

DISTRIBUTION:

Docket File 40-6659

- PDR
- NRC Region IV *DSollenberger*
- WMUR r/f
- WMUR w/f
- NMSS r/f
- SZJones
- BPFisher
- HJPettengill
- RDSmith
- JJLinehan
- DEMartin
- REBrowning
- JBMartin

SEP 30 1982

WMUR:SZJ  
Docket No. 40-6659  
04006659100E

MEMORANDUM FOR: Docket File No. 40-6659

FROM: Samuel Z. Jones, Project Manager  
Operating Facility Section II, WMUR

SUBJECT: REVIEW OF ENVIRONMENTAL MONITORING DATA AND 40CFR190  
DOSE CALCULATIONS FOR THE PETROTOMICS MILL

By letter dated June 4, 1982, Petrotomics Company submitted the results of environmental monitoring data and dose assessment for the first quarter of 1982 as required by Amendment No. 9, License Condition No. 30. My review of the data provided is discussed below.

I. Airborne Effluents

| Radionuclide | MPC <sub>a</sub> (µCi/ml) | *Conc.                   | Location | % MPC |
|--------------|---------------------------|--------------------------|----------|-------|
| U-nat        | 5 x 10 <sup>-12</sup>     | 1.5 x 10 <sup>-14</sup>  | Site 5   | 0.3   |
| Ra-226       | 2 x 10 <sup>-12</sup>     | 2.17 x 10 <sup>-14</sup> | Site 3   | 1.1   |
| Th-230       | 3 x 10 <sup>-13</sup>     | 7.0 x 10 <sup>-15</sup>  | Site 5   | 2.3   |
| Rn-222       | 3 x 10 <sup>-9</sup>      | 1.58 x 10 <sup>-9</sup>  | Site 2   | 52.7  |
| Pb-210       | 8 x 10 <sup>-12</sup>     | 2.07 x 10 <sup>-14</sup> | Site 1   | 0.3   |
| Po-210       | 7 x 10 <sup>-12</sup>     | --                       | --       | --    |

\*Highest reported concentration

Brief Comments and Conclusions

Petrotomics has submitted the quarterly composite measurement for six airborne particulate sampling sites, as specified in Source Material License SUA-551. Review of the radionuclide data indicates that all of the reported airborne effluents were below the appropriate MPC's and similar to the previous quarters results.

40-6659/mab/82/09/01/1

20524

|        |                    |   |   |   |   |
|--------|--------------------|---|---|---|---|
| OFC :  | 8210210527 820930  | : | : | : | : |
|        | PDR ADOCK 04006659 | : | : | : | : |
|        | C PDR              | : | : | : | : |
| NAME : | :                  | : | : | : | : |
| DATE : | 82/09/27           | : | : | : | : |

SEP 30 1982

II. Groundwater (Chemical Parameters)

| <u>Common Ions</u> | <u>*Standards (mg/l)</u> | <u>**Conc.</u> | <u>Location</u> | <u>% MPC</u> |
|--------------------|--------------------------|----------------|-----------------|--------------|
| Conductance        |                          | --             | --              | --           |
| pH                 | (2) 6.5-8.5              | 7.7            | RTH #5          | --           |
| Nitrate            | (1) 10                   | 1.3            | RTH #1          | 13           |
| Sulfate            | (2) 250                  | 825            | RTH #1          | 330          |
| Chloride           | (2) 250                  | 440            | RTH #1          | 176          |
| Arsenic            | (1) 0.05                 | ND (0.002)     | ALL             | 4            |
| Selenium           | (1) 0.01                 | --             | --              | --           |
| Iron               | (2) 0.05                 | --             | --              | --           |
| TDS                | (2) 500                  | 2089           | RTH #1          | 417.8        |

- (1) Primary
- (2) Secondary
- \* EPA Drinking Water Stds
- \*\* Highest concentration reported

Brief Comments and Conclusions

Petrotomics has submitted the results of chemical parameters associated with groundwater monitoring as specified in Source Material License SUA-551. The highest reported results of chemical parameters were taken at RTH #1 (a tailings dam monitor). Several of the results exceeded the EPA drinking water standards. However, these results were from wells within the restricted area boundary. Results at the Townsite were all within normal limits of the EPA drinking water standards.

III. Groundwater (Radionuclides)

| <u>Radionuclide</u> | <u>MPC<sub>w</sub> (µCi/ml)</u> | <u>*Conc.</u>           | <u>Location</u> | <u>% MPC</u> |
|---------------------|---------------------------------|-------------------------|-----------------|--------------|
| U-nat               | 3 x 10 <sup>-5</sup>            | 6.09 x 10 <sup>-9</sup> | RTH #4          | 0.02         |
| Ra-226              | 3 x 10 <sup>-8</sup>            | 4.74 x 10 <sup>-9</sup> | RTH #1          | 15.8         |
| Th-230              | 2 x 10 <sup>-6</sup>            | 0.7 x 10 <sup>-9</sup>  | RTH #4          | 0.04         |
| Pb-210              | 7 x 10 <sup>-7</sup>            | 7.74 x 10 <sup>-9</sup> | POTABLE         | 1.1          |
| Po-210              | 1 x 10 <sup>-7</sup>            | 2.5 x 10 <sup>-9</sup>  | RTH #1          | 2.5          |

\*Highest reported concentration

40-6659/mab/82/09/01/1

---

OFC : : : : : : :  
 -----  
 NAME : : : : : : :  
 -----  
 DATE : 82/09/27 : : : : : : :

---

OFFICIAL DOCKET COPY

SEP 30 1982

Brief Comments and Conclusions

Petrotomics has performed quarterly grab sampling at seven monitor wells as specified in SUA-551. Review of the radionuclide data indicates that all of the reported groundwater measurements were below the appropriate MPCs.

IV. Surfacewater (Radionuclides)

| <u>Radionuclide</u> | <u>MPC<sub>w</sub> (µCi/ml)</u> | <u>*Conc.</u>           | <u>Location</u>                              | <u>% MPC</u> |
|---------------------|---------------------------------|-------------------------|--|--------------|
| U-nat               | 3 x 10 <sup>-5</sup>            | 12.2 x 10 <sup>-9</sup> | Mill Feed Pond                               | 0.04         |
| Ra-226              | 3 x 10 <sup>-8</sup>            | 6.7 x 10 <sup>-9</sup>  | Mill Feed Pond                               | 22.3         |
| Th-230              | 2 x 10 <sup>-6</sup>            | 5.96 x 10 <sup>-9</sup> | Sand Draw                                    | 0.8          |
| Pb-210              | 7 x 10 <sup>-7</sup>            | 6.48 x 10 <sup>-9</sup> | Little Medicine<br>Bow River                 | 0.9          |
| Po-210              | 1 x 10 <sup>-7</sup>            | 5.6 x 10 <sup>-9</sup>  | Little Medicine<br>Bow River<br>(Downstream) | 5.6          |

\*Highest reported concentration

Brief Comments and Conclusions

Petrotomics has reported the results of quarterly grab sampling of surface water for five locations, as specified in Source Material License SUA-551. Review of the radionuclide data indicates that all of the reported surfacewater measurements are below the appropriate MPC's.

V. Vegetation and Soil

Brief Comments and Conclusions

The licensee is required by SUA-551 to collect soil and vegetation samples annually during the grazing season. Samples were not collected during the first quarter of 1982.

40-6659/mab/82/09/01/1

---

OFC : : : : : : :  
 NAME : : : : : : :  
 DATE : 82/09/27 : : : : : : :

---

VII. Direct Radiation - (Gross beta-gamma)

|    | <u>mrem/qtr</u> | <u>Location</u>                                |
|----|-----------------|--|
| 1. | 38.9            | Site 1 - 7800' WNW of yellowcake dryer stack.  |
| 2. | 70.2            | Site 2 - 500' S of yellowcake dryer stack.     |
| 3. | 60.5            | Site 3 - 3200' NE of yellowcake dryer stack.   |
| 4. | 40.3            | Site 4 - 11800' NNE of yellowcake dryer stack. |
| 5. | 55.5            | Site 5 - 3000' ENE of yellowcake dryer stack.  |
| 6. | 40.3            | Site 6 - 11700' S of yellowcake dryer stack.   |

Brief Comments and Conclusions

Petrotomics has submitted the results of direct radiation measurements, as specified in Source Material License SUA-551. Site #1 is the background sample location. Site #4 is the nearest residence location.

VIII. Stack Sampling

| <u>Radionuclide</u> | <u>Total Release Rate (Ci/qtr)</u> |
|---------------------|------------------------------------|
| U-nat               | $3.64 \times 10^{-4}$              |
| Ra-226              | $8.23 \times 10^{-6}$              |
| Th-230              | $4.22 \times 10^{-6}$              |
| Pb-210              | $9.8 \times 10^{-7}$               |

Comments and Conclusions

The above release rates are a summation of the dryer stack, packaging room stack, and cooler stack at the Petrotomics facility.

40 CFR 190 Dose Assessment

Petrotomics has considered the following exposure pathways in determining their compliance with 40 CFR 190 orders: (1) external radiation; and (2) inhalation of airborne particulates. The license was not required to submit vegetation data for the first quarter of 1982, therefore, no values were considered for the ingestion of meat from cattle grazing on contaminated vegetation. The dose calculations submitted by the licensee were computed

40-6659/mab/82/09/01/1

---

OFC : : : : : : :  
 -----  
 NAME : : : : : : :  
 -----  
 DATE : 82/09/27 : : : : : : :

---



SEP 30 1982

using actual monitoring data. The staff has compared the dose assessment provided by the licensee with NRC calculations. The staff agrees with the results submitted by the licensee.

The staff's calculations indicate that the projected annual dose commitment at the nearest residence would be less than 25 mrem/year for either whole body or any individual organ as specified in 40CFR190.

**Original signed by**

Samuel Z. Jones, Project Manager  
Operating Facility Section II  
Uranium Recovery Licensing Branch  
Division of Waste Management

Approved by: Original signed by  
H. J. Pettengill, Section Leader  
Operating Facility Section II  
Uranium Recovery Licensing Branch  
Division of Waste Management

Case Closed: 04006659100E

40-6659/mab/82/09/01/1

|      |                 |                  |                   |   |   |   |
|------|-----------------|------------------|-------------------|---|---|---|
| OFC  | : WMUR <i>M</i> | : WMUR <i>JB</i> | : WMUR <i>HJP</i> | : | : | : |
| NAME | : SZJones:mb    | : BPFisher       | : HJPettengill    | : | : | : |
| DATE | : 82/09/27      | : 82/09/27       | : 82/09/27        | : | : | : |

OFFICIAL DOCKET COPY