

URANIUM REDUCTION COMPANY

LAR FILE ~~DOWN~~

INTER-OFFICE CORRESPONDENCE

To R. F. Hollis
From R. L. Curfman

Date August 1, 1962

Subject ATTACHED PRINTS, TAILINGS DIKE AND POND TYPICAL
CROSS-SECTION

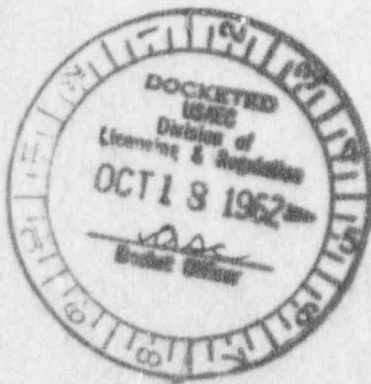
As you requested, colored prints of the tailings dike and pond are attached.

Sheet 1 of each assembly shows a scale cross-section of the dike and a diagrammatic section of the pond. The points where the metallurgical department took gradation sand samples are designated and numbered. The samples taken in the pond bear out that there is definitely a slime blanket present under the fluid which tends to seal the sand bottom preventing seepage.

Sheet 2 of each assembly shows the same cross-section with a colored portion (red) showing the estimated line of repose of the compacted sand in the event a major break in the tails pipe caused washing of some of the dike material. This sheet portrays conclusively that loss of the pond fluid would be impossible due to a malfunction of this type. The enormous bulk of sand surrounding the pond makes it next to impossible to lose the entire pond except from some major catastrophe.

R. L. Curfman

BLC:as



9612200321 620801
PDR ADOCK 04003453
C PDR

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**ANSTEC
APERTURE
CARD**

Also Available on
Aperture Card

Tailings Pond

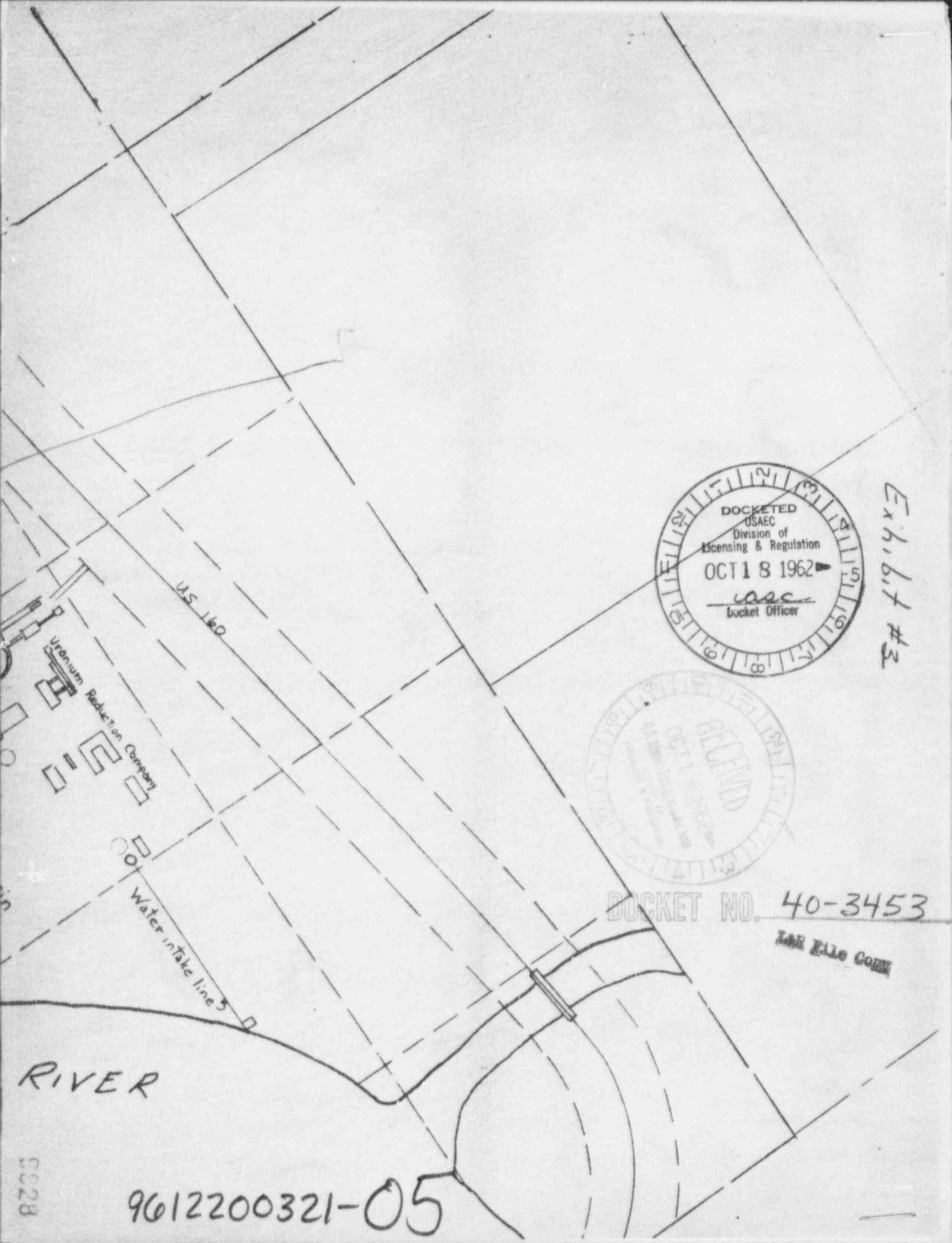
12" Decant line

Secondary settling bas

Drain to river

COLORADO

9612200321-05



Exh. 6, 7 #3



DOCKET NO. 40-3453

LAKE ELLE CODE

RIVER

9612200321-05

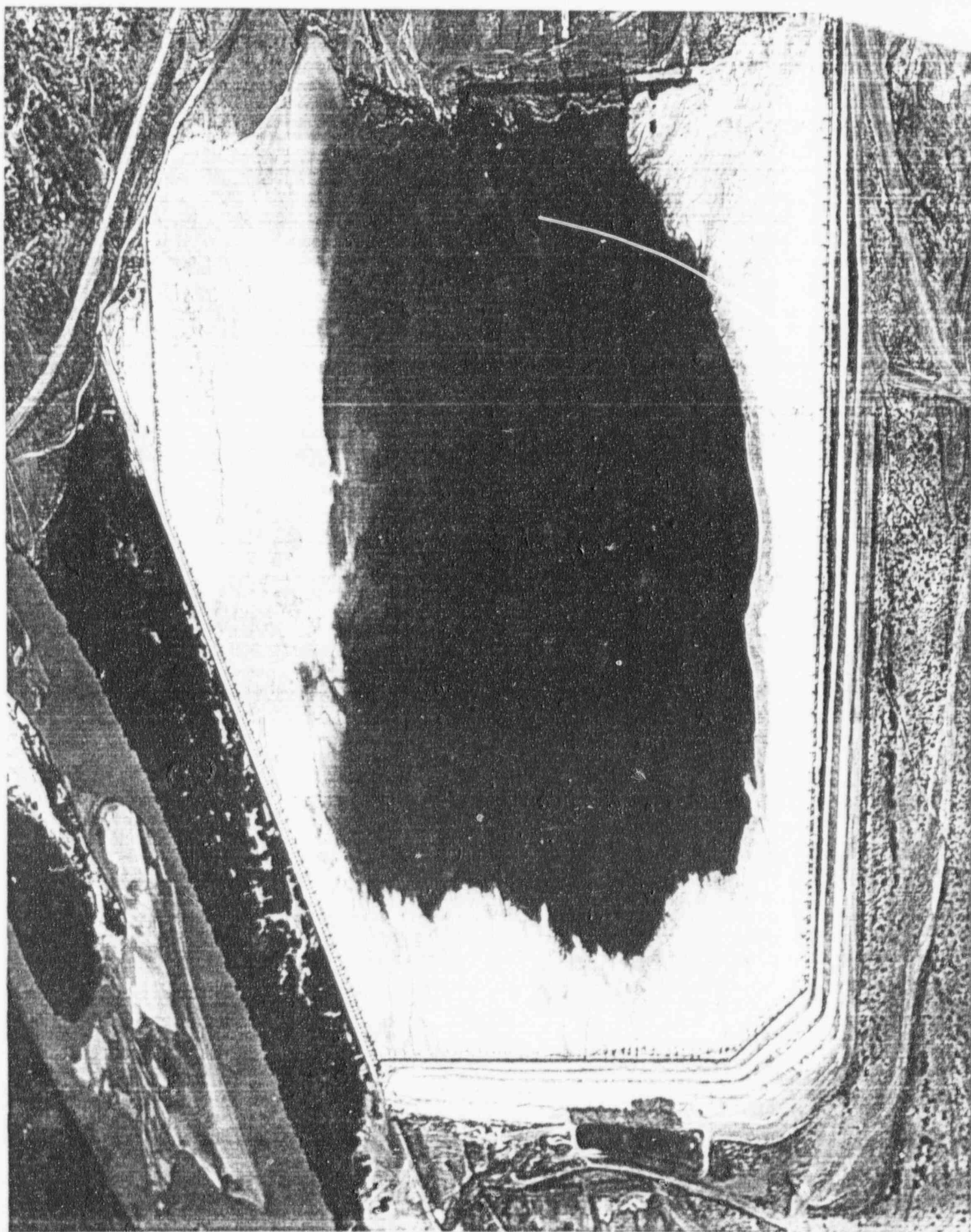
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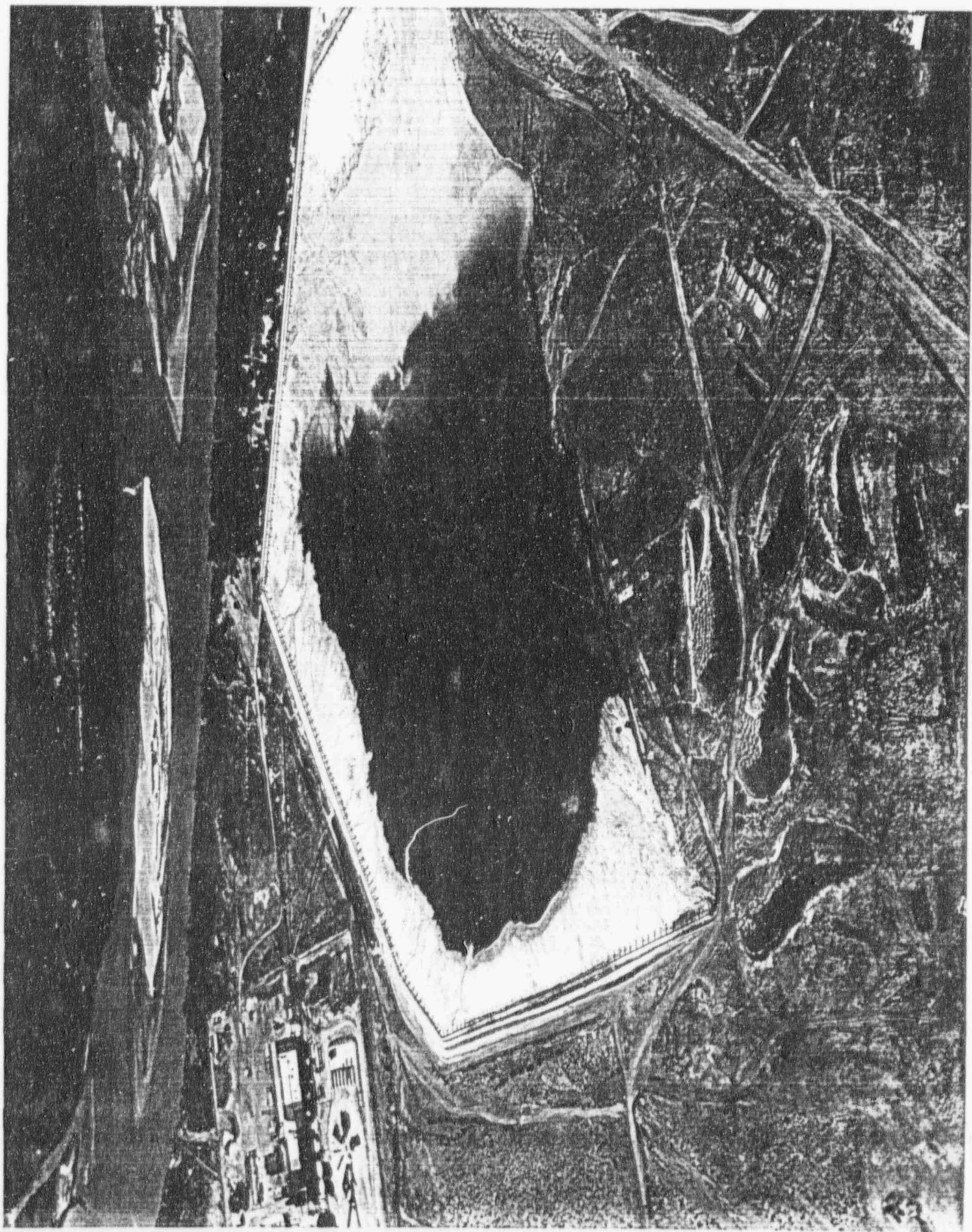
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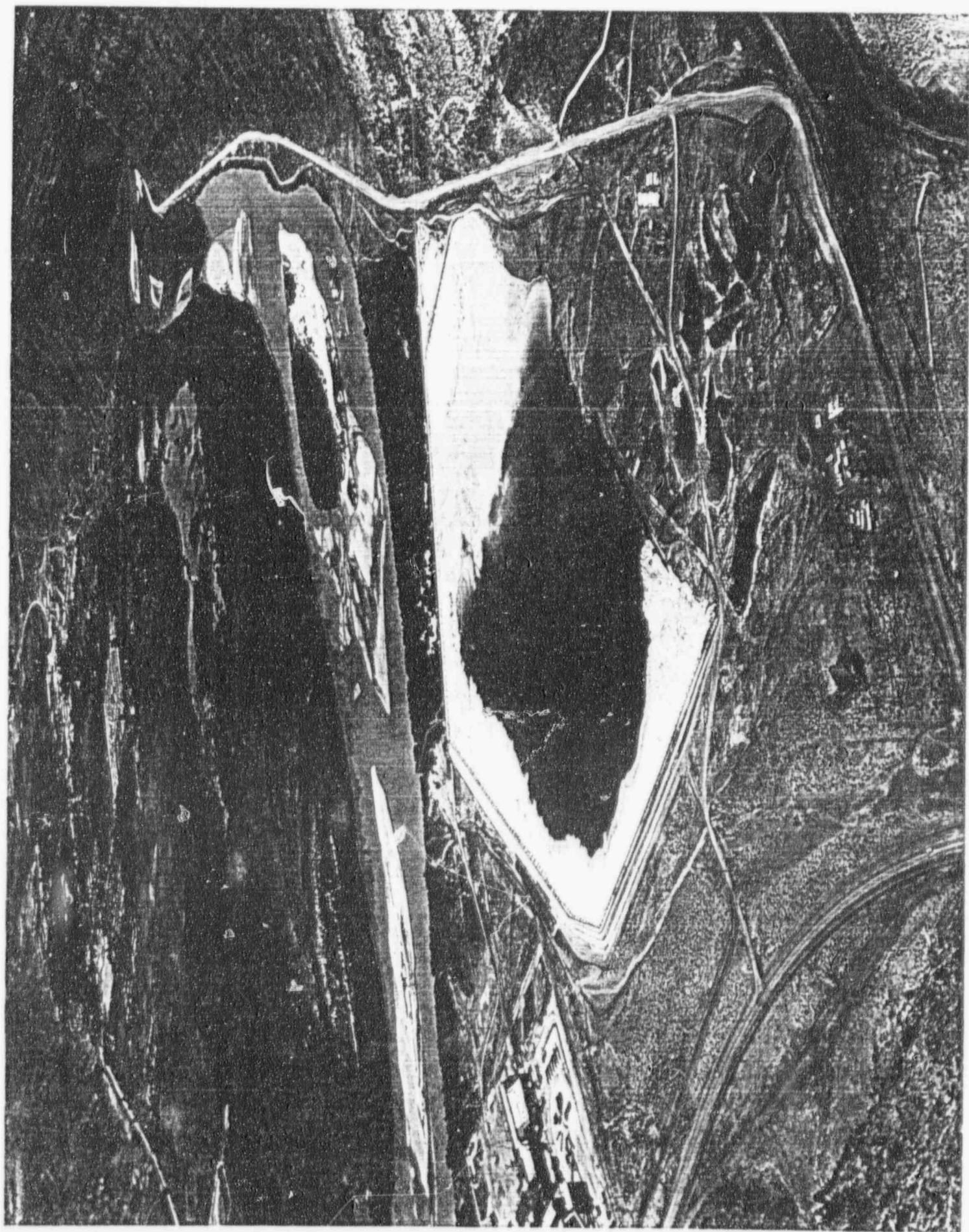
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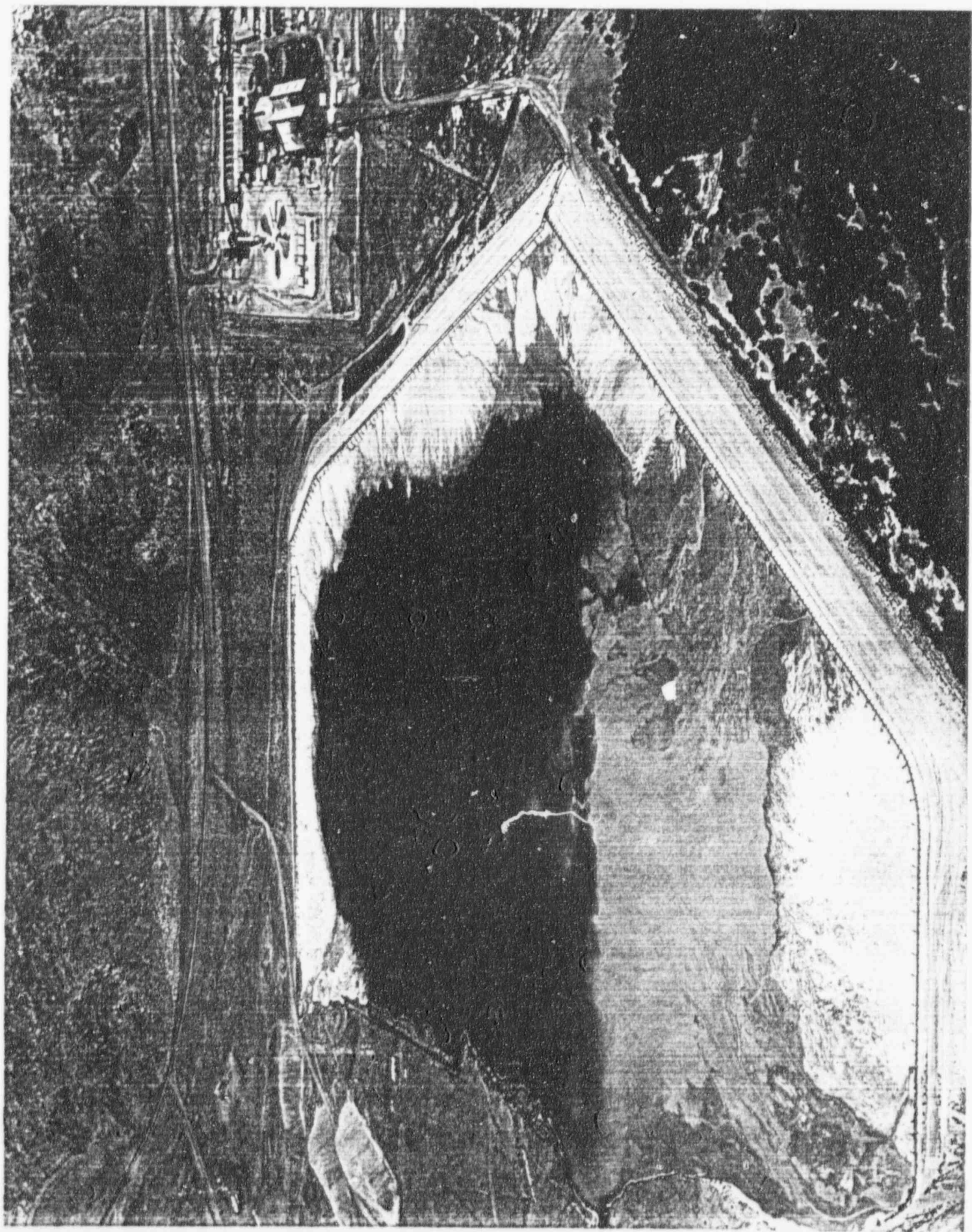
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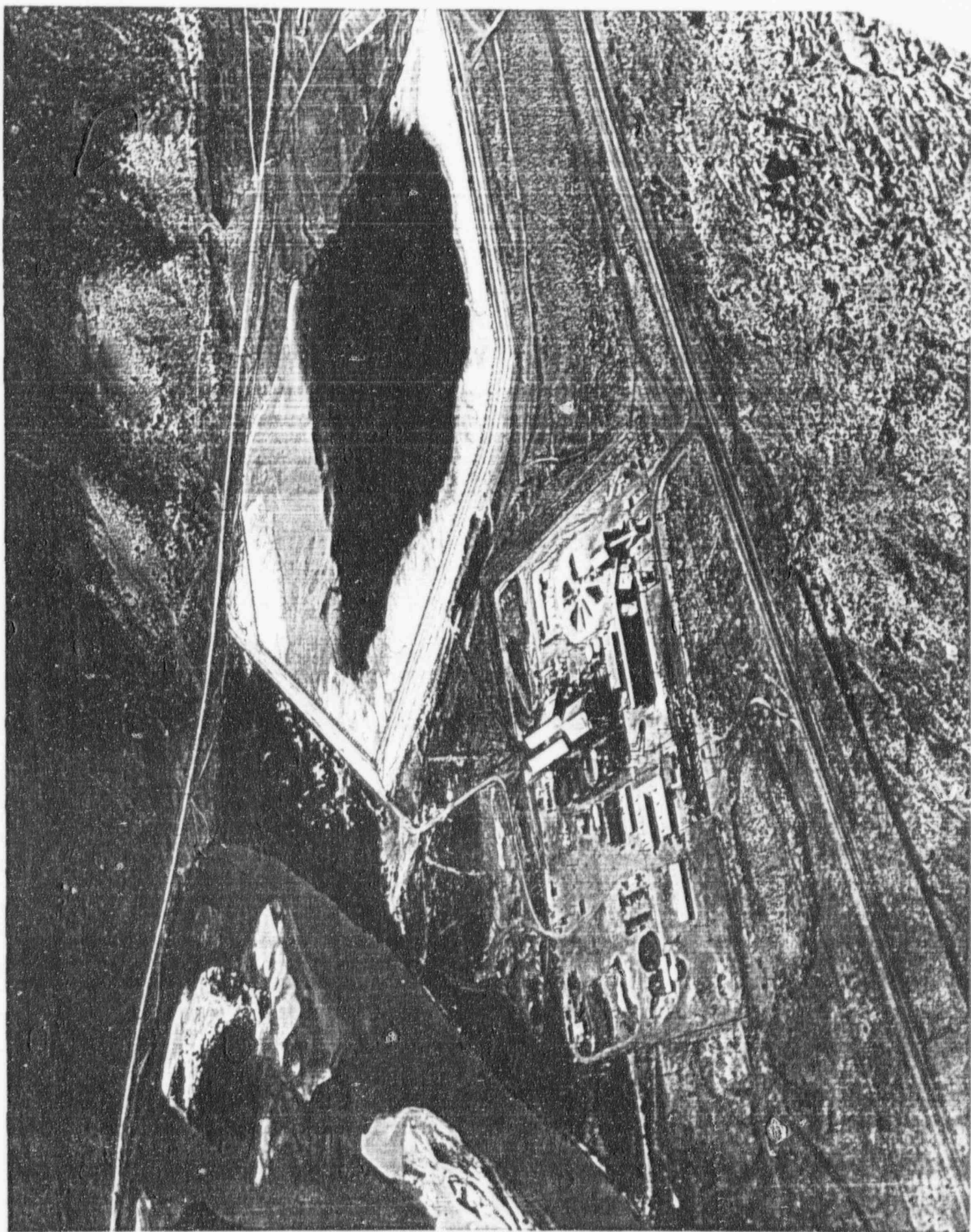
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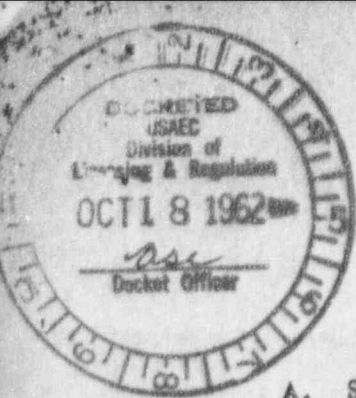


Exhibit #6

DOCKET NO. 40-3453

EAS FILE COPY

METHOD FOR THE
FLUORIMETRIC DETERMINATION OF U_3O_8

A. Sample Preparation:

1. Liquids:

Dilute all aqueous samples according to the estimated concentration so that 1.0 ml of the diluted sample contains approximately 0.01 mg U_3O_8 . (See Dilution Tables) The diluted sample should contain 5% (V-V) Free Nitric Acid. (Samples excessively basic should be neutralized by the dropwise addition of conc. HNO_3 before the proper amount of HNO_3 is added) Samples known to contain reduced U_3O_8 must be oxidized to a light yellow color by the dropwise addition of 30% H_2O_2 .

2. Solids:

After appropriate dissolution, dilute to the desired volume (See Dilution Tables). Mix well, and transfer a portion of this solution to a centrifuge tube and centrifuge in order to clarify solution. Pipet desired aliquot from this tube.

3. Extraction:

1. Pipet the desired aliquot (usually 1 ml and no more than 3 ml) of the diluted sample into an extraction vial.
2. Add 15 ml of Saturated $Al(NO_3)_3$ solution from a 250 ml dispensing burette.
3. Add 10.0 ml of Ethyl Acetate from the automatic pipet.
(Important - Critical addition)

4. Cap the vial and place on Eberbach shaker for 1-2 minutes.

C. Pellet Preparation:

1. Place 20 clean and dry platinum dishes on the nichrome wire gauze as shown in the following diagram.

2. Using the pellet maker, place a pellet of the NaF flux on each dish. Uniformity of pellet size is necessary if reproducibility is to be maintained. (Pellet size should be 0.4 gm. - check occasionally).

3. From the organic layer (top layer) of the extracted samples, fill a 0.2 ml graduated pipette, and drain 0.1 onto each of two pellets.

NOTE: Prepare an extracted standard solution of 1.0 g/L U_3O_8 exactly as the samples were prepared and pipet . 1 ml samples onto each of the pellets shown in the above diagram marked with an S.

4. Volatilize the ethyl acetate from the pellets by placing the

Gauze under the drying units for a period of 15 min. (may vary.)

D. Fusion:

1. Transfer the gauze containing the platinum dishes and dried pellets onto the burner ring.
2. Fire the burner and adjust flame to give fusion temperature of 900°C . (Check with Thermocouple.)
3. Fuse at 900°C . for 2 minutes and then increase gas flow to give temperature of 850°C . for 1 more minute.
4. Allow fusions to solidify and then transfer gauze to cooling table for a period of at least 15 min.
5. Melts are now ready to read on the Fluorimeter.

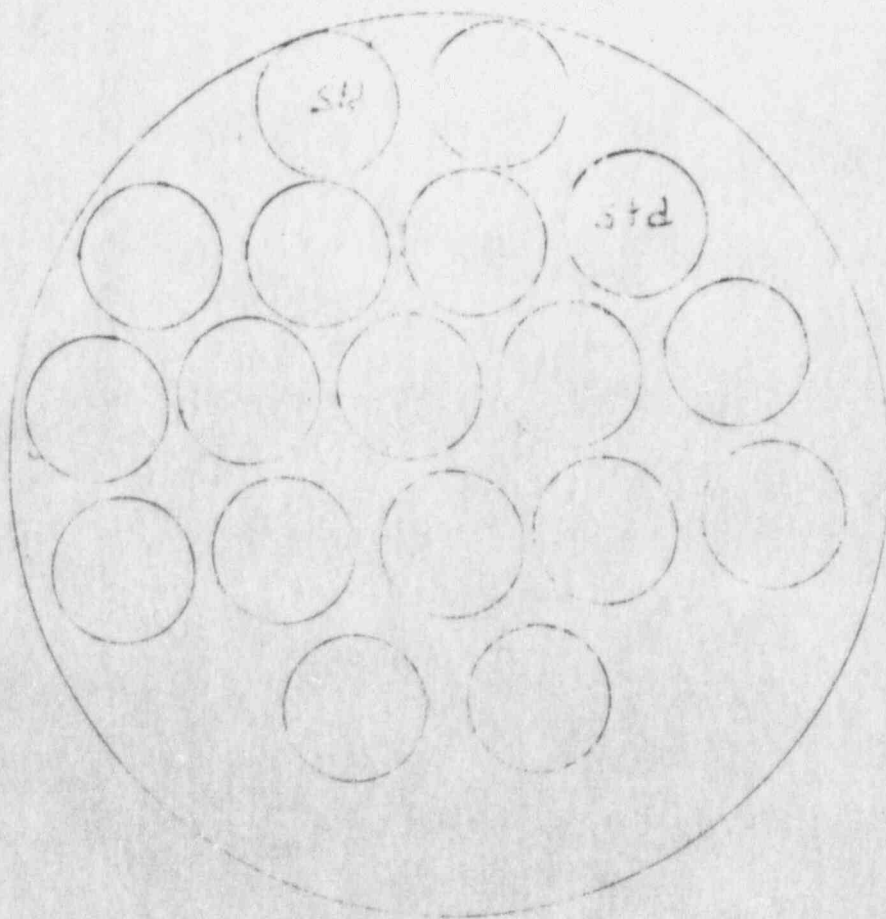
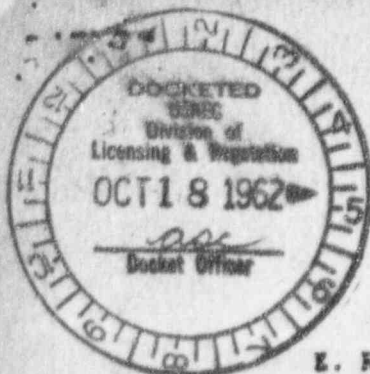


Exhibit #5



DOCKET NO. 40-3453

Determination of Radium 226 in Mill Effluents
E. R. Ebersole, A. Harbertson, J. K. Flygare and C. W. Bill
Tentative Method Outlined October 5, 1959

Reagents:

Methyl Purple Indicator Solution

$(\text{NH}_4)_2\text{SO}_4$ - 50% w/v

NaOH - 4 Normal

H_2SO_4

Lead carrier solution - 10mg Pb^{++}/ml - Dissolve 16 gm of $\text{Pb}(\text{NO}_3)_2$ in one liter of H_2O

Barium carrier solution - 1 mg Ba^{++}/ml - Dissolve 1.530 gm of BaCl_2 in one liter of distilled water

EDTA solution - 10% w/v - Dissolve 100 gms of Ethylenediaminetetraacetate Disodium salt in one liter of distilled water

HClO_4 - 70%

Na_2SO_4 - Reagent Grade

Mets Cresol Purple - .1% solution

Procedure:

Transfer from 100 to 1000 ml of sample into a 1500 ml beaker and if sample volume is less than one liter dilute to one liter with distilled water.

While stirring, add 20 ml of lead carrier solution, 10 ml of barium carrier solution, 20 ml of H_2SO_4 , and 15 gms of Na_2SO_4 . Allow the sample to set overnight and filter through a millipore filter then discard the filtrate.

Place the filter and precipitate in a 250 ml Erlenmeyer Flask. Add 15 ml of HNO_3 , 5 ml of 70% HClO_4 , and destroy the filter by heating to dense fumes of perchloric acid. The lead and barium sulfates will go into solution in the fuming perchloric acid, thus insuring solution of all radium present. Evaporate the perchloric acid to low volume (2 - 3 ml)



and cool. Add 20 ml of EDTA solution, 10 ml of distilled water, 2 drops of .1% Meta Cresol Purple indicator to the cold perchloric acid solution and neutralize the acid by drop wise addition of 4 N. NaOH to the purple color of the indicator. Then add an additional .5 ml (10 drops) of the 4 N. NaOH to bring the pH to 11 - 12.

Place the flask on a hot plate and boil for five minutes to insure solution of lead, barium, radium, radium daughters, and any thorium, if present, as the EDTA complexes. Cool the sample and filter through a quantitative filter paper, using pulp, into a 40ml centrifuge tube to remove any material insoluble in alkaline EDTA solution. Wash the filter paper with a 1% alkaline (pH 11) solution of EDTA, catching the washings in the centrifuge tube. Discard the filter paper. Add 2 ml of 50% $(\text{NH}_4)_2\text{SO}_4$ and 2 drops of methyl purple indicator to the solution in the centrifuge tube. While stirring the solution, adjust the pH to between pH 4 and 5 by dropwise addition of glacial acetic acid until the indicator just turns from green to purple.

Barium and radium sulfates will precipitate, at this pH, from the EDTA solution, leaving lead, radium daughters, and any thorium present, in solution as EDTA complexes. Note the time of the barium sulfate precipitation. Centrifuge to collect the precipitate and discard the supernatant solution. Break up the precipitate with a stirring rod and slurry with 10 ml of distilled water. Again centrifuge and discard the wash water. Slurry the precipitate with 1 ml of water and transfer the slurry, quantitatively to a 2 inch serrated steel planchett, using distilled water as necessary to complete the transfer.

Dry the sample slowly to avoid spitting and muffle at 500° C for 10 minutes. Cool and make the first alpha count in a low background gas-flow proportional counter.

Calculations:

Three hours after the first precipitation of barium sulfate the alpha activity counted will include all radium isotopes present and their respective daughters which have grown in during this period.

In order to determine the radium 226 activity a second count must be made at a designated interval such that sufficient growth of the Ra 226 daughters and simultaneous decay of Ra 223 and its daughters enable one to calculate the actual Ra 226 activity.

For example the activity of the sample may be counted at 3 hours and one week after the barium sulfate precipitation and the radium 226 calculated from the two counts as follows:

$$(1) A_2 = X + 3X \left(1 - e^{-\frac{0.693 t_2}{T}}\right) + 4Y \left(e^{-\frac{0.693 t_2}{T_1}}\right)$$

$$(2) A_1 = X + 3X \left(1 - e^{-\frac{0.693 t_1}{T}}\right) + 4Y \left(e^{-\frac{0.693 t_1}{T_1}}\right)$$

A_1 = total activity at time t_1 in counts/minute

A_2 = total activity at time t_2 in counts/minute

X = Ra 226 activity in counts/minute

Y = Ra 223 activity in counts/minute

T = Half life of Rn 222 = 91.9 hours

T_1 = Half life of Ra 223 = 278.4 hours

t_1 = Time elapsed between time of precipitation and time of first count

t_2 = Time elapsed between time of precipitation and time of second count

If the exponentials in equations (1) and (2) are evaluated for counting times t_1 equal 3 hours and t_2 equal 1 week and equation (2) is subtracted from equation (1), to eliminate the Y term, it is found that:

$$(3) \quad X = \frac{A_2 - .66 A_1}{2.44}$$

Example: $t_1 = 3 \text{ hr.}$ $t_2 = 168 \text{ hr.}$

$$A_2 = X + 3X(1 - e^{-\frac{.693 \cdot 168}{91.9}}) + 4Y(e^{-\frac{.693 \cdot 168}{278.4}}) = X + 3X(1 - e^{-1.268}) + 4Y(e^{-.418})$$

$$A_1 = X + 3X(1 - e^{-\frac{.693 \cdot 3}{91.9}}) + 4Y(e^{-\frac{.693 \cdot 3}{278.4}}) = X + 3X(1 - e^{-.0226}) + 4Y(e^{-.0075})$$

Resolving exponents:

$$A_2 = X + 3X(.717) + 4Y(.668) = 3.15X + 2.63Y$$

$$A_1 = X + 3X(.977) + 4Y(.994) = 1.07X + 3.98Y$$

$$A_2 = 3.15X + 2.63Y$$

$$\begin{array}{l} -.66A_1 = -.71X + 2.63Y \\ \hline A_2 - .66A_1 = 2.44X \end{array} \quad \therefore X = \frac{A_2 - .66A_1}{2.44}$$

Values of A for Specific Time t

t hours	Value of A	t hours	Value of A
1	A = 1.03X + 3.99Y	19	A = 1.40X + 3.81Y
2	A = 1.05X + 3.98Y	20	A = 1.42X + 3.80Y
3	A = 1.07X + 3.97Y	21	A = 1.44X + 3.79Y
4	A = 1.09X + 3.96Y	22	A = 1.46X + 3.78Y
5	A = 1.11X + 3.95Y	23	A = 1.48X + 3.78Y
6	A = 1.13X + 3.94Y	24	A = 1.50X + 3.77Y
7	A = 1.15X + 3.93Y	25	A = 1.52X + 3.76Y
8	A = 1.17X + 3.92Y	26	A = 1.53X + 3.75Y
9	A = 1.19X + 3.91Y	27	A = 1.55X + 3.74Y
10	A = 1.22X + 3.90Y	28	A = 1.57X + 3.73Y
11	A = 1.24X + 3.89Y	29	A = 1.59X + 3.72Y
12	A = 1.26X + 3.88Y	30	A = 1.61X + 3.71Y
13	A = 1.28X + 3.87Y	31	A = 1.63X + 3.70Y
14	A = 1.30X + 3.86Y	32	A = 1.64X + 3.69Y
15	A = 1.32X + 3.85Y	33	A = 1.66X + 3.68Y
16	A = 1.34X + 3.84Y	34	A = 1.68X + 3.67Y
17	A = 1.36X + 3.83Y	35	A = 1.70X + 3.66Y
18	A = 1.38X + 3.82Y	36	A = 1.71X + 3.65Y

<u>t hours</u>	<u>Value of A</u>
37.	$A = 1.72X + 3.65Y$
38	$A = 1.74X + 3.64Y$
39	$A = 1.76X + 3.63Y$
40	$A = 1.78X + 3.62Y$
41	$A = 1.80X + 3.61Y$
42	$A = 1.82X + 3.60Y$
43	$A = 1.83X + 3.59Y$
44	$A = 1.85X + 3.58Y$
45	$A = 1.85X + 3.57Y$
46	$A = 1.86X + 3.57Y$
47	$A = 1.88X + 3.56Y$
48	$A = 1.90X + 3.55Y$
49	$A = 1.92X + 3.54Y$
50	$A = 1.94X + 3.53Y$
51	$A = 1.96X + 3.52Y$
52.	$A = 1.97X + 3.52Y$
53	$A = 1.99X + 3.51Y$
54	$A = 2.00X + 3.50Y$
55	$A = 2.02X + 3.49Y$
56	$A = 2.03X + 3.48Y$
57	$A = 2.05X + 3.47Y$
58	$A = 2.06X + 3.46Y$
59	$A = 2.08X + 3.45Y$
60	$A = 2.09X + 3.44Y$
61	$A = 2.11X + 3.44Y$
62	$A = 2.12X + 3.43Y$
63	$A = 2.13X + 3.42Y$
64	$A = 2.15X + 3.41Y$
65	$A = 2.16X + 3.40Y$
66	$A = 2.18X + 3.39Y$
67	$A = 2.19X + 3.38Y$
68	$A = 2.20X + 3.38Y$
69	$A = 2.21X + 3.37Y$
70	$A = 2.23X + 3.36Y$
71	$A = 2.24X + 3.35Y$
72	$A = 2.26X + 3.34Y$
73	$A = 2.28X + 3.33Y$
74	$A = 2.29X + 3.32Y$
75	$A = 2.30X + 3.31Y$
76	$A = 2.31X + 3.30Y$
77	$A = 2.32X + 3.29Y$
78	$A = 2.33X + 3.30Y$
79	$A = 2.34X + 3.29Y$
80	$A = 2.36X + 3.28Y$
81	$A = 2.37X + 3.27Y$
82	$A = 2.38X + 3.26Y$
83	$A = 2.39X + 3.25Y$

<u>t hours</u>	<u>Value of A</u>
84	$A = 2.40X + 3.24Y$
85	$A = 2.41X + 3.23Y$
86	$A = 2.43X + 3.23Y$
87	$A = 2.44X + 3.22Y$
88	$A = 2.46X + 3.22Y$
89	$A = 2.47X + 3.21Y$
90	$A = 2.48X + 3.20Y$
91	$A = 2.49X + 3.19Y$
92	$A = 2.50X + 3.18Y$
93	$A = 2.51X + 3.18Y$
94	$A = 2.52X + 3.17Y$
95	$A = 2.53X + 3.16Y$
96	$A = 2.54X + 3.15Y$
97	$A = 2.55X + 3.14Y$
98	$A = 2.56X + 3.13Y$
99	$A = 2.57X + 3.12Y$
100	$A = 2.58X + 3.12Y$
101	$A = 2.59X + 3.11Y$
102	$A = 2.61X + 3.10Y$
103	$A = 2.62X + 3.09Y$
104	$A = 2.63X + 3.09Y$
105	$A = 2.64X + 3.08Y$
106	$A = 2.65X + 3.07Y$
107	$A = 2.66X + 3.06Y$
108	$A = 2.67X + 3.06Y$
109	$A = 2.68X + 3.05Y$
110	$A = 2.69X + 3.04Y$
111	$A = 2.70X + 3.03Y$
112	$A = 2.71X + 3.02Y$
113	$A = 2.72X + 3.01Y$
114	$A = 2.73X + 3.01Y$
115	$A = 2.74X + 2.99Y$
116	$A = 2.75X + 2.99Y$
117	$A = 2.76X + 2.99Y$
118	$A = 2.77X + 2.98Y$
119	$A = 2.78X + 2.97Y$
120	$A = 2.79X + 2.97Y$
121	$A = 2.79X + 2.96Y$
122	$A = 2.80X + 2.95Y$
123	$A = 2.81X + 2.95Y$
124	$A = 2.82X + 2.94Y$
125	$A = 2.83X + 2.93Y$
126	$A = 2.84X + 2.92Y$
127	$A = 2.85X + 2.92Y$
128	$A = 2.86X + 2.91Y$
129	$A = 2.86X + 2.90Y$
130	$A = 2.87X + 2.90Y$

<u>t hours</u>	<u>Value of A</u>
131	$A = 2.88X + 2.89Y$
132	$A = 2.89X + 2.88Y$
133	$A = 2.90X + 2.83Y$
134	$A = 2.91X + 2.87Y$
135	$A = 2.91X + 2.86Y$
136	$A = 2.92X + 2.86Y$
137	$A = 2.93X + 2.85Y$
138	$A = 2.94X + 2.84Y$
139	$A = 2.95X + 2.83Y$
140	$A = 2.96X + 2.82Y$
141	$A = 2.96X + 2.81Y$
142	$A = 2.97X + 2.81Y$
143	$A = 2.98X + 2.80Y$
144	$A = 2.99X + 2.80Y$
145	$A = 3.00X + 2.79Y$
146	$A = 3.01X + 2.78Y$
147	$A = 3.01X + 2.77Y$
148	$A = 3.02X + 2.77Y$
149	$A = 3.02X + 2.76Y$
150	$A = 3.03X + 2.75Y$
151	$A = 3.04X + 2.75Y$
152	$A = 3.05X + 2.74Y$
153	$A = 3.05X + 2.74Y$
154	$A = 3.06X + 2.73Y$
155	$A = 3.07X + 2.72Y$
156	$A = 3.07X + 2.71Y$
157	$A = 3.08X + 2.70Y$
158	$A = 3.09X + 2.70Y$
159	$A = 3.10X + 2.69Y$
160	$A = 3.10X + 2.68Y$
161	$A = 3.11X + 2.68Y$
162	$A = 3.12X + 2.67Y$
163	$A = 3.12X + 2.66Y$
164	$A = 3.13X + 2.66Y$
165	$A = 3.13X + 2.65Y$
166	$A = 3.14X + 2.64Y$
167	$A = 3.15X + 2.64Y$
168	$A = 3.15X + 2.63Y$
169	$A = 3.16X + 2.62Y$
170	$A = 3.17X + 2.62Y$
171	$A = 3.17X + 2.61Y$
172	$A = 3.18X + 2.61Y$
173	$A = 3.19X + 2.60Y$
174	$A = 3.19X + 2.59Y$
175	$A = 3.20X + 2.59Y$
176	$A = 3.20X + 2.58Y$
177	$A = 3.21X + 2.57Y$

<u>t hours</u>	<u>Value of A</u>
178	$A = 3.22X + 2.57Y$
179	$A = 3.22X + 2.56Y$
180	$A = 3.22X + 2.55Y$
181	$A = 3.23X + 2.55Y$
182	$A = 3.23X + 2.54Y$
183	$A = 3.24X + 2.54Y$
184	$A = 3.25X + 2.53Y$
185	$A = 3.25X + 2.52Y$
186	$A = 3.26X + 2.52Y$
187	$A = 3.27X + 2.51Y$
188	$A = 3.27X + 2.50Y$
189	$A = 3.28X + 2.50Y$
190	$A = 3.28X + 2.50Y$
191	$A = 3.29X + 2.50Y$
192	$A = 3.29X + 2.49Y$
193	$A = 3.30X + 2.48Y$
194	$A = 3.30X + 2.47Y$
195	$A = 3.31X + 2.46Y$
196	$A = 3.31X + 2.45Y$
197	$A = 3.32X + 2.45Y$
198	$A = 3.32X + 2.44Y$
199	$A = 3.33X + 2.44Y$
200	$A = 3.33X + 2.43Y$
201	$A = 3.34X + 2.43Y$
202	$A = 3.34X + 2.42Y$
203	$A = 3.35X + 2.42Y$
204	$A = 3.35X + 2.41Y$
205	$A = 3.36X + 2.40Y$
206	$A = 3.37X + 2.40Y$
207	$A = 3.37X + 2.39Y$
208	$A = 3.38X + 2.39Y$
209	$A = 3.38X + 2.38Y$
210	$A = 3.39X + 2.37Y$
211	$A = 3.39X + 2.37Y$
212	$A = 3.40X + 2.37Y$
213	$A = 3.40X + 2.36Y$
214	$A = 3.41X + 2.35Y$
215	$A = 3.41X + 2.34Y$
216	$A = 3.42X + 2.33Y$
217	$A = 3.42X + 2.33Y$
218	$A = 3.42X + 2.32Y$
219	$A = 3.42X + 2.32Y$
220	$A = 3.42X + 2.32Y$

Counts per minute of Ra 226 alpha activity are converted to
uc/ml as follows:

$$(4) \frac{\text{CPM}}{\% \text{ Geometry}} = \text{DPM}$$

$$(5) \frac{(\text{DPM}) (1000 \text{ ml/L})}{(\% \text{ Chemical Extraction}) (\text{ml Sample})} = \text{DPM/Liter}$$

$$(6) \frac{\text{DPM/L}}{2.22 \times 10^9 \frac{\text{DPM/L}}{\text{uc/ml}}} = \text{uc/ml}$$

(combining equations (4), (5), and (6))

$$(7) \frac{\text{CPM} \times 10^{-6}}{(G) (E) (2.22) (\text{ml Sample})} = \text{uc/ml}$$

Example:

$$G = .42 \quad E = .85 \quad \text{CPM} = 100 \quad \text{ml Sample} = 5$$

$$\frac{100 \text{ CPM} \times 10^{-6}}{(.42) (.85) (2.22) (5)} = 2.62 \times 10^{-5}$$

Geometry and chemical extraction are constants; therefore
equation (7) may be resolved to:

$$(8) \frac{\text{CPM} \times 10^{-6}}{(.793) (\text{ml Sample})} = \text{uc/ml}$$

Conversion Factors for Alpha counts

$$\frac{\text{DPM/Liter}}{2.22 \times 10^9} = \text{uc/ml} \quad \text{or} \quad (\text{DPM/L}) (4.5 \times 10^{-9}) = \text{uc/ml}$$

The following equations are true only for ores which are in
secular equilibrium.

$$(\text{U}_3\text{O}_8) (6460) = \text{DPM/gm of U238 + U235} \quad \text{or}$$

$$(\text{U}_3\text{O}_8) (6460) = \text{DPM/gm of Ra226 + Ra 223} \quad \text{or}$$

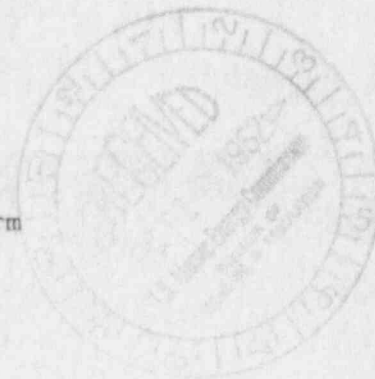
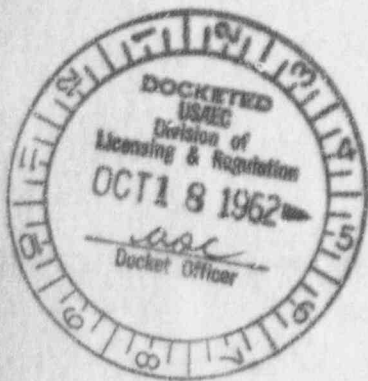
$$(\text{U}_3\text{O}_8) (6460) = \text{DPM/gm of Th230 + Th 227}$$

$$(\text{Gms. U}_3\text{O}_8/\text{Liter}) (3.95 \times 10^{-4}) = \frac{U}{\text{uc/ml}}$$

$$(\text{U}_3\text{O}_8) (6253) = \text{DPM/gm of R 226}$$

Determination of Thorium 230

Reagents: Meta Cresol Purple Indicator 0.1% sol'n
Hydroxylamine hydrochloride 4 Molar aqueous sol'n
TTA (Trifluoro thienyl butanedione) 0.5 Molar in Benzene
Ammonium Hydroxide
Nitric Acid
Hydrochloric Acid - 9 Normal
Triisooctylamine - 20% sol'n in chloroform
Chloroform - Reagent Grade



Procedure:

Transfer 200 ml of acidified sample to a 250 ml separatory funnel. Note: (for low range samples boil a liter down to 200 ml and transfer to the separatory funnel). Add 4 drops of 0.1% Meta-Cresol Purple indicator solution and 5 ml of 4 molar hydroxylamine hydrochloride. Hydroxylamine hydrochloride reduces iron from the ferric to the ferrous state and thus retards the extraction of iron by TTA. Adjust the pH of the samples by adding NH_4OH dropwise to the yellow color of the indicator then add NH_3 dropwise to pH 0.8.

Add 25 ml of 0.5 molar TTA solution. Extract thorium into the TTA benzene by shaking vigorously for five minutes. Allow the layers to separate, draw off the aqueous layer into another separatory funnel and repeat the extraction with a second 25 ml portion of TTA - Benzene.

Combine the organic extracts and wash twice with 10 ml portions of 0.2 N HNO_3 using a 1-minute shaking period. Combine the acid washes and extract and place in a separatory funnel.

To the combined TTA - Benzene extracts add 10 ml of 9 N HCl and shake vigorously for 2 minutes. Draw off the acid portion into a second separatory funnel. Add a second 10 ml portion of 9 N HCl to

the organic and repeat the extraction combining the acid portions.

Add 10 ml of 20% Tri-isooctylamine in Chloroform to the 9 N HCl solution and extract using a 2-minute shaking period and discard the organic phase.

Note: (if large quantities of iron are present in the HCl as indicated by a strong yellow color, repeat the TIA extraction until no further reduction of the color in the HCl is obtained). Following the TIA Chloroform extraction add 10 ml of Chloroform and shake for one minute to remove organic material from the acid layer. Discard the Chloroform. Draw off the acid layer into a 100 ml beaker and evaporate to dryness on a hot plate. Add 5 ml of HNO_3 and again evaporate to dryness to remove chloride. Take up the residue in 3 ml of HNO_3 and reduce the volume to approximately 1 ml by evaporation. Transfer the solution quantitatively to a 1 1/4 inch serrated planchette using distilled water as required to complete the transfer. Evaporate the solution to dryness under a heat lamp and muffle at 500°C for ten minutes.

Alpha count the planchette in a low background, gas flow, proportional counter.

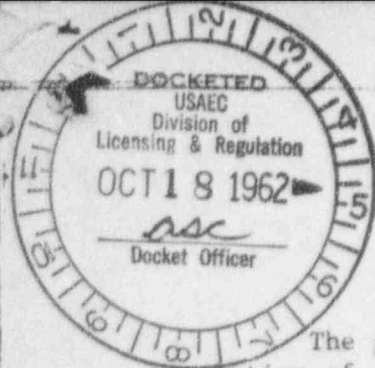
Calculations

$$\begin{aligned}
 & \frac{\text{CPM}}{(\text{counting Eff.}) (\text{DPM/uc}) (\text{Sample Vol. ml}) (\text{Chemical Eff.})} = \text{uc Th 230/ml} \\
 & \frac{1 \text{ c/m}}{(.45)(2.22 \times 10^{-6} \text{ DPM/uc})(200 \text{ ml})(.95)} = 0.527 \times 10^{-8} \text{ uc/ml} \\
 & (\text{CPM}) (0.527 \times 10^{-8}) = \text{uc/ml}
 \end{aligned}$$

Exhibit #10

DOCKET NO. 40-3453

LAR File Copy

PONDMAN REPORT

The pondman will daily perform the following duties and upon completion of each will check the square in the right hand column:

- | | <u>Check</u> |
|--|--------------------------|
| 1. Check the decant of the main pond for overflow, clarity, etc. | <input type="checkbox"/> |
| 2. Remove, if necessary, any trash on the decant screen. | <input type="checkbox"/> |
| 3. Check the entire liner for leaks by driving slowly around the edge of the pond. When leaks are found, repair them with the calking iron and calking material. | <input type="checkbox"/> |
| 4. As necessary, alternate the flow of tailings between A and B side. Upon changing the flow of tailings walk along the line into which the tailings flow has been introduced and check for leaks (take a shovel, calking iron, and calking material). Plug all leaks as much as possible with the calking material. Use the shovel, as necessary, to help direct any remaining leaks back into the pond. Maintain a clear effluent by changing the points of discharge when required. | <input type="checkbox"/> |
| 5. Check and record Weir measurements. | |
| Record Weir Measurement #1 _____ | <input type="checkbox"/> |
| Record Weir Measurement #2 _____ | |
| 6. Check Barite and record feed rate and fill hopper when necessary. | |
| Record feed rate _____ | <input type="checkbox"/> |
| 7. Pick up the effluent sample and take it to the laboratory. | <input type="checkbox"/> |
| 8. Fasten the 'Do not Enter' cables across the roads before leaving the pond. | <input type="checkbox"/> |

List below any repair or change recommendations that should go to the Yard Foreman: _____

Date _____

Signature of Pondman _____

PONDMAN REPORT

The pondman will daily perform the following duties and upon completion of each will check the square in the right hand column:

Check

1. Check the decant of the main pond for overflow, clarity, etc. ☐

2. Remove, if necessary, any trash on the decant screen. ☐

3. Check the entire lines for leaks by driving slowly around the edge of the pond. When leaks are found, repair them with the calking iron and calking material. ☐

4. As necessary, alternate the flow of tailings between A and B side. Upon changing the flow of tailings walk along the line into which the tailings flow has been introduced and check for leaks (take a shovel, calking iron, and calking material). Plug all leaks as much as possible with the calking material. Use the shovel, as necessary, to help direct any remaining leaks back into the pond. Maintain a clear effluent by changing the points of discharge when required. ☐

5. Check and record Weir measurements.

Record Weir Measurement #1 _____ ☐

Record Weir Measurement #2 _____ ☐

6. Check Barite and record feed rate and fill hopper when necessary.

Record feed rate _____ ☐

7. Pick up the effluent sample and take it to the laboratory. ☐

8. Fasten the 'Do not Enter' cables across the roads before leaving the pond. ☐

List below any repair or change recommendations that should go to the Yard Foreman: _____

Date

Signature of Pondman

Uranium Reduction Company

MOAB, UTAH

DOCKET NO. 40-3453

REPORT OF METALLURGICAL TESTS

LAB FILE COPY

TO: T. F. Izzo PROBLEM NO.: C 10 PT-17
 FROM: Temple DATE: July 25, 1962
 SUBJECT: Screen Analysis of Samples from Tailings Pond. Samples numbered proceeding from dike
at 30 ft. intervals.

	<u>% \nearrow 325 M.</u>	<u>% - 325 M.</u>
#1	91.3	8.7
#2	81.8	18.2
#3	80.4	19.6
#4	49.6	50.4
#5	64.6	35.4
#6	55.0	45.0
30' from Shore	6.5	93.5
Middle of Pond	0.5	99.5

