DOCKET NO. 40-6639

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PETROTOMICS COMPANY

TIDEWATER OIL COMPANY • MANAGING PARTNER

P. O. DRAWER 2450 • CASPER, WYOMING

October 14, 1964

Mr. R. Lowenstein, Director
Division of Licensing & Regulation
U. S. ATOMIC ENERGY COMMISSION
Washington 25, D. C.

Dear Mr. Lowenstein:

Petrotomics Company wishes to submit the following three (3) Items to you for consideration:

ITEM I

The Source Material License No. SUA-551, issued to Petrotomics Company, which expires May 31, 1966, contains the following condition (13) "The licensee shall determine concentrations of Uranium, Thorium-230 and Radium-226 in mill water sources used for potable or culinary purposes. These determinations shall be made monthly."

This has been done for the past 30 months and the analysis, (see Appendix A) indicate that the potable water has been well below the maximum permissable content for Radium-226, Thorium-230 and Uranium during this period.

In view of the consistent nature of these results and the fact that the potable water supply has been averaging less than 25 percent of MPC total, we wish to have our License No. SUA-551 amended so that the concentration of Radium-226, Thorium-230 and Uranium can be determined at less frequent intervals. We believe a 6 month interval would be adequate to maintain control.

ITEM II

In the initial and supplemental application submitted by Petrotomics Company to Donald A. Nussbaumer, January 12, 1962, which resulted in the issuance of Source Material License No. SUA-551, we stated "Item 3 - The liquid effluent survey program will consist of taking water samples from drill holes located below the tailings dam. The samples taken on a monthly basis could indicate possible subsurface seepage."

This has been done for the past 30 months and the analysis, see Appendix B, C and D, indicate that there has been no detectable change in the Uranium, Radium-226 or Thorium-230 concentration for any of the three wells designated R. T. H. 1, 2 and 3.

As suggested in the application this data adequately establishes the fact that there is no subsurface seepage from the effluents contained in the tailings pond.

In view of the above facts, we wish to have our License No. SUA-551 amended so that the well survey can be made at less frequent intervals. We believe a yearly sampling and analysis for Radium-226, Thorium-230 and Uranium would be adequate.

ITEM III

In the initial and supplemental application submitted by Petrotomics Company to Donald A. Nussbaumer, January 12, 1962, which resulted in the issuance of Source Material License No. SUA-551, we stated, "Item 5 - Tailings dam - Description, Integrity, Capacity, etc. (4th Paragraph). In the event seepage is detected or suspected below the dam, samples of the effluent will be analyzed for Uranium, Thorium-230 and Radium-226." Seepage was observed below the second tailings dam and sampling was started immediately. During the first year of this survey the concentration of radioactive material contained in the seep effluent remained very low, comparable to ground water analysis for this area. The survey, see Appendix E, eventually detected an increase in Thorium-230 concentration to several times the M. P. C. The flow rate of seepage effluent in the drainage channel varies between 25 gpm and 35 gpm except during the 30 to 60 days of spring run-off when a gully below and outside the tailings area dilutes the flow to an estimated 200 gpm. It was not possible to obtain actual flow rate measurements and sampling was curtailed during late winter and early spring months because of severe ice and snow conditions. The drainage channel was buried under 10 feet of ice and drifted snow.

At flow rates up to 35 gpm the effluent disappears within one-half mile of the restricted area. Four and one-half miles of dry stream bed separate this point from the Little Medicine Bow river, except during spring runoff when dilution would lower the concentration by a factor estimated to be 50 to 1. Samples taken above and below the confluence with the Little Medicine Bow River showed lower radioactive material concentrations in the downstream sample - see Appendix F. The river is not used for culinary or potable purposes from this point to a point below the town of Medicine Bow, a distance of 25 miles.

Addition of lime rock in the channel below the tailings dam appears to have been effective in partially precipitating Thorium-230 in recent months.

We are also continuing our program of distributing tailings over the entire tailings disposal area, endeavoring to effectively seal the area with the slime portion of the tailings.

In view of the above facts, we wish to have our License No. SUA-551, amended to permit discharge into unrestricted areas, liquid effluents containing concentrations of Thorium-230 in excess of the limits specified in Appendix B, Table II, Column 2, Part 20.

We propose to continue:

1. Our program of sampling the seepage effluent at monthly intervals and analyzing for Uranium, Thorium-230 and Radium-226.
2. Utilize disposal of tailings to effect a seal of the tailings disposal area to eliminate the seepage.
3. Addition of lime rock to the effluents to effect a reduction of Thorium-230 concentration, to achieve full compliance.

Sincerely yours,

PETROTOMICS COMPANY

By John D. Crozier
John D. Crozier
Radiologist

JDC/es

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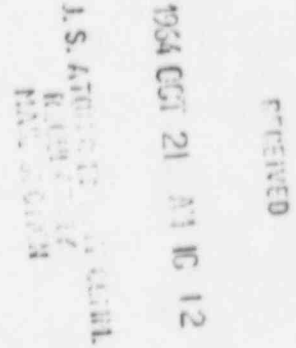
APPENDIX A

PETROTOMICS COMPANY

POTABLE WATER
ANALYTICAL SUMMARY

Sample	Date	Ra-226 μc/ml	Th-230 μc/ml	U_3O_8 μc/ml
# 3	4/12/62			
7	5/ 8/62	3.6×10^{-9}	$<5 \times 10^{-9}$	5.3×10^{-7}
11	6/ 5/62	4.1×10^{-9}	$<5 \times 10^{-9}$	5.3×10^{-7}
16	7/11/62	3.5×10^{-9}	5×10^{-9}	11.7×10^{-7}
21	8/10/62	1.2×10^{-8} *	$<5 \times 10^{-9}$	8.3×10^{-7}
26	9/17/62	2.7×10^{-9}	$<5 \times 10^{-9}$	6.9×10^{-7}
32	10/12/62	2.2×10^{-8} *	6.5×10^{-9}	5.5×10^{-7}
38	11/ 8/62	3.8×10^{-9}	$<5 \times 10^{-9}$	6.1×10^{-7}
44	12/11/62	1.9×10^{-9}	$<5 \times 10^{-9}$	7.3×10^{-7}
49	1/21/63	8.7×10^{-9}	9.0×10^{-9}	7.0×10^{-7}
55	2/ 8/63	1.1×10^{-9}	$<5 \times 10^{-9}$	7.0×10^{-7}
61	3/26/63	7.4×10^{-9}	2.1×10^{-8}	4.4×10^{-7}
67	4/25/63	1.0×10^{-8} *	1.5×10^{-8}	4.3×10^{-7}
73	5/22/63	4.0×10^{-9}	1.2×10^{-8}	4.0×10^{-7}
79	6/20/63	8.3×10^{-9}	1.4×10^{-8}	8.0×10^{-7}
84	7/29/63	0×10^{-10}	8×10^{-9}	3.63×10^{-7}
92	8/29/63	0×10^{-10}	$<5 \times 10^{-9}$	5.5×10^{-7}
98	9/30/63	1.0×10^{-9}	1.5×10^{-8}	5.3×10^{-8}
103	10/17/63	2.1×10^{-9}	6.6×10^{-8}	7.0×10^{-7}
108	11/14/63	1.3×10^{-9}	7.7×10^{-9}	5.0×10^{-7}
113	12/19/63	1.1×10^{-9}	$<5 \times 10^{-9}$	5.3×10^{-7}
117	1/29/64	3.4×10^{-8} *	2.7×10^{-7} *	5.4×10^{-7}
118	2/23/64	1.7×10^{-9}	$<5 \times 10^{-9}$	$.77 \times 10^{-7}$
119	3/12/64	3.3×10^{-9}	1.6×10^{-8}	2.0×10^{-6}
123	4/15/64	1.6×10^{-9}	2.9×10^{-7}	4.67×10^{-7}
127	6/ 3/64	1.9×10^{-9}	$<5 \times 10^{-9}$	3.2×10^{-7}
132	6/16/64	2.4×10^{-9}	2.4×10^{-8}	$.1 \times 10^{-7}$
139	7/13/64	2.4×10^{-9}	$<5 \times 10^{-9}$	7.7×10^{-7}

* These analysis are considered to be in error.



APPENDIX B

PETROTOMICS COMPANY

RADIOACTIVE MATERIAL SURVEY
SUMMARY
R T H NO. 1

Sample	Date	Ra-226 μc/ml	Th-230 μc/ml	U_3O_8 μc/ml	
# 6	4/12/62				
10	5/ 8/62	8.0×10^{-10}	$<5 \times 10^{-9}$	$<7 \times 10^{-9}$	
14	6/ 5/62	1.3×10^{-9}	$<5 \times 10^{-9}$	$<7 \times 10^{-9}$	
19	7/10/62	1.3×10^{-9}	5×10^{-9}	7×10^{-9}	
24	8/10/62	0×10^{-10}	$<5 \times 10^{-9}$	$<7 \times 10^{-9}$	
29	9/17/62	1.0×10^{-9}	$<5 \times 10^{-9}$	$<1 \times 10^{-8}$	
35	10/12/62	9.0×10^{-10}	6.5×10^{-9}	$<7 \times 10^{-9}$	
41	11/ 8/62	7.0×10^{-10}	$<5 \times 10^{-9}$	$<7 \times 10^{-9}$	
47	12/11/62	1.8×10^{-9}	5×10^{-9}	$<7 \times 10^{-9}$	
52	1/21/63	0×10^{-9}	$<5 \times 10^{-9}$	$<7 \times 10^{-9}$	
58	2/ 8/63	0×10^{-10}	1.2×10^{-8}	1.1×10^{-7}	
64	3/26/63	3.0×10^{-9}	9.5×10^{-8}	1.7×10^{-8}	
69	4/25/63	4.7×10^{-9}	$<5 \times 10^{-9}$	$<7 \times 10^{-9}$	
76	5/22/63	4.3×10^{-9}	$<5 \times 10^{-9}$	$<7 \times 10^{-9}$	
82	6/20/63	7.1×10^{-9}	$<5 \times 10^{-9}$	$<7 \times 10^{-9}$	
87	7/29/63	1.2×10^{-9}	3.0×10^{-7}	$.9 \times 10^{-7}$	
91	8/29/63	1.3×10^{-9}	$<5 \times 10^{-9}$	$<7 \times 10^{-9}$	
96	9/30/63	2.8×10^{-9}	$<5 \times 10^{-9}$	$<7 \times 10^{-9}$	
101	10/17/63	2.2×10^{-9}	$<5 \times 10^{-9}$	$<7 \times 10^{-9}$	
106	11/14/63	8.7×10^{-10}	1.7×10^{-8}	1.2×10^{-8}	
111	12/19/63	4.7×10^{-10}	$<5 \times 10^{-9}$	$<7 \times 10^{-9}$	
116	1/29/64	2.8×10^{-9}	$<5 \times 10^{-9}$	$<7 \times 10^{-9}$	
	Feb.	- -	- -	- -	Snow
122	3/12/64	5.4×10^{-9}	$<5 \times 10^{-9}$	$<7 \times 10^{-9}$	
126	4/15/64	7.8×10^{-9}	$<5 \times 10^{-9}$	$<7 \times 10^{-9}$	
128	6/ 3/64	0×10^{-9}	$<5 \times 10^{-9}$	$<7 \times 10^{-9}$	
133	6/16/64	2.1×10^{-9}	$<5 \times 10^{-9}$	$<7 \times 10^{-9}$	
140	7/13/64	1.1×10^{-8}	$<5 \times 10^{-9}$	$<7 \times 10^{-9}$	

DOCKET NO. 40-6659

APPENDIX C

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PETROTOMICS COMPANY

RADIOACTIVE MATERIAL SURVEY
SUMMARY
R T H NO. 2

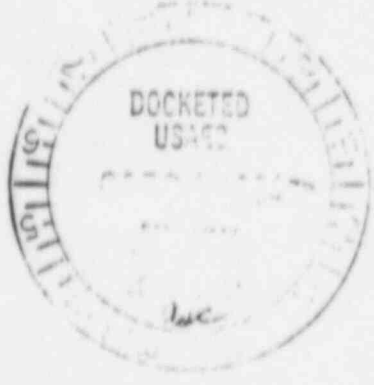
Sample	Date	Ra-226 μc/ml	Th-230 μc/ml	U_3O_8 μc/ml	
# 5	4/12/62				
9	5/ 8/62	1.9×10^{-9}	5×10^{-9}	7×10^{-9}	
13	6/ 5/62	0×10^{-10}	$<5 \times 10^{-9}$	$<7 \times 10^{-9}$	
18	7/10/62	1.2×10^{-9}	5×10^{-9}	7×10^{-9}	
23	8/10/62	1.3×10^{-9}	$<5 \times 10^{-9}$	$<7 \times 10^{-9}$	
28	9/17/62	2.1×10^{-9}	- 0 -	1.6×10^{-8}	
34	10/12/62	1.5×10^{-9}	6.8×10^{-9}	$<7 \times 10^{-9}$	
40	11/ 8/62	1.3×10^{-9}	$<5 \times 10^{-9}$	$<7 \times 10^{-9}$	
46	12/11/62	0×10^{-9}	$<5 \times 10^{-9}$	1×10^{-8}	
51	1/21/63	0×10^{-9}	$<5 \times 10^{-9}$	$<7 \times 10^{-9}$	
57	2/ 8/63	0×10^{-9}	6×10^{-9}	$<7 \times 10^{-9}$	
63	3/26/63	5.3×10^{-9}	$<5 \times 10^{-9}$	1.0×10^{-8}	
68 (2)	4/25/63	3×10^{-9}	1.3×10^{-8}	7×10^{-9}	
75	5/22/63	3×10^{-9}	$<5 \times 10^{-9}$	$<7 \times 10^{-9}$	
81	6/20/63	9×10^{-10}	$<5 \times 10^{-9}$	7×10^{-9}	
86	7/29/63	2.5×10^{-9}	1.0×10^{-8}	$<7 \times 10^{-9}$	
90	8/29/63	1.5×10^{-9}	$<5 \times 10^{-9}$	$<7 \times 10^{-9}$	
95	9/30/63	2.3×10^{-9}	$<5 \times 10^{-9}$	$<7 \times 10^{-9}$	
100	10/17/63	2.2×10^{-9}	5.5×10^{-9}	$<7 \times 10^{-9}$	
105	11/14/63	1.2×10^{-9}	6.6×10^{-9}	1×10^{-8}	
110	12/19/63	8.8×10^{-10}	$<5 \times 10^{-9}$	$<7 \times 10^{-9}$	
115	1/29/64	1.0×10^{-9}	$<5 \times 10^{-9}$	$<7 \times 10^{-9}$	
	Feb.	- -	- -	- -	Snow
121	3/12/64	5.8×10^{-9}	$<5 \times 10^{-9}$	$<7 \times 10^{-9}$	
125	4/15/64	0×10^{-9}	$<5 \times 10^{-9}$	$<7 \times 10^{-9}$	
129	6/ 3/64	8.1×10^{-10}	3.1×10^{-8}	1.4×10^{-8}	
134	6/16/64	1.8×10^{-9}	$<5 \times 10^{-9}$	$<7 \times 10^{-9}$	
141	7/13/64	3.8×10^{-9}	1.2×10^{-8}	$<7 \times 10^{-9}$	

APPENDIX D

PETROTOMICS COMPANY

RADIOACTIVE MATERIAL SURVEY
SUMMARY
R T H NO. 3

Sample	Date	Ra-226 μc/ml	Th-230 μc/ml	U_3O_8 μc/ml	
# 4	4/12/62				
8	5/8/62	4.0×10^{-10}	7.1×10^{-9}	7×10^{-9}	
12	6/5/62	9.0×10^{-10}	$<5 \times 10^{-9}$	$<7 \times 10^{-9}$	
17	7/10/62	2.2×10^{-9}	5×10^{-9}	7×10^{-9}	
22	8/10/62	9.0×10^{-10}	$<5 \times 10^{-9}$	$<7 \times 10^{-9}$	
27	9/17/62	2.5×10^{-9}	$<5 \times 10^{-9}$	9×10^{-8}	
33	10/12/62	2.6×10^{-9}	6.0×10^{-9}	1.0×10^{-8}	
39	11/ 8/62	0×10^{-10}	$<5 \times 10^{-9}$	$<7 \times 10^{-9}$	
45	12/11/62	1.6×10^{-9}	$<5 \times 10^{-9}$	$<7 \times 10^{-9}$	
50	1/21/63	2.1×10^{-9}	7.7×10^{-9}	$<7 \times 10^{-9}$	
56	2/8/63	0×10^{-9}	5.0×10^{-9}	7×10^{-9}	
62	3/26/63	9.4×10^{-9}	$<5 \times 10^{-9}$	7×10^{-9}	
68 (1)	4/25/63	7.6×10^{-9}	3.7×10^{-7}	3.7×10^{-8}	
74	5/22/63	1.2×10^{-8}	$<5 \times 10^{-9}$	7×10^{-9}	
80	6/20/63	2.7×10^{-9}	1.11×10^{-7}	$<7 \times 10^{-9}$	
85	7/29/63	NS	NS	NS	Well sanded up.
89	8/29/63	2.6×10^{-9}	$<5 \times 10^{-9}$	1.0×10^{-8}	
94	9/30/63	2.7×10^{-9}	$<5 \times 10^{-9}$	7×10^{-9}	
99	10/17/63	2.6×10^{-10}	6.4×10^{-9}	8×10^{-9}	
104	11/14/63	2.7×10^{-9}	8.7×10^{-9}	2.6×10^{-8}	
109	12/19/63	1.0×10^{-9}	$<5 \times 10^{-9}$	$<7 \times 10^{-9}$	
114	1/29/64	2.7×10^{-9}	$<5 \times 10^{-9}$	$<7 \times 10^{-9}$	
	Feb.	- -	- -	- -	Snow
120	3/12/64	2.3×10^{-9}	$<5 \times 10^{-9}$	$<7 \times 10^{-9}$	
124	4/15/64	1.9×10^{-9}	$<5 \times 10^{-9}$	$<7 \times 10^{-9}$	
130	6/ 3/64	9.2×10^{-9}	1.8×10^{-8}	1.83×10^{-7}	
135	6/16/64	1.3×10^{-9}	$<5 \times 10^{-9}$	$<7 \times 10^{-9}$	
142	7/13/64	1.4×10^{-8}	2.2×10^{-6}	$.23 \times 10^{-7}$	



APPENDIX E

PETROTOMICS COMPANY

RADIOACTIVE MATERIAL SURVEY
SUMMARY
DRAINAGE CHANNEL BELOW TAILINGS DAM

Sample	Date	Ra-226 μc/ml	Th-230 μc/ml	U_3O_8 μc/ml
# 15	6/ 5/62	7.0×10^{-9}	$<5 \times 10^{-9}$	9.7×10^{-7}
20	7/10/62	1.5×10^{-9}	5×10^{-9}	$.23 \times 10^{-7}$
25	8/10/62	1.5×10^{-9}	$<5 \times 10^{-9}$	7×10^{-9}
30	9/17/62	2.6×10^{-9}	$<5 \times 10^{-9}$	9.6×10^{-7}
36	10/12/62	2.5×10^{-9}	5×10^{-9}	9.0×10^{-8}
42	11/8/62	1.0×10^{-9}	$<5 \times 10^{-9}$	$.61 \times 10^{-7}$
48	12/11/62	2.1×10^{-9}	$<5 \times 10^{-9}$	$.6 \times 10^{-7}$
53	1/21/63	2.9×10^{-10}	$<5 \times 10^{-9}$	1.1×10^{-7}
65	3/26/63	7.7×10^{-9}	1.2×10^{-7}	3.2×10^{-7}
71	4/25/63	3.0×10^{-9}	$<5 \times 10^{-9}$	$<7 \times 10^{-9}$
77	5/22/63	4.3×10^{-9}	2.03×10^{-6}	7.63×10^{-7}
83	6/20/63	6.7×10^{-9}	3.4×10^{-6}	2.1×10^{-6}
88	7/29/63	3.7×10^{-9}	6.5×10^{-7}	2.2×10^{-6}
93	8/29/63	4.1×10^{-9}	2.2×10^{-6}	3.4×10^{-6}
97	9/30/63	4.2×10^{-9}	5.4×10^{-6}	4.3×10^{-6}
102	10/17/63	1.9×10^{-9}	7.3×10^{-6}	7.0×10^{-6}
107	11/14/63	6.4×10^{-10}	1.3×10^{-5}	5.0×10^{-6}
112	12/19/63	9.3×10^{-10}	6.8×10^{-6}	1.5×10^{-6}
	*Jan.	- - -	- - -	- - -
	*Feb.	- - -	- - -	- - -
	*March	- - -	- - -	- - -
	*April	- - -	- - -	- - -
* Under 10 feet of snow.				
131	6/3/64	7.4×10^{-9}	6.3×10^{-6}	1.2×10^{-8}
136	6/16/64	4.4×10^{-9}	2.5×10^{-8}	18.0×10^{-7}
143	7/13/64	1.6×10^{-9}	3.6×10^{-6}	3.33×10^{-6}

APPENDIX F

SAMPLE ABOVE CONFLUENCE MEDICINE BOW RIVER

137	6/16/64	8.2×10^{-9}	1.4×10^{-8}	1.6×10^{-6}

SAMPLE BELOW CONFLUENCE MEDICINE BOW RIVER

138	6/16/64	1.2×10^{-9}	$<5 \times 10^{-9}$	1.5×10^{-7}

*U GOVERNMENT PRINTING OFFICE: 1964 — 720-07

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DESCRIPTION: (Must Be Unclassified)

Ltr. req. several amendments to lic. SUA-551 and trans:

ENCLOSURES:

(1 cy. ea)

Appendices A thru F

REMARKS: Mail Room Distribution:
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REFERRED TO	DATE	RECEIVED BY	DATE
Hasselmann 10-21 w/file cy. 1-compliance cy.			
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U. S. ATOMIC ENERGY COMMISSION **MAIL CONTROL FORM** FORM AEC-326S (8-60)

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