/Matrix

WATER

% moisture

SAS no

| ANALYTE         | CAS NO | RESULT<br>pCi/l | 2σ ERR<br>(TOTAL) | MDA<br>pCi/l | RDL<br>pCi/l | QUALI-<br>FIERS | TES. |
|-----------------|--------|-----------------|-------------------|--------------|--------------|-----------------|------|
| Gross Alpha     |        | -0.15           | 1.3               | 2.6          |              | U               | GA   |
| Gross Beta      |        | 0.037           | 1.4               | 2.5          |              | U               | GB   |
| Radium 228      |        | -1.2            | 0.51              | 0.95         | 3.0          | U               | RA28 |
| Radium 226      |        | 0.080           | 0.066             | 0.11         | 0.50         | U               | R226 |
| Uranium 233/234 |        | 0.047           | 0.030             | 0.029        | 0.10         | J               | U    |
| Uranium 235     |        | -0.008          | 0.016             | 0.043        |              | U               | U    |
| Uranium 238     |        | 0.012           | 0.014             | 0.011        | 0.10         | J               | U    |
| Thorium 228     |        | 0.030           | 0.011             | 0.11         |              | UX              | TH   |
| Thorium 230     |        | 0.007           | 0.026             | 0.049        | 0.10         | U               | TH   |
| Thorium 232     |        | 0.007           | 0.015             | 0.027        | 0.10         | U               | TH   |

| TEST | PLANCHET | SUFFIX   | %YIELD | ANALYZED                | BY | METHOD REFERENCE |
|------|----------|----------|--------|-------------------------|----|------------------|
| GA   | 100      | 11/17/97 | KP     | EPA-600 900.0           |    |                  |
| GB   | 100      | 11/17/97 | KP     | EPA-600 900.0           |    |                  |
| RA28 | 87       | 12/09/97 | KP     | EPA, 1980b              |    |                  |
| R226 | 89       | 12/19/97 | KP     | EPA 1980, 903.1         |    |                  |
| U    | 89       | 12/04/97 | NJ     | DOE 1990, HASL-300 U-02 |    |                  |
| TH   | 67       | 12/05/97 | NJ     | LANL 1986, ER200        |    |                  |

## METHOD BLANKS

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## SUMMARY DATA SECTION

Page 2

Lab id NUTECH ABQ

Protocol -

Version 1

Form DVD-DS

Version 3.0B

Report date 12/29/97

## THERMO NUTECH

KERR MCGEE

9711033-03

Lab Control Sample

## LAB CONTROL SAMPLE

SDG/Version 9710277D

Client/Case no Kerr McGee

Contact Mary Kamoss

Contract Shipping #971022207

Lab sample id 9711033-03

Client sample id Lab Control Sample

Dept sample id

Material/Matrix

WATER

% moisture

SAS no

| ANALYTE         | RESULT<br>pCi/l | 2σ ERR<br>(TOTAL) | MDA<br>pCi/l | RDL<br>pCi/l | QUALI-<br>PIERS | TEST | ADDED<br>pCi/l | 2σ ERR<br>pCi/l | REC<br>% | 3σ LIMITS<br>(TOTAL) | PROTOCOL<br>LIMITS |
|-----------------|-----------------|-------------------|--------------|--------------|-----------------|------|----------------|-----------------|----------|----------------------|--------------------|
| Gross Alpha     | 100             | 24                | 2.0          |              |                 | GA   | 75.2           | 2.3             | 133      | 52-148               |                    |
| Gross Beta      | 110             | 18                | 2.8          |              |                 | GB   | 99.3           | 4.5             | 111      | 72-128               |                    |
| Radium 228      | 15              | 3.1               | 0.84         | 3.0          |                 | RA28 | 19.0           | 0.82            | 79       | 75-125               |                    |
| Radium 226      | 14              | 2.1               | 0.079        | 0.50         |                 | R226 | 11.9           | 1.1             | 118      | 70-130               |                    |
| Uranium 233/234 | 9.4             | 0.98              | 0.052        | 0.10         |                 | U    | 9.71           | 0.87            | 97       | 80-120               |                    |
| Uranium 235     | 0.41            | 0.094             | 0.040        |              |                 | U    |                |                 |          |                      |                    |
| Uranium 238     | 9.9             | 1.0               | 0.012        | 0.10         | B               | U    | 9.71           | 0.87            | 102      | 80-120               |                    |
| Thorium 228     | 0.031           | 0.062             | 0.11         |              | U               | TH   |                |                 |          |                      |                    |
| Thorium 230     | 4.9             | 0.54              | 0.031        | 0.10         |                 | TH   | 5.18           | 0.22            | 95       | 83-117               |                    |
| Thorium 232     | -0.026          | 0.021             | 0.052        | 0.10         | U               | TH   |                |                 |          |                      |                    |

| SUF-YIELD |          |     |          |             |                         |
|-----------|----------|-----|----------|-------------|-------------------------|
| TEST      | PLANCHET | PIX | %        | ANALYZED BY | METHOD REFERENCE        |
| GA        |          | 100 | 11/17/97 | KP          | EPA-600 900.0           |
| GB        |          | 100 | 11/17/97 | KP          | EPA-600 900.0           |
| RA28      |          | 38  | 12/09/97 | KP          | EPA, 1980b              |
| R226      |          | 84  | 12/19/97 | KP          | EPA 1980, 903.1         |
| U         |          | 84  | 12/04/97 | NJ          | DOE 1990, HASL-300 U-02 |
| TH        |          | 87  | 12/05/97 | NJ          | LANL 1986, ER200        |

LAB CONTROL SAMPLES

Page 1

SUMMARY DATA SECTION

Page 3

Lab id NUTECH ABO

Protocol -

Version 1

Form DVD-LCS

Version 3.08

Report date 12/29/97

## THERMO NUTEC

KERR MCGEE

9711033-01

CU3-41-003

## DUPLICATE

|                                 |                                     |                                                      |
|---------------------------------|-------------------------------------|------------------------------------------------------|
| SDG/Version <u>9710277D</u>     | Client/Case no <u>Kerr McGee</u>    |                                                      |
| Contact <u>Mary Kamoss</u>      | Contract <u>Shipping #971022207</u> |                                                      |
| DUPLICATE                       | ORIGINAL                            |                                                      |
| Lab sample id <u>9711033-01</u> | Lab sample id <u>9710277-01</u>     | Client sample id <u>CU3-41-003</u>                   |
| Dept sample id _____            | Dept sample id _____                | Location/Matrix _____ <u>WATER</u>                   |
| Client samp id _____            | Received <u>10/24/97</u>            | Collected/Volume/Basis <u>10/26/97 13:00 4145 ML</u> |
| % moisture _____                | % moisture _____                    | Custody/SAS no/Level _____                           |

| ANALYTE         | DUPLICATE<br>pCi/l | 2σ ERR<br>(TOTAL) | MDA<br>pCi/l | RDL<br>pCi/l | QUALI-<br>FIERS | TEST | ORIGINAL<br>pCi/l | 2σ ERR<br>(TOTAL) | MDA<br>pCi/l | QUALI-<br>FIERS | RPD<br>% | 3σ<br>TOT | DER<br>σ |
|-----------------|--------------------|-------------------|--------------|--------------|-----------------|------|-------------------|-------------------|--------------|-----------------|----------|-----------|----------|
| Uranium 233/234 | 4.8                | 0.54              | 0.064        | 0.10         |                 | U    | 5.9               | 0.63              | 0.041        | B               | 21       | 23        | 2.6      |
| Uranium 235     | 0.077              | 0.040             | 0.033        |              |                 | U    | 0.13              | 0.046             | 0.010        |                 | 51       | 89        | 1.7      |
| Uranium 238     | 2.6                | 0.33              | 0.055        | 0.10         |                 | U    | 3.9               | 0.44              | 0.041        |                 | 40       | 26        | 4.7      |
| Thorium 228     | 0.68               | 0.12              | 0.088        |              |                 | TH   | 0.64              | 0.11              | 0.061        |                 | 6        | 37        | 0.5      |
| Thorium 230     | 0.33               | 0.072             | 0.032        | 0.10         |                 | TH   | 0.30              | 0.065             | 0.026        |                 | 10       | 46        | 0.6      |
| Thorium 232     | 0.55               | 0.098             | 0.022        | 0.10         |                 | TH   | 0.54              | 0.094             | 0.020        |                 | 2        | 37        | 0.1      |

| TEST | DUPLICATE<br>PLANCHET | SUP- YIELD<br>FIX | % ANALYZED BY | ORIGINAL<br>PLANCHET | SUP-YIELD<br>FIX | % ANALYZED BY | METHOD REFERENCE        |
|------|-----------------------|-------------------|---------------|----------------------|------------------|---------------|-------------------------|
| U    |                       | 79                | 12/04/97 NJ   |                      | 98               | 12/03/97 NJ   | DOE 1990, HASL-300 U-02 |
| TH   |                       | 89                | 12/05/97 NJ   |                      | 89               | 12/04/97 NJ   | LANL 1986, ER200        |

DUPLICATES

Page 1

SUMMARY DATA SECTION

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Lab id NUTEC ABQProtocol -Version 1Form DVD-DUPVersion 3.08Report date 12/29/97

## THERMO NUTEC

KERR MCGEE

9711033-01

CU3-41-008

DUPLICATE

|                                 |                                     |                                                      |
|---------------------------------|-------------------------------------|------------------------------------------------------|
| SDG/Version <u>9710277D</u>     | Client/Case no <u>Kerr McGee</u>    |                                                      |
| Contact <u>Mary Kamoss</u>      | Contract <u>Shipping #971022207</u> |                                                      |
| DUPLICATE                       | ORIGINAL                            |                                                      |
| Lab sample id <u>9711033-01</u> | Lab sample id <u>9710277-06</u>     | Client sample id <u>CU3-41-008</u>                   |
| Dept sample id _____            | Dept sample id _____                | Location/Matrix _____ <u>WATER</u>                   |
| Client samp id _____            | Received <u>10/24/97</u>            | Collected/Volume/Basis <u>10/20/97 15:10 4261 ML</u> |
| % moisture _____                | % moisture _____                    | Custody/SAS no/Level _____                           |

| ANALYTE    | DUPLICATE<br>pCi/l | 2σ ERR<br>(TOTAL) | MDA<br>pCi/l | RDL<br>pCi/l | QUALI-<br>FIERS | TEST | ORIGINAL<br>pCi/l | 2σ ERR<br>(TOTAL) | MDA<br>pCi/l | QUALI-<br>FIERS | RPD<br>% | 3σ DER<br>TOT | σ   |
|------------|--------------------|-------------------|--------------|--------------|-----------------|------|-------------------|-------------------|--------------|-----------------|----------|---------------|-----|
| Radium 226 | 0.93               | 0.18              | 0.13         | 0.50         |                 | R226 | 1.3               | 0.22              | 0.095        |                 | 33       | 38            | 2.6 |

| TEST | DUPLICATE<br>PLANCHET | SUF- YIELD<br>FIX | % ANALYZED BY | ORIGINAL<br>PLANCHET | SUF-YIELD<br>FIX | % ANALYZED BY | METHOD REFERENCE |
|------|-----------------------|-------------------|---------------|----------------------|------------------|---------------|------------------|
| R226 |                       | 87                | 12/19/97 KP   |                      | 83               | 12/19/97 KP   | EPA 1980, 903.1  |

DUPLICATES

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SUMMARY DATA SECTION

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Lab id NUTEC ABQ  
 Protocol -  
 Version 1  
 Form DVD-DUP  
 Version 3.08  
 Report date 12/29/97

## THERMO NUTECH

KERR MCGEE

9711033-01

CU3-41-009

## DUPLICATE

|                                 |                                 |                                                      |  |
|---------------------------------|---------------------------------|------------------------------------------------------|--|
| SDG/Version <u>9710277D</u>     |                                 | Client/Case no <u>Kerr McGee</u>                     |  |
| Contact <u>Mary Kamoss</u>      |                                 | Contract <u>Shipping #971022207</u>                  |  |
| DUPLICATE                       |                                 | ORIGINAL                                             |  |
| Lab sample id <u>9711033-01</u> | Lab sample id <u>9710277-07</u> | Client sample id <u>CU3-41-009</u>                   |  |
| Dept sample id _____            | Dept sample id _____            | Location/Matrix <u>WATER</u>                         |  |
| Client samp id _____            | Received <u>10/24/97</u>        | Collected/Volume/Basis <u>10/20/97 15:30 4236 ML</u> |  |
| % moisture _____                | % moisture _____                | Custody/SAS no/Level _____                           |  |

| ANALYTE    | DUPLICATE<br>pCi/l | 2σ ERR<br>(TOTAL) | MDA<br>pCi/l | RDL<br>pCi/l | QUALI-<br>FIERS | TEST | ORIGINAL<br>pCi/l | 2σ ERR<br>(TOTAL) | MDA<br>pCi/l | QUALI-<br>FIERS | RPD<br>% | 3σ DER<br>TOT | o   |
|------------|--------------------|-------------------|--------------|--------------|-----------------|------|-------------------|-------------------|--------------|-----------------|----------|---------------|-----|
| Radium 228 | 150                | 23                | <u>7.9</u>   | 3.0          |                 | RA28 | 170               | 26                | <u>6.5</u>   |                 | 13       | 32            | 1.2 |

| TEST | DUPLICATE<br>PLANCHET | SUF- YIELD<br>FIX | % ANALYZED BY | ORIGINAL<br>PLANCHET | SUF-YIELD<br>FIX | % ANALYZED BY | METHOD REFERENCE |
|------|-----------------------|-------------------|---------------|----------------------|------------------|---------------|------------------|
| RA28 |                       | 60                | 12/08/97 KP   |                      | 59               | 12/09/97 KP   | EPA, 1780b       |

DUPLICATES

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SUMMARY DATA SECTION

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Lab id NUTECH ABQProtocol -Version 1Form DVD-DUPVersion 3.08Report date 12/29/97

## THERMO NUTech

KERR MCGEE

9711033-01

CU3-41-011

## DUPLICATE

|                                 |                                 |                                                      |  |
|---------------------------------|---------------------------------|------------------------------------------------------|--|
| SDG/Version <u>9710277D</u>     |                                 | Client/Case no <u>Kerr McGee</u>                     |  |
| Contact <u>Mary Famosa</u>      |                                 | Contract <u>Shipping #971022207</u>                  |  |
| DUPLICATE                       |                                 | ORIGINAL                                             |  |
| Lab sample id <u>9711033-01</u> | Lab sample id <u>9710277-09</u> | Client sample id <u>CU3-41-011</u>                   |  |
| Dept sample id _____            | Dept sample id _____            | Location/Matrix _____ <u>WATER</u>                   |  |
| Client samp id _____            | Received <u>10/24/97</u>        | Collected/Volume/Basis <u>10/20/97 16:00 4163 ML</u> |  |
| % moisture _____                | % moisture _____                | Custody/SAS no/Level _____                           |  |

| ANALYTE     | DUPLICATE<br>pCi/l | 2σ ERR<br>(TOTAL) | MDA<br>pCi/l | RDL<br>pCi/l | QUALI-<br>FIERS | TEST | ORIGINAL<br>pCi/l | 2σ ERR<br>(TOTAL) | MDA<br>pCi/l | QUALI-<br>FIERS | RPD<br>% | 3σ DER<br>TOT | σ   |
|-------------|--------------------|-------------------|--------------|--------------|-----------------|------|-------------------|-------------------|--------------|-----------------|----------|---------------|-----|
| Gross Alpha | 53                 | 23                | 22           |              |                 | GA   | 33                | 15                | 14           |                 | 47       | 96            | 1.5 |
| Gross Beta  | 32                 | 12                | 17           |              |                 | GB   | 25                | 10                | 14           |                 | 25       | 80            | 0.9 |

| TEST | DUPLICATE<br>PLANCHET | SUF- YIELD<br>FIX | % ANALYZED BY | ORIGINAL<br>PLANCHET | SUF-YIELD<br>FIX | % ANALYZED BY | METHOD REFERENCE |
|------|-----------------------|-------------------|---------------|----------------------|------------------|---------------|------------------|
| GA   |                       | 100               | 11/17/97 KP   |                      | 100              | 11/17/97 KP   | EPA-600 900.0    |
| GB   |                       | 100               | 11/17/97 KP   |                      | 100              | 11/17/97 KP   | EPA-600 900.0    |

DUPLICATES

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SUMMARY DATA SECTION

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Lab id NUTECH ABO  
 Protocol -  
 Version 1  
 Form DVD-DUP  
 Version 3.08  
 Report date 12/29/97