

CAL:ND

SOURCE MATERIAL LICENSE

License No. R-139

Effective April 1, 1957

TO PERSONS DELIVERING SOURCE MATERIAL
TO THE ANACONDA COPPER MINING COMPANY

A temporary license is hereby issued pursuant to Code of Federal Regulations, Title 10 - Chapter 1, Atomic Energy, Part 40 - Control of Source Material, authorizing the transfer and delivery of source material presented to the Anaconda Copper Mining Company at Bluewater, New Mexico, by the persons named in schedule A below, who have made application for license on Form AEC-2.

The names of the persons licensed hereunder will be entered in Schedule A below from time to time.

This license as to each such person shall expire on April 1, 1958, or upon receipt of a specific license by the licensee in response to his application on form AEC-2, whichever occurs first.

FOR THE ATOMIC ENERGY COMMISSION

~~SECRET~~

and

~~Lyall Johnson~~
Lyall Johnson
Chief, Licensing Branch
Division of Civilian Application

SCHEDULE A

Name of Licensee

Date of Temporary License

DOCKETED
U.S.A.E.C.

MAR 6 7 1957

DATE

BY

BY J.P.S.

J.P.S.
LICENSING OFFICER

CAL:ND

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The names of the persons licensed hereunder will be entered in Schedule A below from time to time.

This license as to each such person shall expire on April 1, 1958, or upon receipt of a specific license by the licensee in response to his application on form AEC-2, whichever occurs first.

FOR THE ATOMIC ENERGY COMMISSION

and
dispatched

Lvall Johnson
Chief, Licensing Branch
Division of Civilian Application

SCHEDULE A

Name of Licensee

Date of Temporary License

cc: Docket File
Document Rm.
M. Mann, INS

OFFICE ▶	CAL	CAL	CAL			
SURNAME ▶	NDoulos/jl	Atkins	LJohnson			
DATE ▶			2/27			

UNITED STATES
ATOMIC ENERGY COMMISSION

WASHINGTON 25, D. C.

IN REPLY REFER TO:

Docket No. 40-662-665

SOURCE MATERIAL LICENSE

License No. R- 138

Dated:

MAR 27 1957

The Anaconda Company
P. O. Box 638
Grants, New Mexico

Attention: Mr. A. J. Fitch

Gentlemen:

Pursuant to the Atomic Energy Act of 1954 and Section 40.21 of the Code of Federal Regulations, Title 10 - Atomic Energy, Chapter 1, Part 40 - Control of Source Material, you are hereby licensed to receive possession of and title to raw and refined source material without limitation as to quantity, for resale and for processing with raw source material from your own mining operations.

You are further licensed to transfer and deliver possession of and title to refined source material to any person licensed by the Atomic Energy Commission, within the limits of his license.

As a condition of this license, you are required to maintain records of your inventories, receipts and transfers of refined source material.

This license is subject to all the provisions of the Atomic Energy Act of 1954 now or hereafter in effect and to all valid rules and regulations of the U. S. Atomic Energy Commission, including 10 CFR 20, "Standards For Protection Against Radiation."

Neither this license nor any right under this license shall be assigned or otherwise transferred in violation of the provisions of the Atomic Energy Act of 1954.

This license shall expire April 1, 1958.

DOCKETED
U.S.A.E.C.

MAR 27 1957

EPTE

J.D.S.

LICENSING OFFICER

FOR THE ATOMIC ENERGY COMMISSION

and

dispatched

Lyall Johnson
Chief, Licensing Branch
Division of Civilian Application

CERTIFIED A TRUE COPY

BY *J.D.S.*

Docket given

THE ANACONDA COMPANY

New Mexico Operations

P. O. Box 638, Grants, New Mexico



A. J. FITCH
MANAGER

March 21, 1957

U. S. Atomic Energy Commission
Licensing Control Branch
Division of Construction and Supply
Washington, 25, D. C.

Gentlemen:

Enclosed is Form AEC-2 in duplicate requesting renewal of our License No. R-138 which expires April 1, 1957.

Our License No. R-139, under which we take care of shippers who have applied for but not received their license, likewise expires April 1, 1957. A renewal of this license also will be appreciated.

Very truly yours,

A. J. Fitch

P. S. Will you please send us a supply of your Form AEC-2 (4-47).

AJF:fd

Encls 2

DOCKETED
U.S.A.E.C.

MAR 25 1957

L. TE

J.P.S.
DOCKET OFFICER

**APPLICATION FOR AEC LICENSE TO
TRANSFER, DELIVER, EXPORT, OR RECEIVE
URANIUM OR THORIUM SOURCE MATERIAL**

Pursuant to Code of Federal Regulations, Title 11—
Atomic Energy, Part 40—Control of Source Material

2. PREVIOUS AEC LICENSE NUMBER, IF ANY.

No. R-138

INSTRUCTIONS

File two (2) copies of this application with the U. S. Atomic Energy Commission, P.O. Box 100, Washington, D. C. 20540. This application may be used for an original license or for the renewal of a license. In the case of a renewal, this application should be received by the Commission on or before 30 days before the expiration of the previous license. Complete blocks 1, 2, 3, 9, and if you combine two or more of the activities of Producer, Processor, Distributor, Exporter, or Consumer, complete each of the applicable blocks numbered 4 through 8.

TO: U. S. Atomic Energy Commission, Licensing Control Branch
~~Export Control Section~~ Division of Construction & Supply
~~New York 33, N. Y.~~ Washington, 25, D. C.

1. NAME AND ADDRESS OF APPLICANT
(Street, city, zone, state)

The Anaconda Company
New Mexico Operations
Box 638
Grants, New Mexico

3. INVENTORY. INVENTORY OF SOURCE MATERIAL, RAW AND REFINED, AS OF None
(Specify date of last inventory)

INSTRUCTION.—Include all source material in your possession or under your control, regardless of location. Include any source material you have possession of but which is owned by others, whether or not they are licensees of the Commission. Please specify that part of your inventory which is owned by other persons, listing the names, addresses, and quantities owned by each. Do not include in this inventory any raw source material not yet removed from its place of deposit in nature.

(a) Raw Source Material

DESCRIPTION OF MATERIAL	ESTIMATED PERCENT URANIUM OR THORIUM	QUANTITY IN INVENTORY (Gross tons)	NAME AND ADDRESS OF OWNER, IF DIFFERENT FROM THAT IN BLOCK 1 ABOVE
None			
<p>DOCKETED U.S.A.E.C. MAR 25 1957</p>			
<p>DATE</p>			

(b) Refined Source Material

DESCRIPTION OF MATERIAL	GRADE (Comm., CP, USP, etc.)	PERCENT OF URANIUM OR THORIUM	QUANTITY (Lb.)	NAME AND ADDRESS OF OWNER, IF DIFFERENT FROM THAT IN BLOCK 1 ABOVE
None				

909.
DOCKET OFFICER

A. Andrews Lease comprising the following:			
a. Francis Group (Francis 1-35, Incl.)	McKinley	Francis 1-14 Incl. located by H. Andrews, Prewitt, N. M.; leased by ACM Co.	Unknown Unknown
b. Alta Group (Alta 1-4 Incl.)	McKinley	Located by H. Andrews Prewitt, New Mexico; Leased to A.C.M. Co.	" "
(Alta 5-36)	McKinley	Located by Anaconda but included in Andrews Lease	" "
c. And all the mineral rights in Sec. 5, 9, 17, 33 & E $\frac{1}{2}$ & E $\frac{1}{2}$ W $\frac{1}{2}$ Sec. 21, T14N, R11W.	McKinley	Owned by W. C. Andrews Prewitt, New Mexico Leased to A.C.M. Co.	
B. Section 4, 33 & 34 Lease comprising:			
a. Tom Group (1-24 Incl.)	Valencia	Leased to A.C.M. Co from Alton L. Head & Mary F. Head, James M. Keeney & Grace Keeney, John H. Gossett & Kathleen Gossett, Mark Elkins & Ina Elkins, Fred J. Glover & Peggy Glover	" "
b. Dave Group (1-18, Incl.)	Valencia	SE $\frac{1}{4}$ SE $\frac{1}{4}$, Sec. 33 owned by Mark Elkins, Grants, N.M.;	" "
c. Forest Group (2-30, Incl.)	Valencia	Leased to A.C.M. Co.	" "
d. SE $\frac{1}{4}$ SE $\frac{1}{4}$, Sec. 33, T12N, R9W	Valencia		
C. Don Group (1B-6B Incl.)			
D. Mountain Group (1B-4B Incl.)			
E. Elkins Lease comprising all mineral rights in the following:			
T 12 N, R 8 W			
S $\frac{1}{2}$ SW $\frac{1}{4}$ of Sec. 28	Valencia	Property leased by A.C.M.Co. from Mark Elkins, Grants, N.M.	" "
SE $\frac{1}{4}$ SE $\frac{1}{4}$ of Sec. 29			
SE $\frac{1}{4}$ of Sec. 30			
E $\frac{1}{2}$ SW $\frac{1}{4}$ of Sec. 30			
SW $\frac{1}{4}$ NE $\frac{1}{2}$ of Sec. 30			
SE $\frac{1}{4}$ NW $\frac{1}{4}$ of Sec. 30			
Lots 1, 2, 3, 4 of Sec. 30			
NE $\frac{1}{4}$ NE $\frac{1}{4}$ of Sec. 32			
N $\frac{1}{2}$ N $\frac{1}{2}$ of Sec. 33			
T 12 N, R 9 W			
Section 9			
S $\frac{1}{2}$ of Sec. 17			
Section 19			

E. Elkins Lease (Continued)

Lots 1 & 12, Sec. 26)	Valencia	Property Leased by A.C.M.Co. from Mark Elkins, Grants, N.M..	Unknown	Unknown
SE 1/4 of Sec. 28					
Section 29					
Section 31					
SW 1/4 of Sec. 32					
NW 1/4 of Sec. 36					

F. Laguna Indian Reservation
 comprising various leases
 applied for or to be applied
 for under the exclusive rights
 conveyed by an agreement dated
 October 18, 1951, between the
 Pueblo of Laguna & A.C.M. Co.

Valencia	Pueblo of Laguna, c/o U. S. Indian Service, Albuquerque, N.M.	Unknown	Unknown
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G. L Bar Ranch Area, comprising
 various leases applied for or
 to be applied for under the
 exclusive rights conveyed
 by an agreement dated August
 14, 1954, between L Bar Cattle
 Co. and A.C.M. Co..

Valencia & Sandoval	L Bar Cattle Co. 807 Staley Bldg. Wichita Falls, Texas	Unknown	Unknown
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H. La Ventana Area, Lode
 Mining Claims Mesa #1
 thru 24, 26

Sandoval		Unknown	Unknown
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I. Chief Uranium - Section 28:
 W 1/2 Sec. 28, T14N, R10W

McKinley	Navajo Indian Allot- ments, Window Rock Arizona	Unknown	Unknown
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J. BG Claims: 1-157, 167,
 176-184, 193-223, 276-281,
 286-291, 296-300, 306-390,
 400-417, in Sec. 12, 24,
 T12N, R4W, and Sec. 8, 9,
 10, 11, 12, 13, 14, 15, 17, 18,
 20, 21, 28, 29, 30 T12N, R3W.

Sandoval	Anaconda Copper Mining Co., Grants, N. M.	Unknown	Unknown
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K. Fernandez Ranch Claims
 T. 16 N, R. 9 W.

McKinley	Located by The Anaconda Co. and Floyd W. Lee	Unknown	Unknown
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Section: - Claim Name:

- 2 2169-1 thru 2169-20
- 8 8169-1 thru 8169-36
- 10 10169-1 thru 10169-36
- 12 12169-1 thru 12169-36
- 14 14169-1 thru 14169-1
- 22 22169-1 thru 22169-36
- 24 24169-1 thru 24169-36
- 26 26169-1 thru 26169-36
- 28 28169-1 thru 28169-36
- 30 30169-1 thru 30169-36

K. Fernandez Claims (Continued)

T 16 N, R 8 W

Section: - Claim Name:

- 2 2168-1 thru 2168-31
- 4 4168-1 thru 4168-36
- 6 6168-1 thru 6168-36
- 8 8168-1 thru 8168-36
- 10 10168-1 thru 10168-36
- 12 12168-1 thru 12168-36
- 14 14168-1 thru 14168-36
- 18 18168-1 thru 18168-36
- 20 20168-1 thru 20168-8
20168-9A and 20168-10A
20168-19 thru 20168-36
- 22 22168-1 thru 22168-36
- 24 24168-1 thru 24168-36
- 26 26168-1 thru 26168-36
- 28 28168-1 thru 28168-36
- 30 30168-1 thru 30168-36
- 34 34168-1 thru 34168-36

T 16 N, R 7 W

- 4 4167-1 thru 4167-36
- 6 6167-1 thru 6167-36
- 8 8167-1 thru 8167-36
- 10 10167-1 thru 10167-36
- 12 12167-1 thru 12167-36
- 14 14167-1 thru 14167-36
- 18 18167-1 thru 18167-36
- 20 20167-1 thru 20167-36
- 22 22167-1 thru 22167-36
- 24 24167-1 thru 24167-36
- 26 26167-1 thru 26167-36
- 28 28167-1 thru 28167-36
- 30 30167-1 thru 30167-36
- 34 34167-1 thru 34167-36

T 16 N, R 6 W

- 12 12166-1 thru 12166-36
- 24 24166-1 thru 24166-36

T 15 N, R 8 W

- 2 2158-1 thru 2158-36
- 4 4158-1 thru 4158-28
- 6 6158-1 thru 6158-36
- 8 8158-1 thru 8158-36
- 10 10158-1 thru 10158-36
- 12 12158-1 thru 12158-36
- 14 14158-1 thru 14158-36
- 18 18158-1 thru 18158-36
- 20 20158-1 thru 20158-36
- 22 22158-1 thru 22158-36
- 24 24158-1 thru 24158-36
- 26 26158-1 thru 26158-36
- 28 28158-2A, 28158-4A,
~~28158-6A, 28158-10A,~~
~~28158-12A, 28158-14A,~~
28158-23 thru 28158-36
- 30 30158-1 thru 30158-36
- 32 32158-1 thru 32158-36

Section: - Claim Name:

- 4 4157-1 thru 4157-36

Section:	Claim Name:
4	4157-1 thru 4157-36
6	6157-1A, 6157-3A, 6157-5A, 6157-7A, 6157-10A 6157-11 thru 6157-28 6157-31A thru 6157-36A
8	8157-1 thru 8157-36
10	10157-1A thru 10157-23A
18	18157-1 thru 18157-36
20	20157-1 thru 20157-36
22	22157-1 thru 22157-7
24	24157-1 thru 24157-4
26	26157-1 thru 26157-36
28	28157-1 thru 28157-36
30	30157-1 thru 30157-36
34	34157-1 thru 34157-36

T 14 N, R 8 W

4	4148-3, 4148-4, 4148-5, 4148-8, 4148-9, 4148-10, 4148-16A, 4148-17A, 4148-18A, 4148-21 thru 4148-36
14	14148-1 thru 14148-32
22	22148-1 thru 22148-10

T 14 N, R 7 W

4	4147-1 thru 4147-4
6	6147-1 thru 6147-3

L. The Elizabeth Group of Lode Mining Claims

T 13 N, R 8 W

11	Elizabeth Nos. 1 thru 36 Valencia	Property leased by The Anacenda Company from Charles E. Morrison & Lottie Lucille Morrison J. A. Little and Novella Davis Little, Roy L. Riner and Josephine Riner, Charles A. Carroll and Ida Carroll, Wayne Smith and Grace Smith.	Unknown	Unknown
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5. PROCESSORS. IF YOU REQUEST AN ATOMIC ENERGY COMMISSION LICENSE TO CHEMICALLY PROCESS SOURCE MATERIAL, CHECK THIS BOX AND SUPPLY THE INFORMATION REQUESTED IN THIS BLOCK, AS WELL AS THE INFORMATION REQUESTED IN BLOCKS 1, 2, 3, AND 9.

(a) THE APPLICANT CHEMICALLY PROCESSES SOURCE MATERIAL IN PLANTS LOCATED AT: (These plants include all of the plants in which the applicant will process source material under the terms of any license issued by the Commission.)

1. Bluewater, 10 Miles Northwest of Grants, New Mexico

2.

3.

4.

(b) IN THE EVENT RESIDUES AND TAILINGS ARE TO BE DISCARDED PLEASE DESCRIBE THESE RESIDUES AND TAILINGS, THE FREQUENCY OF DISCARDS, THE PROBABLE SOURCE MATERIAL CONTENT AND THE REASONS FOR NOT CONSERVING THE MATERIAL:

Finely ground ore, after treatment in leaching plant, will contain unrecoverable fines ranging from 0.005% to 0.03% U_3O_8 ; these tailings will be discarded continuously into a tailings pond whence they could be reclaimed in the future if process improvements or economic considerations should render necessary or desirable.

6. DISTRIBUTORS. IF YOU REQUEST AN ATOMIC ENERGY COMMISSION LICENSE TO RECEIVE SOURCE MATERIAL FOR RESALE ONLY, WITHOUT ANY INTERMEDIATE PROCESSING, CHECK THIS BOX AND COMPLETE BLOCKS 1, 2, 3, AND 9.

7. CONSUMERS. IF YOU REQUEST AN ATOMIC ENERGY COMMISSION LICENSE TO USE SOURCE MATERIAL IN CHEMICAL ANALYSIS OR IN THE MANUFACTURE OF, OR FOR INCORPORATION IN, ANY PRODUCT, CHECK THIS BOX AND SUPPLY THE INFORMATION REQUESTED IN THIS BLOCK AS WELL AS THE INFORMATION REQUESTED IN BLOCKS 1, 2, 3, AND 9.

DESCRIPTION OF SOURCE MATERIAL TO BE USED	ESTIMATED ANNUAL REQUIREMENTS (Lb.)	USES
		INDICATE WHETHER (1) AS ANALYTICAL REAGENT, (2) FOR INCANDESCENT MAN- TLES, (3) MEDICINAL, OR (4) OTHER. IN THE CASE OF OTHER USES, DESCRIBE THE PRODUCT, THE SOURCE MATERIAL CONTENT, AND THE MANNER IN WHICH THE PRODUCT WILL BE USED.

8. EXPORTERS. IF YOU REQUEST AN ATOMIC ENERGY COMMISSION LICENSE TO EXPORT SOURCE MATERIAL, CHECK THIS BOX AND SUPPLY THE BALANCE OF THE INFORMATION REQUESTED IN THIS BLOCK AS WELL AS THE INFORMATION REQUESTED IN BLOCKS 1, 2, 3, AND 9. (Note that approval on Form AEC-7 is required for each individual export transaction.)

Name and address of each of your agents who for your account will prepare Department of Commerce "Shipper's Export Declaration" (Form 7525-V), will request permission to export on Form AEC-7, and will ship source material.

NAME OF AGENT	ADDRESS

9. **CERTIFICATION AND AGREEMENT.** THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION AND AGREEMENT ON BEHALF OF THE APPLICANT (1) CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH CODE OF FEDERAL REGULATIONS, TITLE 11—ATOMIC ENERGY, PART 40—CONTROL OF SOURCE MATERIAL; (2) CERTIFY THAT ALL INFORMATION CONTAINED IN THIS APPLICATION IS TRUE AND COMPLETE TO THE BEST OF THEIR KNOWLEDGE AND BELIEF; AND (3) AGREE THAT IN THE EVENT THAT THIS APPLICATION IS APPROVED BY THE ATOMIC ENERGY COMMISSION, AND A LICENSE IS ISSUED, THAT THE DULY AUTHORIZED REPRESENTATIVES OF THE COMMISSION MAY FREELY INSPECT AT ALL REASONABLE TIMES FACILITIES AND RECORDS, TAKE SAMPLES FOR ASSAY, AND DO SUCH OTHER THINGS AS WILL, IN THE OPINION OF THE COMMISSION, ASSURE THAT ALL SOURCE MATERIAL HANDLED BY THE APPLICANT UNDER THE AUTHORITY OF HIS LICENSE, IS PROPERLY ACCOUNTED FOR AND USED.

THE ANACONDA COMPANY
New Mexico Operations

BY [Signature]
(Signature of applicant)

Manager
(Title)

March 21, 1957
(Date)

Section 35 (A) of the United States Criminal Code, 18 U. S. C. Sec. 80, makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

(FOR GOVERNMENT USE ONLY)

UNITED STATES OF AMERICA
ATOMIC ENERGY COMMISSION

LICENSE NO. _____

SOURCE MATERIAL LICENSE

State of New Mexico, County of Valencia:
Subscribed and sworn to (or affirmed) before me
this 21st day of March, 1957.

*My Commission expires
May 14, 1958*

*Katherine Huffman
notary Public*

THE ANACONDA COMPANY

New Mexico Operations

P. O. Box 638, Grants, New Mexico



A. J. FITCH
MANAGER

March 17, 1958

U. S. Atomic Energy Commission
Licensing Control Branch
Division of Construction and Supply
Washington 25, D. C.


Gentlemen:

Herewith are the executed and notarized original and duplicate of Form AEC-2. Will you please renew our Source Material License No. R-138, which will expire April 1, 1958.

Please also renew our Source Material License No. R-139 ⁴⁰⁻⁶⁶⁵ which covers the shipments of ore to us by others who have made application to the Commission on Form AEC-2 and are awaiting receipt of their Source Material License.

Very truly yours,

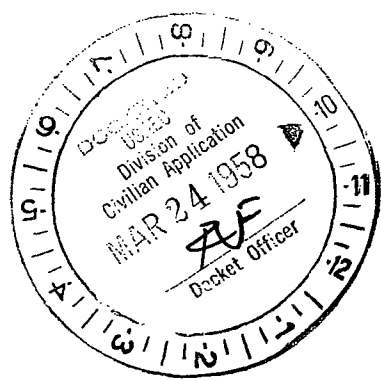
THE ANACONDA COMPANY

By 
E. C. Peterson
Assistant Manager

nk
Encls.(2)

cc: Mr. C. E. Tonry - Grand Junction

Incident 6-2211



FORM AEC-2
(4-47)

UNITED STATES OF AMERICA
ATOMIC ENERGY COMMISSION

Form approved
Budget Bureau No. 38-R002.2
Approval expires 6/30/60

**APPLICATION FOR AEC LICENSE TO
TRANSFER, DELIVER, EXPORT, OR RECEIVE
URANIUM OR THORIUM SOURCE MATERIAL**

Pursuant to Code of Federal Regulations, Title 10—
Atomic Energy, Part 40—Control of Source Material

2. PREVIOUS AEC LICENSE NUMBER, IF ANY.

No. R-138

INSTRUCTIONS

File two (2) copies of this application with the U. S. Atomic Energy Commission, ~~Room 3000, 400 ...~~
This application may be used for an original license or for the renewal of a license. In the case of a renewal, this application should be received by the Commission on or before 30 days before the expiration of the previous license. Complete blocks 1, 2, 3, 9, and if you combine two or more of the activities of Producer, Processor, Distributor, Exporter, or Consumer, complete each of the applicable blocks numbered 4 through 8.

TO: U. S. Atomic Energy Commission, ~~Room 3000, 400 ...~~
Licensing Control Branch
Division of Construction & Supply
Washington 25, D. C.

1.

NAME AND ADDRESS OF APPLICANT
(Street, city, zone, state)

The Anaconda Company
New Mexico Operations
Box 638
Grants, New Mexico

3. INVENTORY. INVENTORY OF SOURCE MATERIAL, RAW AND REFINED, AS OF None (Specify date of last inventory)

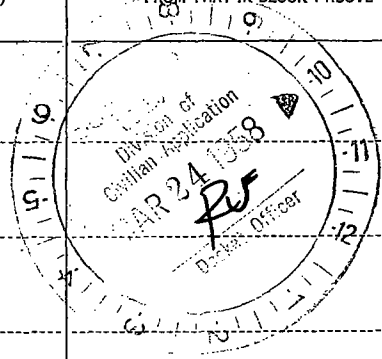
INSTRUCTION.—Include all source material in your possession or under your control, regardless of location. Include any source material you have possession of but which is owned by others, whether or not they are licensees of the Commission. Please specify that part of your inventory which is owned by other persons, listing the names, addresses, and quantities owned by each. Do not include in this inventory any raw source material not yet removed from its place of deposit in nature.

(a) Raw Source Material

DESCRIPTION OF MATERIAL	ESTIMATED PERCENT URANIUM OR THORIUM	QUANTITY IN INVENTORY (Gross tons)	NAME AND ADDRESS OF OWNER, IF DIFFERENT FROM THAT IN BLOCK 1 ABOVE
None			

(b) Refined Source Material

DESCRIPTION OF MATERIAL	GRADE (Comm., CP, USP, etc.)	PERCENT OF URANIUM OR THORIUM	QUANTITY (Lb.)	NAME AND ADDRESS OF OWNER, IF DIFFERENT FROM THAT IN BLOCK 1 ABOVE
None				



4. PRODUCERS. (Miners of uranium and thorium containing ores and gravels) IF YOU REQUEST AN ATOMIC ENERGY COMMISSION LICENSE TO TRANSFER AND DELIVER SOURCE MATERIAL AFTER ITS REMOVAL FROM ITS PLACE OF DEPOSIT IN NATURE, CHECK THIS BOX AND SUPPLY THE INFORMATION REQUESTED IN THIS BLOCK AS WELL AS THE INFORMATION REQUESTED IN BLOCKS 1, 2, 3, AND 9.

NAMES OF OPERATING PROPERTIES (Show number of claims included on each property)	LOCATIONS (Mining district and county)	NAMES AND ADDRESSES OF OWNERS IF DIFFERENT FROM APPLICANT	ESTIMATED QUANTITY OF ORE TO BE PRODUCED IN NEXT 12 MONTHS	ESTIMATED PERCENT URANIUM OR THORIUM
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A. Andrews Lease comprising the following:

a. Francis Group (Francis 1-35, Incl.)	McKinley	Francis 1-14 Incl. located by H. Andrews, Prewitt, N. M.; leased by ACM Co.	Unknown	Unknown
b. Alta Group (Alta 1-4 Incl.)	McKinley	Located by H. Andrews Prewitt, New Mexico; Leased to A.C.M. Co.	"	"
	McKinley	Located by Anaconda but included in Andrews Lease	"	"
c. And all the mineral rights in Sec. 5, 9, 17, 33 & E $\frac{1}{2}$ & E $\frac{1}{2}$ W $\frac{1}{2}$ Sec. 21, T14N, R11W.	McKinley	Owned by W. C. Andrews Prewitt, New Mexico Leased to A.C.M. Co.		

B. Section 4, 33 & 34 Lease comprising:

a. Tom Group (1-24 Incl.)	Valencia	Leased to A.C.M. Co. from Alton L. Head & Mary F. Head, James M. Keeney & Grace Keeney, John H. Gossett & Kathleen Gossett, Mark Elkins & Ina Elkins, Fred J. Glover & Peggy Glover	"	"
b. Dave Group (1-18, Incl.)	Valencia	SE $\frac{1}{4}$ SE $\frac{1}{4}$, Sec. 33 owned by Mark Elkins, Grants, N.M.;	"	"
c. Forest Group (2-30, Incl.)	Valencia	Leased to A.C.M. Co.	"	"
d. SE $\frac{1}{4}$ SE $\frac{1}{4}$, Sec. 33, T12N, R9W	Valencia	Leased to A.C.M. Co.	"	"

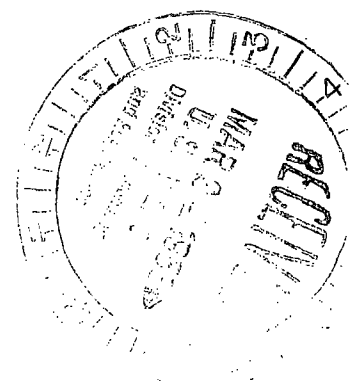
C. Don Group (1B-6B Incl.) Valencia

D. Mountain Group (1B-4B Incl.) Valencia

E. Elkins Lease comprising all mineral rights in the following:

T. 12 N, R 8 W
 S $\frac{1}{2}$ SW $\frac{1}{4}$ of Sec. 28)
 SE $\frac{1}{4}$ SE $\frac{1}{4}$ of Sec. 29)
 SE $\frac{1}{4}$ of Sec. 30)
 E $\frac{1}{2}$ SW $\frac{1}{4}$ of Sec. 30)
 SW $\frac{1}{4}$ NE $\frac{1}{4}$ of Sec. 30)
 SE $\frac{1}{4}$ NW $\frac{1}{4}$ of Sec. 30)
 Lots 1, 2, 3, 4 of Sec. 30)
 Valencia

Property leased A.C.M. Co. from Mark Elkins, Grants, N.M. " "



NE $\frac{1}{4}$ NE $\frac{1}{4}$ of Sec. 32
 N $\frac{1}{2}$ N $\frac{1}{2}$ of Sec. 33

T 12 N, R 9 W
 Section 9
 S $\frac{1}{2}$ of Sec. 17
 Section 19
 Section 21
 NW $\frac{1}{4}$ NE $\frac{1}{4}$ of Sec. 26

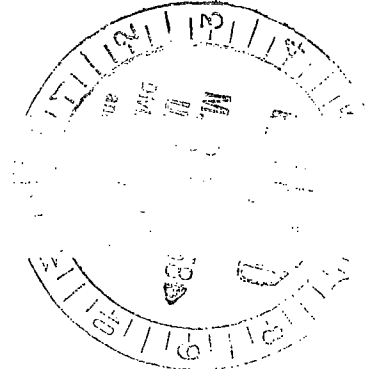
<p>E. Elkins Lease (continued) Lots 1 & 12, Sec. 26 SE$\frac{1}{4}$ of Sec. 28 Section 29 Section 31 SW$\frac{1}{4}$ of Sec. 32 Section 33 NW$\frac{1}{4}$ of Sec. 36</p>	<p>Valencia</p>	<p>Property Leased by A.C.M. Co. from Mark Elkins, Grants, N.M.</p>	<p>Unknown</p>	<p>Unknown</p>
<p>F. Laguna Indian Reservation comprising various leases applied for or to be applied for under the exclusive rights conveyed by an agreement dated October 18, 1951, between the Pueblo of Laguna & A.C.M. Co.</p>	<p>Valencia</p>	<p>Pueblo of Laguna, c/o U.S. Indian Service, Albuquerque, N. M.</p>	<p>Unknown</p>	<p>Unknown</p>
<p>G. L Bar Ranch Area, comprising various leases applied for or to be applied for under the exclusive rights conveyed by an agreement dated August 15, 1957, between L Bar Cattle Co. and A.C.M. Co.</p>	<p>Valencia & Sandoval</p>	<p>L Bar Cattle Co. 807 Staley Bldg. Wichita Falls, Texas</p>	<p>Unknown</p>	<p>Unknown</p>
<p>H. Chief Uranium - Section 28: W$\frac{1}{2}$ Sec. 28, T14N, R10W</p>	<p>McKinley</p>	<p>Navajo Indian Allot- ments, Window Rock, Arizona</p>	<p>Unknown</p>	<p>Unknown</p>
<p>I. BG Claims: 1-36, 98-157, 203-208, 211-218, 220-223, 276-281, 286-291, 296-300, 306-390, 412-417, in Sec. 12, 24, T12N, R4W, and Sec. 13, 14, 15, 17, 18, 20, 21, T12N, R3W.</p>	<p>Sandoval</p>	<p>Anaconda Copper Mining Co., Grants, N. M.</p>	<p>Unknown</p>	<p>Unknown</p>
<p>J. Fernandez Ranch Claims <u>T 16 N, R 9 W</u> <u>Section: - Claim Name:</u> 2 2169-1 thru 2169-20 8 8169-1 thru 8169-36 10 10169-1 thru 10169-36 12 12169-1 thru 12169-36 14 14169-1 thru 14169-36 22 22169-1 thru 22169-36 24 24169-1 thru 24169-36 26 26169-1 thru 26169-36</p>	<p>McKinley</p>	<p>Located by The Anaconda Co. and Floyd W. Lee</p>	<p>Unknown</p>	<p>Unknown</p>

20 20107-1 thru 20107-30
28 28169-1 thru 28169-36
30 30169-1 thru 30169-36
34 34169-1 thru 34169-36

T 16 N, R 8 W

Section: - Claim Name:

2 2168-1 thru 2168-31
4 4168-1 thru 4168-36
6 6168-1 thru 6168-36
8 8168-1 thru 8168-36



J. Fernandez Claims (continued)

T 16 N, R 8 W

Section: - Claim Name:

10 10168-1 thru 10168-36
12 12168-1 thru 12168-36
14 14168-1 thru 14168-36
18 18168-1 thru 18168-36
20 20168-1 thru 20168-8
20168-9A and 20168-10A
20168-19 thru 20168-36
22 22168-1 thru 22168-36
24 24168-1 thru 24168-36
26 26168-1 thru 26168-36
28 28168-1 thru 28168-36
30 30168-1 thru 30168-36
34 34168-1 thru 34168-36

T 16 N, R 7 W

4 4167-1 thru 4167-36
6 6167-1 thru 6167-36
8 8167-1 thru 8167-36
10 10167-1 thru 10167-36
12 12167-1 thru 12167-36
14 14167-1 thru 14167-36
18 18167-1 thru 18167-36
20 20167-1 thru 20167-36
22 22167-1 thru 22167-36
24 24167-1 thru 24167-36
26 26167-1 thru 26167-36
28 28167-1 thru 28167-36
30 30167-1 thru 30167-36
34 34167-1 thru 34167-36

T 16 N, R 6 W

12 12166-1 thru 12166-36
24 24166-1 thru 24166-36

T 15 N, R 8 W

2 2158-1 thru 2158-36
4 4158-1 thru 4158-28
6 6158-1 thru 6158-36
8 8158-1 thru 8158-36
10 10158-1 thru 10158-36
12 12158-1 thru 12158-36
14 14158-1 thru 14158-36
18 18158-1 thru 18158-36
20 20158-1 thru 20158-36
22 22158-1 thru 22158-36
24 24158-1 thru 24158-36
26 26158-1 thru 26158-36



26 26158-1 thru 26158-36
 28 28158-2A, 28158-3A, 28158-4A, 28158-5A, 28158-6A, 28158-10A, 28158-12A, 28158-14A, 28158-23 thru 28158-36
 30 30158-1 thru 30158-36
 32 32158-1 thru 32158-36

T 15 N, R 7 W

Section: - Claim Name:
 4 4157-1 thru 4157-36
 6 6157-1A, 6157-3A, 6157-5A, 6157-7A, 6157-10A, 6157-11 thru 6157-28, 6157-31A thru 6157-36A
 8 8157-1 thru 8157-36
 10 10157-1A thru 10157-23A
 18 18157-1 thru 18157-36
 20 20157-1 thru 20157-36
 22 22157-1 thru 22157-7
 24 24157-1 thru 24157-4
 26 26157-1 thru 26157-36
 28 28157-1 thru 28157-36
 30 30157-1 thru 30157-36
 34 34157-1 thru 34157-36

T 14 N, R 8 W

4 4148-3, 4148-4, 4148-5, 4148-8, 4148-9, 4148-10, 4148-16A, 4148-17A, 4148-18A, 4148-21 thru 4148-36
 14 14148-1 thru 14148-32
 22 22148-1 thru 22148-10

T 14 N, R 7 W

4 4147-1 thru 4147-4
 6 6147-1 thru 6147-3

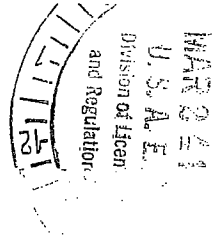
K. The Elizabeth Group of Lode Mining Claims

T 13 N, R 8 W

11	Elizabeth Nos. 1 thru 36	Valencia	Property leased by The Anaconda Company from Charles E. Morrison & Lottie Lucille Morrison, J. A. Little and Novella Davis Little, Roy L. Riner and Josephine Riner, Charles A. Carroll and Ida Carroll, Wayne Smith and Grace Smith.	Unknown	Unknown
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L. Navajo Leases

a.	Tract No. 19, Contract No. 14-20-603-3584, NW $\frac{1}{4}$, Sec. 10, T14N, R10W.	McKinley	Property leased by The Anaconda Company from Glin ne pah (Mrs. Johnson Garcia) C#8742, heir of A. Kenneth bah Sosie, original allottee, and General Superintendent at Window Rock Navajo Agency	Unknown	Unknown
----	--	----------	---	---------	---------



General Superintendent at Window Rock Navajo Agency for undetermined heir(s) of Ha diz bah, deceased heir of A. Kenneth bah Sosie. Post Office - Coolidge, New Mexico.

L. Navajo Leases (continued)

b. Tract No. 20, Contract No. 14-20-603-3585, NW $\frac{1}{4}$, Sec. 20, T14N, R10W.	McKinley	Property leased by The Anaconda Company from Ah che des bah Barbone (Nellie Barbone) C#12557 Post Office - Prewitt, New Mexico.	Unknown	Unknown
c. Tract No. 21, Contract No. 14-20-603-3586, NE $\frac{1}{4}$, Sec. 20, T14N, R10W.	McKinley	Property leased by The Anaconda Company from General Superintendent, Navajo Agency, Window Rock, Arizona for undetermined heir(s) of Jolley Barbone. Allot No. 062440(3248).	"	"
d. Tract No. 22, Contract No. 14-20-603-3587, SW $\frac{1}{4}$, Sec. 20, T14N, R10W.	McKinley	Property leased by The Anaconda Company from Frank Barbone C#12555 Post Office - Coolidge, New Mexico.	"	"
e. Tract No. 23, Contract No. 14-20-603-3588, SE $\frac{1}{4}$, Sec. 20, T14N, R10W.	McKinley	Property leased by The Anaconda Company from Johnny Barbone C#86229 Post Office - Prewitt, New Mexico.	"	"
f. Tract No. 57, Contract No. 14-20-603-3589, NE $\frac{1}{4}$, Sec. 22, T15N, R10W.	McKinley	Property leased by The Anaconda Company from Hah nah pah, A.K.A. Mrs. Bezzhin Begay Largo C#8687 Post Office - Prewitt, New Mexico.	"	"
g. Tract No. 58, Contract No. 14-20-603-3590, NW $\frac{1}{4}$, Sec. 22, T15N, R10W.	McKinley	Property leased by The Anaconda Company from Kee Yazzie, A.K.A. John Yazzie Largo C#8695 Post Office - Prewitt, New Mexico.	"	"
h. Tract No. 59, Contract No. 14-20-603-3591, SW $\frac{1}{4}$, Sec. 22, T15N, R10W.	McKinley	Property leased by The Anaconda Company from Na nos bah, A.K.A. Grace Largo C#8696, Post Office - Prewitt, New Mexico.	"	"
i. Tract No. 60, Contract No. 14-20-603-3592, SE $\frac{1}{4}$, Sec. 22, T15N, R10W.	McKinley	Property leased by The Anaconda Company from Bah (Rachel Largo) C#8697, Post Office - Prewitt, New Mexico.	"	"

L. Navajo Leases (continued)

j. Tract No. 65, Contract No.
14-20-603-3593, SW $\frac{1}{4}$, Sec. 26,
T15N, R10W.

McKinley Property leased by The Unknown Unknown
Anaconda Company from
Hah nah pah, A.K.A.
Mrs. Bezzhin Begay Largo
C#8687, only surviving
heir of Ah ke ha bah, and
General Superintendent,
Window Rock Navajo Agency
for undetermined heirs of
Bezzhin Begay, deceased
heir of Ah ke ha bah,
original allottee. Post
Office - Prewitt, New Mexico.

k. Tract No. 66, Contract No.
14-20-603-3594, NW $\frac{1}{4}$, Sec. 26,
T15N, R10W.

McKinley Leased by The Anaconda " "
Company from Knop ah A.K.A.
Peter Antonio C#8701.
Address: U.S.M.C. Repair Br.
Barstow, California

l. Tract No. 69, Contract No.
14-20-603-3595, Lots 3 & 4,
and E $\frac{1}{2}$ SW $\frac{1}{4}$, Sec. 30, T15N,
R10W.

McKinley Leased by The Anaconda " "
Company from Ya da bah Platero
(Grace Platero) C#8765. Post
Office - Prewitt, New Mexico.

m. Tract No. 70, Contract No.
14-20-603-3596, SE $\frac{1}{4}$, Sec. 30,
T15N, R10W.

McKinley Leased by The Anaconda " "
Company from Ha nap bi he
Platero, A.K.A. Caroline
Kenneth C#8768. Post Office
Prewitt, New Mexico.

n. Tract No. 75, Contract No.
14-20-603-3597, NW $\frac{1}{4}$, Sec. 34,
T15N, R10W.

McKinley Leased by The Anaconda " "
Company from De net e jole,
or Juanito Platero C#8763.
Post Office - Prewitt, New
Mexico.

o. Tract No. 76, Contract No.
14-20-603-3598, NE $\frac{1}{4}$, Sec. 34,
T15N, R10W.

McKinley Leased by The Anaconda " "
Company from Na ta ye nes
wood Platero, A.K.A.
Leonard Platero C#8769.
Post Office - Prewitt, New
Mexico.

5. PROCESSORS. IF YOU REQUEST AN ATOMIC ENERGY COMMISSION LICENSE TO CHEMICALLY PROCESS SOURCE MATERIAL, CHECK THIS BOX AND SUPPLY THE INFORMATION REQUESTED IN THIS BLOCK, AS WELL AS THE INFORMATION REQUESTED IN BLOCKS 1, 2, 3, AND 9.

(a) THE APPLICANT CHEMICALLY PROCESSES SOURCE MATERIAL IN PLANTS LOCATED AT: *(These plants include all of the plants in which the applicant will process source material under the terms of any license issued by the Commission.)*

1. Bluewater, 10 Miles Northwest of Grants, New Mexico

2.

3.

4.

(b) IN THE EVENT RESIDUES AND TAILINGS ARE TO BE DISCARDED PLEASE DESCRIBE THESE RESIDUES AND TAILINGS, THE FREQUENCY OF DISCARDS, THE PROBABLE SOURCE MATERIAL CONTENT AND THE REASONS FOR NOT CONSERVING THE MATERIAL:

Finely ground ore, after treatment in leaching plant, will contain unrecoverable fines ranging from 0.005% to 0.03% U_3O_8 ; these tailings will be discarded continuously into a tailings pond whence they could be reclaimed in the future if process improvements or economic considerations should render necessary or desirable.

6. DISTRIBUTORS. IF YOU REQUEST AN ATOMIC ENERGY COMMISSION LICENSE TO RECEIVE SOURCE MATERIAL FOR RESALE ONLY, WITHOUT ANY INTERMEDIATE PROCESSING, CHECK THIS BOX AND COMPLETE BLOCKS 1, 2, 3, AND 9.

7. CONSUMERS. IF YOU REQUEST AN ATOMIC ENERGY COMMISSION LICENSE TO USE SOURCE MATERIAL IN CHEMICAL ANALYSIS OR IN THE MANUFACTURE OF, OR FOR INCORPORATION IN, ANY PRODUCT, CHECK THIS BOX AND SUPPLY THE INFORMATION REQUESTED IN THIS BLOCK AS WELL AS THE INFORMATION REQUESTED IN BLOCKS 1, 2, 3, AND 9.

DESCRIPTION OF SOURCE MATERIAL TO BE USED	ESTIMATED ANNUAL REQUIREMENTS (Lb.)	USES
		INDICATE WHETHER (1) AS ANALYTICAL REAGENT, (2) FOR INCANDESCENT MAN- TLES, (3) MEDICINAL, OR (4) OTHER. IN THE CASE OF OTHER USES, DESCRIBE THE PRODUCT, THE SOURCE MATERIAL CONTENT, AND THE MANNER IN WHICH THE PRODUCT WILL BE USED.

8. EXPORTERS. IF YOU REQUEST AN ATOMIC ENERGY COMMISSION LICENSE TO EXPORT SOURCE MATERIAL, CHECK THIS BOX AND SUPPLY THE BALANCE OF THE INFORMATION REQUESTED IN THIS BLOCK AS WELL AS THE INFORMATION REQUESTED IN BLOCKS 1, 2, 3, AND 9. *(Note that approval on Form AEC-7 is required for each individual export transaction.)*

Name and address of each of your agents who for your account will prepare Department of Commerce "Shipper's Export Declaration" (Form 7525-V), will request permission to export on Form AEC-7, and will ship source material.

NAME OF AGENT	ADDRESS

9. CERTIFICATION AND AGREEMENT. THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION AND AGREEMENT ON BEHALF OF THE APPLICANT (1) CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH CODE OF FEDERAL REGULATIONS, TITLE 11—ATOMIC ENERGY, PART 40—CONTROL OF SOURCE MATERIAL; (2) CERTIFY THAT ALL INFORMATION CONTAINED IN THIS APPLICATION IS TRUE AND COMPLETE TO THE BEST OF THEIR KNOWLEDGE AND BELIEF; AND (3) AGREE THAT IN THE EVENT THAT THIS APPLICATION IS APPROVED BY THE ATOMIC ENERGY COMMISSION, AND A LICENSE IS ISSUED, THAT THE DULY AUTHORIZED REPRESENTATIVES OF THE COMMISSION MAY FREELY INSPECT AT ALL REASONABLE TIMES FACILITIES AND RECORDS, TAKE SAMPLES FOR ASSAY, AND DO SUCH OTHER THINGS AS WILL, IN THE OPINION OF THE COMMISSION, ASSURE THAT ALL SOURCE MATERIAL HANDLED BY THE APPLICANT UNDER THE AUTHORITY OF HIS LICENSE, IS PROPERLY ACCOUNTED FOR AND USED.

THE ANACONDA COMPANY
New Mexico Operations

BY [Signature]
(Signature of applicant)

Assistant Manager

(Title)

March 15, 1958

(Date)

Section 35 (A) of the United States Criminal Code, 18 U. S. C. Sec. 80, makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

(FOR GOVERNMENT USE ONLY)

UNITED STATES OF AMERICA
ATOMIC ENERGY COMMISSION

LICENSE NO. _____

SOURCE MATERIAL LICENSE

State of New Mexico, County of Valencia:
Subscribed and sworn to (or affirmed) before
me this 15th day of March, 1958.

Katie Mae Huffman
Notary Public

My commission expires
May 14, 1958

Lots 1,2,3,4 of Sec. 30)
NE $\frac{1}{4}$ NE $\frac{1}{4}$ of Sec. 32)
N $\frac{1}{2}$ N $\frac{1}{2}$ of Sec. 33)

SEP 13 1962

DLA:DPH
10-665

The Anaconda Company
New Mexico Operations
P. O. Box 639
Grants, New Mexico

Attention: Mr. A. J. Fitch
Manager

Gentlemen:

Enclosed is AEC Source Material License No. SUA-647.

In your application for renewal of your license, you reference the use of respirators. Please note that pursuant to Section 20.103(e)(1), 10 CFR 20, allowances may not be made for the use of protective equipment such as respirators in determining exposure of individuals to concentrations of airborne radioactivity without specific Commission approval. This does not mean, however, that respirators may not be used to further reduce below the limits of 10 CFR 20, exposures of individuals to concentrations of radioactive material in restricted areas.

Sincerely yours,

Distribution:

Formal
Doc. Rm.
Suppl. ✓
Br. and Div. rfs
DFHarmon, LR
Compl.
Doulos, License & letter(3)
S/Health, license only
Enclosures:
10 CFR 20
SUA-647

Director
Division of Licensing and Regulation

*LR Supply Replacement
9/13/62
2W*

OFFICE ▶	LR D.H.	LR DN	LR Dulac	LR Supply Replacement		
SURNAME ▶	DFHarmon:rl	DANussbaumer	L. Johnson	R. Lowenstein		
DATE ▶	8/22/62	8/29/62	8/29/62	8/1/62		

COPY

Form AEC-410
(1-61)

UNITED STATES
ATOMIC ENERGY COMMISSION

SOURCE MATERIAL LICENSE

Pursuant to the Atomic Energy Act of 1954, and Title 10, Code of Federal Regulations, Chapter 1, Part 40, "Licensing of Source Material," and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, possess and import the source material designated below; to use such material for the purpose(s) and at the place(s) designated below; and to deliver or transfer such material to persons authorized to receive it in accordance with the regulations in said Part. This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954 and is subject to all applicable rules, regulations, and orders of the Atomic Energy Commission, now or hereafter in effect, including Title 10, Code of Federal Regulations, Chapter 1, Part 20, "Standards for Protection Against Radiation," and to any conditions specified below.

Licensee		3. License No.
1. Name	The Anaconda Company	SUA-647
2. Address	P. O. Box 638 Grants, New Mexico	4. Expiration Date
		September 30, 1965
		5. Docket No.
		40-665
6. Source Material	Uranium	7. Maximum quantity of source material which licensee may possess at any one time under this license
		Unlimited

CONDITIONS

8. Authorized use (Unless otherwise specified, the authorized place of use is the licensee's address stated in Item 2 above.)

For processing uranium ore in accordance with the procedures described in the licensee's applications dated February 3, and October 9, 1959, May 18, July 5 and December 28, 1960, January 30, April 19, August 17 and October 11, 1961, and June 6 and July 11, 1962.

9. Authorized place of use: The licensee's uranium processing facility located near Grants, New Mexico.

10. The licensee is hereby exempt from the requirements of Section 20.203(e)(2) and 20.203(f)(2), 10 CFR 20, for areas and containers within the mill, provided all entrances to the mill are conspicuously posted in accordance with Section 20.203(e)(2) and with the words, "Any area or container within this

SA
8/22/62 *SA*
8/29/62

For the U. S. ATOMIC ENERGY COMMISSION

SOURCE MATERIAL LICENSE
Supplementary SheetLicense Number SUA-647

mill may contain radioactive material."

11. The licensee shall immediately notify the Director, Region IV, Division of Compliance, USAEC, Denver, Colorado, by telephone and telegraph of any failure in an earth dam retention system which results in a release of radioactive material into unrestricted areas. This requirement is in addition to the requirements of 10 CFR 20.
12. The licensee is hereby authorized to incinerate discarded wooden equipment containing source material and return the ashes to process for recovery of the contained uranium in accordance with the procedures described in his application dated October 14, 1961.
13. The licensee is hereby authorized to dispose of radioactive liquid waste resulting from uranium processing operations into a subterranean disposal well according to the procedures described in his application dated July 5, 1960, and subject to the following conditions:
 - (a) Records shall be maintained of the volume of waste disposed, the average concentration of the radioactive constituents and the natural water head pressures and injection rates.
 - (b) Increases in injection pressure above that produced by the natural water head of the waste effluent stream is not authorized.
 - (c) A yearly summary report shall be submitted to this office describing the status of the injection program, including average monthly liquid injection rates, the concentration of radioactive constituents, average concentrations of uranium, radium-226 and thorium-230 in monitored well and surface waters, and the level of the water table. The first report shall be submitted no later than September 30, 1963

COPY

For the U. S. Atomic Energy Commission

Date SEP 13 1962by _____
Division of Licensing and Regulation
Washington 25, D. C.

DUCKET NO. 70-665
Fitch

THE ANACONDA COMPANY

New Mexico Operations

P. O. Box 638, Grants, New Mexico



A. J. FITCH
MANAGER

May 18, 1960

Mr. J. C. Delaney, Chief
Nuclear Material Section
Licensing Branch
Division of Licensing and Regulation
United States Atomic Energy Commission
Washington 25, D. C.

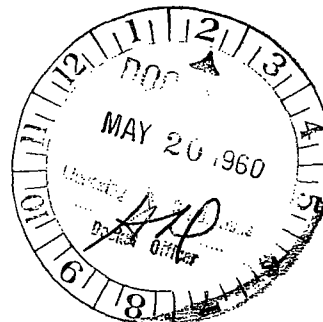
Dear Mr. Delaney:

Herewith are the original and one copy of our application on Form AEC-2 for the renewal of our Source Material License No. R-138, which expires on June 30, 1960.

Yours very truly,

A. J. FITCH

AJF:MA
Encl.



**APPLICATION FOR AEC LICENSE TO
TRANSFER, DELIVER, EXPORT, OR RECEIVE
URANIUM OR THORIUM SOURCE MATERIAL**

Pursuant to Code of Federal Regulations, Title 10—
Atomic Energy, Part 40—Control of Source Material

2. PREVIOUS AEC LICENSE NUMBER, IF ANY.

R-138

INSTRUCTIONS

File two (2) copies of this application with the U. S. Atomic Energy Commission, 1901 Constitution Ave. NW., Washington 25, D. C. This application may be used for an original license or for the renewal of a license. In the case of a renewal, this application should be received by the Commission on or before 30 days before the expiration of the previous license. Complete blocks 1, 2, 3, 9, and if you combine two or more of the activities of Producer, Processor, Distributor, Exporter, or Consumer, complete each of the applicable blocks numbered 4 through 8.

TO: U. S. Atomic Energy Commission,
1901 Constitution Ave. NW.,
Washington 25, D. C.

1.

NAME AND ADDRESS OF APPLICANT
(Street, city, zone, state)

The Anaconda Company
New Mexico Operations
Post Office Box 638
Grants, New Mexico

3. INVENTORY. INVENTORY OF SOURCE MATERIAL, RAW AND REFINED, AS OF

April 30, 1960

(Specify date of last inventory)

INSTRUCTION.—Include all source material in your possession or under your control, regardless of location. Include any source material you have possession of but which is owned by others, whether or not they are licensees of the Commission. Please specify that part of your inventory which is owned by other persons, listing the names, addresses, and quantities owned by each. Do not include in this inventory any raw source material not yet removed from its place of deposit in nature.

(a) Raw Source Material

DESCRIPTION OF MATERIAL	ESTIMATED PERCENT URANIUM OR THORIUM	QUANTITY IN INVENTORY (Gross tons)	NAME AND ADDRESS OF OWNER, IF DIFFERENT FROM THAT IN BLOCK 1 ABOVE
Grude Ore	.173% U ₃ O ₈	36,480.13	
Ore in Process, in the form of solutions and finely ground solids		42,023.48 Pounds U ₃ O ₈	

(b) Refined Source Material

DESCRIPTION OF MATERIAL	GRADE (Comm., CP, USP, etc.)	PERCENT OF URANIUM OR THORIUM	QUANTITY (Lb.)	NAME AND ADDRESS OF OWNER, IF DIFFERENT FROM THAT IN BLOCK 1 ABOVE
Mill Concentrate		84.2% U ₃ O ₈	58,518.47	

4. PRODUCERS. (Miners of uranium and thorium containing ores and gravels) IF YOU REQUEST AN ATOMIC ENERGY COMMISSION LICENSE TO TRANSFER AND DELIVER SOURCE MATERIAL AFTER ITS REMOVAL FROM ITS PLACE OF DEPOSIT IN NATURE, CHECK THIS BOX AND SUPPLY THE INFORMATION REQUESTED IN THIS BLOCK AS WELL AS THE INFORMATION REQUESTED IN BLOCKS 1, 2, 3, AND 9.

NAMES OF OPERATING PROPERTIES <i>(Show number of claims included on each property)</i>	LOCATIONS <i>(Mining district and county)</i>	NAMES AND ADDRESSES OF OWNERS IF DIFFERENT FROM APPLICANT	ESTIMATED QUANTITY OF ORE TO BE PRODUCED IN NEXT 12 MONTHS	ESTIMATED PERCENT URANIUM OR THORIUM
Jackpile Mine	Valencia	Pueblo of Laguna c/o United Pueblos Agency Albuquerque, New Mexico	884,989 Tons	.186% U ₃ O ₈
Pagate Mine	Valencia	Pueblo of Laguna c/o United Pueblos Agency Albuquerque, New Mexico	Unknown	
F-33 Mine, including Forest Mining Claims Nos. 2, 3, 4 and 5	Valencia	Alton L. Hoad, Agent Grants, New Mexico	Unknown	
South L-Bar Mine	Valencia	Lee S. Evans and Jno. W. Hampton Laguna, New Mexico	Unknown	

RECEIVED
MAY 20 1953
U.S.A.E.C.
Division of Licensing
& Regulation
WASHINGTON, D.C.

5. PROCESSORS. IF YOU REQUEST AN ATOMIC ENERGY COMMISSION LICENSE TO CHEMICALLY PROCESS SOURCE MATERIAL, CHECK THIS BOX AND SUPPLY THE INFORMATION REQUESTED IN THIS BLOCK, AS WELL AS THE INFORMATION REQUESTED IN BLOCKS 1, 2, 3, AND 9.

(a) THE APPLICANT CHEMICALLY PROCESSES SOURCE MATERIAL IN PLANTS LOCATED AT: (These plants include all of the plants in which the applicant will process source material under the terms of any license issued by the Commission.)

1. Approximately 10 miles northwest of Grants, New Mexico.

2.

3.

4.

(b) IN THE EVENT RESIDUES AND TAILINGS ARE TO BE DISCARDED PLEASE DESCRIBE THESE RESIDUES AND TAILINGS, THE FREQUENCY OF DISCARDS, THE PROBABLE SOURCE MATERIAL CONTENT AND THE REASONS FOR NOT CONSERVING THE MATERIAL:

Tailings consisting of finely ground ore solids in an aqueous solution will be discharged twenty-four hours per day, six days a week into a tailings pond adjacent to the plant. These tailings will contain approximately .015% U₃O₈, which is not economically recoverable at present.

6. DISTRIBUTORS. IF YOU REQUEST AN ATOMIC ENERGY COMMISSION LICENSE TO RECEIVE SOURCE MATERIAL FOR RESALE ONLY, WITHOUT ANY INTERMEDIATE PROCESSING, CHECK THIS BOX AND COMPLETE BLOCKS 1, 2, 3, AND 9.

7. CONSUMERS. IF YOU REQUEST AN ATOMIC ENERGY COMMISSION LICENSE TO USE SOURCE MATERIAL IN CHEMICAL ANALYSIS OR IN THE MANUFACTURE OF, OR FOR INCORPORATION IN, ANY PRODUCT, CHECK THIS BOX AND SUPPLY THE INFORMATION REQUESTED IN THIS BLOCK AS WELL AS THE INFORMATION REQUESTED IN BLOCKS 1, 2, 3, AND 9.

DESCRIPTION OF SOURCE MATERIAL TO BE USED	ESTIMATED ANNUAL REQUIREMENTS (Lb.)	USES INDICATE WHETHER (1) AS ANALYTICAL REAGENT, (2) FOR INCANDESCENT MANTLES, (3) MEDICINAL, OR (4) OTHER. IN THE CASE OF OTHER USES, DESCRIBE THE PRODUCT, THE SOURCE MATERIAL CONTENT, AND THE MANNER IN WHICH THE PRODUCT WILL BE USED.

8. EXPORTERS. IF YOU REQUEST AN ATOMIC ENERGY COMMISSION LICENSE TO EXPORT SOURCE MATERIAL, CHECK THIS BOX AND SUPPLY THE BALANCE OF THE INFORMATION REQUESTED IN THIS BLOCK AS WELL AS THE INFORMATION REQUESTED IN BLOCKS 1, 2, 3, AND 9. (Note that approval on Form AEC-7 is required for each individual export transaction.)

Name and address of each of your agents who for your account will prepare Department of Commerce "Shipper's Export Declaration" (Form 7525-V), will request permission to export on Form AEC-7, and will ship source material.

NAME OF AGENT	ADDRESS

9. **CERTIFICATION AND AGREEMENT.** THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION AND AGREEMENT ON BEHALF OF THE APPLICANT (1) CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH CODE OF FEDERAL REGULATIONS, TITLE 10—ATOMIC ENERGY, PART 40—CONTROL OF SOURCE MATERIAL; (2) CERTIFY THAT ALL INFORMATION CONTAINED IN THIS APPLICATION IS TRUE AND COMPLETE TO THE BEST OF THEIR KNOWLEDGE AND BELIEF; AND (3) AGREE THAT IN THE EVENT THAT THIS APPLICATION IS APPROVED BY THE ATOMIC ENERGY COMMISSION, AND A LICENSE IS ISSUED, THAT THE DULY AUTHORIZED REPRESENTATIVES OF THE COMMISSION MAY FREELY INSPECT AT ALL REASONABLE TIMES FACILITIES AND RECORDS, TAKE SAMPLES FOR ASSAY, AND DO SUCH OTHER THINGS AS WILL, IN THE OPINION OF THE COMMISSION, ASSURE THAT ALL SOURCE MATERIAL HANDLED BY THE APPLICANT UNDER THE AUTHORITY OF HIS LICENSE, IS PROPERLY ACCOUNTED FOR AND USED.

THE ANACONDA COMPANY
NEW MEXICO OPERATIONS

BY *[Signature]*
(Signature of applicant)

May 18, 1960

(Date)

Manager

(Title)

Section 35 (A) of the United States Criminal Code, 18 U. S. C. Sec. 80, makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

STATE OF NEW MEXICO)
County of Valencia) ss.

(FOR GOVERNMENT USE ONLY)

Subscribed and sworn to
(or affirmed) before me this
18th day of May, 1960.

UNITED STATES OF AMERICA
ATOMIC ENERGY COMMISSION
SOURCE MATERIAL LICENSE

LICENSE NO. _____

Katie M. Huffman
Notary Public

My Commission expires
May 14, 1962.

40-665
LRL:ND

MAY 28 1959

The Anaconda Company
New Mexico Operations
P. O. Box 638
Grants, New Mexico

Attention: Mr. A. J. Fitch

Gentlemen:

Enclosed is renewal of your Source Material license R-138.

In reference to your request of May 14, 1959, we have incorporated into your license the exemption from the labeling requirements, Section 20.203(f)(2) of the regulation 10 CFR 20, "Standards for Protection Against Radiation".

Very truly yours,

Distribution:
Document room
Formal & Suppl.
Br & Div rf's

J. C. Delaney
Chief, Nuclear Materials Section
Licensing Branch
Division of Licensing & Regulation

Enclosures:
R-138
10 CFR 20

OFFICE	LRL	LRL				
SURNAME	NDoulos/cw	<i>Delaney</i>				
DATE	5-26-59	5-26-59				

SOURCE MATERIAL LICENSE

License No. R-138

Dated: Effective July 1, 1959

40-665
LRL:ND

The Anaconda Company
New Mexico Operations
P. O. Box 638
Grants, New Mexico

Gentlemen:

Pursuant to the Atomic Energy Act of 1954 and Section 40.21 of the Code of Federal Regulations, Title 10 - Atomic Energy, Chapter 1, Part 40 - Control of Source Material, you are hereby licensed to receive possession of and title to at your plant located at Bluewater, New Mexico, raw and refined source material for resale and for processing with raw source material from your own mining operations.

You are further licensed to transfer and deliver possession of and title to refined source material to any person licensed by the Atomic Energy Commission, within the limits of his license.

As a condition of this license, you are required to maintain records of your inventories, receipts and transfers of refined source material.

The issuance of this license does not constitute any agreement by the Commission to purchase ores and/or concentrates or other products from the licensee.

This license is subject to all the provisions of the Atomic Energy Act of 1954 now or hereafter in effect and to all valid rules and regulations of the U. S. Atomic Energy Commission, including 10 CFR 20, "Standards for Protection Against Radiation", except that you are exempt from the requirements of Section 20.203(f)(2) for individual shipping containers of uranium provided that areas are posted as described in your letter dated February 3, 1959. Neither this license nor any right under this license shall be assigned or otherwise transferred in violation of the provisions of the Atomic Energy Act of 1954.

This license shall expire June 30, 1960.

Distribution:
Document room
Formal & Suppl
INS
RM (2)

FOR THE ATOMIC ENERGY COMMISSION

OFFICE ▶	s/Health LRL	LRL	J. C. Delaney
SURNAME ▶	NDoulos/cw	J. C. Delaney	Chief, Nuclear Materials Section Licensing Branch
DATE ▶	5-28-59	5-28-59	Division of Licensing & Regulation

NO. 66
LRL:ND

MAY 26 1959

The Anaconda Company
New Mexico Operations
P. O. Box 638
Grants, New Mexico

Attention: Mr. A. J. Fitch

Gentlemen:

Enclosed is renewal of your Source Material License R-138.

In reference to your request of May 14, 1959, we have incorporated into your license the exemption from the labeling requirements, Section 20.203(F)(2) of the regulation 10 CFR 20, "Standards for Protection Against Radiation".

Very truly yours,

J. C. Delaney
Chief, Nuclear Materials Section
Licensing Branch
Division of Licensing & Regulation

Enclosures:
R-138
10 CFR 20

40-665

LRL:RD

SOURCE MATERIAL LICENSE

License No. R-138

Dated: Effective July 1, 1959

The Anaconda Company
New Mexico Operations
P. O. Box 638
Grants, New Mexico

Gentlemen:

Pursuant to the Atomic Energy Act of 1954 and Section 40.21 of the Code of Federal Regulations, Title 10 - Atomic Energy, Chapter 1, Part 40 - Control of Source Material, you are hereby licensed to receive possession of and title to at your plant located at Bluewater, New Mexico, raw and refined source material for resale and for processing with raw source material from your own mining operations.

You are further licensed to transfer and deliver possession of and title to refined source material to any person licensed by the Atomic Energy Commission, within the limits of his license.

As a condition of this license, you are required to maintain records of your inventories, receipts and transfers of refined source material.

The issuance of this license does not constitute any agreement by the Commission to purchase ores and/or concentrates or other products from the licensee.

This license is subject to all the provisions of the Atomic Energy Act of 1954 now or hereafter in effect and to all valid rules and regulations of the U. S. Atomic Energy Commission, including 10 CFR 20, "Standards for Protection Against Radiation", except that you are exempt from the requirements of Section 20.203(f)(2) for individual shipping containers of uranium provided that areas are posted as described in your letter dated February 3, 1959. Neither this license nor any right under this license shall be assigned or otherwise transferred in violation of the provisions of the Atomic Energy Act of 1954.

This license shall expire June 30, 1960.

FOR THE ATOMIC ENERGY COMMISSION

J. C. Delaney
Chief, Nuclear Materials Section
Licensing Branch
Division of Licensing & Regulation

THE ANACONDA COMPANY

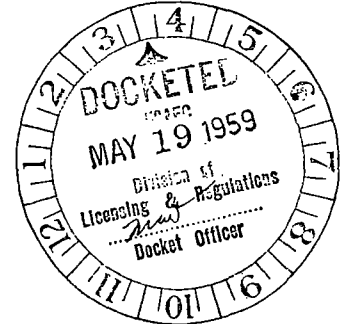
New Mexico Operations

P. O. Box 638, Grants, New Mexico



A. J. FITCH
MANAGER

May 15, 1959



United States Atomic Energy Commission
Division of Licensing and Regulation
Washington 25, D. C.

Attention: Mr. Lyall Johnson, Chief
Licensing Branch

Gentlemen:

Herewith are the original and one copy of our appli-
cation on Form AEC-2 for the renewal of our Source Material
License No. R-138, which expires on June 30, 1959.

Yours very truly,

A. J. FITCH

AJF:MA
Encl.

cc: Mr. W. Spencer Hutchinson, Jr., Director
Source Material Procurement Division
United States Atomic Energy Commission
Grand Junction Operations Office
Grand Junction, Colorado (wo/encl)

FORM AEC-2
(7-55)

UNITED STATES OF AMERICA
ATOMIC ENERGY COMMISSION

Form approved.
Budget Bureau No. 39-R002.4.

**APPLICATION FOR AEC LICENSE TO
TRANSFER, DELIVER, EXPORT, OR RECEIVE
URANIUM OR THORIUM SOURCE MATERIAL**

Pursuant to Code of Federal Regulations, Title 10—
Atomic Energy, Part 40—Control of Source Material

2. PREVIOUS AEC LICENSE NUMBER, IF ANY.

No. R-138

INSTRUCTIONS

File two (2) copies of this application with the U. S. Atomic Energy Commission, 1901 Constitution Ave. NW., Washington 25, D. C. This application may be used for an original license or for the renewal of a license. In the case of a renewal, this application should be received by the Commission on or before 30 days before the expiration of the previous license. Complete blocks 1, 2, 3, 9, and if you combine two or more of the activities of Producer, Processor, Distributor, Exporter, or Consumer, complete each of the applicable blocks numbered 4 through 8.

TO: U. S. Atomic Energy Commission,
1901 Constitution Ave. NW.,
Washington 25, D. C.

1.

NAME AND ADDRESS OF APPLICANT
(Street, city, zone, state)

The Anaconda Company
New Mexico Operations
Post Office Box 638
Grants, New Mexico

3. INVENTORY. INVENTORY OF SOURCE MATERIAL, RAW AND REFINED, AS OF

April 30, 1959

(Specify date of last inventory)

INSTRUCTION.—Include all source material in your possession or under your control, regardless of location. Include any source material you have possession of but which is owned by others, whether or not they are licensees of the Commission. Please specify that part of your inventory which is owned by other persons, listing the names, addresses, and quantities owned by each. Do not include in this inventory any raw source material not yet removed from its place of deposit in nature.

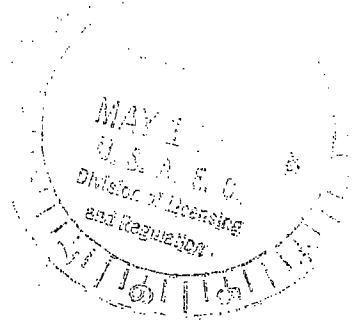
(a) Raw Source Material

DESCRIPTION OF MATERIAL	ESTIMATED PERCENT URANIUM OR THORIUM	QUANTITY IN INVENTORY (Gross tons)	NAME AND ADDRESS OF OWNER, IF DIFFERENT FROM THAT IN BLOCK 1 ABOVE
Crude Ore	.174% U ₃ O ₈	37,308.91	United States Atomic Energy Commission Grand Junction, Colorado
Crude Ore	.250% U ₃ O ₈	17,574.06	

(b) Refined Source Material

DESCRIPTION OF MATERIAL	GRADE (Comm., CP, USP, etc.)	PERCENT OF URANIUM OR THORIUM	QUANTITY (Lb.)	NAME AND ADDRESS OF OWNER, IF DIFFERENT FROM THAT IN BLOCK 1 ABOVE
Mill Concentrate		78.42% U ₃ O ₈	38,027.42	

A. Laguna Indian Reservation comprising various leases applied for or to be applied for under the exclusive rights conveyed by an agreement dated October 18, 1951, between the Pueblo of Laguna and Anaconda Copper Mining Company (now The Anaconda Company)	Valencia	Pueblo of Laguna c/o United Pueblos Agency Albuquerque, N. M.	Unknown	Unknown
B. "Section 33" Mine, comprised of the following:				
a. Tom Group of Mining Claims Nos. 1 to 24, inclusive	Valencia	Alton L. Head, Agent Grants, New Mexico	Unknown	Unknown
b. Dave Group of Mining Claims Nos. 1 to 18, inclusive	Valencia	Alton L. Head, Agent Grants, New Mexico	Unknown	Unknown
c. Forest Group of Mining Claims Nos. 2 to 30, inclusive	Valencia	Alton L. Head, Agent Grants, New Mexico	Unknown	Unknown
d. SE 1/4 SE 1/4 of Section 33, Township 12 North, Range 9 West	Valencia	Alton L. Head, Agent Grants, New Mexico	Unknown	Unknown
C. South L-Bar Mining Lease	Valencia	Lee S. Evans and Jno. W. Hampton Laguna, New Mexico	Unknown	Unknown



5. PROCESSORS. IF YOU REQUEST AN ATOMIC ENERGY COMMISSION LICENSE TO CHEMICALLY PROCESS SOURCE MATERIAL, CHECK THIS BOX AND SUPPLY THE INFORMATION REQUESTED IN THIS BLOCK, AS WELL AS THE INFORMATION REQUESTED IN BLOCKS 1, 2, 3, AND 9.

(a) THE APPLICANT CHEMICALLY PROCESSES SOURCE MATERIAL IN PLANTS LOCATED AT: *(These plants include all of the plants in which the applicant will process source material under the terms of any license issued by the Commission.)*

1. Approximately 10 miles northwest of Grants, New Mexico.

2.

3.

4.

(b) IN THE EVENT RESIDUES AND TAILINGS ARE TO BE DISCARDED PLEASE DESCRIBE THESE RESIDUES AND TAILINGS, THE FREQUENCY OF DISCARDS, THE PROBABLE SOURCE MATERIAL CONTENT AND THE REASONS FOR NOT CONSERVING THE MATERIAL:

Finely ground ore, after treatment in leaching plant, will contain unrecoverable fines ranging from 0.005% to 0.03% U₃O₈; these tailings will be discarded continuously into a tailings pond whence they could be reclaimed in the future if process improvements or economic considerations should render necessary or desirable.

6. DISTRIBUTORS. IF YOU REQUEST AN ATOMIC ENERGY COMMISSION LICENSE TO RECEIVE SOURCE MATERIAL FOR RESALE ONLY, WITHOUT ANY INTERMEDIATE PROCESSING, CHECK THIS BOX AND COMPLETE BLOCKS 1, 2, 3, AND 9.

7. CONSUMERS. IF YOU REQUEST AN ATOMIC ENERGY COMMISSION LICENSE TO USE SOURCE MATERIAL IN CHEMICAL ANALYSIS OR IN THE MANUFACTURE OF, OR FOR INCORPORATION IN, ANY PRODUCT, CHECK THIS BOX AND SUPPLY THE INFORMATION REQUESTED IN THIS BLOCK AS WELL AS THE INFORMATION REQUESTED IN BLOCKS 1, 2, 3, AND 9.

DESCRIPTION OF SOURCE MATERIAL TO BE USED	ESTIMATED ANNUAL REQUIREMENTS (Lb.)	USES
		INDICATE WHETHER (1) AS ANALYTICAL REAGENT, (2) FOR INCANDESCENT MANTLES, (3) MEDICINAL, OR (4) OTHER. IN THE CASE OF OTHER USES, DESCRIBE THE PRODUCT, THE SOURCE MATERIAL CONTENT, AND THE MANNER IN WHICH THE PRODUCT WILL BE USED.

8. EXPORTERS. IF YOU REQUEST AN ATOMIC ENERGY COMMISSION LICENSE TO EXPORT SOURCE MATERIAL, CHECK THIS BOX AND SUPPLY THE BALANCE OF THE INFORMATION REQUESTED IN THIS BLOCK AS WELL AS THE INFORMATION REQUESTED IN BLOCKS 1, 2, 3, AND 9. *(Note that approval on Form AEC-7 is required for each individual export transaction.)*

Name and address of each of your agents who for your account will pre- request permission to export on Form AEC-7, and will ship source material.

URANIUM
THORIUM
Department of Commerce "Shipper's Export Declaration" (Form 7525-V), will

NAME OF AGENT	ADDRESS

9. **CERTIFICATION AND AGREEMENT.** THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION AND AGREEMENT ON BEHALF OF THE APPLICANT (1) CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH CODE OF FEDERAL REGULATIONS, TITLE 10—ATOMIC ENERGY, PART 40—CONTROL OF SOURCE MATERIAL; (2) CERTIFY THAT ALL INFORMATION CONTAINED IN THIS APPLICATION IS TRUE AND COMPLETE TO THE BEST OF THEIR KNOWLEDGE AND BELIEF; AND (3) AGREE THAT IN THE EVENT THAT THIS APPLICATION IS APPROVED BY THE ATOMIC ENERGY COMMISSION, AND A LICENSE IS ISSUED, THAT THE DULY AUTHORIZED REPRESENTATIVES OF THE COMMISSION MAY FREELY INSPECT AT ALL REASONABLE TIMES FACILITIES AND RECORDS, TAKE SAMPLES FOR ASSAY, AND DO SUCH OTHER THINGS AS WILL, IN THE OPINION OF THE COMMISSION, ASSURE THAT ALL SOURCE MATERIAL HANDLED BY THE APPLICANT UNDER THE AUTHORITY OF HIS LICENSE, IS PROPERLY ACCOUNTED FOR AND USED.

THE ANACONDA COMPANY
NEW MEXICO OPERATIONS

BY *[Signature]*
(Signature of applicant)

May 15, 1959

(Date)

Manager (Title)

Section 35 (A) of the United States Criminal Code, 18 U. S. C. Sec. 80, makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

STATE OF NEW MEXICO) ss.
County of Valencia)

(FOR GOVERNMENT USE ONLY)

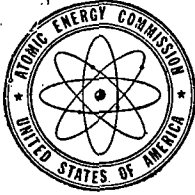
UNITED STATES OF AMERICA
ATOMIC ENERGY COMMISSION
SOURCE MATERIAL LICENSE

LICENSE NO. _____

Subscribed and sworn to
(or affirmed) before me this
15th day of May, 1959.

Katie M. Huffman
Notary Public

My Commission expires
May 14, 1962.



UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON 25, D. C.

IN REPLY REFER TO:

40-663
LRL:JCD

SOURCE MATERIAL LICENSE

The Anaconda Company
New Mexico Operations
P. O. Box 638
Grants, New Mexico

License No. R-138

Dated: June 30, 1958

Attention: Mr. A. J. Pitch

Gentlemen:

Pursuant to the Atomic Energy Act of 1954 and Section 40.21 of the Code of Federal Regulations, Title 10 - Atomic Energy, Chapter 1, Part 40 - Control of Source Material, you are hereby licensed to receive possession of and title to ~~at the location stated above, raw and refined source material without limitation as to quantity, for resale and for processing with raw source material from your own mining operations.~~

You are further licensed to transfer and deliver possession of and title to refined source material to any person licensed by the Atomic Energy Commission, within the limits of his license.

As a condition of this license, you are required to maintain records of your inventories, receipts and transfers of refined source material.

This license is subject to all the provisions of the Atomic Energy Act of 1954 now or hereafter in effect and to all valid rules and regulations of the U. S. Atomic Energy Commission, including 10 CFR 20, "Standards For Protection Against Radiation.", ~~except that you are exempt from the requirements of Section 20.203(f) for individual shipping containers of uranium.~~ Neither this license nor any right under this license shall be assigned or otherwise transferred in violation of the provisions of the Atomic Energy Act of 1954.

This license shall expire ⁶⁰ June 30, 1958.

CC: Document room
Formal file
Suppl. file
GJOO
RM
INS
S/health

FOR THE ATOMIC ENERGY COMMISSION

Lyall Johnson
Chief, Licensing Branch
Division of Licensing and Regulation

.....
DICTATED *Jes*

APPROVED

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON 25, D. C.

IN REPLY REFER TO:

40-665
LAL:MD

The Anaconda Company
New Mexico Operations
P.O. Box 638
Grants, New Mexico

SOURCE MATERIAL LICENSE

License No. ~~B-138~~

Dated: MAR 31 1958

Attention: Mr. A. J. Fitch

Gentlemen:

Pursuant to the Atomic Energy Act of 1954 and Section 40.21 of the Code of Federal Regulations, Title 10 - Atomic Energy, Chapter 1, Part 40 - Control of Source Material, you are hereby licensed to receive possession of and title to , at the location stated above, raw and refined source material without limitation as to quantity, for resale and for processing with raw source material from your own mining operations.

You are further licensed to transfer and deliver possession of and title to refined source material to any person licensed by the Atomic Energy Commission, within the limits of his license.

As a condition of this license, you are required to maintain records of your inventories, receipts and transfers of refined source material.

This license is subject to all the provisions of the Atomic Energy Act of 1954 now or hereafter in effect and to all valid rules and regulations of the U. S. Atomic Energy Commission, including 10 CFR 20, "Standards For Protection Against Radiation."

Neither this license nor any right under this license shall be assigned or otherwise transferred in violation of the provisions of the Atomic Energy Act of 1954.

This license shall expire ~~June 30, 1958.~~

CC: Document room
Formal file
---Suppl. file
State health rep.
INS
RM
GJOO

FOR THE ATOMIC ENERGY COMMISSION

J. C. Delaney
Chief, Materials Section
Licensing Branch
Division of Licensing and Regulation

DICTATED *JF*
APPROVED *JED*

EXPERT SYSTEM LICENSE EVALUATION
EVALUATION REPORT FOR LICENSE SUA-00647

INVENTORY CONTENTS FOR LICENSE NUMBER: SUA-00647

Docket 40-00665

Licensee: THE ANACONDA COMPANY

Address: GRANTS, NEW MEXICO

Zip: 87020

Description of site: GRANTS NM. & BLUEWATER, NM.

This license was listed as SUPERCEDED BY ANOTHER LICENSE

No new license number was given

THIS LICENSE WAS LISTED AS BEING TRANSFERRED TO AN AGREEMENT STATE: NM

State of operation: NM

Site used: GRANTS NM. & BLUEWATER, NM.

Disposition information present: NO DISPOSITION INFORMATION GIVEN

Remarks:

JOB NUMBER: 0327 BOX NUMBER: 10

THIS LICENSE WAS ELIMINATED FROM CONSIDERATION

The reason for elimination was: SUPERCEDED BY NEW LICENSE

EXPERT SYSTEM LICENSE EVALUATION
EVALUATION REPORT FOR LICENSE R-00139

INVENTORY CONTENTS FOR LICENSE NUMBER: R-00139

Docket blank

Licensee: THE ANACONDA COMPANY

Address: GRANTS NEW MEXICO

Zip:

Description of site: DELIVERY ONLY

State of operation: NM

Site used: DELIVERY ONLY

Disposition information present: NO DISPOSITION INFORMATION GIVEN

This license was listed as expired on 04/01/58

Remarks: POSSIBLY COVERED BY R-138

JOB NUMBER: 0327 BOX NUMBER: 10

DESCRIPTION OF ACTIVITY OR FACILITY: URANIUM MINING

--Type and form of materials licensed--

--Material--

--Form--

NATURAL U/NORMAL U

Loose material

1. License was for loose materials, or materials handled loose

CATEGORY FOR POTENTIAL SITE CONTAMINATION:

SITE IS ELIMINATED FROM CONSIDERATION

The reason is: ~~Materials insignificant~~ *See comments*

The reason for elimination was: Materials insignificant

Reviewer's comments concerning license R-00139

License R-139 was obtained by Anaconda to take care of shippers delivering ore to the facility who had applied for but not received their license. License R-138 covered the actual processing of the ore.W

EXPERT SYSTEM LICENSE EVALUATION
EVALUATION REPORT FOR LICENSE R-00138

INVENTORY CONTENTS FOR LICENSE NUMBER: R-00138

Docket 40-00665

Licensee: THE ANACONDA COMPANY

Address: GRANTS NEW MEXICO

Zip:

Description of site: LICENSEE'S ADDRESS

This license was listed as SUPERCEDED BY ANOTHER LICENSE

Contents of the new license field SUA-647

State of operation: NM

Site used: LICENSEE'S ADDRESS

Disposition information present: NO DISPOSITION INFORMATION GIVEN

Remarks: POSSIBLY COVERED BY SUA-00647

JOB NUMBER: 0327 BOX NUMBER: 10

THIS LICENSE WAS ELIMINATED FROM CONSIDERATION

The reason for elimination was: SUPERCEDED BY NEW LICENSE

Files

August 7, 1961

C. G. Welty, Enforcement Branch
Division of Licensing and Regulation

THE ANACONDA COMPANY, NEW MEXICO OPERATIONS,
P. O. BOX 638, GRANTS, NEW MEXICO
SOURCE MATERIAL LICENSE NO. R-138, DOCKET NO. 40-665
APPLICATION FOR RENEWAL OF SOURCE MATERIAL LICENSE NO. R-138
TO PROCESS URANIUM ORES AT THE COMPANY'S PLANT NEAR GRANTS,
NEW MEXICO

LR:GG

The licensee on May 18, 1960, submitted an application for renewal of License No. R-138 which had an expiration date of June 30, 1960. On May 23, 1960, DL&R acknowledged receipt of the application.

DL&R on December 1, 1960, in a compliance letter, requested licensing information from Anaconda concerning ten phases of the Company's activities under License No. R-138. This information was submitted on January 30, 1961. The following is a summary of review findings and associated comments.

On December 2, 1960, the Anaconda Company was authorized to discharge liquid effluents by injecting them into a deep well.

FINDINGS

ITEM 1. Organization, Authority and Supervision.

A chart of the Management indicating the position and name of administrative and supervisory personnel was provided. The chart indicates that Mr. R. M. Wilde the Industrial Radiological Engineer for the mill reports directly to the Mill Manager, A. D. Fitch and his Assistant, E. C. Peterson. Information is sufficient.

ITEM 2. Radiological Personnel Qualifications.

Mr. Ralph M. Wilde is in charge of the plant radiation safety program. He has a B.S. in chemistry and has had six years experience in the uranium industry; two years as an analytical chemist, two years as a metallurgist, and two years in his present position.

OFFICE ▶						
SURNAME ▶						
DATE ▶						

RE: The Anaconda Company

Item 2 - continued

Mr. Wilde attended a training course in radiological health at the Robert A. Taft Sanitary Engineering Center. He has visited the Winchester Laboratory and the Environmental Health Field Station of the USPHS in Salt Lake City, Utah, for additional training. He is presently serving as chairman of the New Mexico State Radiation Protection Technical Advisory Council, which advises the New Mexico State Department of Public Health.

Mr. Wilde appears well qualified for the position of Plant Industrial Radiological Engineer.

ITEM 3. Restriction of Mill and Pond Areas.

The mill and tailings areas are fenced and posted. Access gates are locked or guarded. Guards make periodic patrols to determine if gates and fences are secure against unauthorized entry.

ITEMS 4 AND 5. Dusty Areas and Dust Control Equipment.

The licensee submitted a bound volume containing descriptions and blue prints of dusty areas and dust control equipment. A master index drawing is provided showing the location of all dust areas.

Area A - The Bucking Room.

The ventilation system as indicated by Drawing No. 142-2 consists of hoods over 5 Pulverizers, the 4" x 6" Jaw Crusher, 5 splitters, 4 rolling units, 2 bucking boards, and 2 Eggers Sample grinders; a settling chamber in which large dust particles are removed from the ventilation air; and a 4,000 CFM and a 5,000 CFM fan exhausting air from the settling chamber. It appears that all dust producing equipment in the Bucking Room is ventilated by this system.

Area B - Primary Crusher.

Drawing No. 47-3 shows that the hammer mill, shaker, screens, and transfer points are enclosed and ventilated. Ventilation air is passed through a dust settling chamber and an Am. Air Filter, Type N rotocelone dust collector (R-1) before being discharged to the atmosphere.

OFFICE ▶					
SURNAME ▶					
DATE ▶					

RE: The Anacenda Company

Items 4 and 5 - continued.

Area C - Fine Ore Bins and Conveyor to Rod Mill in Acid Leach Plant.

Drawing No. 47-8 shows that inlets and outlets to fine ore bins and ore belt transfer points are enclosed and ventilated. It appears that the ore bins are maintained under a negative pressure. Vent air is passed through a dust settling plenum and an Am. Air Filter, Type-N Rotoclone (R-7), and discharged to the atmosphere.

Area D - Secondary Crushing Plant.

Drawing No. 47-23 shows the ventilation system for the cone crusher and transfer points on conveyors leading to and from the crusher. Air is passed through a dust settling chamber, an AM. AIR FILTER, Type N Rotoclone (R-8), and discharged to the atmosphere.

Area E - Fine Ore Bins in the Carbonate Leach Circuit.

Drawing No. 47-11 indicates that ore bins No. 1, 2, 3 and 7 are served by a separate ventilation and air cleaning system from that which serves bins No. 4, 5 and 6. Each system ventilates inlets and outlets to ore bins, maintains bins under negative pressure (except for bins No. 1, 2, 3 and 4), and ventilates enclosures over conveyor transfer points. Each system is provided with a dust settling chamber and Am. Air Filter, Type N Rotoclone dust collector (R 4 and 5) through which air is passed before being exhausted to the atmosphere.

Area F - Limestone Storage Bins and Sample Tower.

Drawings No. 47-12, 47-15, 47-16, and D-75 indicate that a ventilation system provides negative static for limestone ore Bins No. 1, 2, 3, and 4, ventilation for enclosures at conveyor ore transfer points in the sample tower, and ventilation for the acid grind and leach MnO₂ system. The air is passed through a dust settling chamber and an Am. Air Filter, Type N Rotoclone (R-3) and discharged to the atmosphere.

OFFICE ▶						
SURNAME ▶						
DATE ▶						

RE: The Anaconda Company

Items 4 and 5 - continued.

Area G - Limestone Sample Tower.

Drawings numbered U-15 and U-16 indicate that conveyor transfer points, classifier screens, and ore sampling equipment are enclosed and ventilated by a single ventilation system. Air is passed through a dust settling chamber and an Am. Air Filter, Type N Rotoclone (R-6), and discharged to the atmosphere.

Area H - Sandstone Sample Tower and Limestone Crushing Plant.

Drawing No. U-3 shows the system which ventilates enclosures at ore screens, conveyor transfer points, and ore sampling equipment. Air is passed through a dust settling chamber and an Am. Air Filter, Type N Rotoclone (R-2), and discharged to the atmosphere.

Area I - Limestone Primary Crusher.

Drawing No. U-4 shows the system that ventilates enclosures on the crusher and ore conveyor transfer points. Air is passed through a cyclone dust collector, a dust settling chamber, and an Am. Air Filter, Type N Rotoclone (R-9), and discharged to the atmosphere.

Area J - Yellow Cake Sampling Laboratory.

Drawings F-26 and F-27 show the sample preparation hood and ventilation system. There is a water spray unit installed in the duct downstream from the blower apparently for dust precipitation purposes. It is noted that the blower is located at the back of the hood thus making some of the duct in the laboratory under positive pressure.

No details are provided of the spray collection chamber, or the manner in which the system exhausts to the atmosphere.

Area K - Yellow Cake, Drum Dryers, Drying Plates and Barrel loading.

Four independent ventilation systems are described.

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RE: The Anaconda Company

Items 4 and 5 - continued.

Area K - continued

- System 1. This system ventilates the hopper enclosure on the carbonate circuit drum dryer, and hoods over the double and single drying plates. Air is passed through a 4000 CFM Joy Microdyne dust collector and exhausted to the atmosphere. (From drawings No. F-2 and F-22).
- System 2. This system ventilates the hopper enclosure on the two acid circuit drum dryers, and the furnace dust collection hood. The air is passed through an 8,000 CFM Joy Microdyne dust collector and exhausted to the atmosphere. (See drawings No. F-2 and F-22).
- System 3. This system exhausts the enclosures over the two acid circuit drum dryers. The air is passed through what appears to be a wet spray dust collector (Anaconda Dust Collector), a large dust collection tank, a cyclone liquid mist collector and exhausted to the atmosphere. (From drawings No. F-38 and F-57.)
- System 4. This unit exhausts eight barrel filling hoods. Dust collecting equipment is not specified or described. (See drawing No. F-78).

The licensee should be requested to submit information concerning the dust collecting unit.

Area L - Yellow Cake Filter Press.

Each of four filter presses is ventilated by an overhead canopy hood. The hoods are long and appear to have no baffles. Air flow distribution is probably poor. Each hood has an individual vaneaxial fan which exhausts 3,460 CFM. It does not appear that air cleaning is provided. (From Drawing No. F-79.).

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RE: The Anaconda Company

Area M - Carbonate Process Drum Dryer.

Drawing No. D-88-10 shows the drum dryer enclosure ventilated at the top. The air is passed through a wet impact dust collector and a precipitation tank where water mist is removed, and discharged to the atmosphere through a vent from the top of the tank.

Area N - Metallurgical Laboratory.

Drawing No. E-44 shows the sample splitter hood which opens on both sides and is vented by a baffled plenum down the center of the hood. Air appears to be vented directly to the atmosphere with no air cleaning.

Area P - Lime Mixing Tank in Ion Exchange Building.

Drawing No. E-46 is of the air ejector ventilation system for the sack opening hood and the lime mixing tank. No radioactive materials are involved in this operation.

ITEMS 6 AND 7. The Air Survey Program.

The licensee uses Gast Model AD44D air pumps with 5 to 25 liters per minute capacity, and Steplex Hi-Volume, Model TFLA air samplers at about 17 CFM.

Whatman No. 41 filter paper is used. Air sampling equipment has been calibrated for air flow rate at Los Alamos Scientific Laboratory.

Samples are taken on a quarterly basis in all areas except in the Yellow Cake Section where air concentrations at times exceed MPC. Sampling in the Yellow Cake area is on a monthly basis. Approximately 86 mill locations are sampled resulting in about 140 air samples per quarter.

GA, BZ and Process Air samples are drawn.

The method of analyzing for Uranium is stated to be essentially the same as the Fluorimetric method developed by Claude W. Sill, Health and Safety Division, U.S. A.E.C., Idaho Falls, Idaho. The step-by-step analysis procedure was described.

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RE: The Anaconda Company

Items 6 and 7 - continued

The air sampling and uranium analysis procedures appear satisfactory.

ITEM 8. Determination of Employee Average Weekly Exposure to dust.

Average daily and weekly exposures are calculated from results of air surveys and occupancy time studies.

Employees entering areas with concentrations in excess of MPC are required to wear respirators.

The licensee's attention should be directed to the provisions and requirements of Section 20.103(c)(3).

ITEM 9. Mill Discharge Stacks and Effluents.

The applicant states that only 6 mill stacks discharge effluents containing air-borne radioactive material.

Ore dust

- a. No. 1 Rotoclone, Crushing plant.
- b. No. 2 Rotoclone, Ore Sampling Tower.
- c. No. 7 Rotoclone, Fine Ore Bins.
- d. Sample Bucking Room.

The licensee has failed to describe the exhaust from Rotoclones No. 3, 4, 5, 6, 8 and 9. Perhaps this is because these units do not exhaust through stacks.

Yellow Cake Dust

- a. Anaconda Dust Collector.
- b. Microdyne Dust Collector.

The licensee has failed to describe the exhaust from the sample preparation hood, the barreling hoods, the filter presses, the carbonate circuit drum dryer, and the metallurgical laboratory, and has not indicated which microdyne collector (4000 CFM or 800 CFM unit) is referred to.

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RE: The Anaconda Company

Item 9 - ContinuedConcentrations discharged from the six stacks:

<u>Stack location</u>	<u>Yearly Average Concentration</u>
No. 1 Rotoclone	7.80×10^{-13} $\mu\text{c/ml}$ U Nat.
No. 2 Rotoclone	3.15×10^{-13} $\mu\text{c/ml}$ U Nat.
No. 7 Rotoclone	2.84×10^{-13} $\mu\text{c/ml}$ U Nat.
Bucking room	1.99×10^{-12} $\mu\text{c/ml}$ U Nat.
Anaconda Collector	5.03×10^{-11} $\mu\text{c/ml}$ U Nat.
Microdyne Collector	6.82×10^{-11} $\mu\text{c/ml}$ U Nat.

Note: Only the two stacks discharging yellow cake dust have average concentrations that exceed the MPC of 2×10^{-12} $\mu\text{c/ml}$ of air for natural uranium in unrestricted areas.

The licensee's methods for determining the concentration of radioactive material released to the environment.

Air samples are taken of stack effluents and in areas around the stacks to determine what is discharged and the effect of dilution and dispersion.

The licensee indicated that an environmental air sampling program was being formulated on the basis of our air survey guide, "An Acceptable Basis for Surveying to Determine Concentrations of Radioactive Material Discharged as Air Effluents from Uranium Mills." The program was scheduled to start in February, 1961.

The Anaconda Company also has a water sampling program for periodically testing wells, springs and ponds in the area for chemical and radioactive constituents. This includes 50 sources of water.

Additional air and water environmental surveys have been conducted by Associated Nucleonics, Inc., in the period of December, 1958 through December, 1959. The surveys were made to detect any effect on the environment from mill operations.

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RE: The Anaconda Company

ITEM 10. Written Radiological Safety Instructions.

Copies of eight different Memoranda and Bulletins were submitted. Material in these items cover nearly all phases of Safety, Radiological Health and Industrial Hygiene.

In addition, it is stated that specific instructions to supervisors on health and safety are recorded in the supervisor's log books.

GENERAL REMARKS

Generally, the Anaconda Company facilities and operations appear satisfactory with respect to Health and Safety. However, the licensee should be requested to provide additional information concerning deficiencies in the application as discussed above under each item.

In brief, the deficiencies are: Insufficient descriptions of ventilation and dust collection equipment, failure to describe certain ventilation exhaust ports and effluents and the need for clarification of the statements which indicate that respirators may be relied on to prevent employee overexposure.

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SURNAME ▶	Cowley: lrm <i>Cowley</i>					
DATE ▶	8-7-61					

LICENSING BRANCH ROUTE SLIP

DATE: 11-14-60

① Price, H. L. _____
Kirk, R. L. _____
Price, H. R. _____
Marsh, D. _____
Beck, C. K. _____
Rogers, L. R. _____
Mason, J. R. _____
Teets, S. A. _____
DI&R Mail Room _____

~~Johnson, L. R.~~ _____
Floury, E. R. _____
Edwards, C. T. _____
Borlik, R. F. _____
Keros, F. W. _____
Mason, N. D. _____
Frederick, R. J. _____

Delaney, J. C. _____
Lane, J. L. _____
MacCreless, E. G. _____
Doulos, N. _____
Gustavson, S. R. _____
Johnson, E. G. _____
Steele, R. _____
Diggs, R. _____
Allen, M. _____
Dorsey, H. _____

Hal: Van Blarcom of Raw Materials Division
checked with Dime today on this.
I believe you have this case on your
desk - for signature

From: Lu J. [Signature]

✓ attached mem. 11/14

R. L. Faulkner, Deputy Director
Division of Raw Materials

November 8, 1960

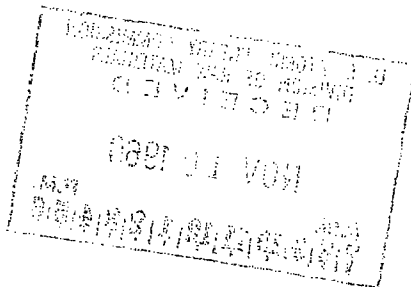
Allan E. Jones, Manager
Grand Junction Operations Office

ANACONDA DEEP WELL DISPOSAL SYSTEM

Symbol: MA:AEJ

During the meeting at Las Vegas, officials of the Anaconda Company asked me to inquire about the delay in AEC approval for their deep well effluent disposal system. I was told that the State of New Mexico had approved and tentative approval had been obtained from other interested regulatory groups.

The AEC approval has been pending for sometime and apparently Anaconda has been unable to get any expression from the Commission. I believe we should inquire as to the cause of delay and suggest to our people that Anaconda be given some kind of an answer.



03063

MR. PRICE

Attached amendment
relates to well
disposal. Have
thought you might
to be aware of
upcoming letter,
which is appended
for info only at this
time.

~~(Anacostia) (K
Partly look back for
Lamentin conference.~~

RSE

J. C. Delaney

ANACONDA COMPANY - APPLICATION DATED JULY 5, 1960, FOR DEEP-WELL DISPOSAL
L&R:JLL

In your memo of October 12, 1960, recommendation is made to permit Anaconda to dispose of liquid waste from their uranium milling operations by gravity injection into a deep well. Also, you recommend that certain conditions be incorporated into their license. Following are the conditions that you recommend and our comment on each:

1. "That the Anaconda Company shall monitor well, spring and surface waters as described in their letter dated July 5, 1960, and shall maintain records of monitoring results"

Comment

On page 11 of the enclosure to the application, Anaconda states that it ---"plans to continue its present monitoring program as outlined in Plate IX." This involves 51 monitoring sites with the majority of sites being checked on a bi-monthly basis, others at monthly or semi-annual intervals. Therefore, the first part of your recommendation is a restatement of the applicant's intent and in regard to maintaining records, this is a reiteration of Section 20.401.

2. "That the Company shall keep detailed records of the amount of liquids injected, pressures or water head in the injection well and radiological analysis of waste liquids injected."

Comment

This is a reiteration of Section 20.401

3. "That the company shall undertake the collection of additional data relative to movement, destination, and radiological quality of the injected or displaced liquids as may be necessary to assure that no hazards exist to people and property."

Comment

If a condition is imposed to collect additional data, we must have criteria as to when this collection is to start, where in their procedures is modification to be made, and how this data is to differ from that presented in their application which summarizes their 90-day test program. It appears that this would be covered under 20.401 and is an unqualified extension of Item 1 and 2 above.

4. "That liquids will be injected by gravity (natural water head) only and that the company will apply for special authorization from the DI&R, U.S.A.E.C. to use pressure injection if such practice is considered necessary.

Comment

We believe this to be an undue restriction. As indicated in their application (p. 11) there are injection build-up pressures and recovery falloff pressures that will occur during periods of active injection and during periods of shutdown. During an increase in the buildup pressure (backup) counter to the water head pressure, it may be necessary at times to increase the injection pressure to force the waste into the disposal strata.

There is no evidence to the contrary to show that absorption characteristics of the disposal strata will be affected by increasing the injection pressure. Rather their report shows that as a result of ion exchange characteristics of the soil at the disposal depth that the soil clay has sufficient capacity to exchange for anions under circumstances of increased injection. The clay has an exchange capacity of 899 gm Ra/ft³ (pii), whereas the total radium available for discharge over a 7 year period is set at 10.2 grams (piii) with an average daily output of 4.0×10^{-4} grams (pii). Also the applicant states that a monitor well adjacent to the disposal well will provide cross-formational communication for the detection of unanticipated contamination of the potable water table (p. 11). Finally, the applicant states (p. 7) that at low injection rates no surface injection pressures are necessary but that low injection pressures may be necessary at high rates of injection and during the latter period of the well's life. We agree with this procedure as does the New Mexico Department of Health which stipulates in their letter to Anaconda that a significant increase in injection rates must be approved. Extrapolating by difference from Anaconda's injected rate of 400-990 gpm it appears that a significant increase would have to be in the order 2X or 1500-2000 gpm.

5. "That the average monthly injection rate will not exceed 1000 gpm unless quantities in excess of this disposal rate are specifically authorized by DL&R."

Comment

We do not agree for the reasons set forth in Item 4 above. However, if an injection rate maximum is to be set, it should not be set at 1000. The applicant states (p 3) that the liquid waste discharged by the mill averages 1,058 gpm; therefore, if any value is to be applied, it should reflect at least an average value of 1,058 gpm. Further, the limit of 400-999 gpm at the head of the well is only an approximation. In attachment II of application dated Oct. 9, 1959, it is also noted that injection rates up to 1500 gpm were anticipated.

6. "That the company shall immediately notify the DL&R if it is known or if it appears that injected liquids are penetrating the barrier interval or moving into potable surface as subsurface waters."

Comment

The applicant could not comply with this condition because there is no provision for detection at the barrier level. The monitor well extends into the potable water aquifers while the barrier level continues from 638 to 950 feet. Also, the applicant states in the July 5, 1960, application (cover letter) that if there is any likelihood of contamination of potable water supplies, they will "discontinue operation of the disposal system immediately". Under these circumstances we don't believe a condition of this

nature is necessary.

7. Submitting of a yearly summary report.

Comment

It is believed that the periodic inspections made by the Division of Compliance would suffice. As observed in the case of the mills, they routinely send these reports in along with the inspection findings.

In conclusion, we feel that the authorization as given should be conditioned to the statements of their application of July 5, 1960. The authorization would read as follows: "Pursuant to 10 CFR 40, your License R-138 is hereby amended to authorize the disposal of liquid wastes from uranium processing operations according to the procedures submitted in your application dated July 5, 1960"

OCT 12 1960

Joseph Delaney, Chief, Nuclear Materials
Branch
Division of Licensing and Regulation
L. R. Rogers, Asst. Director for Nuclear Materials Safety
Division of Licensing and Regulation

APPLICATION BY ANACONDA COMPANY,
GRANTS, NEW MEXICO
FOR DEEP WELL DISPOSAL

DOCKET NO. 40-665

SYMBOL: DLR:CGW

The Anaconda Company, by letter dated October 9, 1959, requested Commission approval of a 90 day deep well effluent disposal test. On November 17, 1959, D L & R authorized the licensee to conduct the proposed test which was started on January 20, 1960.

By letter dated July 5, 1960, the Anaconda Company submitted a report entitled "Appraisal of Proposed Liquid Waste Disposal by Underground Injection," covering results of their 90 day deep well injection test, and requested Commission approval to continue disposing of liquid wastes in this manner provided it continues to appear that overlying potable water supplies will not become contaminated. The report and a copy of the cover letter were submitted by RSB to the Environmental and Sanitary Engineering Branch, Division of Reactor Development for evaluation and comments. Their comments are contained in the memo dated September 26, 1960, from Lieberman to Rogers.

The following is a summary of the more important data submitted in the Anaconda report:

1. The yearly average liquid mill effluent flow rate is 1,058 GPM.
2. The quantity of liquids available for well disposal will probably vary between 400 to 990 GPM
3. The approximate concentration of radioactive constituents -

<u>MATERIAL</u>	<u>CONCENTRATION μ/ml</u>	<u>SOLUBLE MPC μ/ml NEW PART 20</u>
Gross Alpha	2.4×10^{-4}	- - -
Natural Uranium	1.6×10^{-5}	2×10^{-5}
Thorium 230	2.7×10^{-4}	2×10^{-6}
Radium 226	6.6×10^{-7}	10^{-8}

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4. Intervals in the disposal well -
 - a. potable water interval, 0 - 638 feet depth
 - b. barrier interval, 638 - 950 feet depth
 - c. disposal interval, 950 - 1,778 feet depth
5. The barrier interval is said to contain horizontal seams of Gypsum ($CaSO_4 \cdot 2H_2O$) which will act as an effective barrier to the upward migration of wastes.
6. Calculated maximum distance (radius) that radioactive constituents might travel horizontally out from the well during seven years of discharging at 990 GPM is 500 to 1000 feet. (The seven year period covers the present contract between the licensee and the AEC for production of uranium concentrate.)
7. 52 wells, springs and other sources of domestic and irrigation waters will be sampled on a monthly, bi-monthly or semi-annual basis.
8. A monitor well was drilled down through the potable aquifer 300 feet distance from the disposal well. This well will be sampled on a monthly basis.
9. There are no domestic or irrigation wells within two miles of the disposal well.
10. It is expected that no injection pressure will be necessary since the normal water table is 229 feet below the surface and will provide about 100 PSI natural injection pressure.

Based upon our review of the data and information submitted by Anaconda, and the conclusions drawn by the Environmental and Sanitary Engineering Branch, we recommend that the Anaconda Mill license be amended pursuant to Section 20.302, to authorize deep well disposal of mill liquid effluents under the following conditions:

1. That the Anaconda Company shall monitor well, spring and surface waters as described in their letter dated July 5, 1960, and shall maintain records of monitoring results.
2. That the company shall keep detailed records of the amount of liquids injected, pressures or water head in the injection well, and radiological analyses of waste liquids injected.

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3. That the company shall undertake the collection of additional data relative to movement, destination, and radiological quality of the injected or displaced liquids, as may be necessary to assure that no hazards exist to people and property.
4. That liquids will be injected by gravity (natural water head) only, and that the company will apply for special authorization from the D L & R, U. S. AEC, to use pressure injection if such practice is considered necessary.
5. That the average monthly injection rate will not exceed 1,000 GPM unless quantities in excess of this disposal rate are specifically authorized by the D L & R.
6. That the company shall immediately notify the D L & R if it is known or if it appears that injected liquids are penetrating the barrier interval or moving into potable surface or subsurface waters.
7. That a yearly summary report shall be submitted to the D L & R describing the status of the injection program, including average monthly liquid injection rates, the concentration of radioactive constituents, average concentrations of radium and thorium in monitored well and surface waters, and the level of the water table. The first report to be submitted one year following the date of this authorization.

NOTE: The above conditions are similar to the conditions appearing in the May 20, 1960 letter from the New Mexico State Department of Public Health, authorizing the Anaconda Company to continue disposing of liquid mill wastes by deep well injection. This is in response to the recommendation by J. A. Lieberman to L. R. Rogers in the memorandum dated September 26, 1960, and because we believe the New Mexico State Health Department's recommendations have a sound basis.

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SURNAME ▶	<i>CGWetry</i>	<i>WRP</i>	<i>LRRogers</i>			
DATE ▶	10-11-60	10/11/60	<i>[Signature]</i>			

lrm
10-11-60

Joseph Delaney, Chief, Nuclear Materials
Branch
Division of Licensing and Regulation
L. E. Rogers, Asst. Director for Nuclear Materials Safety
Division of Licensing and Regulation

APPLICATION BY ANACONDA COMPANY,
GRANTS, NEW MEXICO
FOR DEEP WELL DISPOSAL

DOCKET NO. 40-665

SYMBOL: DLR:CGW

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 - b. barrier interval, 638 - 950 feet depth
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5. The barrier interval is said to contain horizontal seams of Gypsum ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$) which will act as an effective barrier to the upward migration of wastes.
6. Calculated maximum distance (radius) that radioactive constituents might travel horizontally out from the well during seven years of discharging at 990 GPM is 500 to 1000 feet. (The seven year period covers the present contract between the licensee and the AEC for production of uranium concentrate.)
7. 52 wells, springs and other sources of domestic and irrigation waters will be sampled on a monthly, bi-monthly or semi-annual basis.
8. A monitor well was drilled down through the potable aquifer 300 feet distance from the disposal well. This well will be sampled on a monthly basis.
9. There are no domestic or irrigation wells within two miles of the disposal well.
10. It is expected that no injection pressure will be necessary since the normal water table is 229 feet below the surface and will provide about 100 PSI natural injection pressure.

Based upon our review of the data and information submitted by Anaconda, and the conclusions drawn by the Environmental and Sanitary Engineering Branch, we recommend that the Anaconda Mill license be amended pursuant to Section 20.302, to authorize deep well disposal of mill liquid effluents under the following conditions:

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2. That the company shall keep detailed records of the amount of liquids injected, pressures or water head in the injection well, and radiological analyses of waste liquids injected.

- X 3. That the company shall undertake the collection of additional data relative to movement, destination, and radiological quality of the injected or displaced liquids, as may be necessary to assure that no hazards exist to people and property.
- ✓ 4. That liquids will be injected by gravity (natural water head) only, and that the company will apply for special authorization from the D L & R, U. S. AEC, to use pressure injection if such practice is considered necessary.
- X 5. That the average monthly injection rate will not exceed 1,000 GPM unless quantities in excess of this disposal rate are specifically authorized by the D L & R.
- X 6. That the company shall immediately notify the D L & R if it is known or if it appears that injected liquids are penetrating the barrier interval or moving into potable surface or subsurface waters.
7. That a yearly summary report shall be submitted to the D L & R describing the status of the injection program, including average monthly liquid injection rates, the concentration of radioactive constituents, average concentrations of radium and thorium in monitored well and surface waters, and the level of the water table. The first report to be submitted one year following the date of this authorization.

NOTE: The above conditions are similar to the conditions appearing in the May 20, 1960 letter from the New Mexico State Department of Public Health, authorizing the Anacosta Company to continue disposing of liquid mill wastes by deep well injection. This is in response to the recommendation by J. A. Lieberman to L. R. Rogers in the memorandum dated September 26, 1960, and because we believe the New Mexico State Health Department's recommendations have a sound basis.

DLR:RSB
CGW:elty:lrm

OGC

DLR:RSB
LRR:rogers

Lester Rogers
Chief, Radiation Safety Branch

September 26, 1960

Lyall Johnson
Chief, Licensing Branch

THE ANACONDA COMPANY LETTER DATED SEPTEMBER 21, 1960, REQUESTING
PERMISSION TO DISPOSE OF RADIOACTIVE MILL WASTE ON A TEMPORARY
BASIS - DOCKET NO. 40-665

SYMBOL: L&R:ND

Please review the subject request and advise us of your recommen-
dations as to the action we should take.

Please return the enclosed file copy of the letter with your
comments.

Enclosure:
Ltr. dtd 9-21-60

OFFICE ▶	L&R	L&R	L&R			
SURNAME ▶	Doulos/mad	J.C. Delaney	L. Johnson			
DATE ▶	9-26-60					

UNITED STATES GOVERNMENT

Memorandum

TO : L. R. Rogers, Chief, Radiation Safety Br. DATE: September 26, 1960
Division of Licensing and Regulation

FROM : J. A. Lieberman, Chief *ESS. for J.A.L.*
Environmental & Sanitary Engineering Branch, DRD

SUBJECT: APPLICATION BY ANACONDA COMPANY, GRANTS, NEW MEXICO, FOR
DEEP WELL DISPOSAL - DOCKET NO. 40-665

RD:NT:ESE:ESS

In accordance with your request I examined the subject application. The evidence submitted in its support seems to me to be sufficient to justify its acceptance, with conditions the same as or similar to those outlined in the letter from the New Mexico Department of Health of May 20, 1960.

It is my impression that on the whole the Anaconda Company has approached this problem in a careful and thorough manner. There are, however, several aspects that might warrant subsequent investigation (perhaps in the category of research and development?) and I offer the following for your consideration.

1. There seems to be no observation well that penetrates the formations into which the waste is to be injected. It is recognized that deep wells are expensive, and in this case may not be essential to demonstrate the safety of the operation. However, unless such are installed it does not appear possible to check design predictions against operational performance.
2. The calculations predicting the distance of outward migration from the injection well of the waste fluid and its contained radioelements are based on the assumption that the injection formation is homogeneous. A margin of safety is built into the calculations by taking credit for only 60 percent of the porosity, and by assuming all flow is in a 90-degree segment. However, because most permeable formations are in fact non-homogeneous, the possibility exists that the calculations may be misleading. That is, the possibility exists that narrow bands or stringers of waste fluid may travel farther than the maximum distance predicted in the calculations.
3. No evidence is given that the injection formation has the capacity to receive wastes over a long period of time, say seven years. In this connection, reference is made to E. S. Simpson's

memorandum to W. E. Hale, USGS, and Hale's reply, item 2, copies attached.

4. In Appendix B and Plate VIII of the report, the injection formation is divided into two zones: Zone A is called the zone of maximum penetration of fluids (average rock porosity 16%); Zone B is called the zone of maximum fluid flow (average rock porosity 22%). Unless there are aspects of the hydrology that escape me, the zone of maximum fluid flow (which I gather is the more permeable of the two) also should be the zone of maximum fluid penetration.

5. The dispersion of radium and thorium is treated by making simplifying and somewhat arbitrary assumptions. Under the circumstances, I believe this is justifiable. (That is, the capacity of the earth materials for neutralization of acid and sorption of radium is very great, so that the exact distance of dispersion is not important so long as it can be shown this distance is small.) However, should a future effort be made to monitor the injection formation, the physical-chemical aspects should be given more detailed and careful analysis.

Attachments
As stated

William E. Hale, U.S. Geological Survey
P.O. Box 4217, Albuquerque, New Mexico

✓
3 1980

Eugene S. Simpson, Geologist (USGS)
Environmental & Sanitary Engineering Br.
Division of Reactor Development

ANACONDA COMPANY PROPOSAL FOR WASTE DISPOSAL NEAR BLUEWATER, N.M.

SYMBOL: RD:NT:KSK:ESS

As you probably know, the Anaconda Company is applying to AEC for an amendment to their license which would permit them to continue indefinitely (under certain conditions) the injection of mill effluent into the Meseta Blanca and other formations. To support the application, Anaconda submitted a document describing the geology and hydrology of the area, the construction of their injection well, the results of the 90-day test recently concluded, and their prognostication of the effect of a 7-year disposal operation.

I have been asked to assist in the evaluation of the health and safety aspects of this proposal and since I understand your office has followed the operation on behalf of the New Mexico State Engineer, I would appreciate your answers or comments on the following questions:

1. What is the existing head relationship between water in the overlying potable-water aquifer and the brine in the injection-aquifer in the vicinity of the disposal well?
2. Could reasonably accurate piezometric contours be calculated for the pressure build-up in the injection-aquifer that would occur after 1-year operation, 2-year operation, etc? Would it then be possible to estimate the head relationship (after the periods specified) as in item 1 above?
3. The "barrier interval" between the potable-water aquifer and the injection-aquifer is reported to occur at hole depth 638 feet to 950 feet. Is it safe to assume that the vertical permeabilities reported for this zone (on the order of a few tenths of a millidarcy to a few millidarcies) is truly representative? That is, is it safe to assume joints and cracks are tightly closed or otherwise sealed? Are the interbedded clays effective barriers, or is there any reason to suspect they may be lenticular or discontinuous?

(continued)

OFFICE ▶						
SURNAME ▶						
DATE ▶						

William E. Hale


- 2 -

- 4. In your opinion, is there anything the Anacosta Company may reasonably and properly be asked to do to assure the continuing health and safety of the disposal operation, other than the items listed in the letter of May 20 from the New Mexico Department of Health?

Your help in this matter will be greatly appreciated.

cc: Harry LeGrand, USGS
 Geo. DeBuchanne, USGS

DIST:

Subj. 
 RD Rdg
 NT Rdg
 Lieberman Rdg

OFFICE ▶	RD: NT: ESE					
SURNAME ▶	EE Simpson: bmr					
DATE ▶	8 / /60					



IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY
Ground Water Branch
P.O. Box 4217
Albuquerque, New Mexico
August 18, 1950

To: Eugene A. Simpson, Geologist (USGS)
Environmental and Sanitary Engineering Branch
Division of Reactor Development
Atomic Energy Commission
Washington 25, D. C.

From: District Engineer, Ground Water Branch, USGS
Albuquerque, N. Mex.

Subject: Anaconda Company proposal for waste disposal near Bluewater, N. Mex.

This is in reply to your memorandum request of August 5 for comments on the Anaconda disposal well at Bluewater. I will attempt to answer your questions in the order you asked them, preceded by a brief discussion of the general geology and hydrology of the area.

The Anaconda mill and disposal pond were constructed on an irregular surface of a basalt flow which locally is covered by a few feet of clay, silt, and sand. The basalt flows are interbedded with alluvium in the principal valleys and are underlain by alluvium, the Chinle formation, or by the San Andres limestone in the vicinity of the mill. The alluvium consists of clay, silt, sand, and gravel in various ratios of intermixture. The Chinle consists of red mudstone and a few beds of sandstone and conglomerate. The San Andres limestone consists of an upper limestone bed, a middle limy sandstone bed, and a lower limestone bed. The limestone beds have many fractures and solution channels, which impart a very high permeability. The San Andres is underlain by the Glorieta sandstone, a fine-grained limy sandstone having a low to intermediate permeability. The Glorieta is underlain by the Yeso formation, which consists of sandstone, anhydrite, and fine-grained sandstone in the upper part.

The San Andres limestone is the principal aquifer. The transmissibility of the San Andres ranges from 400,000 to 3,420,000 gpd/ft where tested. The yield of wells is as much as 2,800 gpm, and the specific capacity of wells ranges from 10 to 1,100 gpm/ft. Dissolved solids in the water from the San Andres range from about 350 to 2,200 ppm. Sulfate is the most critical chemical constituent. The concentration of sulfate ranges from about 120 to 650 ppm. Water from the San Andres is used for rural domestic supplies, for trailer parks, for municipal supply at Grants and the Anaconda town site, and for irrigation. The gradient of the water table or piezometric surface in the San Andres limestone is little more than a foot to the mile to the east or southeast.

The alluvium and basalt form an aquifer of secondary importance along the Rio San Jose. The alluvium and basalt generally yield less water to wells than the San Andres does, but the chemical quality of the water in the alluvium

Simpson, Eugene L.

August 18, 1960

Page 2

commonly is better. Water from the alluvium and basalt is used for rural domestic supplies, for municipal supply at Milan, and for irrigation of small tracts. The gradient of the water table in the alluvium and basalt is parallel to the Rio San Jose and its principal tributaries.

The Glorieta sandstone has not been tested for yield separately, because the overlying San Andres limestone is so much more permeable. It presumably yields water to many wells indirectly, by vertical flow into the San Andres in areas of heavy withdrawal from the San Andres.

Only the beds of sandstone and conglomerate in the Chinle formation have been tapped for water supplies in the area. The yield of these wells generally is a few tens of gallons per minute. The chemical quality of water in the Chinle varies widely, from a few hundred to a few thousand parts per million of dissolved solids.

The area around the Anaconda mill is crossed by many normal faults. One set of faults trends north, one set trends east, and a third set trends northeast. The vertical displacement along the faults ranges from a few feet to as much as 700 or 800 feet.

Chemical analyses of water collected at different times from the same wells in the vicinity of the Anaconda mill indicated that water was percolating from the effluent pond to the water table and was being pumped from wells. The principal chemical indicator was nitrate which increased from about 15 to 75 ppm in samples from some wells. At the time, the Anaconda Company was using ammonium nitrate in its process of uranium concentration. Because the concentration of nitrate in drinking water is more critical than that of chloride, the company changed from an ammonium nitrate process to a sodium chloride process. The changes in ion concentration other than nitrate have been inconclusive, and the concentration of nitrate has decreased since the use of ammonium nitrate at the mill ceased.

The Anaconda disposal well was drilled about 2 miles northeast of the mill and about 1½ miles northeast of the effluent pond. The well site is underlain by a veneer of alluvium which lies on the lower member of the Chinle formation. The stratigraphic units penetrated and the abbreviated lithology are shown in the attached log of the well.

The discussions of your specific questions follow.

1. Hydraulic head relationship. - - The head relationship between the potable-water aquifer (San Andres-Glorieta) and the injection aquifer (the lower part of the Yaso formation) has not been precisely determined. The altitude of water level in the injection well after the San Andres-Glorieta was cased off and before injection of fluids was started was 6454 feet, April 14, 1959. A drill stem test of the San Andres-Glorieta that was

Mr. Simpson.

Page 3

made during drilling indicated the same altitude, within the limits of accuracy of the method. The altitude of water level in a well (NW $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 5, T. 12 N. R. 10 W.) that taps the San Andres a mile north of the injection well also was 6454 feet in January 1958. The nearly flat piezometric surface of water in the San Andres in this area indicates that the water level at the disposal well is essentially the same in both aquifers. A monitoring well was drilled to the base of the Glorieta sandstone about 300 feet southeast of the disposal well in March 1960, after a few weeks of injection of mill effluent into the Yeso formation. The altitude of water level in the monitoring well was also 6454 feet March 19, 1960.

2. Pressure buildup from injection. - - Temporary cessation of injection at critical times obscured the initial reaction of water level to a probable barrier, during the only two long periods of injection. Thus, the pressure buildup cannot be accurately computed, until we learn more about the effects of the barrier or barriers. Because of more urgent work on other projects, we have not attempted to interpret the recovery data, which may be more diagnostic. The apparent coefficient of transmissibility of the sandstone in the Yeso formation is about 10,000 gpd/ft. Furthermore, the coefficient of storage cannot be determined from the one well that taps the Yeso aquifer. The coefficient of storage of the Gallup sandstone, which is somewhat similar to the sandstones of the Yeso formation, is 0.00005 at Gallup. The coefficient of storage of the San Andres-Glorieta aquifer in the Grants-Bluewater area averages about 0.0005. The coefficient of storage of the Yeso aquifer probably is within this range and nearer to that of the Gallup sandstone. Thus a coefficient of storage of 0.00005 seems reasonable to assume. We believe that approximate pressure buildups for different distances at different times can be calculated, when we learn more about the distance and effectiveness of the ground-water barriers.

3. The vertical barrier interval. - - According to my interpretation of material penetrated by the disposal well (see log) the base of the San Andres limestone is at a depth of 478 feet and the base of the Glorieta sandstone is at a depth of 577 feet. The contact between the Glorieta and Yeso is indistinct, and the two may intertongue in an interval of several tens of feet immediately below 577 feet. The interval from 577 to 1,304 feet (the San Isidro member of the Yeso formation) is predominately mudstone, siltstone, and very fine-to fine-grained sandstone. Several beds of dense limestone, anhydrite, and gypsum, and a few beds of coarse-grained sandstone were also penetrated in that interval. Many fractures or veins were observed in cores from the San Isidro member, but essentially all of them were sealed tightly with gypsum.

Both the cement in the annular space between the 12.7-inch I.D. casing and the wall of the hole and between the 7.9-inch I.D. casing and the wall of the hole and the 12.7-inch casing were tested before the casing was perforated by building up pressure inside the casing. These operations were observed by personnel of the State Engineer office and were approved as satisfactory tests by them.

Mr. Simpson
Page 4

We concluded that the pressure buildup curves during the injection tests do not indicate a detectable amount of leakage from the Yeso aquifer.

4. Health and safety of the disposal operation. - - We have met several times with personnel of the New Mexico Department of Public Health and the New Mexico State Engineer Office to discuss the Anaconda disposal operation. We have all agreed that at this time we can see no danger in the disposal operation as performed by the company during the 90-day test period. We further agreed that certainly deep-well injection of the mill effluent is preferable to use of an evaporation pond that leaks. The U.S.G.S. is following the chemical monitoring of nearby wells by the Anaconda Co. with interest and at times will analyze samples from some of the same sources for comparison. We do not suggest at this time that the Anaconda Co. should do more to assure the health and safety of the disposal operation. If doubts arise in the future we will contact the State Department of Health.

If you have further questions about the Anaconda disposal well or the disposal operation, please feel free to contact us.

Sam W. West

Sam W. West
for W. E. Hale, District Engineer

SWW/zmm

cc: Harry LeGrande, U.S.G.S.
George DeBuchananne, U.S.G.S.

~~Pick up mail~~

~~4-315~~

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Evel Bowman

RD

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UNITED STATES GOVERNMENT

Memorandum

TO: Lester Rogers
Chief, Radiation Safety Branch

DATE: September 26, 1960

FROM: Lyall Johnson *TN*
Chief, Licensing Branch

SUBJECT: THE ANACONDA COMPANY LETTER DATED SEPTEMBER 21, 1960, REQUESTING
PERMISSION TO DISPOSE OF RADIOACTIVE MILL WASTE ON A TEMPORARY
BASIS - DOCKET NO. 40-665

SYMBOL: L&R:ND

Please review the subject request and advise us of your recommendations as to the action we should take.

Please return the enclosed file copy of the letter with your comments.

Enclosure:
Ltr. dtd 9-21-60

40-665

MEMO ROUTE SLIP

Form AEC-98 (Rev. May 14, 1947)

See me about this
Note and return

For concy
For signa

For action
For information

TO (Name and unit)

INITIALS

REMARKS

L. R. Rogers
L&R
M.S. C-233

DATE

TO (Name and unit)

INITIALS

REMARKS

Amanda
File

DATE

TO (Name and unit)

INITIALS

REMARKS

DATE

FROM (Name and unit)

REMARKS

E. C. Van Blarcom
RM
M.S. C-167 *Van*

PHONE NO.
5147

DATE
7/15/60

USE OTHER SIDE FOR ADDITIONAL REMARKS

U.S. GOVERNMENT PRINTING OFFICE: 1957 O-422007

40-668-

Excerpt from memo dated June 16, 1960 from Durrel L. Brown, GJ00 to W. Spencer Hutchinson, Jr., GJ00. Subject: Visit to the Anaconda Company, Bluewater, New Mexico, June 8, 1960.

Effluent Disposal

No additional effluent will be discharged into the deep well until AEC approval is received. A new permanent building is being constructed at the well site to house the equipment. New pumps will be purchased. Also a new plastic lined pipe will be installed inside the well casing. The original plastic liner has shown signs of adhesion failure.



UNITED STATES GOVERNMENT

Memorandum

TO : Lester Rogers
Chief, Radiation Safety Branch

DATE: May 23, 1960

FROM : Lyall Johnson
Chief, Licensing Branch

SUBJECT: APPLICATION FOR RENEWAL OF LICENSE R-138, THE ANACONDA COMPANY -
DOCKET NO. 40-665

SYMBOL: L&R:ND

I shall appreciate your recommendations as to the action we should take regarding the request for renewal of the subject license. We have advised the licensee of the receipt of their application for renewal.

Enclosure:
Docket No. 40-665
containing appl. dtd 5-18-60

ANACONDA COPPER AND GOLD CO. WASTES AND GROUND WATER

The radiation technical advisory committee has approved the plan to dump uranium wastes by the Anaconda mill at Bluewater. The plan is to dump the wastes into a series of pits which are not to be used for human consumption.

The plan has been approved by state health officials and engineers. The plan is to begin on a test basis about 60 days ago.

The mill will pump about 800 gallons per minute into a well. The well is to be sealed to prevent leakage.

A local health officer, the best thing that has come up yet. Carl Jensen, of the State Sanitation Office, said. He said it was the first operation of this type in New Mexico.

Most other mills are dumping the wastes into lagoons on top of the ground and there has been some fear of seepage into underground waters.

There appears to be any danger, the official said. Jensen said.

The plan is headed by Anaconda safety director Ralph White. White was stepped down from the chairmanship during the discussion on the disposal program.

The council was created by the 1959 legislature to help the health department regulate sources and users of radioactive materials in New Mexico.

Other members are Dr. Martin Fleck, radiologist at the University of New Mexico, Dr. Martin Goodwin, Cleveland radiologist, State Sen. Harold Agnew, Los Alamos physicist, and Dr. Paul Lee, Los Alamos radiologist. Lee was absent from the meeting because of illness.

The council also approved a request by the Federal Bureau of Geographical Survey to put small quantities of hydrogen 3, a weak beta emitter, into Lake MacMillan to measure amount of water from the lake that is going into the Pecos river.

(Continued)

The amount of hydrogen 3 to be used will be portions 500 to 1,000 times as safe as specified in the U.S. Bureau of Standards handbook, Jensen said.

The matter probably will be placed in the lake in August and the river will be tested next spring.

Lyall

This doesn't
respond to offer
to change date.

Suggest we say
prior commitments
preclude attendance
on 15th & make
it impossible now
to suggest
alternates within
next several
weeks.

You sign it
Koh

Docket No. 40-665

The Anaconda Company
New Mexico Operations
P. O. Box 638
Grants, New Mexico

Attention: Mr. A. J. Fitch

Gentlemen:

This will acknowledge receipt of your letter dated April 7, 1960.

We regret that we are unable to participate in the meeting you have set up for April 15, 1960, in Albuquerque, New Mexico to discuss your experimental work on the disposal of your uranium mill waste water.

Sincerely yours,

DISTRIBUTION

Doc. Rm.
Formal
Suppl.
L&R - LRL Readings

Director
Division of Licensing & Regulation

VIA AIR MAIL

Rogers announced meeting - 9

OFFICE ▶	<i>W</i> LRL	<i>JH</i> LRL	L&R			
SURNAME ▶	NDoulos /rh	LJohnson	HLPrice			
DATE ▶	4/12/60	4/12/60	4/ /60			

Office Memorandum • UNITED STATES GOVERNMENT

TO : Lyall Johnson, Chief, Licensing Branch
Division of Licensing and Regulation

DATE: OCT 28 1959

FROM : *Lester R. Rogers*
Lester R. Rogers, Chief, Radiation Safety Branch
Division of Licensing and Regulation

SUBJECT: DEEP WELL DISPOSAL, NINETY-DAY TEST PERIOD --
THE ANACONDA COMPANY, P. O. BOX 638, GRANTIS, NEW MEXICO
DOCKET NO. 40-665

SYMBOL: DLR:CGW

In their letter and enclosures dated October 9, 1959, The Anaconda Company has provided adequate information for an evaluation of their proposal for a 90-day, deep well, waste disposal test. The information indicates that with the physical characteristics of the area and the proposed plan of injection during the 90-day test, it is very unlikely that the waste material will find its way into overlying geological strata which contain usable subsurface waters. Therefore, it is concluded that the 90-day injection test, as proposed, is satisfactory from the radiological safety viewpoint.

The proposal does not provide adequate information necessary for an evaluation of a program for subterranean waste disposal on a continuing basis. Such an evaluation should be based on results available from the proposed 90-day test injection and additional information concerning potential uses of ground and surface waters in the vicinity of the disposal area, and proposed methods of monitoring for displacement of the contamination in the disposal area.

OCT 28 1959

Lyall Johnson, Chief, Licensing Branch
Division of Licensing and Regulation

Lester R. Rogers, Chief, Radiation Safety Branch
Division of Licensing and Regulation

DEEP WELL DISPOSAL, NINETY-DAY TEST PERIOD --
THE ANACONDA COMPANY, P. O. BOX 638, GRANTS, NEW MEXICO
DOCKET NO. 40-665

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OFFICE ▶	DLR:RSB	DLR:RSB				
SURNAME ▶	<i>CGW</i> CGWelty:lwj	<i>LRR</i> LRRogers				
DATE ▶	10-27-59	10- -59				

ANACONDA MEETING - SEPTEMBER 29, 1959

40-465

Fitch, A. J.	Manager - The Anaconda Company P. O. Box 638 Grants, New Mexico
Lynn, R. D.	The Anaconda Company
Wilde, Ralph M.	The Anaconda Company
Amstutz, Ray W.	Engineer - Earlougher Engineering P. O. Box 4597 Tulsa, Oklahoma
Dolan, John P.	Petroleum Research Corporation P. O. Box 8377 Denver, Colorado
Simpson, E. S.	(USGS) Reactor Development Division
Belter, W. G.	Reactor Development Division (Environmental & Sanitary Engineering Br.)
Ross, Donald M.,(Dr.)	Biology & Medicine Division
Van Blarcom, B. C.	Raw Materials Division
Lowenstein, R.	Office of General Council
Connor, T. B.	Office of General Council
Price, H. E.	Licensing and Regulation Division
Mason, J. R.	Licensing and Regulation Division (Isotopes Branch)
Rogers, L. R.	Licensing and Regulation Division (Radiation Safety Branch)
Delaney, J. C.	Licensing and Regulation Division (Licensing Branch)

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Lynn, H. D.	The Anaconda Company
Wilde, Ralph H.	The Anaconda Company
Amstutz, Ray W.	Engineer - Harlowgar Engineering P. O. Box 1697 Tulsa, Oklahoma
Dolan, John P.	Petroleum Research Corporation P. O. Box 8377 Denver, Colorado
Simpson, E. S.	(USGS) Resactor Development Division
Bolter, W. G.	Resactor Development Division (Environmental & Sanitary Engineering Br.)
Ross, Donald N., (Dr.)	Biology & Medicine Division
Van Blarcom, H. G.	New Materials Division
Levensstein, H.	Office of General Council
Connor, T. B.	Office of General Council
Price, H. L.	Office of General Council
Mason, J. H.	Planning and Regulation Division (Isotopes Branch)
Rogers, L. R.	Planning and Regulation Division (Radiation Safety Branch)
Delaney, J. C.	Planning and Regulation Division (Planning Branch)

LICENSING BRANCH ROUTE SLIP

Price, H. L. _____
Kirk, R. L. _____
Price, E. R. _____
Marsh, D. _____
Beck, C. K. _____
Rogers, L. R. _____
Mason, J. R. _____
Teets, S. A. _____
DI&R Mail Room _____

Johnson, L. E. _____
Fleury, E. R. _____
Edwards, C. T. _____
Borlik, R. F. _____
Karas, F. W. _____
Mason, W. D. _____
Frederick, R. J. _____

NOTE: _____
Delaney, J. C. _____
Lane, J. L. _____
McCreless, T. G. _____
Doulos, N. _____
Gustavson, S. R. _____
Johnson, R. G. _____
Steele, E. _____
Diggs, R. _____
Allen, M. _____
Dorsey, H. _____

*Please put in
Araconda sample only*

From: *JSD* _____

Office Memorandum • UNITED STATES GOVERNMENT

TO : Lyall Johnson, Chief, Licensing Branch
Division of Licensing and Regulation

DATE: NOV 13 1958

FROM : Lester R. Rogers, Chief, Radiation Safety Branch
Division of Licensing and Regulation

SUBJECT: DISPOSAL PROPOSAL - THE ANACONDA COMPANY, P. O. BOX 638, GRANTS, NEW MEXICO

Symbol: DLR:DAN

The method which Anaconda has proposed would appear to reduce any associated radiation hazard by delivering the waste material to an area well below the source of most usable ground water. However, such a procedure is to be considered only as an interim measure since it may require extensive monitoring to insure that, after a long period of time, the material does not reach a water supply in concentrations in excess of those permitted under Part 20. Therefore, it is suggested that a letter be addressed to Anaconda expressing the following ideas:

Your proposal to dispose of processing solutions into a deep well would be considered as an interim measure. It is preferable to reduce the concentration of radioactive material in the discharged solution to that which is considered acceptable under the provisions of 10 CFR 20. It is our understanding that information on economical methods of reducing the amount of radium present in the tailings are being developed through our Division of Raw Materials research program.

To further evaluate your proposal, we require the following information: (1) topographical, geological, and hydrological characteristics of the immediate area used for disposal; (2) present and potential usage of ground and surface water in the vicinity of the disposal area; (3) proposed method of monitoring to determine that the material, upon reaching the disposal site, does not reach ground waters in concentrations in excess of those permitted by Part 20.

If the information on the physical characteristics of the area are such that it is unlikely that the material will be displaced from its disposal site in concentrations in excess of those permitted under Part 20, no monitoring program will be necessary.

Lyall Johnson

page 2

The most preferable method of handling the disposal of such waste solutions would be to reduce the concentration to that which is permissible under Part 20 (Table II of Appendix B). Upon achieving these levels in the waste solution, approval is granted under Section 20.103 for discharge of these solutions directly into the environment (i. e., nearby streams or other ground waters) as far as the concentrations of radioactivity are concerned.

Lyall Johnson, Chief, Licensing Branch
Division of Licensing and Regulation

NOV 13 1958

Lester R. Rogers, Chief, Radiation Safety Branch
Division of Licensing and Regulation

DISPOSAL PROPOSAL - THE ANACONDA COMPANY, P. O. BOX 638, GRANTS, NEW MEXICO

Symbol: DLR:DAN

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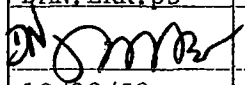
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Lyall Johnson
page 2

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OFFICE ▶	DLR DAN:LRR:ps	DLR JCDeLaney	DLR LJohnson			
SURNAME ▶						
DATE ▶	10/20/58					

Office Memorandum • UNITED STATES GOVERNMENT

TO : Lyall Johnson, Chief, Licensing Branch
Division of Licensing and Regulation

DATE: 6/30/58?

FROM : Lester R. Rogers, Chief, Radiation Safety Branch
Division of Licensing and Regulation

SUBJECT: REQUEST FOR EXEMPTION FROM 10 CFR 20 - THE ANACONDA COMPANY, P. O. BOX 638,
GRANTS, NEW MEXICO. - DOCKET NO. 40-665

SYMBOL: DLR:CMF

Our letter of May 23, 1958, listed two items of non-compliance. This company's letter of June 16, 1958, stated that they will post all areas as required by Section 20.203(e)(2) but request an exemption from labeling ~~and~~ the shipping containers as required by Section 20.203(f)(2). *possible*

In view of their contract with the Commission in regard to shipping containers and the radiation levels involved, their request is reasonable. The mill surveys conducted by HASL indicated that radiation levels of the drums are not significant in terms of overall exposure to the workers. The radiation level at the surface of the shipping drums is approximately 1 mr/hr.

It should be noted that Section 20.205 exempts from the labeling and posting requirements of Section 20.203 materials packaged and labeled in accordance with ICC regulations providing inside containers are labeled in accordance with Section 20.203(f). Since there are no inner containers in this case, this portion of the exemption will not apply. The areas in which the drums will be stored will be posted as required by Section 20.203(e)(2), *Therefore exemption from labeling after shipment, during storage, is also considered appropriate.* *P.R.B.*

It is recommended that Source Material License No. R-138 be amended to include the requested exemption.

An example exemption would be as follows:

Based on your letter of June 16, 1958, an exemption from Section 20.203(f)(2) is hereby granted for individual shipping containers of uranium.

Because of the radiation levels this can and should be waived. Exemption from Section 20.203(f) does make such a waiver. P.R.B.

Lyall Johnson, Chief, Licensing Branch
Division of Licensing and Regulation

Lester R. Rogers, Chief, Radiation Safety Branch
Division of Licensing and Regulation

REQUEST FOR EXEMPTION FROM 10 CFR 20 - THE ANACONDA COMPANY, P. O. BOX 638,
GRANTS, NEW MEXICO. - DOCKET NO. 40-665

SYMBOL: DLR:CMF

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Lyall Johnson, Chief, Licensing Branch
Division of Licensing and Regulation

Lester R. Rogers, Chief, Radiation Safety Branch
Division of Licensing and Regulation

REQUEST FOR EXEMPTION FROM 10 CFR 20 - THE ANACONDA COMPANY, P. O. BOX 638,
GRANTS, NEW MEXICO. - DOCKET NO. 40-665

SYMBOL: DLR:CMF

Our letter of May 23, 1958, listed two items of non-compliance. This company's letter of June 16, 1958, stated that they will post ^{ed} all areas as required by Section 20.203(e)(2) but request an exemption from labeling ~~and~~ the shipping containers as required by Section 20.203(f)(2). *Possible*

In view of their contract with the Commission in regard to shipping containers and the radiation levels involved, their request is reasonable. The mill surveys conducted by HASL indicated that radiation levels of the drums are not significant in terms of overall exposure to the workers. The radiation level at the surface of the shipping drums is approximately 1 mr/hr.

It should be noted that Section 20.205 exempts from the labeling and posting requirements of Section 20.203 materials packaged and labeled in accordance with ICC regulations providing inside containers are labeled in accordance with Section 20.203(f). Since there are no inner containers in this case, this portion of the exemption will not apply. The areas in which the drums will be stored will be posted as required by Section 20.203(e)(2). *Therefore, exemption from labeling after shipment, during storage, is also considered appropriate.*
It is recommended that Source Material License No. R-138 be amended to include the requested exemption.

Because of the radiation levels, this can and should be waived, Exemption from Section 20.203(f) does make such a waiver.

An example exemption would be as follows:

Based on your letter of June 16, 1958, an exemption from Section 20.203(f)(2) is hereby granted for individual shipping containers of uranium.

07803

OFFICE ▶	DLR:RSB					
SURNAME ▶	CMF:lwj:ARR					
DATE ▶	6/30/58					

Office Memorandum • UNITED STATES GOVERNMENT

TO : H. L. Price, Director
Division of Licensing and Regulation

FROM : Marvin M. Mann, Assistant Director for Compliance
Division of Inspection *M*

SUBJECT: THE ANACONDA COMPANY, GRANTS, NEW MEXICO, LICENSE NO. R-138

SYMBOL: INS:LDL

DATE: JUN 18 1959

Transmitted herewith are copies of a memorandum from D. I. Walker, Idaho, dated May 25, 1959, subject as above, with attachments, regarding questions raised by the licensee in connection with the proposed amendment to 10 CFR 20.

This office would appreciate receiving copies of any correspondence you may have with the licensee in this regard.

Enclosures:

Cpy memo fm D.I. Walker,
dtd 5/25/59, w/attachments

*Only cpy. of ltr. from R. M. Wilde
to Dr. Walker (100) sent
to PDRm 7/1/59 Dm.*

*of oge
Bsm 6/24*

*ans to Wilde
7/20*

Office Memorandum • UNITED STATES GOVERNMENT

TO: Mr. Mann, Asst. Director, Compliance
Division of Inspection, Washington, D. C.

DATE: May 25, 1959

FROM: Donald T. Walker, Director, Division of Licensee
Inspection, Idaho Operations Office

SUBJECT: THE ANACONDA COMPANY, GRANTS, NEW MEXICO, SOURCE MATERIAL LICENSE
NO. R-138

SYMBOL: LI:DIW

Transmitted herewith is a copy of a letter from Ralph M. Wilde, who is in charge of the Anacoda mill's health physics program. You will note that Mr. Wilde has posed some questions concerning the interpretations of the proposed amendment to 10 CFR 20.

I am also enclosing a copy of my reply to him and have stated that AEC Headquarters may wish to make further comments on his letter and my answer. If comments from Headquarters are forwarded to the licensee, I would appreciate receiving a copy of your letter to them.

Enclosures:

- ✓ Cy ltr fm Wilde to Walker 5/12/59
- ✓ Cy ltr to Wilde fm Walker 5/25/59

LI:DW

May 25, 1959

Mr. Ralph M. Wilde
The Anaconda Company
P. O. Box 638
Grants, New Mexico

Dear Mr. Wilde:

Thank you for your letter of May 19, 1959, concerning the proposed amendment to 10 CFR 20.

As you have observed in your letter, the permissible concentrations for soluble and insoluble fractions of the various isotopes listed in Appendix B are considerably different. It will also be noted that for some isotopes the MPC for the soluble fraction is greater than for the insoluble, while in others, the reverse is found. In each case, however, the MPC is based on estimated damage to the critical organ. Should the material be insoluble in body fluids, the isotope will remain in the lung which will, in this particular case, be the critical organ. Should the isotope be soluble, then the particular organ where it may concentrate will become the critical organ. In a case where the isotope is soluble but does not accumulate in any particular organ, such as the sodium isotopes, the MPC is then based on a whole body dose.

It is thus apparent that the MPC's are based on solubility in body fluids. Unfortunately, I am not in a position to tell you how to determine whether or not a particular compound may be soluble in such fluids. From my own experience and knowledge, I would guess, in those cases which are of primary concern to you, radium and uranium, that the MPC for radium should be based on all the radium being soluble, since the greatest damage to the body would be where the radium does end up in the blood-forming organs and that the MPC for uranium should be based on the insoluble since the greatest damage to the body would be from the irradiation of the lungs.

I might add that this interpretation is not necessarily an official one, and I am therefore forwarding a copy of this letter to you and a copy of your letter of May 19, 1959, to our headquarters in case they wish to make some additional comments. It will be suggested that their comments, if any, be forwarded directly to you.

Answer to Wilde

Mr. Ralph M. Wilds

- 2 -

May 25, 1959

I might further add, with such an interpretation as I have given above, that if the insoluble uranium 238 concentration in air is within permissible limits, i.e., 7×10^{-11} uc/ml, the concentration of radium 226 would be less than the MPC (3.5×10^{-11} uc/ml vs. an MPC of 3×10^{-11} uc/ml), if the uranium ore had attained secular equilibrium.

I am also hopeful that the proposed amendment may contain an additional MPC for natural uranium, i.e., for the specific ratios of the uranium isotopes of 234, 235, and 238, before it is finally issued.

If you do not have copies, you might wish to obtain the National Bureau of Standards, Handbook 52, "Maximum Permissible Amounts of Radioisotopes in the Human Body and Maximum Permissible Concentrations in Air and Water", and Handbook 59, "Permissible Dose from External Sources of Ionizing Radiation". The handbooks, for sale by the Superintendent of Documents, Washington 25, D. C., for 20 and 30¢, respectively, are the reports of the National Committee on Radiation Protection and are the basis of 10 CFR 20, Standards for Protection Against Radiation.

Very truly yours,



Donald I. Walker, Director
Division of License Inspection
Idaho Operations Office

CC: M. M. Mann, Wash.

C O P Y

THE ANACONDA COMPANY
NEW MEXICO OPERATIONS
P.O. BOX 638,
GRANTS, NEW MEXICO

May 19, 1959

Dr. D. I. Walker, Director
Division of Licensee Inspection
Idaho Operations Office
Idaho Falls, Idaho

Dear Dr. Walker:

Recently we received a copy of the proposed amendment to 10 CFR Part 20, "Standards for Protection Against Radiation," from the Division of Licensing and Regulation. In studying this proposed amendment, questions have arisen on which I should like to ask your advice.

In the amended Appendix B, there are given MPC's for both soluble and insoluble forms of the various isotopes. In some cases there is a considerable difference between the soluble and insoluble MPC for a given isotope. In the case of Radium 226 in air in a restricted area, the soluble MPC is nearly 6700 times greater than the insoluble MPC. In the case of Uranium 238 in air in a restricted area, the soluble MPC is 1.4 times the insoluble MPC.

I should first like to ask what solvent is considered in determining whether an isotope is soluble or insoluble. Is the solvent water, a particular acid, body fluid, or perhaps some other solvent? In the evaluation of a sample of air-borne particulate matter, such as uranium ore dust, should the soluble or insoluble MPC be used as the reference level?

This question of solubility was not of great concern in the first publication of 10 CFR Part 20. The soluble and insoluble MPC's for the isotope which we encounter were generally identical. However, with the adoption of the new amendment, this question of solubility would appear to have great importance.

I want to thank you for your assistance and trust that you can give me answers to these questions.

Very truly yours,

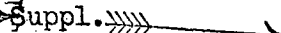
Ralph M. Wilde

RMW:db

C O P Y

Distribution:

Doc. Rm.

Suppl. 

Br. and Div. rfs

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DFHarmon, LR

Formal

DLR:DFH
40-665

JUL 3 - 1962

The Anaconda Company
New Mexico Operations
P. O. Box 638
Grants, New Mexico

Attention: Mr. A. J. Fitch, Manager

Gentlemen:

This refers to your application for renewal of Source Material License No. R-138.

In support of your application we require the following additional information:

1. A description and an analysis of the retention capability and integrity of your tailings retention system, conditions that might lead to accidental release of waste, the environmental effects of such release and your program of inspection and maintenance to prevent such an accidental occurrence. Your analysis of the retention capability and integrity of your system should include drawings showing the layout, heights, top width, side slopes, freeboard, seepage control, protection of embankment surfaces, foundation design, typical cross-sections of dams and characteristics of fill material, etc. This information should be supplemented by a discussion of construction methods and specifications.
2. Your step-by-step procedure for analysis of uranium, radium, and thorium in liquid effluent samples.
3. A description of the present method used for determining exposure of employees to external radiation.

Sincerely yours,

Original Signed by R. L. Kirk

OFFICE ▶	LR <i>DFH</i>	LR <i>DW</i>	LR <i>DFH</i>	LR	LR
SURNAME ▶	DFHarmon:rl	DANussbaumer <small>Deputy Director</small>	LJohnson	RKirk	RLowenstein
DATE ▶	6/14/62	6/18/62	6/21/62	6/21/62	6/21/62

DLA:DFE
40-665

JUN 14 1962

The Anaconda Company
New Mexico Operations
P. O. Box 638,
Grants, New Mexico

Attention: Mr. A. J. Fitch
Manager

Gentlemen:

Pursuant to your letter dated June 6, 1962, Source Material
License No. R-136 is hereby amended as follows:

"The licensee shall immediately notify the Director,
Region IV, Division of Compliance, USAEC, Denver,
Colorado, by telephone and telegraph of any failure
in an earth can retention system which results in a
release of radioactive material into unrestricted
areas. This requirement is in addition to the re-
quirements of 10 CFR 20."

FOR THE ATOMIC ENERGY COMMISSION

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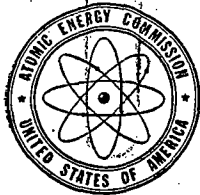
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Compl.
DFHarmon, LR
Doulos, LR
S/Health

Original Signed by R. L. Kirk

Director
Division of Licensing and Regulation

OFFICE ▶		LR <i>DL</i>	LR <i>DL</i>	LR <i>Johnson</i>	LR <i>Kirk</i>	LR <i>Lowenstein</i>
SURNAME ▶		DFHarmon:ral	DANussbaumer	LJohnson	RKirk	RLowenstein
DATE ▶		6/13/62	6/13/62	6/14/62	6/14/62	6/14/62

Journal



UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON 25, D.C.

JUN 4 - 1962

IN REPLY REFER TO:
DLR:DFH
40-665

The Anaconda Company
New Mexico Operations
P. O. Box 638
Grants, New Mexico

Attention: Mr. A. J. Fitch
Manager

Gentlemen:

As you know the uranium mills typically employ earth dam retention systems to control release to unrestricted areas of wastes which contain concentrations of radioactive material in excess of those permitted to be released by 10 CFR Part 20.

In order to provide assurance that appropriate steps are taken by all concerned in the event of a rupture in an earth dam retention system and the resulting release of the contained waste to unrestricted areas, we believe that the public health and safety requires that your source material license be modified by adding the following conditions:

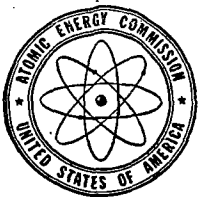
"The licensee shall immediately notify the Director, Region IV, Division of Compliance, USAEC, Denver, Colorado, by telephone and telegraph of any failure in an earth dam retention system which results in a release of radioactive material into unrestricted areas. This requirement is in addition to the requirements of 10 CFR 20."

Accordingly, pursuant to the Atomic Energy Act of 1954, as amended, and the regulations of the Commission, you are hereby notified that we intend to modify your license as indicated above. This notice is sent to you in order that, prior to the institution of formal proceedings for modification of the license, you may have an opportunity to comment on this change. If you are willing to have this condition added to your license without the issuance of a formal order, please so advise us within thirty days from the date of this notice. If we do not receive your consent, an appropriate order will be issued for the modification of your license by the Atomic Energy Commission, in which event you will be offered the opportunity of a formal public hearing in the matter.

Sincerely yours,

RL Kirl

Deputy Director
Division of Licensing and Regulation



UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON 25, D.C.

JUN 4 - 1962

IN REPLY REFER TO:

DLR:DFH

40-655

The Anacanda Company
New Mexico Operations
P. O. Box 626
Grants, New Mexico

Attention: Mr. A. J. Fitch
Manager

Gentlemen:

As you know the uranium mills typically employ earth dam retention systems to control release to unrestricted areas of wastes which contain concentrations of radioactive material in excess of those permitted to be released by 10 CFR Part 20.

In order to provide assurance that appropriate steps are taken by all concerned in the event of a rupture in an earth dam retention system and the resulting release of the contained waste to unrestricted areas, we believe that the public health and safety requires that your source material license be modified by adding the following conditions:

"The licensee shall immediately notify the Director, Region IV, Division of Compliance, USAEC, Denver, Colorado, by telephone and telegraph of any failure in an earth dam retention system which results in a release of radioactive material into unrestricted areas. This requirement is in addition to the requirements of 10 CFR 20."

Accordingly, pursuant to the Atomic Energy Act of 1954, as amended, and the regulations of the Commission, you are hereby notified that we intend to modify your license as indicated above. This notice is sent to you in order that, prior to the institution of formal proceedings for modification of the license, you may have an opportunity to comment on this change. If you are willing to have this condition added to your license without the issuance of a formal order, please so advise us within thirty days from the date of this notice. If we do not receive your consent, an appropriate order will be issued for the modification of your license by the Atomic Energy Commission, in which event you will be offered the opportunity of a formal public hearing in the matter.

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Sincerely yours,

RL Kih

Deputy Director
Division of Licensing and Regulation

DICTATED

SA 5/29/62

APPROVED

6/4/62

LR:JL
40-665

NOV 1 1961

Distribution:

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Suppl.
Compl., w/cy appl. dtd 10-14-61
Br. & Div. Rdgs.
N. Doulos

The Anaconda Company
New Mexico Operations
P. O. Box 638
Grants, New Mexico

Attention: Mr. A. J. Fitch,
Manager

Gentlemen:

This refers to your application dated October 14, 1961, for amendment to Source Material license S-138 to authorize the incineration of discarded wooden equipment.

You are hereby authorized under License S-138 to incinerate discarded wooden equipment containing source material and return the ashes to process for recovery of the contained uranium in accordance with the procedures submitted in application dated October 14, 1961.

FOR THE ATOMIC ENERGY COMMISSION

~~Donald A. Nusbaumer~~, Chief
Source & Special Nuclear Materials Branch
Division of Licensing and Regulation

AIR MAIL

OFFICE ▶	LR	<i>[Signature]</i>			
SURNAME ▶	dolan:sjs	DANusbaumer			
DATE ▶	10-26-61	10- -61			

AUG 14 1961

L&R:JL
40-655

Distribution:

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Br. & Div. Rdgs.
J. J. Lane, L&R

The Anaconda Company
Grants, New Mexico

Attention: Mr. A. J. Fitch

Gentlemen:

This refers to your letter of April 19, 1961, which requested amendment to your Source Material License No. R-138 to discharge airborne radioactivity not to exceed the concentrations specified in Appendix B, Table 2, Column 1, of 10 CFR to the boundary of the restricted area of your uranium mill.

An amendment to your license is not required because in accordance with Section 20.103 of 10 CFR 20 and the terms of your license, the release of these concentrations may be made to the boundary of your restricted area. It is under the circumstance where a plant boundary line would extend beyond a defined restricted area, which in your case is defined by a fence, that a request for a release of these concentrations to the plant boundary, would be appropriate.

Very truly yours,

Donald A. Nussbaumer, Chief
Source & Special Nuclear Materials Branch
Division of Licensing and Regulation

AIR MAIL

OFFICE	L&R	L&R			
SURNAME	J. J. Lane:sjs	DANussbaumer			
DATE	7-21-61	8-9-61			

LR:CGW
40-665

The Anaconda Company
Grants, New Mexico

Attention: Mr. A. J. Fitch, Manager

Gentlemen:

This refers to your letter dated December 28, 1960, in which you discussed steps you have taken to correct those deficiencies in your air survey program which we brought to your attention in our letter of December 1, 1960, and the licensing information submitted in your letter dated January 30, 1961.

It appears that you have taken the necessary action to determine the weighted average exposure of each employee who works in areas having airborne radioactive material above MPC. However, we note from your job exposure calculations that you made allowance for the wearing of respiratory protective equipment during certain activities. Based on our recalculations of the weighted average exposures, we find that the Dryer Operator and Sample Room Operator's calculated exposures were slightly in excess of 4.17×10^{-11} microcuries uranium/milliliter of air (your adjusted MPC based on the MPC for natural uranium specified in 10 CFR 20 prior to its amendment on January 1, 1961,) if allowance is not made for protection afforded by the respirators.

You are reminded that effective January 1, 1961, allowance cannot be made for respirators in the determination of exposure of personnel to airborne radioactivity for the purpose of complying with 10 CFR 20, unless authorized by the Commission. You may wish to apply for such authorization pursuant to 10 CFR 20, Section 20.103(e)(3), "Exposure of individuals to concentrations of radioactive material in restricted areas."

Limits for exposure to airborne radioactivity are established in 10 CFR 20. As indicated in the "Statement of consideration" to amendments of 10 CFR 20, the adoption of these exposure limits should not be considered as a departure from the principle that unnecessary exposure to radiation should be avoided. To this end, respirators are

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SURNAME ▶						
DATE ▶						

frequently used in areas where airborne radioactive material is known to exist in such concentrations that exposure, even without respirators, is within acceptable 19 CFR 20 limits. The AEC encourages this practice as well as the practice of having respirators available for use in emergency situations. Such uses of respirators need not have prior approval of the AEC.

The use of respirators in order to meet the exposure limits in 19 CFR 20 is justified only in those instances in which it is not feasible to provide more positive protective measures such as process and ventilation control. The Commission will not authorize, pursuant to Section 20.103(c)(3), the use of respirators as a substitute for other practical methods of adequate ventilation and process control.

We have reviewed the information you submitted on January 30, 1961, in support of your application for license renewal and find that additional information is necessary as requested below: (The items are listed as in your application.)

ITEMS 4 AND 5. Dusty Areas and Dust Control Equipment.
Dust Control Point K.

Please submit a description of the dust collection equipment in the ventilation system which exhausts the eight barrel filling hoods.

ITEM 9. Mill Discharge Stacks and Effluents.

Perhaps we were not clear in our letter of December 1, 1960, in indicating that information was required concerning all mechanical ventilation exhaust ports from which radioactive materials are exhausted to the atmosphere. Therefore, please describe the location and height of exhaust ports and types and concentrations of radioactive materials discharged for each of the following: Retoclones No. 3, 4, 5, 6, 8 and 9, the sample preparation hood, the barreling hoods, the filter presses, the carbonate and acid circuit drum dryers, and the metallurgical

OFFICE ▶						
SURNAME ▶						
DATE ▶						

The Anaconda Company

- 3 -

ITEM 9. continued -

laboratory. Also, please indicate which Microdyne dust collector you make reference to in this item.

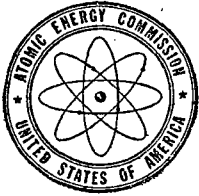
FOR THE ATOMIC ENERGY COMMISSION

Director
Division of Licensing and Regulation

Enclosure
10 CFR 20 Amended

b cc: Compliance Division, HQ) w/cpy ltr 12/28/60 and 1/30/61
Compliance Division, IOO)
Public Document Room

OFFICE ▶	DLR:EB CGW:lrm:REC	LR:S&SNMB DANussbaumer	LR LJohnson	LR ERPrice	LR RLKirk	LR RLowenstein
SURNAME ▶	<i>CGW REC</i>					
DATE ▶	8-14-61					



UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON 25, D. C.

IN REPLY REFER TO:

L&R:J JL
40-665

APR 10 1968

The Anaconda Company
P. O. Box 638
Grants, New Mexico

Attention: Mr. A. J. Fitch
Manager

Gentlemen:

A number of the uranium mills have indicated in their license applications, or amendments thereto, that urinalysis would be performed on employees. Such statements and representations contained in the application became requirements when the licenses were issued, renewed or amended.

Based upon an analysis of the means of assessing internal radiation exposure in connection with uranium mill operations, we have concluded that routine urinalysis for uranium is not necessary. This conclusion is based on the fact that urinalysis for uranium measures only absorbed uranium (i.e. dissolved in body fluids) and therefore is not a valid indicator for insoluble uranium exposures. Thus, the presence or absence of uranium in urine is not satisfactory as a complete indicator.

Air sampling programs are the primary means of evaluating exposure to airborne radioactivity which is the main source of internal exposure in uranium mills. Such air sampling programs are routinely required and the results can be directly related to the air concentration limits in Part 20.

The Commission may in particular cases, pursuant to Section 20.108 of 10 CFR Part 20, require certain forms of bioassay as a special survey since it may provide a qualitative indication of internal exposure.

Therefore, effective this date, you are hereby relieved of any requirements to perform routine urinalysis for uranium in connection with your uranium milling operations if such has been incorporated as a condition of your license as a result of statements and representations made by you in your license application or amendments thereto.

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FOR THE ATOMIC ENERGY COMMISSION

Acting Director
Division of Licensing and Regulation

BIOTATED
APPROVED
DN 6/21/68

L&R:JLL
40-665

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Distribution:

C. Tully, RM (2)

Document Rm.

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Compl. *How/cy ltr dtd 7/5/60*

Suppl.

Br. & Div.

S/Health

OGC

N. Doulos

J. J. Lane

The Anaconda Company
New Mexico Operations
P. O. Box 638
Grants, New Mexico

Attention: Mr. A. J. Fitch
Manager

Gentlemen:

In reference to your application dated July 5, 1960, your Source
Material License No. R-138 is hereby amended to add the following:

"You are hereby authorized to dispose of the radioactive
liquid waste resulting from uranium processing operations
into a subterranean disposal well according to the pro-
cedure described in your application dated July 5, 1960,

"as a condition of this license you are required to main-
tain records of the volume of waste disposed, the average
concentration of the radioactive constituents, and the
natural water head pressures and injection rates. Further,
this license does not authorize an increase in injection
pressure above that produced by the natural water head of the
waste effluent stream."

FOR THE ATOMIC ENERGY COMMISSION

Director
Division of Licensing and Regulation

AIR MAIL

P-20 + 40 Sent

OFFICE ▶	<i>JLL</i> I&R JJLane:sjs	L&R <i>J. J. Lane</i>	OGC <i>WLF</i>	RSB <i>REC</i>	I&R <i>JLL</i> RKirk	I&R <i>HLPrice</i>
SURNAME ▶	NDoulos	<i>J. J. Lane</i>	<i>WLF</i>	<i>REC</i>	<i>HLPrice</i>	<i>HLPrice</i>
DATE ▶	10/26/60	10/26/60	10/27/60	10/27/60	10/11/60	12/2/60

SEP 14 1960

40-665

The Anaconda Company
New Mexico Operations
P. O. Box 638,
Grants, New Mexico

Gentlemen:

Enclosed for your information is a report entitled "AEC Radiation Control Program for Uranium Mill Operators," dated May 11, 1960, which was prepared at the request of the Congressional Joint Committee on Atomic Energy. The purpose of this report was to advise interested members of Congress of the general radiation problems associated with uranium mill operations and the status of each licensed uranium mill with respect to such problems.

We understand that this report is to be included as an appendix to the published record of the Joint Committee hearings on radiation standards.

Sincerely yours,

H. L. Price, Director
Division of Licensing
and Regulation

Enclosure

40-665
L&R:ND

MAY 23 1960

The Anaconda Company
New Mexico Operations
P. O. Box 638
Grants, New Mexico

Attention: Mr. A. J. Fitch

Gentlemen:

This will acknowledge receipt of your application dated May 18,
1960, for renewal (Pursuant to Section 40.26, 10 CFR 40) of your
License No. R-138.

Very truly yours,

J. C. Delaney
Chief, Nuclear Materials Section
Licensing Branch
Division of Licensing & Regulation

DISTRIBUTION:
Formal & Suppl. Dockets
Document Room
Div. of INS, w/cy of
appl. dtd 5-18-60
Br. & Div. Reading files

OFFICE ▶	L&R	L&R				
SURNAME ▶	Doulos/mad	J. C. Delaney				
DATE ▶	5-23-60	5/23				

L&R:JGD
40-665

MAY 11 1960
17

The Amosuda Company
New Mexico Operations
P. O. Box 638
Grants, New Mexico

Attention: Mr. A. J. Fitch

Gentlemen:

In order to clarify the intent of the exemption from the requirements of Section 20.203(f)(2), 10 CFR 20, contained in your License R-138, effective July 1, 1959, Paragraph 5 of said license is hereby amended to read as follows:

"This license is subject to all the provisions of the Atomic Energy Act of 1954 now or hereafter in effect and to all valid rules and regulations of the U. S. Atomic Energy Commission, including 10 CFR 20, "Standards for Protection against Radiation" except that you are exempt from the requirements of Section 20.203(f)(2) provided that all areas are posted as described in your letter dated February 3, 1959. Neither this license nor any right under this license shall be assigned or otherwise transferred in violation of the provisions of the Atomic Energy Act of 1954."

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Br & Div. rf's

FOR THE ATOMIC ENERGY COMMISSION

J. C. Delaney
Chief, Nuclear Materials Section
Licensing Branch
Division of Licensing and Regulation

AIR MAIL

OFFICE ▶	L&R	L+R				
SURNAME ▶	J. Delaney	RSB REC				
DATE ▶	5/12/60	5/11/60				

LYALL JOHNSON, CHIEF, LICENSING BRANCH
DIVISION OF LICENSING AND REGULATION
U S ATOMIC ENERGY COMMISSION
WASHINGTON D C

PRIORITY

MR A J FITCH
ANACONDA COMPANY
GRANTS NEW MEXICO

APRIL 13 1960

REURLET 7 APRIL REGRET THAT PRIOR COMMITMENTS PRECLUDE AEC ATTENDANCE
APRIL 15 ALBUQUERQUE MEETING REGARDING WASTE DISPOSAL AND MAKE IT
IMPOSSIBLE NOW TO SUGGEST ALTERNATE DATE WITHIN NEXT SEVERAL WEEKS
END:DL&R:LJ

CC: Inspection Div., ICO w/cy inc. ltr
Inspection Div., Washington " "

Docket No. 40-665

LJohnson:mjw
4/13/60 11:30 a.m.

B-119						
OFFICE ▶	DY&R					
SURNAME ▶	LJohnson/mjw					
DATE ▶	4/13/60					

40-643

JAN 28 1960

The Amosco Company
New Mexico Operations
P. O. Box 638
Grants, New Mexico

Attention: Mr. A. J. Fitch

Gentlemen:

This is to acknowledge your letter of January 20, 1960
indicating that your 90-day mill waste effluent disposal
test started on that date.

Sincerely yours,

Original Signed by R. L. Kirk
Deputy

R. L. Price, Director
Division of Licensing and Regulation

CC: Tully - RM (2)
INS - Mann (2)
State Health Dept., N. Mexico

Distribution:
Formal
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Suppl.
Branch Reader (Licensing)
Branch Reader (Rad. Safety)
Div. Reading

OFFICE ▶	DLR:RSH	DLR:Lic.	DLR:Kirk	DLR:HLPrice		
SURNAME ▶	CC: Tully - RM (2) 1-27-60	<i>[Signature]</i>	<i>R. L. Kirk</i> 1-28-60	<i>[Signature]</i>		
DATE ▶						

L&R:JCD
40-665

NOV 17 1959

The Anacosta Company
New Mexico Operations
P. O. Box 638
Grants, New Mexico

Attention: Mr. A. J. Fitch

Gentlemen:

Pursuant to your request of October 9, 1959, your License R-138 is hereby amended to permit for a ninety day period only disposal of mill waste effluent by injection through a cased and cemented bore-hole into underlying rock formations in accordance with the procedures set forth in your letter of October 9, 1959. The licensee may commence the disposal at any time before February 1, 1960, upon written notification to the Commission.

FOR THE ATOMIC ENERGY COMMISSION

Distribution:
C.W.Tully, RM (2)
INS, w/c ltr dtd 10-9-59
S/Health

Original Signed by R. L. Kirk

Formal
Doc. Rm.
Suppl.
Br. Reading File
Div. Reading File

Acting
Director
Division of Licensing and Regulation

AIR MAIL

OFFICE ▶	L&R	OGC	T&R	L&R	ZSB	
SURNAME ▶	<i>DeLaney</i>	<i>TBC</i>	<i>Johnson</i>	<i>RL Kirk</i> <i>per Thoma</i>	<i>Dufin</i> <i>WLR</i>	
DATE ▶	11/10/59	11/10/59	11/10/59	11/17/59	11/10/59	

The licensee may commence the ^{disposal} tests at any time before February 1, 1960, upon ^{written} notification to the Commission.

D R A F T
Doulos/je
10-30-59

40-665

Gene Chis

The Anaconda Company
New Mexico Operations
P. O. Box 638
Grants, New Mexico

Attention: Mr. A. J. Fitch

Gentlemen:

Pursuant to your request of October 9, 1959, your License R-138 is hereby amended to the extent you are exempt from Section 20.302 of Title 10, Code of Federal Regulations, Part 20, "Standards for Protection Against Radiation," to ~~conduct~~ ^{permit} for a ninety day period only, a ~~method of disposing~~ ^{the} of mill waste effluent by injection through a cased and cemented

bore-hole into underlying rock formations. ^{in accordance with the procedure set forth in your letter of October 9, 1959.}

Upon the completion of this ninety day test and the resulting conclusions derived therefrom, a determination will be made whether you may continue this method of waste disposal on a long-term basis.

Very truly yours,

*no real obstacle!
TBC*

~~Gene Chis~~
~~Director~~
Director,
DL+R

The 90 day test period shall ^{commence on such date} begin at such time as the licensee shall notify the Commission provided that the test shall begin not later than February 1, 1960.

DLR:AB
40-665

JUL 20 1959

Mr. Ralph M. Wilde
The Anaconda Company
P. O. Box 638
Grants, New Mexico

Dear Mr. Wilde:

A copy of your letter of May 19 to Dr. Donald I. Walker, together with a copy of his reply, has recently been forwarded to our office.

In addition to Dr. Walker's comments we would like to mention the following. We intend including the values for natural uranium given in the new NBS Handbook 69 in the amendment to 10 CFR 20 before it is issued in final form. With the normal radium to uranium ratios found in milling operations, either the soluble or insoluble uranium MPC's of 7×10^{-11} uc/cm³ or 6×10^{-11} uc/cm³, respectively, would be suitable for controlling air concentrations, if these activity limits are used in radio-metric assay. Situations in which Ra/U ratios are unusually high could be investigated as special cases.

The period for submitting comments on the proposed amendment has been extended to August 31, 1959. Any comments that you might wish to submit would receive careful consideration.

Sincerely yours,

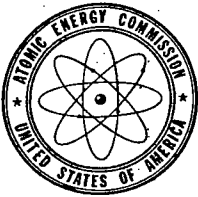
Distribution:

Orig. to addressee
1 suppl. docket
1 formal docket
Div. & br. rfs
Pub.Doc.Rm.

Lester R. Rogers, Chief
Radiation Safety Branch
Division of Licensing & Regulation

cc: D. I. Walker, INS, IDOO
M. M. Mann, INS, Hdqtrs.
R. Lowenstein, OGC
Dr. F. Western, B&M

OFFICE ▶			DLR:RSB		
SURNAME ▶			<i>Allen Bradsky</i> AB:lwj:LRR	<i>LDN/ks</i>	
DATE ▶			7-17-59		



UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON 25, D. C.

IN REPLY REFER TO:

40-665
LRL:JCD

Mr. A. J. Fitch, Mgr.
The Anaconda Company
P. O. Box 638
Grants, New Mexico

January 15, 1959

Gentlemen:

Commission representatives had the opportunity of visiting several mills in 1957 to gather information on the processes and potential exposures associated with the operation of uranium ore processing mills.

For your information, we are enclosing a copy of the summary report prepared from the results of the visits to these mills. The statements and suggestions contained in the report are general and do not constitute a complete evaluation of the conditions of any particular mill operation since the data are limited, in each case, to a brief period of operation and to limited areas of investigation.

Very truly yours,

A handwritten signature in cursive script that reads "J. C. Delaney".

J. C. Delaney
Chief, Nuclear Materials Section
Licensing Branch
Division of Licensing & Regulation

Enclosure:
Summary Report
HASL-40

40-665
LRL:JGD

JAN 14 1959

New Mexico Department of Public Health
P. O. Box 711
Santa Fe, New Mexico

Attention: Mr. Robert P. Lowe, Asst. Director
Environmental Sanitation Services

Gentlemen:

Thank you for your letter of January 8, 1959 regarding liquid waste disposal by the Anaconda Company at its Bluewater uranium mill. We appreciate your comments and on receipt from Anaconda of the information requested in our November 26, 1958 letter, we will further consider authorizing their proposed procedures for waste disposal.

Very truly yours,

J. C. Delaney
Chief, Nuclear Materials Section
Licensing Branch
Division of Licensing & Regulation

OFFICE ▶	LRL					
SURNAME ▶	<i>Delaney</i> CW					
DATE ▶	1-14-59					

Docket No. 40-665
LAR:CPM

NOV 26 1958

The Anaconda Company
New Mexico Operations
P. O. Box 638
Grants, New Mexico

Attention: Mr. A. J. Fitch, Manager

Gentlemen:

This refers to your letter of September 11, 1958, requesting approval for a method of disposal of radioactive waste materials.

Before we may complete our evaluation of your proposal, you should submit more detailed information in regard to the following:

1. Topographical, geological and hydrographical characteristics of the immediate area to be used for disposal.
2. Present and potential uses of ground and surface water in the vicinity of the disposal area.
3. Proposed method of monitoring to determine that the material upon reaching the disposal site does not reach underground water supplies and water bearing formations in concentrations in excess of those permitted by Part 20.

It would be preferable if the waste material were reduced to radioactive concentrations within the limits of Part 20. It is our understanding that information on economical methods of reducing the amount of radium present in mill tailings is being developed through a Division of Raw Materials research program. For information in this regard you may communicate with Mr. John T. Sherman, Division of Raw Materials, U. S. Atomic Energy Commission, Washington 25, D. C.

OFFICE ▶						
SURNAME ▶						
DATE ▶						

NOV 26 1958

In the event that approval is granted to your proposal, it would be on an interim basis only and would not relieve you from compliance with appropriate state or local regulations.

Very truly yours,

J. C. Delaney
Chief, Nuclear Materials Section
Licensing Branch
Division of Licensing & Regulation

DISTRIBUTION:
Formal Docket
Suppl. Docket
Document Room (Hold)
M. M. Mann, INS
John T. Sherman, RM

Handwritten signature and date: 11/20/58

OFFICE ▶	L&R	L&R				
SURNAME ▶	<i>McCallum/mad</i>	<i>Delaney</i>				
DATE ▶	11-19-58	11/20				

Docket No. 40-665

L&R:CFM

NOV 26 1958

Dr. Stanley J. Leland
State Director of Public Health
New Mexico Department of Public Health
P. O. Box 711
Santa Fe, New Mexico

Dear Dr. Leland:

For your information we have enclosed copies of an application from The Anaconda Company requesting approval of subterranean waste disposal activities, and of our reply to Anaconda. We would be pleased to be informed of any special knowledge you may have of the questions raised in our letter or of any other information you feel would be of help to us in this regard.

We will keep you informed of any further action we may take in this case.

Very truly yours,

J. C. Delaney
Chief, Nuclear Materials Section
Licensing Branch
Division of Licensing & Regulation

Enclosures:

- 1. Cy. of Anaconda's ltr dtd. 9-11-58
- 2. Cy of our reply to Anaconda

*Discussed with DCM
we merge 11/27/58
Alm E R
Both agreeable*

OFFICE ▶	L&R	L&R				
SURNAME ▶	<i>McCallum</i>	<i>Delaney</i>				
DATE ▶	11-24-58	11/26				

SEARCHED
40-46

JUL 1 1958

The Ammonia Company
P. O. Box 638
Grenada, New Mexico

Attention: Mr. A. J. Mitch

Gentlemen:

We wish to acknowledge the receipt of your letter of June 16, 1958. It appears that you are taking action to correct these deficiencies in your source material program which were brought to your attention in our letter of May 23, 1958.

Enclosed you will find an amendment to Source Material License No. S-135 granting an exemption from the licensing requirements of Section 20.203(f) for individual shipping containers of uranium.

Your cooperation is appreciated.

Very truly yours,

Lynell Johnson, Chief
Licensing Branch
Division of Licensing & Regulation

Enclosure:
amendment to License No. S-135.

cc: Inspection Divl, IDO
Inspection Div., Edgtrs.
E. E. Cunningham, DLR
E. Van Blarcom, DRM
W. B. Carlson, GJCO
Public Document Room

Distribution:
Formal Docket File
Suppl. Docket File
Div. & Br. rfs

OFFICE ▶	DLR:RSB	OGC DLR	DLR	DLR	
SURNAME ▶	CMF: LWR: LRR	JCharnoff	JCDelaney	LJohnson	
DATE ▶	6/30/58			6/30/58	

40-1917
LRL:ND

MAR 31 1958

The Anaconda Company
P. O. Box 638
Grants, New Mexico

Attention: Mr. A. J. Fitch

Gentlemen:

This is in reference to your application for renewal of your source material licenses Nos. R-138 and R-139.

Enclosed is a copy of AEC regulation 10 CFR 20, "Standards for Protection Against Radiation". Compliance with Part 20 is made a condition of all source material licenses issued by the Commission.

In addition to the information you have provided, we also require the following:

1. The procedure you intend to employ in safeguarding employees against dust and contamination exposure through the escape of radioactive materials in the processing of such materials.
2. A general description of the types of instruments you will have available to perform necessary health and safety surveys.
3. If waste products are anticipated, we require the volume and concentration of radioactive materials and the methods by which you intend to dispose of this waste from your processing mill.

As you were advised by Mr. Doulos regarding renewal of your license R-139, the issuance or renewal of licenses of this nature has been discontinued inasmuch as a producer delivering ore to your company should himself obtain a license from the Commission prior to initiating delivery.

OFFICE ▶					
SURNAME ▶					
DATE ▶					

The Amnonda Company

- 2 -

In order not to interrupt your activities pending receipt of the above information, we are enclosing renewal of your source material license R-138 for a period of three months, at which time we shall further consider the extension of the expiration of your license to the usual one-year period.

Very truly yours,

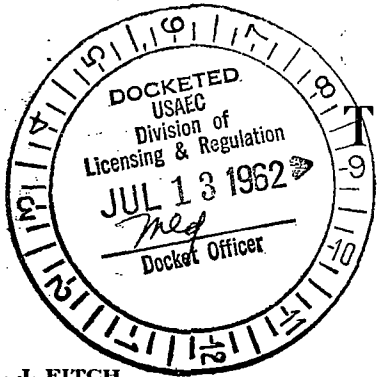
J. C. Delaney
Chief, Materials Section
Licensing Branch
Division of Licensing & Regulation

Enclosures:
10 CFR 20
License R-138

Distribution:
Document room
Formal file
Suppl. file
MMann INS
GJOO Attn: AEJones
JTSherman RM

OFFICE ▶	LRL	LRL				
SURNAME ▶	NDoulos/cw	JC Delaney				
DATE ▶	3-31-58	3-31-58				

FROM: THE ANACONDA COMPANY Grande, New Mexico A. S. PITCH		DATE OF DOCUMENT: 7/11/62	DATE RECEIVED: 7/13/62	NO: 7412
TO: E. L. Kirk		LTR: 7	MEMO:	REPORT:
CLASSIF: U		POST OFFICE: 7	REG. NO: 7	FILE CODE: 40-665
DESCRIPTION: (Must Be Undersified) Lic. Furnishing addit. info as requested in our ltr of 7/5/62 for renewal of Lic. No. B-138		REFERRED TO: D. A. Ausabauer	DATE: 7/13	RECEIVED BY:
ENCLOSURES: 1. Procedures for Analysis of Uranium and Thorium in liquid effluent samples 2. Memo dtd 7/10/62 to E. G. Peterson in J. E. Pearson 3. Sketch of Tailing Disposal Area 4. Figure 1 (Plan Map showing foot boundary and patrol road of Anaconda Co.		w/ file of 1 file by for compliance J. Pearson	7/13	
REMARKS: Mail Room Distribution Public Document Room				



DOCKET NO. 40-665

THE ANACONDA COMPANY

New Mexico Operations

P. O. Box 638, Grants, New Mexico

L&R File Copy



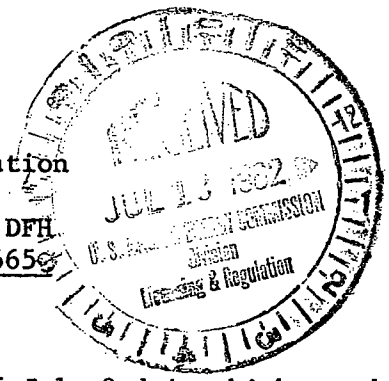
A. J. FITCH
MANAGER

July 11, 1962

United States Atomic Energy Commission
Washington 25, D. C.

Attention: Mr. R. L. Kirk, Deputy Director
Division of Licensing and Regulation

Re: DLR:DFH
40-665



Gentlemen:

This is in reply to your letter of July 3rd in which you have asked for additional information in support of our application for renewal of Source Material License No. R-138.

The tailing disposal at the Bluewater Mill of The Anaconda Company is into a natural basin to the north of the plant area.

This basin was formed by a high lava flow escarpment across the west and south boundaries of a limited catchment area and by higher mesa formations on the north and east. Before being utilized for tailing disposal, two small lakes formed seasonally in the depression from runoff accumulations. Overflow drainage from this natural basin was to the southeast through a very narrow draw that in the beginning of tailings disposal was dammed off and backfilled with the deposit of sand tailing and of such extent as now to preclude any possible outflow or overflow. This is obvious in the sketches of the pond area.

The capability and integrity of retention of tailings within this basin are extremely high if not impregnable. Retaining dams on the west, north, and east sides of the tailings area are used for the purpose of restriction within the basin, to form a more impermeable slime-sealed bottom and periphery, and to control the collection of drained supernatant water for removal and deep-well disposal.

Our greater concern in the retention of tailings has been that of tailings water seepage into the underlying alluvium and rock formations. The objective of our decantation and deep-well disposal system for tailing water has been to present a minimal seepage area by regulation of the level and areal extent of the water collection pond within the retention

Copy Provided
Compliance

Handwritten initials and date: 1/13/62

Registry No. 3

7412

July 11, 1962

area. With the recent "stretch-out" curtailment to one half of the former tonnage treatment, it is believed that seepage will be somewhere between 10% to nil of the total water discarded to tailings. This is indicated by water balances to be less than 50 gpm.

The tailings disposal area is only a small part of a greater containment basin and all within an even larger surrounding restricted area of the plant site. We cannot visualize any condition that might lead to accidental release of waste. Any breach of the confinement area would still have retention within the basin. Even outside and beyond the basin, there are no continually flowing streams in the water courses of this arid region.

Immediately about the disposal area, within a circle of two miles radius, 11 water wells are sampled and monitored. In the greater area and between the Bluewater Plant and the town of Grants a total of 45 to 48 wells (some are only seasonally operated for irrigation) are also sampled and monitored. Samplings are taken monthly and analyzed for chemical salts and twice yearly for radionuclides. A monitor well in the potable aquifer and immediate to the disposal well is sampled weekly. Some well samplings are in their sixth year of monitoring by The Anaconda Company.

In support of our application and to supply requisite detail and give answer to your inquiries, the following are attached and here described:

1. A sketch of the tailing disposal area showing by contours the general geomorphic features; the containment dam and dikes; the classified and segregated areas of sands, slimes, and pond; and, the breakwater, decanter, and filter building for the removal, treatment, and deep-well disposal of water.

The relatively small pond area is to be noted. Also, the pre-pond and present drainages are indicated.

Circled alphabetical symbols are references to the several dikes and the accompanying cross sections and drawings showing the foundations, dimensions, and dike construction.

2. A sketch showing the restricted area boundaries at the plant site and, within this boundary, the relationship of the mill and the general tailing area.

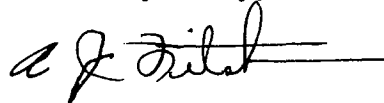
3. A supplemental memorandum of information on the tailings retention system with a set of six sketches describing the construction methods and specifications relating to and showing by lineal and cross sections the dike structures and water removal facilities.

July 11, 1962

4. Our step-by-step procedure for analysis of uranium, radium, and thorium in liquid effluent samples.
5. A description of the present method used for determining exposure of employees to external radiation.

Total disposal of tailing to the main tailing area now exceeds six million dry tons of solids. Part of the completely filled south end, as well as older small tailing areas, have been covered with topsoil.

Yours very truly,

A handwritten signature in cursive script, appearing to read "A. J. Fitch", with a horizontal line extending to the right from the end of the signature.

A. J. FITCH

AJF:MA
Enc.

Jul 11 10 09 AM '62

MEMORANDUM TO: E. C. Peterson, Assistant Manager
FROM : J. E. Pearson, Plant Engineer
SUBJECT : Supplemental Information of Tailings Retention System

References:

- 1) To Sketch of Tailings Disposal Area.
- 2) Sketch Nos. 2, 3, 4 and 5, Longitudinal Sections of Dam Profiles A, B, C, D, E, F, & G.
- 3) Sketch No. 6 Typical Cross Section of Dams.
- 4) Sketch No. 7 Typical Cross Section of Dam "D" through Filter Plant and Decanter.

Reference - Item No. 1

Item No. 1 refers to the sketch plan of the tailings retention area showing contours of the surrounding area and the location of the dams alphabetically.

Reference - Item No. 2

The profiles as shown on the various sketches indicate the base contour upon which the dams were constructed showing elevations and quantity of cubic yards. The cubic yards as noted are predicated upon 20% compaction of the cross-sectional area.

Reference - Item No. 3

This sketch No. 6 denotes the typical cross sections of the various increments of the dams from "A" to and including "G". All dams, other than "D" which has a 30-ft. crest, have a 12'-0" wide crest on a 1-1/2:1 slope, as noted on sketch.

Reference - Item No. 4

Sketch No. 7 illustrates a cross section of Dam "D" at the location of the filter plant and decanter. As noted, the dam is 64-ft. wide and about 142-ft. long tapering into the dam on either end of the area.

July 10, 1962

The pipeline from the decanter to the sump well is a 24-in. I.D. corrugated iron pipe having a 1-in. lining of an asphaltic material patented by the Armco Drainage & Metal Products Corp. The sump well is constructed of the same material and lined. The sump below the pipeline is 10-ft. deep and the overall length of the well is 33-ft. by 6-ft. inside diameter. The pipeline extends on through the rock into a cavity 20-ft. long by 12-ft. wide, the end of the pipe is capped off with a blind flange.

The water level as shown and dated July 10, 1962, indicates a freeboard of 10.5-ft.

Construction of Dams:

All dams were constructed upon bare basaltic rock, the alluvial soil which averaged about 2-1/2 ft. in depth was removed. The material used in the dams is a bentonitic type clay amenable to compaction. This clay was spread by means of powered scrapers in lifts averaging 8-in. to 12-in. in thickness. These layers were compacted by means of a sprinkler truck introducing moisture and one sheepfoot roller having a foot pressure of 465 lbs. per square inch, one sheepfoot roller having a foot pressure of 227 lbs. per square inch, and a pneumatic wobble wheel roller having 13 wheels in contact with ground for an average of 12-square-inch surface area per wheel for a total of 156 square inches or 103.2 lbs. per square inch in pressure. This produced an average compaction of 20 to 25%.

The above specification was followed throughout the construction of the dams.

The only dam requiring riprap is Dam "D". About three to four feet of limestone facing was used for this purpose, ranging in size from fine rock to four and five-foot-diameter boulders.

There has never been any indication of seepage through these dams. They are subjected to an average-weekly inspection by the Engineering Department.



J. E. Pearson
Plant Engineer

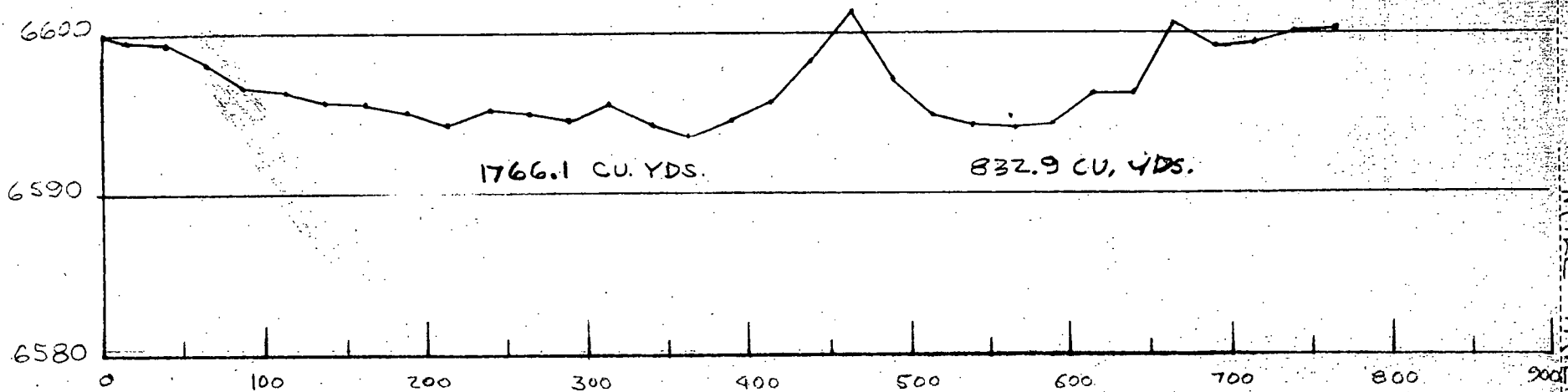
JEP:cig

PROFILES ALONG CENTER LINES OF DAMS

SCALE: VERTICAL 1" = 10 FT.
HORIZONTAL 1" = 100 FT.

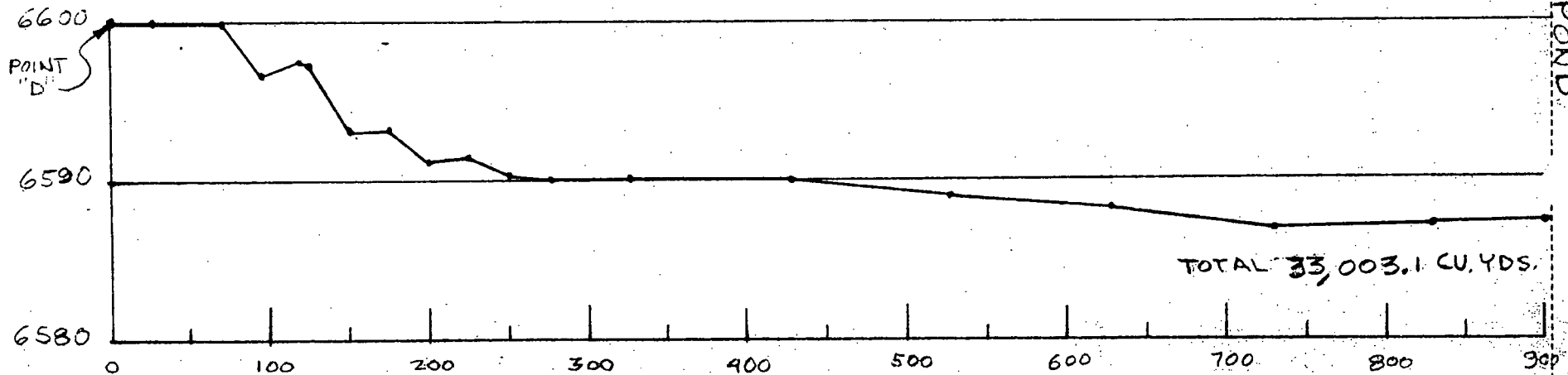
DAM A-B NORTH SIDE SEC. 13

DAM C



DAM D NORTH SIDE SEC. 13

DAM D (CONTINUED) →

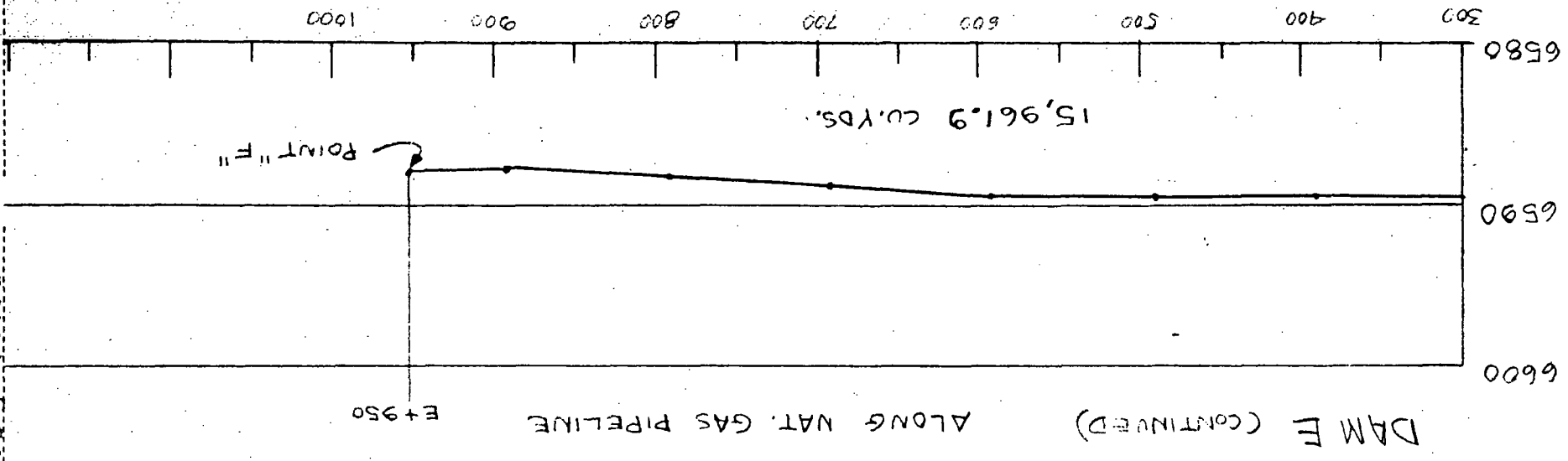
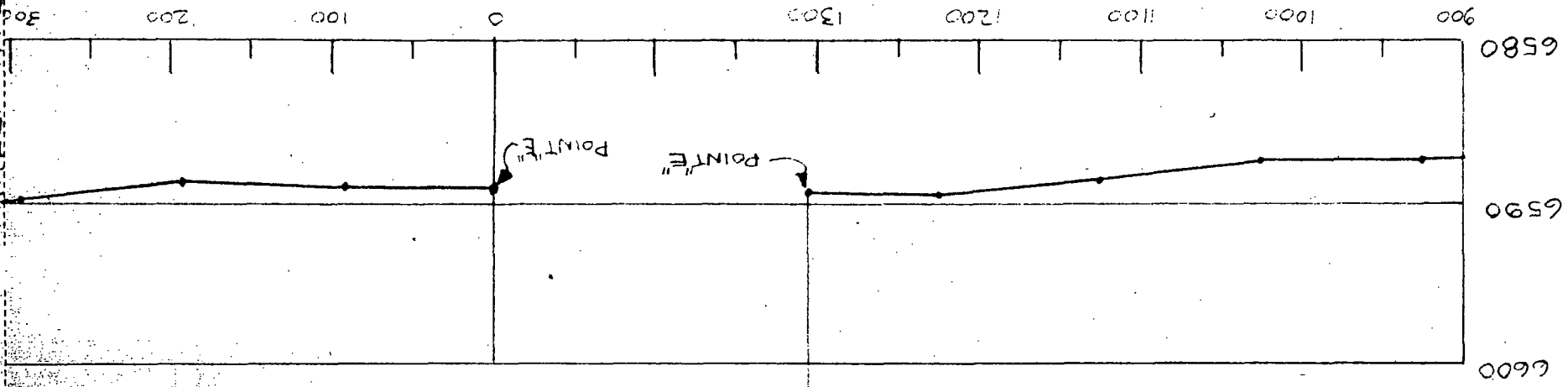


BY _____ DATE _____
 CHECK BY _____ DATE _____
 SUBJECT DAM PROJECTS
 ANACONDA BLUE WATER
 MILL TAILINGS POND
 SHEET NO. 2 OF 2
 JOB NO. _____

BY: _____ DATE: _____
 CHKD. BY: _____ DATE: _____
 SUBJECT: DAM PROFILES
 ANACONDA BLUE WATER
 MILL TAILINGS POND

SHEET NO. 3 OF
 JOB NO.

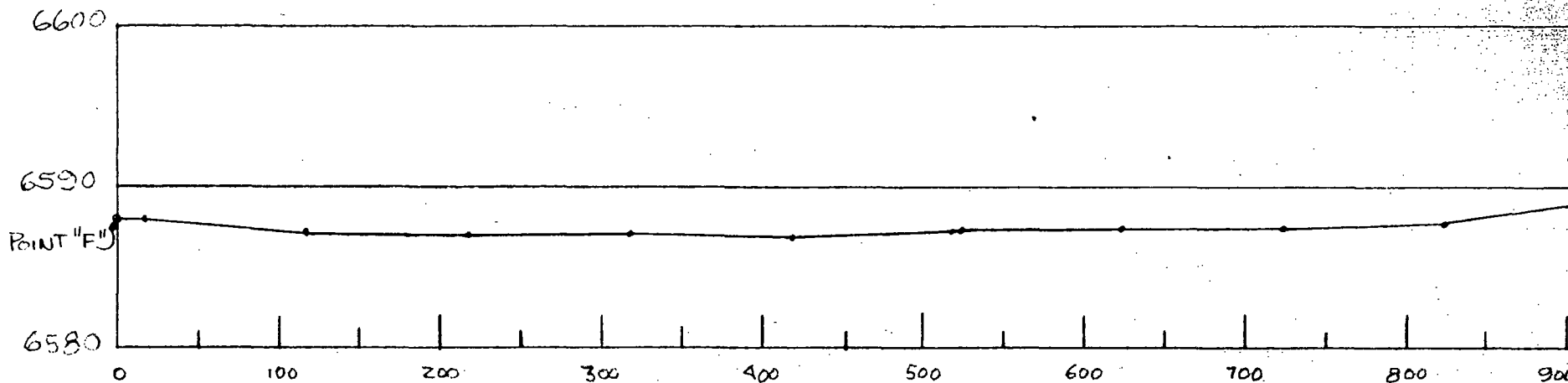
PROFILES ALONG CENTERLINES OF DAMS
 SCALE: VERTICAL 1" = 10 FT.
 HORIZONTAL 1" = 100 FT.



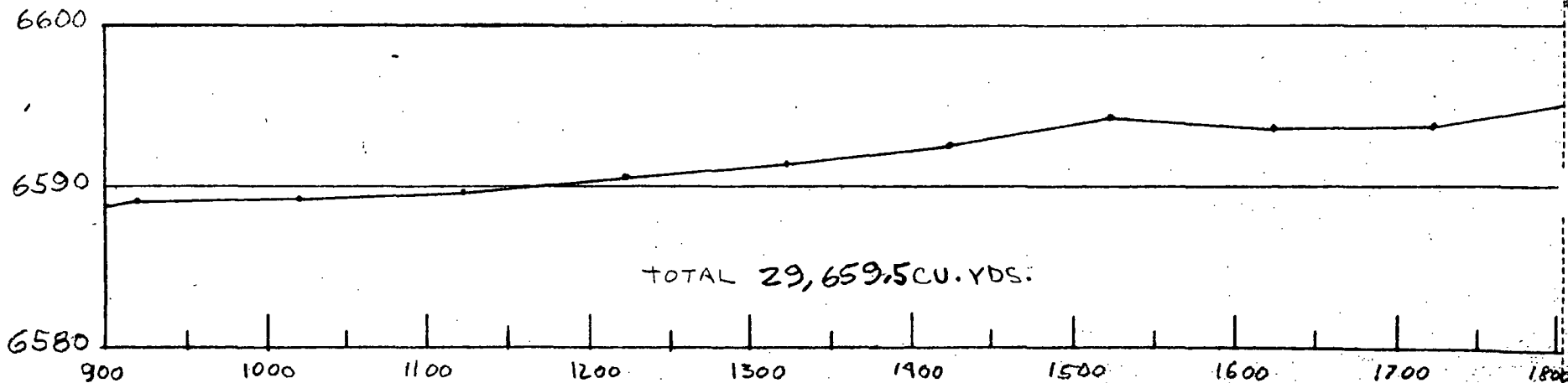
PROFILES ALONG CENTERLINES OF DAMS

SCALE: VERTICAL 1" = 10 FT.
 HORIZONTAL 1" = 100 FT.

DAM F-G EAST SIDE SECT. 13



DAM F-G (CONTINUED)

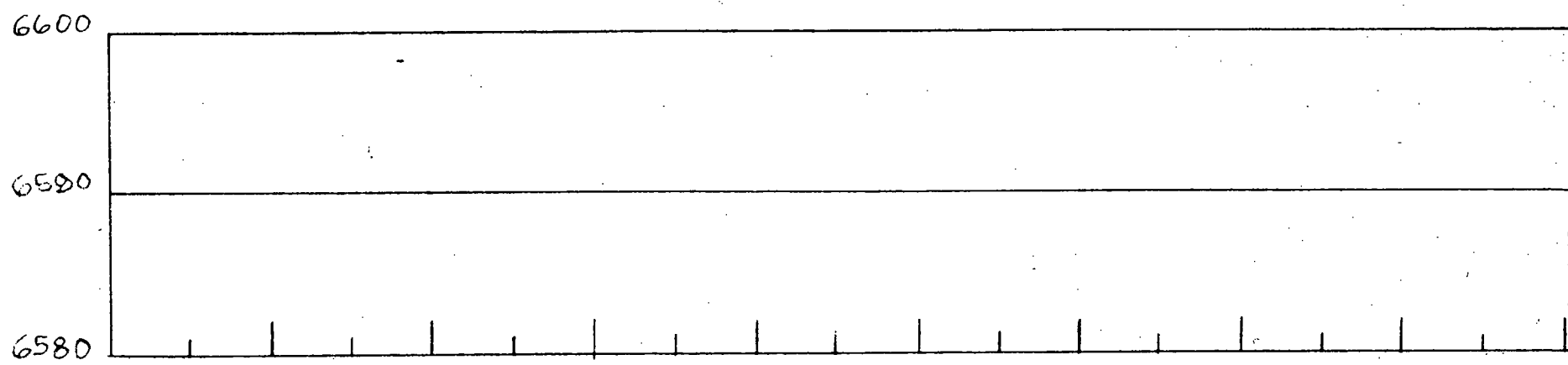
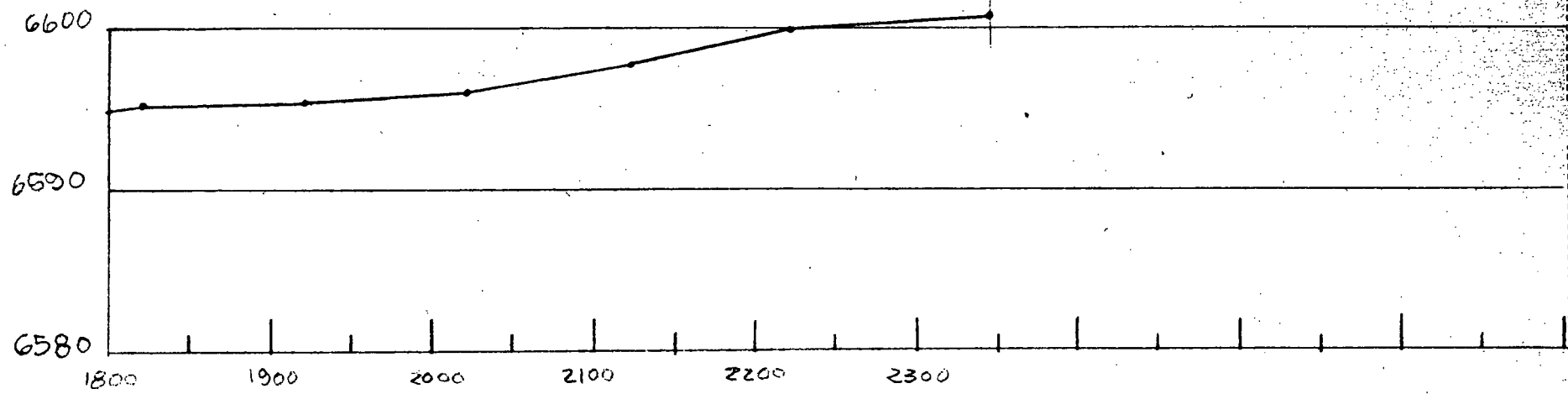


BY: _____ DATE: _____
 CHKD. BY: _____ DATE: _____
 SUBJECT: ANACONDA BLUE WATER DAM PROFILES
 MILL TAILING POND
 SHEET NO. 4 OF 4
 JOB NO. _____

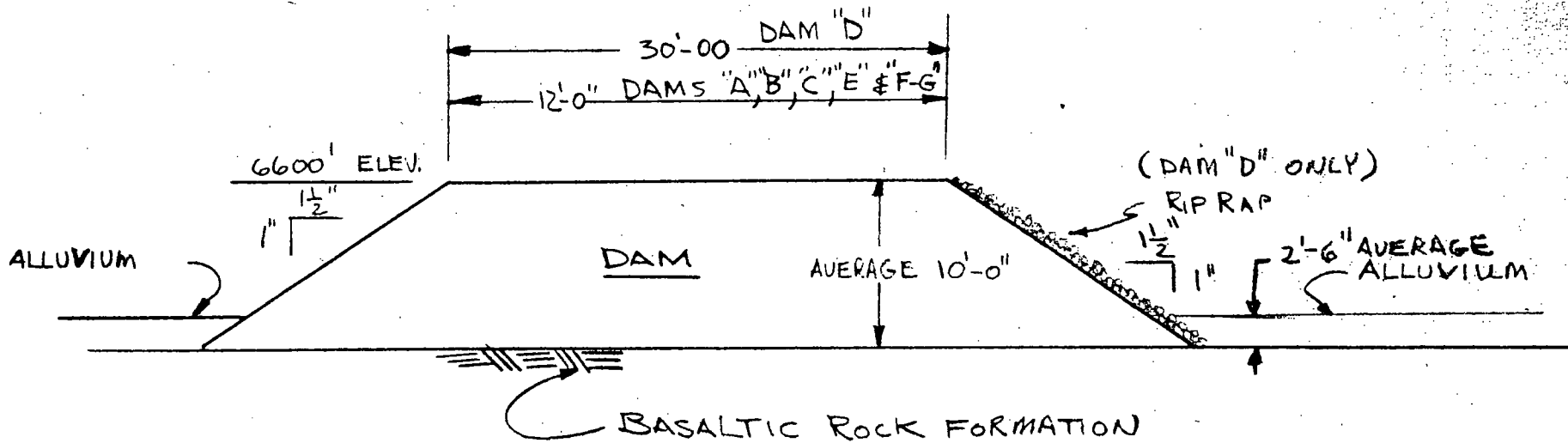
PROFILES ALONG CENTERLINES OF DAMS

SCALE: VERTICAL 1" = 10 FT.
HORIZONTAL 1" = 100 FT.

DAM F-G (CONTINUED) EAST SIDE SECT. 13 F+2345



BY _____ DATE _____
CHKD. BY _____ DATE _____
SUBJECT DAM PROFILE
ANACONDA BLUEWATER
MILL TAILING POND
SHEET NO. 5 OF _____
JOB NO. _____



BY _____
 CHKD BY _____
 DATE _____

SUBJECT DAM
 TYPICAL CROSS SECTION

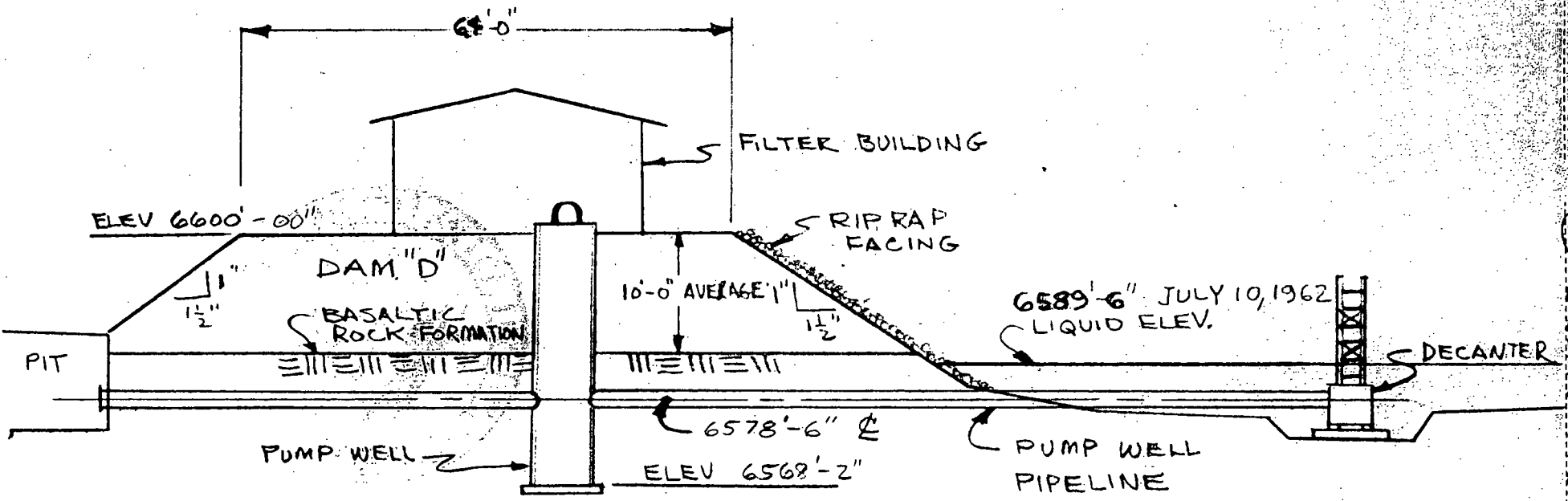
SHEET NO. 6 OF _____
 JOB NO. _____

BY CHKD BY DATE

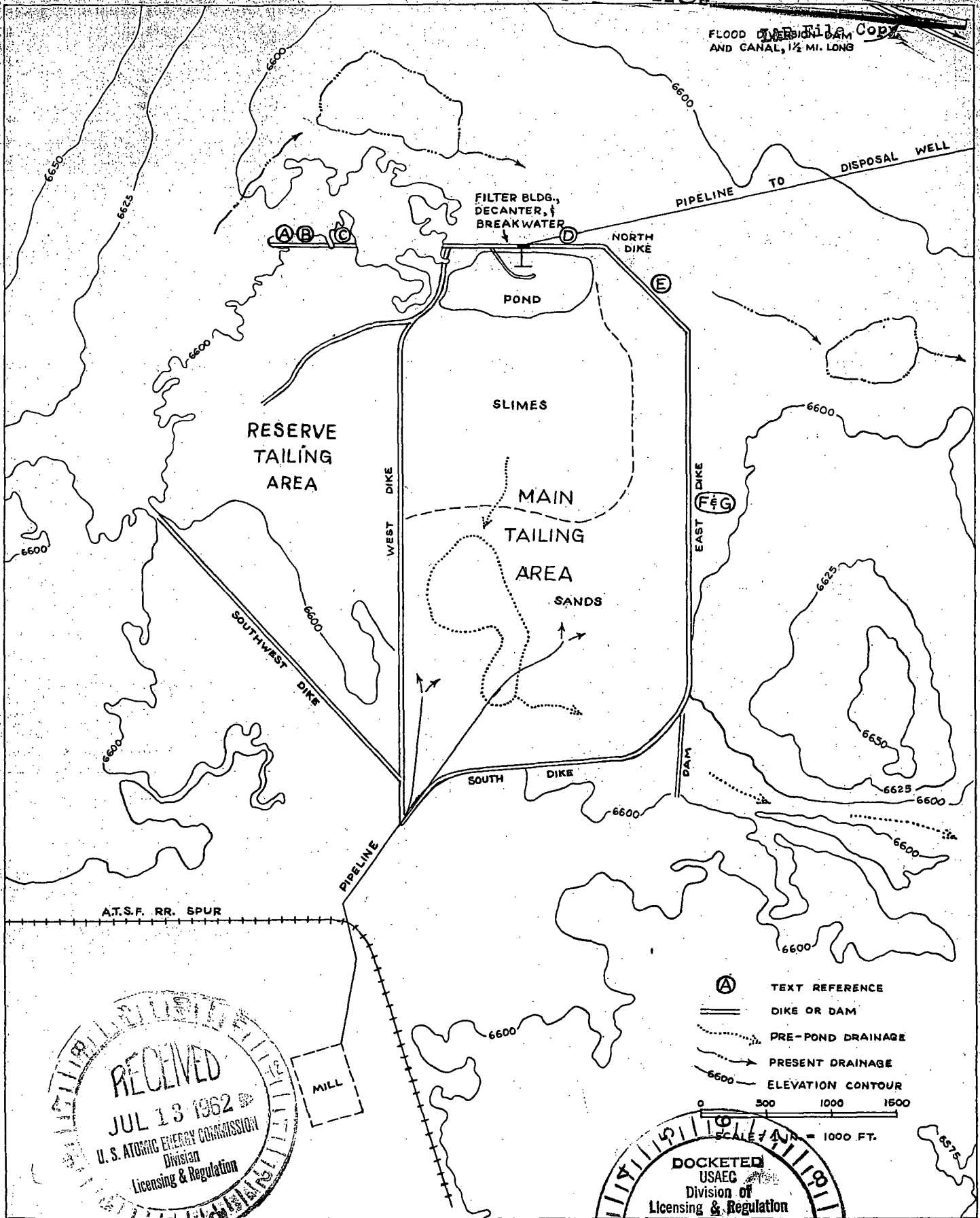
GATE

SUBJECT DAM CROSS SECTION THROUGH DECANter PIPE

SHEET NO. 7 OF JOB NO.



FLOOD DIVERSION DAM AND CANAL, 1/2 MI. LONG



RECEIVED
 JUL 13 1962
 U. S. ATOMIC ENERGY COMMISSION
 Division
 Licensing & Regulation

DOCKETED
 USAEC
 Division of
 Licensing & Regulation
 JUL 13 1962
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 Docket Officer

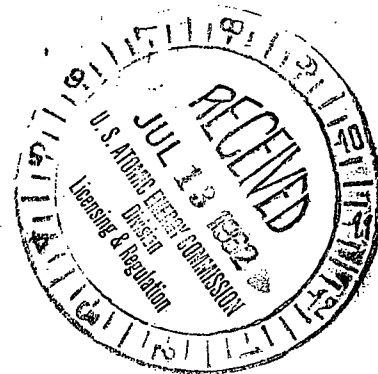
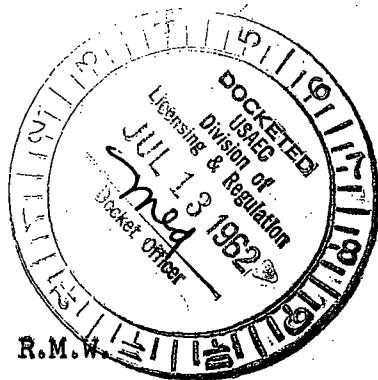
Sketch of Tailing Disposal Area

DOCKET NO. 40-668

~~L&R File Copy~~

PROCEDURES FOR ANALYSIS OF URANIUM, RADIUM
AND THORIUM IN LIQUID EFFLUENT SAMPLES

The Anaconda Company
New Mexico Operations
Grants, New Mexico



PROCEDURE FOR ANALYSIS OF URANIUM
IN LIQUID EFFLUENT SAMPLES

Transfer one ml of the liquid effluent sample to a 50-ml mixing cylinder, add 5 ml of nitric acid, dilute to 50 ml with distilled water and mix thoroughly.

Pipette four 0.1 ml aliquots of the diluted sample onto pellets of 2% lithium fluoride-98% sodium fluoride flux in clean dry platinum dishes. Four standards are run with each set of samples. These standards are prepared by pipetting 0.1 ml aliquots of a solution containing 2.5×10^{-7} uc U per ml onto flux pellets in platinum dishes.

The flux pellets are dried for 10 minutes under an infrared lamp and then fused for three minutes over a modified Fletcher burner. After fusion, the platinum dishes containing the fused pellets are allowed to cool for 15 minutes.

The fluorescent intensity of each pellet is then measured with a Jarrell-Ash Fluorimeter, Mark V.

The uranium concentration of the sample can then be calculated from the fluorescent intensity of the standard and sample pellets as follows:

$$\text{uc U/ml} = \frac{\text{fluorescence reading of sample} - \text{blank}}{\text{fluorescence reading of standard} - \text{blank}} \times \text{dilution factor}$$

$$\text{dilution factor} = 1.25 \times 10^{-5}$$

PROCEDURE FOR ANALYSIS OF RADIUM IN LIQUID
EFFLUENT SAMPLES

Transfer 50 ml of sample to a clean 400-ml beaker and add 4 ml of nitric acid, 150 ml of distilled water, 4 to 6 drops of 0.1% m-cresol purple indicator and 4 drops of 1% aerosol solution. Adjust the pH to 1 to 2 by adding ammonium hydroxide until the indicator just changes to yellow and then add nitric acid until the indicator just turns red. Add 5 mg of barium and 200 mg of lead carriers while stirring the solution vigorously. Continue stirring and add 10 ml of 50% ammonium sulfate solution to precipitate lead and barium sulfates. Allow the precipitate to settle and filter the solution through a quantitative filter paper using paper pulp to insure complete retention of the precipitate. Discard the filtrate.

Place the filter paper containing the lead and barium sulfates in a 250 ml Erlenmeyer flask and add 15 ml of concentrated nitric acid and 7 ml of 72% perchloric acid. Destroy the filter paper by heating to fumes of perchloric acid. If the sample becomes dark-colored just prior to the evolution of fumes, add a few drops of nitric acid to the hot solution to oxidize the remaining organic material. Evaporate the perchloric acid solution to incipient dryness and cool. Add 5 ml of distilled water, 10 ml of 10% EDTA (ethylenediamine tetraacetic acid) - 1.5% TEA (triethanolamine) solution and 2 drops of m-cresol purple indicator. Add 4N sodium hydroxide until the indicator just turns purple and then add 10 drops excess. Place the flask on a hot plate and boil the solution for 5 minutes to insure the solution of lead, barium, radium, radium daughters and any thorium present, as EDTA or TEA complexes.

Cool the sample and filter through quantitative filter paper into a 40-ml centrifuge tube. Wash the filter paper with an alkaline 1% EDTA-0.15% TEA solution, catching the washings in the centrifuge tube. Discard the filter paper. Add one ml of 20% sodium sulfate and 2 drops of methyl purple indicator to the solution in the centrifuge tube. Adjust the pH to approximately 4 to 5 by dropwise addition of glacial acetic acid until the indicator just turns purple, and then add one ml excess. Centrifuge to collect the precipitate and discard the supernate. Slurry the precipitate with 5 ml of distilled water and 5 ml of 10% EDTA-1.5% TEA solution. Add 2 drops of m-cresol purple indicator and repeat the pH adjustment with 4N sodium hydroxide as described above. Heat in a boiling water bath for 5 minutes to redissolve the barium sulfate. Cool, add one ml of 20% sodium sulfate solution and repeat the barium sulfate precipitation with glacial acetic acid as before. Centrifuge, discard the supernate and slurry the precipitate with 10 ml of distilled water. Centrifuge and discard the wash water. Slurry the precipitate with 1 to 2 ml of distilled water and transfer to a 2-inch stainless steel planchet. Dry the sample under an infrared lamp, muffle at 500°C. for 10 minutes, cool, and alpha count in a gas-flow proportional counter for 30 minutes at 3 hours following the second barium sulfate precipitation.

In order to determine the radium-226 activity, a second alpha count must be made at one week after the barium sulfate precipitation and the radium activity calculated from the two counts as follows:

$$\text{Radium-226 activity (cpm)} = \frac{A_2 - 0.66A_1}{2.46}$$

A_1 = activity (cpm) at 3 hours
 A_2 = activity (cpm) at 1 week

After the radium-226 activity has been determined, the concentration of radium-226 in microcuries per milliliter of sample can be calculated as follows:

$$\text{ucRa-226/ml} = \frac{\text{Radium-226 activity (cpm)}}{\text{counting efficiency} \times \text{d/m/uc} \times \text{sample volume} \times \text{chem. yield}}$$

counting efficiency = 0.40
d/m/uc = 2.22×10^6
sample volume = 50 ml
chemical yield = 0.95

Reference: "Determination of Radium-226 and Thorium-230 in Mill Effluents,"
Ebersole, Harbertson, Flygare and Sill. U.S. AEC, Health and
Safety Division, Idaho Operations Office

PROCEDURE FOR ANALYSIS OF THORIUM-230
IN MILL EFFLUENT SAMPLES

Transfer 10 ml of sample to a 125-ml separatory funnel and add 90 ml distilled water, 2 ml of nitric acid, 4 drops of 0.1% m-cresol purple, 5 drops of 20% mercaptoacetic acid and 3 ml of 2M aluminum nitrate in 0.2M nitric acid. Adjust the pH of the sample to the orange color of the indicator (pH 1.6) by adding sodium acetate-acetic acid buffer dropwise. Add 15 ml of 0.5M TTA (thenoyltrifluoroacetone) in benzene and extract for five minutes. Allow the phases to separate and draw off the aqueous layer into another 125-ml separatory funnel. Add a second 15 ml portion of 0.5M TTA-benzene and extract for five minutes. Allow the phases to separate and discard the aqueous. Combine the organic layers and wash for 2 minutes with two 10 ml portions of 0.2M nitric acid. Discard the acid wash. Back extract the thorium with two 10 ml portions of 9N hydrochloric acid. Combine the acid layers and discard the organic. Add 10 ml of a 20% solution of TCA (tricaprylylamine) in chloroform to the 9N hydrochloric acid and extract for 2 minutes. Discard the organic layer. If large quantities of iron are present in the HCl solution as indicated by a strong yellow color, repeat the TCA-chloroform extraction until no further reduction in the color of the acid phase is obtained. Following the final TCA-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 50-ml beaker containing 5 ml of nitric acid and evaporate to dryness on a hot plate. Take up the residue in 3 ml of nitric acid and reduce the volume to approximately one ml by evaporation on a hot plate. Transfer the solution quantitatively to a 2-inch stainless steel planchet. Evaporate the solution to dryness under an infrared lamp and muffle at 500°C. for ten minutes. Alpha count the planchet in a gas-flow proportional counter.

Calculate the thorium activity in microcuries per milliliter as follows:

$$\text{uc Th-230/ml} = \frac{\text{Thorium activity (cpm)}}{\text{counting efficiency} \times \text{d/m/uc} \times \text{sample volume} \times \text{chem. yield}}$$

$$\begin{aligned} \text{counting efficiency} &= 0.45 \\ \text{d/m/uc} &= 2.22 \times 10^6 \\ \text{sample volume} &= 10 \text{ ml} \\ \text{chemical yield} &= 1.00 \end{aligned}$$

Reference: "Determination of Radium-226 and Thorium-230 in Mill Effluents," Ebersole, Harbertson, Flygare and Sill. U.S. AEC, Health and Safety Division, Idaho Operations Office

DESCRIPTION OF THE PRESENT METHOD
USED FOR DETERMINING EXPOSURE OF
EMPLOYEES TO EXTERNAL RADIATION

Film badges are used in our plant for determining the exposure of employees to external radiation. We are currently using film badges supplied by Tracerlab, Inc., 759 23rd Street, Richmond 2, California. These film badges are Tracerlab's Type A-2, twin-film badges. They contain two films, one of which is read at two-week intervals and another which is read at alternate 12 and 14-week intervals.

Previous film badge surveys have indicated that in only two areas of our mill is an individual likely to receive a dose in any calendar quarter in excess of 25 percent of the applicable value specified in paragraph (a) of section 20.101 of 10 CFR Part 20. These areas are the Yellow Cake Section and the clarification press area. Film badges are, therefore, worn by all employees who work continually in these areas.

Film badges are also worn by at least one person in each area or job in the plant. At the present time 36 men are wearing film badges.

In addition to the film badge surveys, quarterly surveys of radiation levels in all plant areas are made with a beta-gamma survey meter (Eberline Model E-112B-1 Geiger Counter). These surveys are made to detect any significant changes which may occur in the radiation levels in the various areas of the mill and to delineate areas of potentially high exposure to external radiation.

FROM: Mr. J. H. ... Alameda, New Mexico		DATE OF DOCUMENT: June 6, 1962	DATE RECEIVED: June 11, 1962	NO. 5157
TO: Mr. ... U. S. A. E. C.		ORIG. <input checked="" type="checkbox"/>	MEMO. <input type="checkbox"/>	REPORT <input type="checkbox"/>
CLASSIF. SECRET		OTHER: 2 BY: ...		
POST OFFICE REG. NO.		ACTION NECESSARY <input type="checkbox"/>	CONCURRENCE <input type="checkbox"/>	DATE ANSWERED BY
FILE CODE: 10-665				
DESCRIPTION (Must be Unclassified)		REFERRED TO	DATE	RECEIVED BY
In reply to 6-1-62 ltr. and advising that they are willing to have the committee mentioned in that ltr. asked to submit ltr. without issuance of formal report.		Receivements	6-11-62	
ENCLOSURES		1/11/62: 1-complissee cy.		(file folder not in)
		Harmon	6/12	

U. S. GOVERNMENT PRINTING OFFICE: 1961
 Distribution
 New Copy

THE ANACONDA COMPANY

L&R File Copy

New Mexico Operations

P. O. Box 638, Grants, New Mexico



A. J. FITCH
MANAGER

June 6, 1962

Division of Licensing and Regulation
United States Atomic Energy Commission
Washington 25, D. C.

Attention: Mr. R. L. Kirk, Deputy Director

Re: DLR:DFH 40-665

Gentlemen:

I have your letter of June 4, 1962, notifying us that you intend to modify our Source Material License by adding the following words:

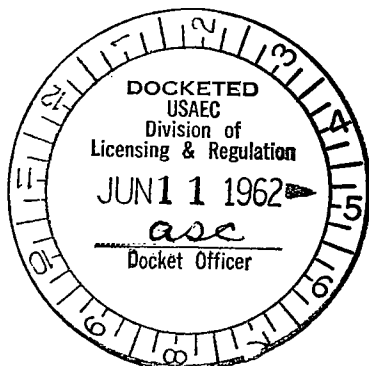
"The licensee shall immediately notify the Director, Region IV, Division of Compliance, USAEC, Denver, Colorado, by telephone and telegraph of any failure in an earth dam retention system which results in a release of radioactive material into unrestricted areas. This requirement is in addition to the requirements of 10 CFR 20."

You are hereby advised that we are willing to have the above condition added to our Source Material License without the issuance of a formal order.

Yours very truly,

A. J. FITCH

AJF:MA



Copy Provided
Compliance

DF
6/13/62

THE ANACONDA COMPANY

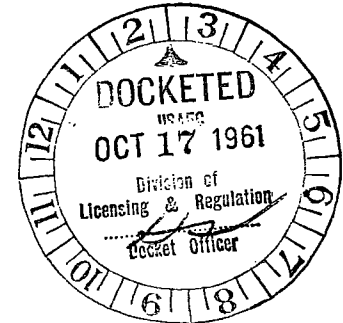
New Mexico Operations

P. O. Box 638, Grants, New Mexico



A. J. FITCH
MANAGER

October 14, 1961



Mr. H. L. Price, Director
Division of Licensing and Regulation
United States Atomic Energy Commission
Washington 25, D. C.

Dear Mr. Price:

As a part of our normal processing procedures at our uranium ore mill near Grants, New Mexico, we wish to burn certain discarded wooden equipment and return the ashes to process for recovery of the small amounts of contained uranium. We, therefore, respectfully request that we be granted an exemption from the requirements of Section 20.305, 10 CFR 20, and that our Source Material License R-138 be amended accordingly.

Approximately 1,000 pounds of discarded wooden equipment would be burned twice a year. The major portion of this material consists of wooden plates and frames from the Shriver filter presses which are used in the clarification of uranium bearing solutions. A minor quantity of other miscellaneous wooden material that has been in contact with uranium bearing solutions would also be treated in this manner and at the same time. The burning would take place in the open, at a designated place within the restricted area of the mill (note Figure 1 attached) during calm weather and well removed from plant activities and personnel.

We believe that it would be extremely unlikely for the permissible limit of air-borne radioactive material to be exceeded as a result of such incineration, in view of the small quantities of material involved and the infrequency of the incineration. However, all proper precautions and control of such semiannual burnings will be exercised and coincident surveys will be made and recorded to assure no exposures beyond permissible limits.

Yours very truly,

A. J. FITCH

AJF:MA

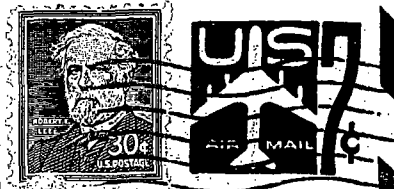
Attachment

cc: Dr. Donald I. Walker, Director
Division of Compliance
United States Atomic Energy Commission
Idaho Falls, Idaho

copy of said Figure 1, enclosed not to be used

FILE NO. 40-665
filey.

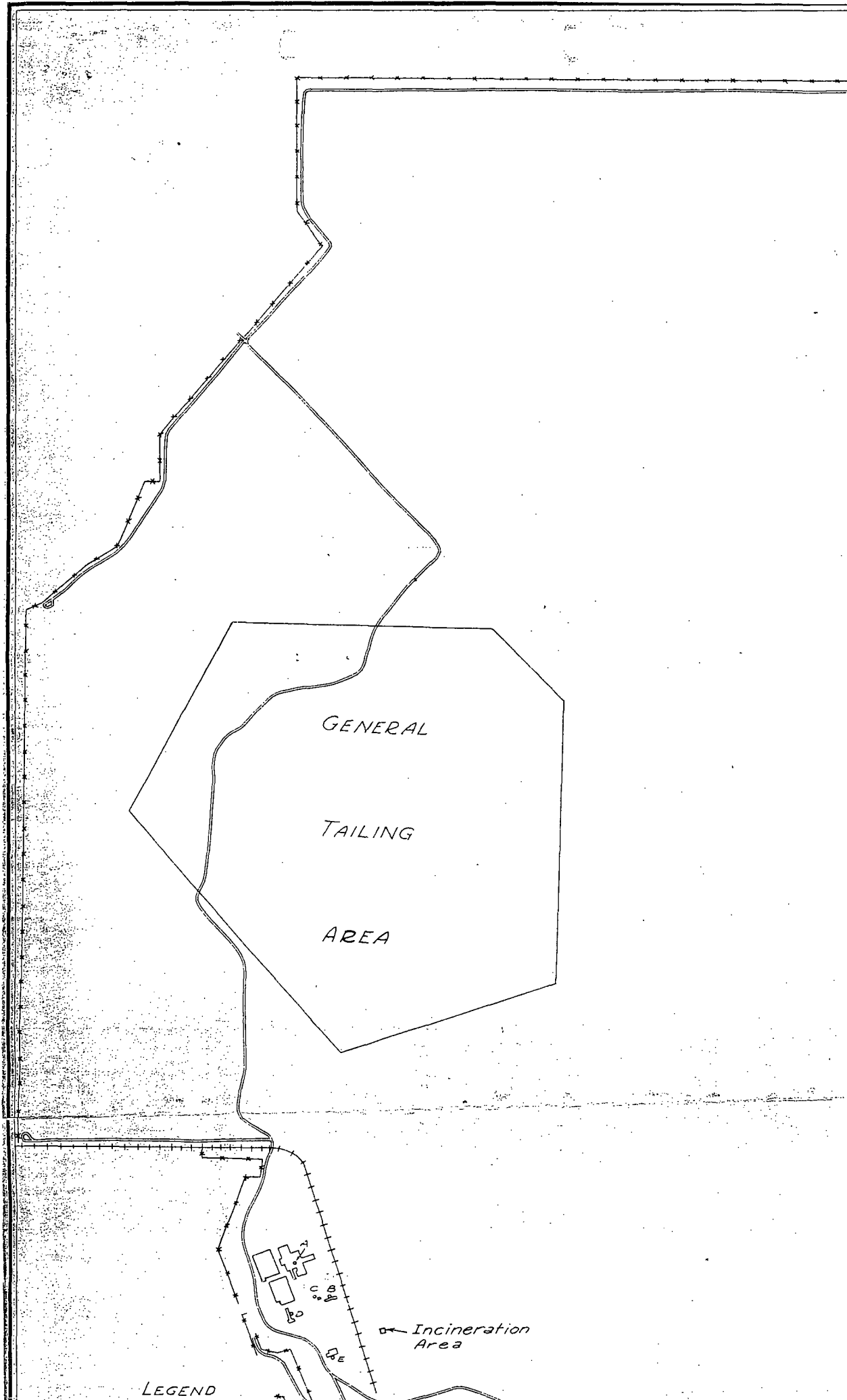
THE ANACONDA COMPANY
NEW MEXICO OPERATIONS
P. O. Box 638
GRANTS, NEW MEXICO



CERTIFIED
No. 666008
MAIL

Mr. H. L. Price, Director
Division of Licensing and Regulation
United States Atomic Energy Commission
Washington 25, D. C.

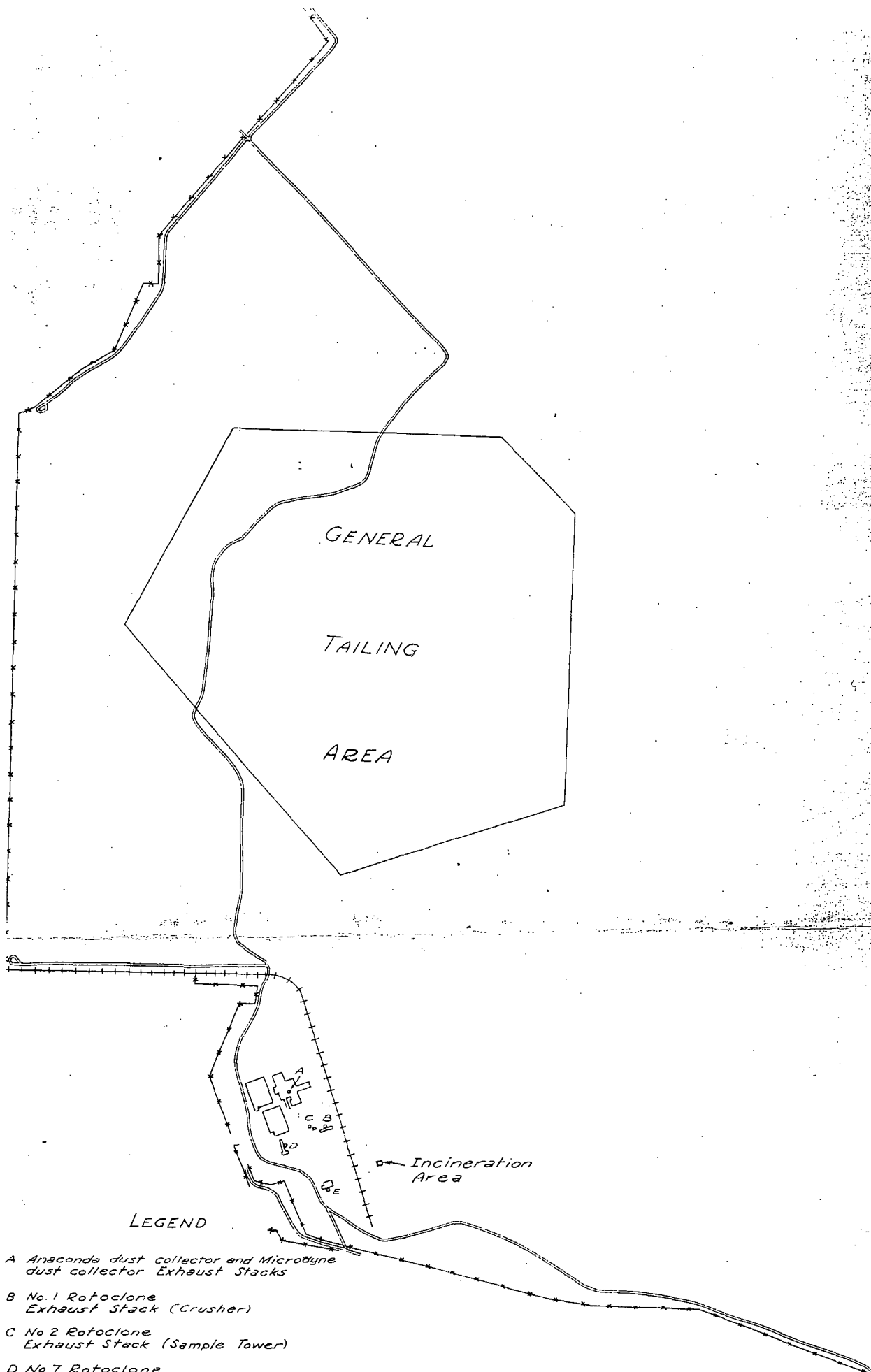
RETURN RECEIPT REQUESTED



GENERAL
TAILING
AREA

Incineration
Area

LEGEND



GENERAL
TAILING
AREA

Incineration
Area

LEGEND

- A Anaconda dust collector and Microbyne dust collector Exhaust Stacks
- B No. 1 Rotoclone Exhaust Stack (Crusher)
- C No. 2 Rotoclone Exhaust Stack (Sample Tower)
- D No. 7 Rotoclone Exhaust Stack (Ore Bins)
- E Sample Bucking Room Exhaust Stack

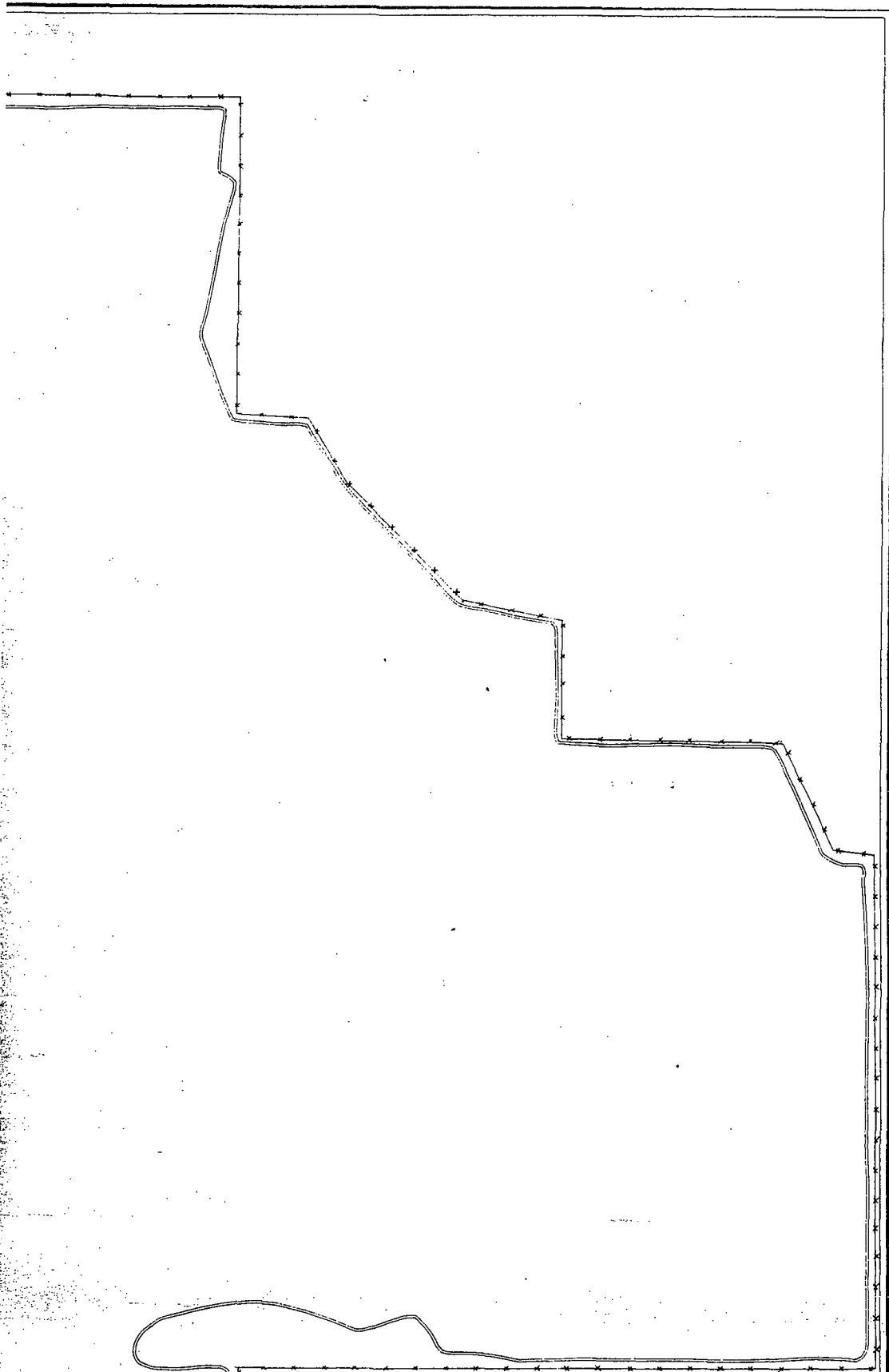


FIGURE I.

PLAN MAP

SHOWING

RESTRICTED AREA BOUNDARY
AND
PATROL ROAD
OF

THE ANACONDA COMPANY
NEW MEXICO OPERATIONS

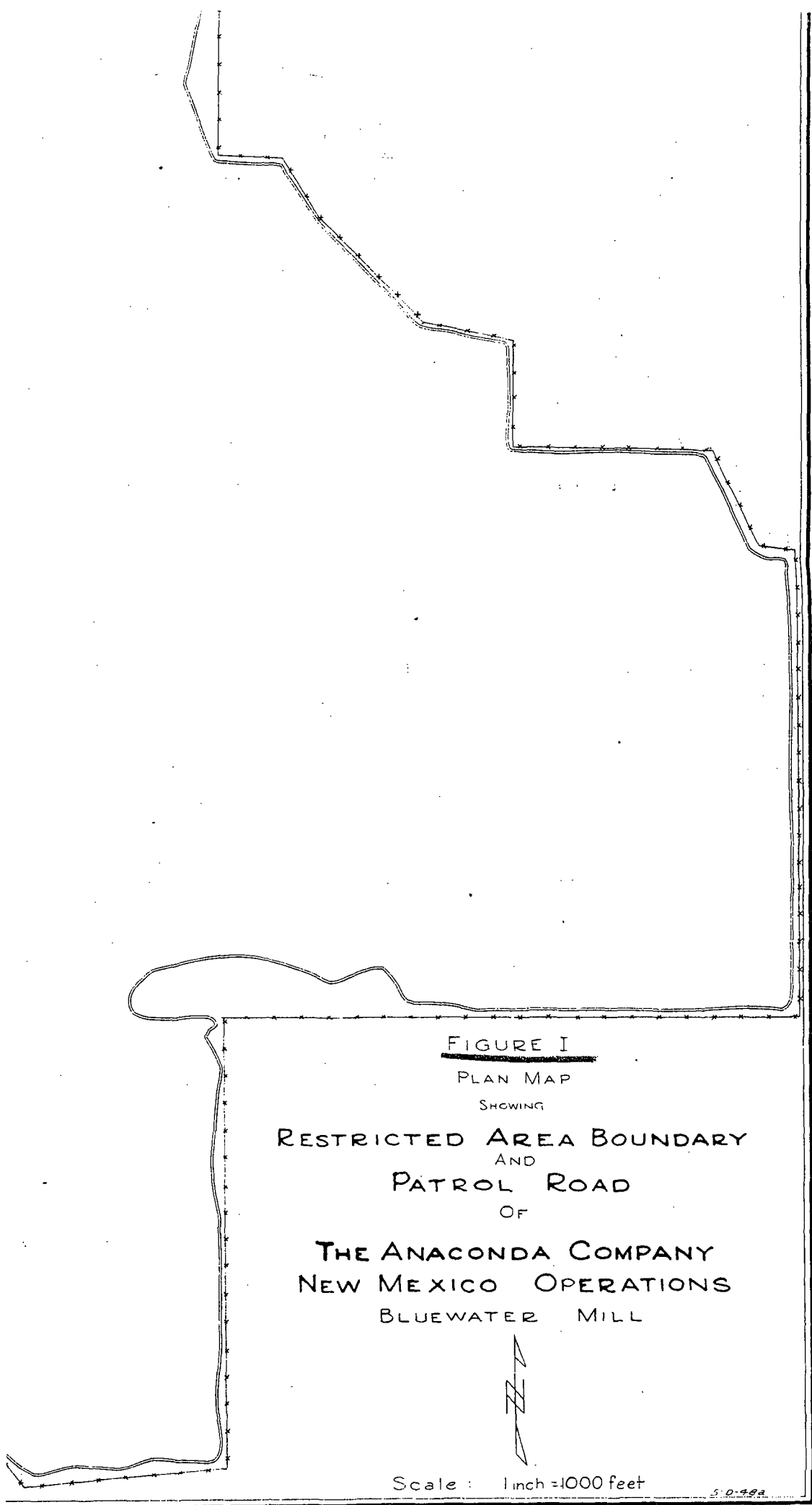
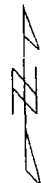


FIGURE I
PLAN MAP
SHOWING
RESTRICTED AREA BOUNDARY
AND
PATROL ROAD
OF
THE ANACONDA COMPANY
NEW MEXICO OPERATIONS
BLUEWATER MILL



Scale : 1 inch = 1000 feet

S. D. 482

THE ANACONDA COMPANY

New Mexico Operations

P. O. Box 638, Grants, New Mexico



August 17, 1961

SECRET, NO. 40-665
J. Kelly

Mr. John Lane
United States Atomic Energy Commission
Division of Licensing and Regulation
Washington 25, D. C.

Dear Mr. Lane:

*started
in rear
of folder*

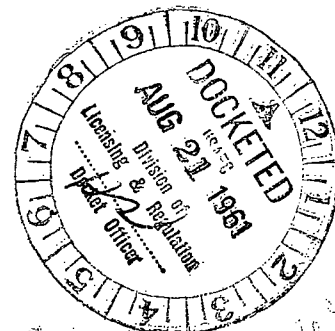
In compliance to your request made in our telephone conversation this morning please find enclosed a print of our drawing No. 11DC-66 showing the general arrangement of the hoods and duct work at the yellow cake drum-loading station beneath the dryers. A rather complete bound volume of prints was sent to the Atomic Energy Commission with our letter of January 30, 1961. However, since that time the changes shown in the accompanying drawing have been made at the yellow cake loading station. This system is exhausted by the 8000 CFM microdyne dust collector as described in the referred-to volume of prints.

Very truly yours,

E. C. Peterson
Assistant Manager

ECP:MA
Enc.

cc: Mr. H. L. Price
Mr. A. J. Fitch
Mr. R. M. Wilde



*Shown to Mr. ...
Aug 22 in refer
to letter*
4 to copy 7/10/61

DOCKET NO. 40-665
August 22, 1961

NOTICE TO THE AEC PUBLIC DOCUMENT ROOM AND OTHERS

Drawing No. 11DC-66 transmitted with letter dated August
17, 1961, from Anaconda Company, Grants, New Mexico, will
be sent to you as soon as available.

DOCKET NO. 40-665
filed

THE ANACONDA COMPANY

New Mexico Operations

P. O. Box 638, Grants, New Mexico



A. J. FITCH
MANAGER

May 24, 1961

Re: 40-665

United States Atomic Energy Commission
Division of Licensing and Regulation
Washington 25, D. C.

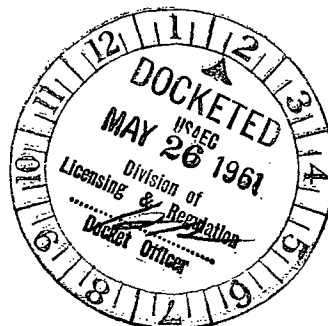
Gentlemen:

We would like very much to know the status of our
May 18, 1960 application for renewal of our Source Material
License No. R-138. Would you please advise.

Yours very truly,

A. J. FITCH

AJF:MA



DOC. LET NO. 40-665

File Copy

THE ANACONDA COMPANY

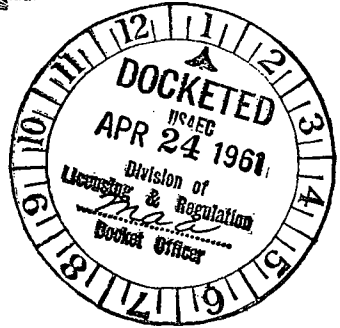
New Mexico Operations

P. O. Box 638, Grants, New Mexico



A. J. FITCH
MANAGER

April 19, 1961



Mr. H. L. Price, Director
Division of Licensing and Regulation
Atomic Energy Commission
Washington 25, D. C.

Dear Mr. Price:

In accordance with the regulations of Title 10 CFR 20, we have, at the Bluewater Plant of The Anaconda Company New Mexico Operations, delineated and posted the boundary and perimeter surrounding the plant and tailing disposal area in a manner prescribed to define it as a "restricted area." Within the enclosing fence line and approaching all gates and the railroad entry is a near-parallel road that will be patrolled on a 24-hour day-and-night schedule by the plant guards to restrict the entry of persons other than mill employees.

Now, and inasmuch as surveys show that we are discharging within the plant area radioactive material as air effluents above MPC and that air-concentration surveys within and at the periphery of the restricted area show that the effluents by dilution and dispersion are not leaving the restricted area in concentrations that exceed 10 CFR 20, Appendix B, Table 2, Column 1, we herewith present supporting survey plats and data and make application in accordance with Section 20.106(a) for permission to discharge concentrations specified in Appendix B, Table 2, Column 1, to the boundary of the restricted area as herein defined.

Accordingly, the following supporting surveys, data and plats, and other material are attached:

- I. Site location.
(Note Attachment I)
- II. Site meteorology.
(Note Attachment II and Figure I)
- III. Types, quantities and concentrations of air effluents discharged.
(Note Attachment III and Figure II)
- IV. Methods for determining concentration of radioactive material released to the environs in air effluents.
(Note Attachment IV and Figure II)

2 addl. cop. of attachments needed for Pub. Sec. Com. + Compliance. Copy letter to compl. 5/23/61 JH

Mr. H. L. Price

-2-

April 19, 1961

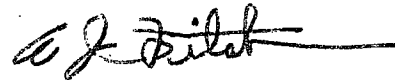
V. Results of environmental air sampling surveys.
(Note Attachment V and Figure II)

VI. Diffusion calculation of ground level concentrations.
(Note Attachment VI, Parts I, II, and III)

The supporting data attached present currently pertinent information concerning our environmental air sampling surveys. These surveys have been made under various wind conditions of from near calm to 35 miles per hour which include the extreme conditions at this site. We realize that these surveys cover only the three-month period from February through April 1961. However, from the air-borne uranium concentrations as determined by these surveys, we believe that it would be extremely unlikely for the permissible limits to be exceeded at the perimeter of the restricted area under any conditions.

Furthermore, it is our intent to continue to make periodic environmental air sampling surveys under varying conditions and throughout the other seasons of the year. The records of these surveys will be available for your examination at any time.

Yours very truly,



A. J. FITCH

AJF:cig

Attachments

c: Mr. Vincent C. Vespe, Director
Compliance Division
United States Atomic Energy Commission
Albuquerque Operations Office
Post Office Box 5400
Albuquerque, New Mexico

ATTACHMENT I

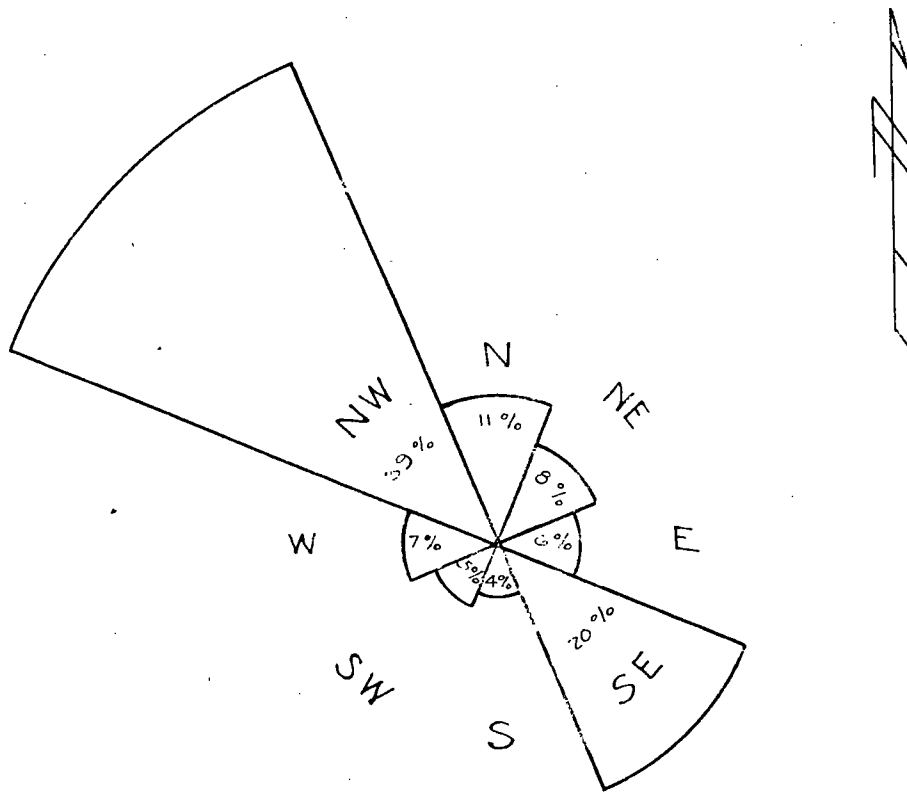
Site Location

The Bluewater Mill of The Anaconda Company is located just north of route US-66, approximately nine and one-half miles northwest of Grants, New Mexico, a town of 11,500 population. Other centers of population in the area include: (1) the village of Milan, population 2,000, seven miles southeast of the mill; (2) the village of Bluewater, population 1,025, two miles west of the mill; and (3) The Anaconda Company housing area, population 310, one-half mile south of the mill. Outside of the above-mentioned communities, the area is only very sparsely populated.

ATTACHMENT II

Site Meteorology (Note Figure I)

A wind rosette giving the percent of wind miles by octants for 1960 at the Bluewater Mill of The Anaconda Company, is shown as Figure I. A total of 34,814 wind miles were recorded for the year 1960. The average wind velocity was 4.0 miles per hour. The most unusual wind velocities are in the range of from 5 to 15 mph. Higher wind velocities of from 15 to 30 mph occur frequently during the spring and occasionally during other seasons of the year. Wind velocities of from 30 to 50 mph occur occasionally during the spring, possibly 6 to 10 times during the season.



Scale: One radius inch = 5000 wind miles

Total Wind Miles, 1960 = 34,814

FIGURE I
 PERCENT OF WIND MILES
 BY OCTANTS FOR 1960 AT
THE ANACONDA COMPANY
 GRANTS, NEW MEXICO

ATTACHMENT III

Types, Quantities and Concentrations of Air Effluents Discharged (Note Figure II)

There are six mill stacks which discharge effluents containing airborne radioactive material. Four of these stacks discharge effluents containing ore dust from the following dust collection systems: No. 1 Rotoclone, Crushing Plant; No. 2 Rotoclone, Ore Sampling Tower; No. 7 Rotoclone, Fine Ore Bins; and Sample Bucking Room. The other two stacks discharge effluents containing yellow cake dust from the following dust collection systems: Anaconda Dust Collector, yellow cake dryers; and the Microdyne Dust Collector, yellow cake packaging and sampling areas. The locations of these stacks are shown on Figure II.

Given in the following table are the concentrations of radioactive material discharged in the stack effluents as determined by survey. Also given are the stack heights above ground level and the volume of effluent discharged from each stack.

<u>Stack Location</u>	<u>Stack Height</u>	<u>Effluent Volume (cfm)</u>	<u>Effluent Concentration uc U-nat/ml</u>
No. 1 Rotoclone Crushing Plant	32'-4"	13,200	1.05×10^{-12}
No. 2 Rotoclone Ore Sampling Tower	23'-11"	13,200	3.48×10^{-13}
No. 7 Rotoclone Fine Ore Bins	23'-8"	13,200	1.92×10^{-13}
Sample Bucking Room	14'-6"	9,000	1.02×10^{-11}
Anaconda Dust Collector Yellow Cake Dryers	62'-11"	6,000	5.21×10^{-10}
Microdyne Dust Collector Yellow Cake Packaging and Sampling	59'-3"	8,000	3.98×10^{-10}

The above concentrations are typical of the actual effluents discharged during periods of normal operation. However, effluents are not discharged continuously from any of these stacks. Given in the following table are the operating times for each of these stacks during the six-month period of 4392 hours from July 1, 1960 to January 1, 1961.

ATTACHMENT III
 (Continued)

<u>Stack Location</u>	<u>Hours of Operation</u>	<u>Percentage of Time Operated</u>
No. 1 Rotoclone	2448	55.7
No. 2 Rotoclone	2448	55.7
No. 7 Rotoclone	3672	83.6
Sample Bucking Room	2448	55.7
Anaconda Dust Collector	944	21.5
Microdyne Dust Collector	944	21.5

In section 20.106(b), 10 CFR 20, it is stated that concentrations of effluents may be averaged for periods of not greater than one year. In accordance with the above-mentioned section the yearly concentration of the stack effluents can be computed by multiplying the actual concentration by the percentage of time operated. These yearly average concentrations are given in the following table.

<u>Stack Location</u>	<u>Yearly Average Effluent Concentration uc U-nat/ml</u>
No. 1 Rotoclone	5.85×10^{-13}
No. 2 Rotoclone	1.94×10^{-13}
No. 7 Rotoclone	1.61×10^{-13}
Sample Bucking Room	5.68×10^{-12}
Anaconda Dust Collector	1.12×10^{-10}
Microdyne Dust Collector	8.56×10^{-11}

ATTACHMENT IV

Methods for Determining the Concentration of Radioactive Material

Released to the Environs in Air Effluents

(Note Figure II)

Our environmental air sampling survey program has been formulated in accordance with the paper received from H. L. Price, Director, Division of Licensing and Regulation, entitled, "A Basis for Surveying to Determine Concentrations of Radioactive Material Discharged as Air Effluents from Uranium Mills."

Air samples are taken periodically of the six stack effluents to determine the concentration of radioactive material being discharged. The results of these surveys have shown that the air effluents discharged from the Yellow Cake Section are the most likely source of air-borne contamination. For this reason the environmental air samples have been taken mainly in a downwind direction from the air effluent discharge stacks of the Yellow Cake Section and only during periods when effluents were being discharged from these stacks. Air effluents containing ore dust were also being discharged from the other four stacks during the sampling periods and the sampling locations were also generally downwind from these stacks. The environmental air samples have also been concentrated in the path of the prevailing wind. The sampling locations are shown on Figure II. As may be seen from Figure II, air samples have been taken both within and at the perimeter of the restricted area.

ATTACHMENT V

Results of Environmental Air Sampling Surveys (Note Figure II)

Given in the attached Table I are the results of the environmental air sampling surveys which have been made to determine the concentration of air-borne radioactive material within and at the perimeter of the restricted area. Included in this table are the meteorological conditions prevailing at the time of sampling. Also given are the distances from the Yellow Cake Stacks to the point of maximum ground level concentration as calculated by Sutton's Equation for the downwind perimeter samples. The sampling locations are shown on Figure II.

As was previously stated, the most likely sources of air-borne contamination are the air effluents discharged from the Yellow Cake Section. Therefore, all of the results given in Table I have been evaluated on the basis of the MPC for Uranium-natural in air in an unrestricted area; namely, 2×10^{-12} uc/ml.

It is evident, on the basis of the survey results presented, that in no case do the concentrations of the air effluents at the perimeter of the restricted area exceed the permissible limits.

TABLE I

Sample No.	Date	Distance From Yellow Cake Stacks			Wind		Sky Conditions	Temperature °F	U-nat Concentration uc/ml x 10 ¹³	Percent of MPC**
		To Sampling Location	To Maximum Ground Level Concentrations*	Heading	Velocity	Heading				
503	2/16/61	920 Feet		346°	5 mph	166°	Cloudy	55	1.61	8
504	2/16/61	1100 Feet		357°	5 mph	177°	Cloudy	55	1.68	8
512	2/24/61	280 Feet		117°	5 mph	297°	Clear	20	1.93	10
513***	2/24/61	1480 Feet	355 Feet	158°	11 mph	238°	Clear	30	1.41	7
514	2/24/61	920 Feet		158°	11 mph	238°	Clear	33	2.59	13
515	2/24/61	520 Feet		158°	11 mph	238°	Clear	35	2.38	12
516	2/27/61	420 Feet		333°	6 mph	153°	Partly Cloudy	20	1.00	5
517	2/27/61	420 Feet		307°	6 mph	127°	Partly Cloudy	25	1.65	8
518***	2/27/61	1240 Feet	350 Feet	333°	8 mph	153°	Partly Cloudy	26	0.54	3
519***	2/27/61	4700 Feet	335 Feet	335°	6 mph	155°	Partly Cloudy	27	0.24	1
520	2/27/61	400 Feet (upwind)		128°	5 mph	128°	Partly Cloudy	28	0.41	2
521	2/27/61	1860 Feet (upwind)		147°	9 mph	147°	Partly Cloudy	30	0.23	1
522***	2/27/61	5440 Feet	335 Feet	332°	6 mph	152°	Partly Cloudy	33	0.27	1

* By Sutton's Equation
 ** MPC - 2×10^{-12} uc/ml
 *** Downwind Perimeter Samples

TABLE I (Continued)

Sample No.	Date	Distance From Yellow Cake Stacks			Wind		Sky Conditions	Temperature °F	U-nat Concentration uc/ml x 10 ⁻¹³	Percent of MPC**
		To Sampling Location	To Maximum Ground Level Concentrations*	Heading	Velocity	Heading				
523***	2/27/61	1240 Feet	350 Feet	332°	9 mph	152°	Partly Cloudy	35	0.57	3
526***	2/28/61	2680 Feet	355 Feet	132°	11 mph	312°	Clear	35	0.99	5
527	2/28/61	1980 Feet		132°	11 mph	312°	Clear	37	0.81	4
528***	2/28/61	1760 Feet	370 Feet	152°	17 mph	332°	Clear	37	1.15	6
532	2/28/61	330 Feet		167°	14 mph	347°	Clear	37	2.55	13
569***	3/21/61	1520 Feet	350 Feet	161°	8 mph	341°	Clear	45	1.59	8
570***	3/21/61	2460 Feet	370 Feet	135°	17 mph	315°	Clear	50	1.51	8
571***	3/21/61	3080 Feet	370 Feet	127°	17 mph	307°	Clear	50	1.33	7
572	3/21/61	2160 Feet		127°	17 mph	307°	Clear	52	1.25	6
573	3/21/61	1680 Feet		127°	17 mph	307°	Clear	53	1.84	9
574	3/21/61	1680 Feet (crosswind)		82°	17 mph	307°	Clear	56	0.63	3
575	3/21/61	1680 Feet (crosswind)		37°	17 mph	307°	Clear	58	0.71	4
576	3/21/61	1680 Feet (upwind)		307°	16 mph	307°	Partly Cloudy	58	0.57	3

* By Sutton's Equation

** MPC - 2×10^{-12} uc/ml

*** Downwind Perimeter Samples

TABLE I (Continued)

Sample No.	Date	Distance From Yellow Cake Stacks			Wind		Sky Conditions	Temperature °F	U-nat Concentration uc/ml x 10 ¹³	Percent of MPC**
		To Sampling Location	To Maximum Ground Level Concentrations*	Heading	Velocity	Heading				
578***	3/21/61	3760 Feet	370 Feet	114°	17 mph	294°	Partly Cloudy	60	1.88	9
579	3/21/61	2400 Feet		114°	17 mph	294°	Partly Cloudy	60	0.96	5
582***	3/21/61	3760 Feet	370 Feet	114°	17 mph	294°	Partly Cloudy	62	0.83	4
603***	4/ 4/61	820 Feet	305 Feet	310°	2 mph	130°	Clear	57	1.73	9
604***	4/ 4/61	3300 Feet	365 Feet	124°	12 mph	304°	Clear	73	0.55	3
605	4/ 4/61	720 Feet (upwind)		304°	12 mph	304°	Clear	73	0.38	2
611***	4/11/61	1975 Feet	1070 Feet	144°	31 mph	324°	Cloudy	42	2.01	10
612	4/11/61	1375 Feet		144°	27 mph	324°	Cloudy	43	2.56	13
613	4/11/61	675 Feet		144°	25 mph	324°	Cloudy	44	1.18	6
614	4/11/61	2800 Feet (upwind)		324°	23 mph	324°	Cloudy	45	0.49	2
615	4/11/61	675 Feet		144°	23 mph	324°	Cloudy	47	0.81	4
616***	4/11/61	1975 Feet	1020 Feet	144°	23 mph	324°	Cloudy	48	0.81	4

* By Sutton's Equation

** MPC - 2×10^{-12} uc/ml

*** Downwind Perimeter Samples

ATTACHMENT VI

Diffusion Calculations of Ground Level Concentrations
Part I - Sutton's Equation

Diffusion calculations were made to determine the theoretical uranium concentrations for the perimeter samples using Sutton's Equation as given below:

$$X = \frac{2 Q (10^{-6})}{C^2 \bar{u} x^{2-n}} e^{-\left(\frac{H^2}{C^2 x^{2-n}}\right)}$$

Where X = ground level concentration in uc/ml

Q = strength of contaminant source in uc/sec

H = stack height in meters

x = distance downwind in meters

\bar{u} = wind speed in meters/sec. -

C = Sutton's coefficient of diffusion

n = Sutton's stability parameter

Also calculated from Sutton's equation were the distances downwind from the source at which the maximum concentration occurs. The derived equation for this calculation is given below:

$$x_{\max} = \frac{H^2}{C^2} \frac{1}{2-n}$$

Where x_{\max} = distance downwind to expected maximum concentration in meters

H = stack height in meters

C = Sutton's coefficient of diffusion

n = Sutton's stability parameter

ATTACHMENT VI
(Continued)

Diffusion Calculations of Ground Level Concentrations
Part II - Data for Calculations

$Q = 2.97 \times 10^{-3} \text{ uc/sec}$ $1 \times 10^{-9} \mu\text{c/ml}$
 $H = 18.3 \text{ meters}$ 2000 ft/sec

<u>Sample No.</u>	<u>C</u>	<u>x</u> <u>meters</u>	<u>n</u>	<u>ū</u> <u>meters/sec</u>
513	0.27	450	0.20	4.9
518	0.275	380	0.20	3.6
519	0.285	1430	0.20	2.7
522	0.285	1660	0.20	2.7
523	0.275	380	0.20	4.0
526	0.27	820	0.20	4.9
528	0.26	540	0.20	7.6
569	0.275	460	0.20	3.6
570	0.26	750	0.20	7.6
571	0.26	940	0.20	7.6
578	0.26	1150	0.20	7.6
582	0.26	1150	0.20	7.6
603	0.31	250	0.20	0.9
604	0.265	1010	0.20	5.4
611	0.115	600	0.25	13.9
616	0.12	600	0.25	10.3

ATTACHMENT VI
(Continued)

Diffusion Calculations of Ground Level Concentrations
Part III - Comparison of Actual to Calculated Concentrations
at Periphery of Restricted Area

<u>Sample No.</u>	<u>Actual Conc.</u> <u>uc/ml x 10¹³</u>	<u>Calculated Conc.</u> <u>uc/ml x 10¹³ *</u>
513	1.41	0.82
518	0.54	1.43
519	0.24	0.18
522	0.27	0.14
523	0.57	1.29
526	0.99	0.29
528	1.15	0.42
569	1.59	1.04
570	1.51	0.24
571	1.33	0.16
578	1.88	0.11
582	0.83	0.11
603	1.73	8.91
604	0.55	0.19
611	2.01	1.00
616	0.81	1.27

* By Sutton's Equation

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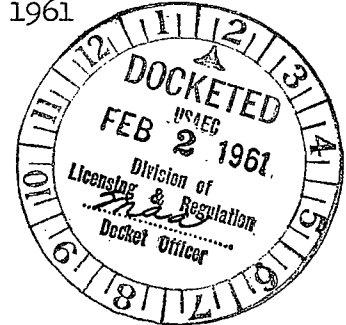
THE ANACONDA COMPANY

New Mexico Operations

P. O. Box 638, Grants, New Mexico



January 30, 1961



Mr. H. L. Price, Director
Division of Licensing and Regulation
United States Atomic Energy Commission
Washington 25, D. C.

Dear Mr. Price:

In further compliance to your request of December 1, 1960, for information regarding certain aspects of our radiation safety program and facilities and equipment, as they pertain to radiation safety, we are pleased to submit the following so that your review and safety evaluation can be completed.

In each instance our reply is preceded by a restatement of the items as numbered in your inquiry:

1. A detailed description of your organization, including authority and responsibility of each level of management and/or supervision in regard to development, approval, and adherence to operating procedures.

A current chart of line management in Anaconda's New Mexico Operations is attached. This presents the lines and level divisions of authority for the respective descriptive titles of position and indicated areas of responsibility. These are believed to be self-evident.

2. The qualifications and experience of the personnel in your organization assigned the responsibility for developing, conducting and administering the radiation safety program for the mill.

The radiation safety program for our mill and plant is under the direction of Ralph M. Wilde, Industrial Radiological Engineer. Mr. Wilde is a college graduate with a B.S. degree in chemistry. He has had a total of six years' experience in the uranium industry; two years as an analytical chemist, two years as a metallurgist, and for the past two years he has been in charge of our radiation safety program. He has received special training in radiological health and safety at the Robert A. Taft Sanitary Engineering Center of the United States Public Health Service. He has also visited the U.S.A.E.C. Winchester Laboratory operated by National Lead Company, Inc. and the Environmental Health Field Station of the U.S.P.H.S. in Salt Lake City, Utah, for additional training. Mr. Wilde is currently

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Reviewed
Completed
2/1/61*

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Division of Licensing and Regulation
United States Atomic Energy Commission
Washington 25, D. C.

serving as chairman of the New Mexico State Radiation Protection Technical Advisory Council. This Council advises the New Mexico State Department of Public Health on technical matters relating to ionizing radiation.

3. A description of the method for restricting both the mill and the tailings pond.

The mill and tailings pond areas are fenced and posted as restricted areas. All access gates are either locked or guarded. A supervised guard detail, working under contract from the Burns Detective Agency, controls entry to the mill area at all times. Periodic patrols are made by the guards to make certain that the unguarded access gates are locked and that no unauthorized persons enter or remain in the restricted mill and tailings pond areas.

- 4 & 5. A diagram of the plant layout, indicating areas and points in the process where dust is generated.

A description of dust collection and ventilation equipment that are utilized when the mill is in operation, including type, capacity and location of such equipment, e.g. ore transfer points, crushing, grinding, etc.

A bound volume, "Plant Dust Collection and Ventilation Equipment", is enclosed with a master index and plat of the plant and plant areas indicating points of dust generation and giving in detail, both by description and by layout drawings, each such division within the mill and the auxiliary operations. This necessarily embraces the Carbonate Mill and other standby facilities that are integral but are not now in operation.

- 6 & 7. A description of the survey program which is followed to determine concentrations of air-borne radioactivity within the mill, including make, model number and capacity of sampling devices, and a step-by-step procedure for sample analysis.

In the description of your air sampling program, please include:

- a. A description of the sampling location in respect to operating personnel;

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Division of Licensing and Regulation
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Washington 25, D. C.

- b. A description of the sampling location in respect to the process operation;
- c. The approximate number of sampling locations in each area; and
- d. The approximate number of air samples taken in each mill area per month.

A description of our air sampling program follows.

In the divisions or sections of the mill where the air-borne radio-activity is more or less uniformly distributed, general area samples are taken in the areas frequented by the operating personnel. Where personnel are working at dust-producing operations or in dusty locations, breathing zone samples are taken to determine the air-borne concentration for the specific operation or location. Air samples are also taken to investigate any operations which might be suspected of producing air-borne radioactivity.

The results of past air sampling surveys have shown that air-borne radio-activity concentrations in excess of the MPC are very rarely found in areas of the mill outside of the Yellow Cake Section. Therefore, we have adopted an air sampling survey schedule calling for monthly surveys in the Yellow Cake Section and for quarterly surveys in the remainder of the mill.

The approximate number of sampling locations and area samples are given in the following table:

<u>Mill Area</u>	<u>No. of Sampling Locations</u>	<u>No. of Samples Taken</u>
Crushing Plant	9	9 per quarter
Sample Tower	4	4 per quarter
Fine Ore Bins	5	5 per quarter
Grind and Leach Bldg.	8	8 per quarter
Ion Exchange Bldg.	10	10 per quarter
Yellow Cake Section	20	75 25 per month
Sample Bucking Room	6	6 per quarter
Offices and Labs.	11	11 per quarter
Shops	6	6 per quarter
Warehouse	3	3 per quarter
Tailing Areas	4	4 per quarter

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The air sampling devices used in our survey program are:

1. Gast Portable Sampler, Model AD440, made by The Gast Manufacturing Corporation, capacity 5 to 25 liters per minute.
2. Staplex Hi-Volume Air Sampler, Model TFLA, made by The Staplex Company, capacity 17 cubic feet per minute with Whatman No. 41 filter paper.

Both of these air samplers have been calibrated by using wet test meters at Los Alamos Scientific Laboratories. The Gast air sampler is used for taking breathing zone and stack effluent samples. The Staplex air sampler is used for taking general area samples.

The air-dust samples are analyzed for uranium by a fluorimetric method. The method used is essentially the same as "The Fluorimetric Determination of Uranium in Air-Dust Samples" by Claude W. Sill, Health and Safety Division, U.S.A.E.C., Idaho Falls, Idaho. The step-by-step procedure is as follows:

Sample Preparation:

The filter paper containing the air-dust sample is placed in a 50-ml beaker containing 6 ml of a 1:2 mixture of perchloric and nitric acid. The beaker is covered with a watch glass and placed on a hot plate. Evaporate the solution until most of the excess perchloric acid has been fumed off, adding additional nitric acid to clear up any dark colors, if necessary. Special precautions should be taken to prevent the bottom of the beaker from becoming dry, even in local spots. If a dark-colored residue is present, add one ml of 48% hydrofluoric acid to dissolve silica and immediately re-evaporate to perchloric acid fumes. Cool the beaker and contents, add 2 ml of nitric acid and heat to dissolve salts. Cool the beaker and contents, rinse the cover glass with distilled water and transfer the solution and any slight insoluble material quantitatively to a 25-ml mixing cylinder. Dilute to the mark with distilled water, mix thoroughly, and allow any insoluble material to settle.

Fluorimetric Determination:

Place a prepared pellet of 2% lithium fluoride - 98% sodium fluoride flux on each of 20 clean dry platinum fluorimeter dishes on nichrome screen. Duplicate 0.1 ml aliquots of each prepared sample solution or appropriate dilutions thereof are pipetted onto the flux pellets. Four standards are run

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with each set of samples. These standards are prepared by pipetting 0.1 ml aliquots of a solution containing 1×10^{-6} gm U_3O_8 per ml onto the flux pellets. The flux pellets are dried for five minutes under an infrared lamp and then fused for three minutes over a modified Fletcher burner. After fusion, the platinum dishes containing the fused pellets are allowed to anneal until cold without removing them from the screen. The fluorescence of the pellets is measured on a Jarrell-Ash Fluorimeter Mark V. The uranium content of the original samples can be calculated from the fluorescent intensity of the standards and samples.

8. A description of the procedure followed in determining the average daily and weekly exposures to air-borne radioactivity for each employee who frequently or occasionally occupies areas where air contamination exceeds MPC values specified in 10 CFR 20.

Working-place time-distribution studies have been made for the employees who, in the performance of their jobs, are required to occupy areas where they are exposed to air-borne radioactivity in concentrations in excess of the MPC. Each employee who enters an area where air contamination exceeds the MPC is required to wear a respirator while in the area.

Air sampling surveys are made periodically to determine the concentrations of air-borne radioactivity to which the employees are exposed. These surveys include both general area and breathing zone samples.

The average daily and weekly exposure of employees to air-borne radioactivity is calculated from the concentrations of such material as determined by surveys and from the time studies.

9. A description of mill discharge stacks, including stack heights, types and concentrations of effluents discharged, method for controlling release of radioactive material, and the methods for determining the concentration of radioactive material released to the environs.

Types and Concentrations of Effluents Discharged.

There are six mill stacks which discharge effluents containing air-borne radioactive material. Four of these stacks discharge effluents containing ore dust from the following dust collection systems: No. 1 Rotoclone, Crushing Plant; No. 2 Rotoclone, Ore Sampling Tower; No. 7 Rotoclone, Fine Ore Bins; and Sample Bucking Room. The other two stacks discharge effluents

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containing yellow cake dust from the following dust collection systems:
 Anaconda Dust Collector, yellow cake dryers; and the Microdyne Dust Collector,
 yellow cake packaging and sampling areas.

The concentrations of radioactive material in these stack effluents as deter-
 mined by survey are as follows:

U^{nat} MPC Unrecd. area = 2 x 10⁻¹²

<u>Stack Location</u>	<u>Stack Height Above Ground Level</u>	<u>Effluent Concentration uc U-nat/ml</u>
No. 1 Rotoclone Crushing Plant	32'-4"	1.40 x 10 ⁻¹²
No. 2 Rotoclone Ore Sampling Tower	23'-11"	5.65 x 10 ⁻¹³
No. 7 Rotoclone Fine Ore Bins	23'-8"	3.40 x 10 ⁻¹³
Bucking Room	14'-6"	3.57 x 10 ⁻¹²
Anaconda Dust Collector Yellow Cake Dryers	62'-11"	2.34 x 10 ⁻¹⁰
Microdyne Dust Collector Yellow Cake Packaging and Sampling	59'-3"	3.17 x 10 ⁻¹⁰

The above concentrations are typical of the actual effluents during periods
 of normal operation. However, effluents are not discharged continuously from
 any of these stacks. Given in the following table are the operating times
 for each of these stacks during the six-month period of 4392 hours from
 July 1, 1960 to January 1, 1961.

<u>Stack Location</u>	<u>Hours of Operation</u>	<u>Percentage of Time Operated</u>
No. 1 Rotoclone	2448	55.7
No. 2 Rotoclone	2448	55.7
No. 7 Rotoclone	3672	83.6
Bucking Room	2448	55.7
Anaconda Dust Collector	944	21.5
Microdyne Dust Collector	944	21.5

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In section 20.106(b), 10 CFR 20, it is stated that concentrations of effluents may be averaged for periods of not greater than one year. In accordance with the above-mentioned section the yearly average concentration of the stack effluents can be computed by multiplying the actual concentration by the percentage of time operated. These yearly average concentrations are given in the following table.

<u>Stack Location</u>	<u>Yearly Average Effluent Concentration uc U-nat/ml</u>
No. 1 Rotoclone	7.80×10^{-13}
No. 2 Rotoclone	3.15×10^{-13}
No. 7 Rotoclone	2.84×10^{-13}
Bucking Room	1.99×10^{-12}
Anaconda Dust Collector	5.03×10^{-11}
Microdyne Dust Collector	6.82×10^{-11}

2 x 10⁻¹² mpc

Methods for Determining the Concentration of Radioactive Material Released to the Environs.

Air samples are taken of the stack effluents to determine the concentration of radioactive material being discharged. Air samples have been taken in the area around the stacks to indicate the effect of atmospheric dilution and dispersion. We are currently formulating an air sampling survey program in accordance with the paper entitled, "An Acceptable Basis for Surveying to Determine Concentrations of Radioactive Material Discharged as Air Effluents From Uranium Mills." This survey program is scheduled to begin in February, 1961.

For a number of years The Anaconda Company has been carrying on a water sampling program in which various wells, springs, and ponds in the area are periodically sampled. These water samples are analyzed for both chemical and radioactive constituents. At the present time fifty (50) sources of water are included in this sampling program.

In addition to the surveys which have been made by The Anaconda Company, four environmental surveys were made by Associated Nucleonics, Inc. during the period from December 1958 through December 1959. These surveys included both air and water samplings and were conducted to indicate the affect of mill operations on air and water supplies within and beyond the plant site.

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10. A copy of written radiological safety operating instructions supplied to employees. These instructions should include provisions for personal hygiene, including washing prior to eating or leaving plant, instructions for wearing personnel monitoring devices and instructions for cleaning up dust and spills within the plant.

Following is a list of attached copies of pertinent instructions:

1. Memorandum entitled, "Operating Procedures for the Protection Against Radioactive Contaminants."
2. Memorandum entitled, "The Use of Protective Equipment and the Practice of Personal Hygiene in the Yellow Cake Section."
3. Memorandum entitled, "The Use of Protective Equipment in the Ion Exchange Building."
4. Memorandum entitled, "The Use of Protective Equipment." This memorandum applies to Crushing Plant employees.
5. News Bulletin dated June 15, 1959, describing film badge program and with attached instructions for wearing film badges.
6. Section H of the Supervisors' Handbook. Several parts of this section deal with Radiological Health and Safety.
7. Memorandum entitled, "Departmental Safety Rule Books."

As an extension of the above-mentioned Section H of the Supervisors' Handbook all departments are currently preparing safety rules which will be printed in booklet form and distributed to employees. Specific rules concerning Radiological Health and Safety will be included in these books.

8. Memorandum entitled, "Dust Control in the Bucking Room."

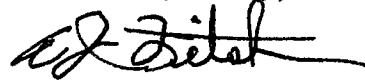
In addition to the above items, specific instructions are recorded in the supervisors' log books concerning the program for care, cleaning, and use of respirators, washing of coveralls in carbonate solution for decontamination, and other operating procedures concerned with radiological health and safety.

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Instructions for cleaning up dust and inadvertent and infrequent spills within the plant are given verbally and have not as yet been presented in written form. However, it has always been standard operating procedure to clean up dust and spills by hosing down with water or by using a vacuum cleaner where possible. In locations where neither of these methods can be used special care is taken so that excessive amounts of dust are not generated during clean-up operations.

Yours very truly,



A. J. FITCH
Manager

AJF:cig

Attachments (9)

Enclosure (1) "Plant Dust Collection and Ventilation Equipment"

INSTRUCTIONS TO MILL REPAIR DEPARTMENT FOR
RECEIVING AND EXECUTING EMERGENCY CALL FOR AMBULANCE

I. Call Originating in Plant Area

- A. When emergency call is received by an employee of the Mill Repair Department, in the absence of the Department Foreman, he will follow the instructions as given by the Supervisor initiating the call and dispatch the ambulance as soon as possible to the designated location.
- B. In all cases, the name of the Supervisor initiating such a call should be obtained and noted.

II. From Source Other Than Plant Area

- A. When emergency call is received by any employee of the Mill Repair Department, he will immediately contact the Mill Repair Foreman to take the call. If such foreman is not readily available, he must contact any available Mill Foreman to take the call.
- B. The Supervisor taking the emergency call will obtain and record on the form provided, the following information:
 - 1. Name, telephone number and location of person originating the emergency call.
 - 2. Name and Company affiliation of person needing ambulance service.
 - 3. Nature of the emergency.
 - 4. Where and how soon ambulance is needed.
 - 5. Where person requiring ambulance service is to be taken.
 - 6. Name of person relaying this emergency call (Telephone Operator or Power Plant Operator).
 - 7. Your name and time and date message was received.
- C. The Supervisor taking the emergency call must decide if and how the ambulance can be dispatched in keeping with recognized Company policy.
- D. Upon dispatching the ambulance, he will properly instruct the man he has assigned to drive the ambulance and make sure that such driver has the above information. If the resuscitator is needed, a man familiar with its operation will also be assigned to accompany the driver along with any additional help that might be required.

INSTRUCTIONS TO SWITCHBOARD OPERATOR AND POWERHOUSE OPERATOR
FOR RECEIVING AND EXECUTING EMERGENCY CALL FOR AMBULANCE

- A. When taking emergency call, obtain and record on the form provided, the following information:
1. Name, telephone number and location of person originating the emergency call.
 2. Name and Company affiliation of person needing ambulance service.
 3. Nature of the emergency.
 4. Where and how soon ambulance is needed.
 5. Where person requiring ambulance service is to be taken.
 6. Your name and time and date message was received.
- B. Immediately contact the Mill Repair Department and ask for the Mill Repair Foreman. If such foreman is not readily available, ask for any available Mill Foreman.
- C. As soon as you have contacted and recognized supervisor, relay the above information being sure that he understands what has been said. Obtain the foreman's name and record on form described above.
- D. Special Instructions to Powerhouse Operator:
- If Mill is not operating, contact Mechanical Department Foreman on duty (this name you have on the "Foreman Schedule" and in the Log Book) and Jack Sabo, TR 6-2653 and pass the above information on to them.

REQUISITIONING AMBULANCE
AT JACKPILE MINE

At the Mine, anyone requesting the ambulance during day shift and on regular work days should contact the Mine Office by radio or any other available means, giving the location and all other pertinent information. The vehicle, ordinarily parked at the Office, will be sent directly to the scene and upon arrival will be placed at the disposal of the senior supervisor present. It is his responsibility to see that the injured is properly loaded and that the ambulance is dispatched to the final destination with a qualified driver (supervisor if possible) accompanied by sufficient responsible help to answer the needs of the emergency. Unless individual desires, or contrary instructions are received, the injured should be transported to the Bataan Memorial Hospital in Albuquerque.

During swing and graveyard shifts and on Sundays and holidays anyone requiring the ambulance should proceed to the Housing Area by the quickest available means where the vehicle is obtainable from the parking zone in front of House No. 3. Upon arrival at the required location the procedure to be followed will be the same as previously outlined.

In all cases, Mine Management should be notified, as soon as possible, when the use of the ambulance has become necessary. The arrangements for medical treatment will be made either by telephone or by written authority depending upon circumstances.

supervisor on the scene will take charge and:

- (i) Ascertain the nature of the injury and make certain that adequate first aid is rendered.
- (ii) Call ambulance to the scene if necessary.
- (iii) Notify Mine Management as soon as possible, giving all pertinent information and actions taken in the matter.

(2) Off the Job Emergencies:

(a) Millsite Housing

The switchboard and Power Plant operators have definite and exact instructions concerning the procedure to be followed upon receipt of a call for the ambulance and will accept the responsibility of notifying the correct personnel for the dispatching of the vehicle to the requested locality.

See instruction sheets covering the responsibilities of the switchboard operators, Power Plant operators, and Mill Repair foreman relative to ambulance service.

- (i) The Company's nurse is available for advice or consultation in the event of emergency. She may be contacted at TR 6-2360 from 7:00 A.M. to 3:30 P.M. Monday through Saturday or at TR 6-2364 on holidays and at all other times.

- (ii) Anyone requesting the Millsite ambulance should:

First, call TR 6-2387 any time of the day or night. The call will be answered by either the switchboard operator or the Power Plant operator.

Second, state "THIS IS AN EMERGENCY!" Give your name and location, the nature of the emergency and how soon and where the ambulance is required. Also, give any other information requested by the person taking the call.

(b) Mine Housing

If ambulance service is desired during day shift on regular work days the Mine Office should be contacted. During swing or graveyard shifts, on Sundays or holidays, arrangements should be made through the Mine Superintendent or his assistant. In the absence of both of these individuals the ambulance is to be

found in the parking zone in front of House #3. When the mine is working on swing or graveyard shifts, the mine foreman on duty should be notified upon the departure and return of the ambulance.

(c) Other

It is Company policy that if public ambulance services are not available in time of need by employees living within the Grants-Bluewater area, the Company ambulance will be made available to those employees and their dependents.

At the Mine, ambulance service is not available to Company personnel off Company premises except by decision of Mine Management.

The Company ambulance will not be sent out to meet requests originating from persons outside of the Company employ or its operations. In dire need or in catastrophic emergency, the Company ambulance may be made available but only on direct permission from the Manager or Assistant Manager.

In no case will the Millsite ambulance be dispatched to a destination further than the Cibola Hospital, unless approved by the Manager or Assistant Manager.

(3) Accident Investigation and Reports:

Management directives require two separate types of formal accident reports to be filed. They are:

First, Accident Report, and

Second, Report of Property, Vehicle, or Equipment Loss or Damage.

To insure the timely and proper reporting of all incidents, a short report form called, "Immediate Report of Incident", is to be used. This form, prepared in pocket-booklet size, is to be used by the shift supervisor to report any and all damage or injuries occurring on his shift, regardless of how minor they may be. Also, this method is to be used to report mishaps that result in "near misses" where equipment is almost damaged or persons almost injured. In this way the shift supervisor can share the responsibility for correcting hazardous practices or conditions with his department supervisor.

The "Immediate Report of Incident" is to be made out in duplicate. The original is to be given to the department

THE ANACONDA COMPANY

New Mexico Operations

██████████ ACCIDENT REPORT

Name of Injured _____ Payroll Number _____

Address of Injured _____

Occupation _____ Department _____

Date of Accident _____ Day _____ Time _____ A.M.
P.M.

Date Disability Began _____ Date Accident Reported _____

Machine, tool or thing causing injury _____

Kind of power (hand, electric, steam, etc.) _____ Was Safety appliance or regulation

provided _____ Was it in use at that time _____ Was accident caused by injured's failure to use or

observe safety appliance or regulation _____

Give a detailed story of the accident, what the injured man was doing, how and where the accident happened:

How could it have been prevented? _____

Was injured wearing prescribed safety equipment? _____ Worked longer than regular workday? _____

Hour employee started work _____ a.m.
p.m. How long in present occupation? _____

Names and addresses of witnesses _____

Nature and Location of Injury (right or left) _____

Has injured man returned to work? _____ If so, give date _____

Name of Doctor _____

Hospital _____

Date of this report _____ Foreman on duty _____

Was employee outside or inside when injured? _____

What were light conditions at the area where injury occurred? _____

If poor, explain: _____

If outside, what were weather conditions? _____

If injured fell or wrenched muscles was floor or footing wet or slippery? _____

If slippery, with what and why? _____

Signature of Supervisor making this report: _____

EMPLOYEE'S STATEMENT OF HOW THE ACCIDENT HAPPENED:

Employee's Signature: _____

SAFETY ENGINEER'S OR INSURANCE ADMINISTRATOR'S STATEMENT OF INVESTIGATION:

Signature: _____

REPORT OF PROPERTY, VEHICLE,
OR EQUIPMENT LOSS OR DAMAGE

Complete description of unit:

Describe how the damage or loss occurred:

Describe the damage in detail:

Was fire involved?

If so, explain:

Time and place of incident: Date: _____ Time: _____ A.M., P.M.

Place: _____

Present location of damaged unit: _____

List persons directly involved:

(name)	(address)	
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Other witnesses:

Estimated cost of replacement or repair:

Was anyone injured?

If so, explain:

Was a "third party" (someone not employed by Anaconda) involved? _____

If so, list names and addresses:

Describe damage to "third party":

Who was responsible for the accident in your opinion?

How can a recurrence be prevented?

Signed: _____
(Supervisor)

The
TEN COMMANDMENTS
of reporting
Property, Vehicle and Equipment Loss or Damage

- (1)...Prepare and submit without delay an "Immediate Report of Incident." Follow it within one or two days with this complete written report.

BE SURE YOU REPORT:

- (2)...All damage, of any nature, in excess of \$100.
- (3)...All losses, regardless of value, where personal injury is involved.
- (4)...Any damage caused us by a "third party" (a person not employed by Anaconda).
- (5)...Any damage that we may cause, or that is claimed by a "third party."

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- (6)...Always be absolutely certain there has been no personal injury when you report none. (Our payment of any property damage would then make us liable for a later claim of injury.)
- (7)...Repair work cannot begin until the initial report of damage has been made. However, damaged equipment and property can be partially dismantled, if need be, to get a closer estimate of the amount of damage, PROVIDED THE DAMAGED PARTS ARE KEPT FOR INSPECTION BY OUR INSURERS.
- (8)...Any "outside" repair bills should be forwarded to our Accounting Department promptly.
- (9)...Be sure the Insurance Department is informed whenever new vehicles, boilers, furnaces, electric motors, or pit equipment is placed in use, or whenever old equipment of this type is discontinued in use.

##

IMMEDIATE REPORT OF INCIDENT

Equipment or Property, Loss or Damage.

Personal Injury.

Description of Damage: _____

Names of Injured: _____

Time & Date of Incident: _____ AM, PM _____. Date Reported to You: _____

Location Where Incident Occurred: _____

Personnel & Witnesses Involved: _____

Statement of How Incident Happened: _____

Date of This Report: _____ . Signature: _____

(Please Department Safety Insurance Mechanical
Routing: Initial) Supervisor _____, Engineer _____, Department _____, Department _____

supervisor by the end of the shift in which the incident is discovered. The duplicate remains in the booklet.

(a) Personal Injuries

When an employee is injured, the Shift Supervisor to whom the accident is reported should make an immediate investigation of the accident and, during the same shift, complete the "Immediate Report of Incident", and place it in the possession of his Department Supervisor.

When this is done the Department Supervisor will initial the report after noting its contents and promptly pass it along to the next departments on the routing list; namely, the Safety Department and the Insurance Department.

The Department Supervisor, Safety Engineer, and/or the Insurance Administrator will then instigate an investigation of the incident. When this has been done the Department Supervisor will complete the formal "Accident Report." This, along with the immediate report will be made a permanent part of Personnel records—in the Safety Department, if only first aid was required—and in the Insurance Department, if medical care or lost time resulted.

(b) Damage to Equipment

It is the primary responsibility of the Shift Supervisor to report all damage, thefts, or losses under his jurisdiction to his Department Supervisor, by means of an "Immediate Report of Incident."

By means of the routing list on this report the incident will then become known to the Safety Department, the Insurance Department, and the Mechanical Department.

All damage should be reported whether it puts the damaged equipment out of use or not.

If the damage or loss is of sufficient value, the Safety Engineer and/or the Insurance Administrator will contact the Department Supervisor and assist in the investigation and completion of the formal report and any insurance report that may be necessary.

e. Safety Incentive Programs

Safety incentive programs are any features of the over-all safety program that provide motivation or awards to the employee for participation in accident-free periods of operation or in some other way promoting safety. Such awards may be intangible, that is, through favorable public notice, or the knowledge that New Mexico Operations is a safe place to work; or, they may be in the form of tangible articles. Typical and current safety incentive programs that have been instituted at this operation are as follows:

- (1) The Accident-free Period Awards,
- (2) The Safety Suggestion Program,
- (3) The Safety Incentive Phone Call Program,
- (4) The Safety Poster Program,
- (5) The Safety Bulletin Board Program.

These programs, however, are subject to change or to complete elimination at any time by the Company.

Safety incentive programs are not to be considered as compensating employees for working safely. They are designed solely to stimulate the interest of employees in safety and to develop safety consciousness in employees and their families. It is clear that all of our people have much to gain, other than awards under these programs, by avoiding injuries. Expensive awards or payment in any form should not be expected of the Company. The Company contributes greatly when it provides safe working places, the services of a safety director and radiological engineer, wages for attending safety meetings and first-aid classes, safety devices, personal safety equipment and clothing, and countless other items. All of these facts should be pointed out by the supervisor when discussing safety awards with the employees in his department.

f. Enforcement of Safety

(1) Laws and Regulations - Types of Enforcement:

This section refers to the actions which may be taken by outside agencies to compel the Company to conduct a safe operation. Several Federal and State agencies are involved and each has various methods of enforcement which, however, will come under one or more of the following headings:

(a) Executive Action

This is a power granted by law to an authorized official or agency to take immediate action to remedy a hazardous situation.

(b) Criminal Action

This grouping refers to various laws which state certain safety violations to be criminal acts. Conviction in court results in the penalties set by law.

(c) Injunctive Action

An appropriate agency may secure a court injunction forbidding violation of safety regulations established by law. Once such an injunction is granted further violation constitutes contempt of court, and the court's authority, either to enforce its order or to penalize further violations, is for all practical purposes unlimited.

(d) Cancellation of contract or lease.

(2) Laws and Regulations - Enforcing Agencies:

(a) Atomic Energy Commission

The Atomic Energy Commission is concerned directly only with radiation safety. The appropriate regulations are set forth in Title 10 Part 20, Code of Federal Regulations, and have been partially described previously in the section entitled Radioactive Hazards. In addition to these standards the following section is pertinent.

Section 20.502 Additional Requirements

"The Commission may, by rule, regulation or order impose upon any licensee such requirements, in addition to those established in the regulations, as it deems appropriate or necessary to protect health or to minimize danger to life or property."

The Commission's power of enforcement can be either by criminal action or injunctive as set forth below.

Section 20.601 Violations

"An injunction or other court order may be obtained prohibiting any violation of any provision of the act or any regulation or order issued thereunder. Any person who wilfully violates any provision of the act or any regulation or order issued thereunder may be guilty of a crime and, upon conviction, may be punished by fine, or imprisonment, or both, as provided by law."

(b) Department of Labor

The Department of Labor is charged with enforcement of the safety provisions of the Walsh-Healey Act which applies to government contractors. The applicable portion of the law is as follows:

"No part of such contract may be performed nor will any of the materials, supplies, articles or equipment to be manufactured or furnished under said contract be manufactured or fabricated in any plants, factories, building or surroundings or under working conditions which are insanitary or hazardous or dangerous to the health and safety of employees engaged in the performance of said contract."

There are no direct actions provided under law which the Department of Labor might take to enforce this provision. Instead, the AEC would be notified that the company is in breach of contract and the AEC would acquire the right to cancel the contract.

(c) State Mine Inspector

Wherever the word "mine" is used in the following discussion it applies also to mills.

The State Mine Inspector may take immediate executive action in accordance with the following provision:

63-4-12. Ordering Dangerous Conditions in Mines
Removed or Removal of Workmen from Danger
Zones

"When any mine or portion of a mine, or machine, device, apparatus or equipment in the judgment of the inspector, is in so dangerous a condition from any cause, as to jeopardize life or health, he shall at once direct the management of the mine to remove the dangerous condition or safeguard the equipment forthwith; should the inspector find during his inspection of the mine, such dangerous condition existing therein, that in his opinion any delay in removing the workmen from such dangerous places or from the entire mine might cause loss of life or serious personal injury to the employees, the inspector shall have the right to request the representative of the operator accompanying the inspector to immediately withdraw all persons from such dangerous places or from the entire mine."

The State Mine Inspector may institute court action in accordance with the following provision:

63-29-1. Penalties for Violation of Act by Mine Operator, Official or Employee

"Any violation of any provision of this act by mine operator, mine official, miner, or other mine employee shall be deemed a misdemeanor and shall be punished by a fine of not more than two hundred (\$200) dollars or by imprisonment of not more than three (3) months in the county jail, or by both such fine and imprisonment. Each and every day's violation of any provision of this act shall be deemed a separate offense, and it shall be the duty of the mine inspector to institute proceedings in the proper courts in case of all such violations."

In case of repeated violations, the State Mine Inspector can obtain a court injunction to ensure enforcement of the code.

The code also has two provisions which specifically apply to every employee. These are as follows:

63-20-6. Safety Devices and Orders - Employees' Duty

"No mine employee or other person shall remove, displace, damage, destroy, carry off, or fail to use any safety device, safeguard notice or warning, provided for use in any mine employment or place of mine employment, or interfere in any way with the use thereof by any other person, or interfere with the use of any method or process adopted for the protection of any mine employee in such employment or place of employment, or fail to neglect to follow and obey safety orders promulgated by the mine operator or the mine inspector, and to do every other thing reasonably necessary to protect the life, health, safety, and welfare of employees, including himself."

63-20-7. Misdemeanors, Punishment - Intoxicants, Damage to Equipment, Violation of Danger Signs and Unauthorized Travel Prohibited

"Any employee violating the provisions of section 199 of article 34 (63-20-6) shall be deemed guilty of a misdemeanor punishable by a fine or imprisonment or both as set forth in another section of this act. No miner or other person shall carry into a mine intoxicating liquids or alcohol beverages or enter the mine under the influence of intoxicating

liquids; he shall not destroy any part of the machinery or equipment of the mine; no unauthorized person shall enter any part of the mine against a danger sign nor travel any haulageway in a mine where a manway is provided."

(d) State Department of Public Health

The State Department of Public Health is responsible for enforcement of the State Industrial Codes and State Regulations on Radiation. The Department has the following powers:

- (i) It may take immediate executive action by issuing a "cease and desist" order prohibiting any violation of the codes.
- (ii) If the "cease and desist" order is not obeyed it may:

First, institute criminal prosecution for violation of the code. Conviction results in penalties very similar to those specified in the mining code, or

Second, it may act through the State attorney general to obtain a court injunction forbidding such practices. This again subjects the violator to contempt of court proceedings.

(e) State Engineer

The State Engineer has "general supervision of the waters of the state." He has authority under a great number and variety of State laws to order the correction of unsafe practices in public or private water works or the correction of practices which might make water unsafe for use. If such condition is not corrected "within a reasonable time after notification" the violation shall constitute a misdemeanor and the State Engineer will give notice to the District Attorney that such a violation exists.

The District Attorney shall at once proceed against the owner, and all parties responsible therefor."

(f) Other Governmental Agencies

Mining leases on public land normally contain phrases similar to the following, "the lessee shall take appropriate steps for the preservation of the property and the health and safety of the workmen." Inspecting

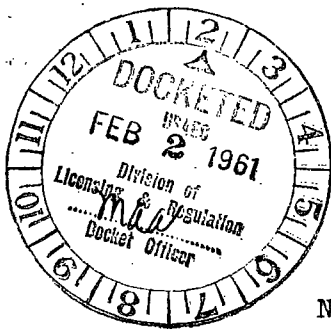
agents might be any person or agency designated by the department granting the lease. For example, land might be leased from the Forest Service or the Bureau of Indian Affairs but the inspection agency designated by the Secretary of the Interior might be the Bureau of Mines or the U. S. Geological Survey. The final remedy for violation of such lease provisions would be cancellation of the lease.

(3) Enforcement by Management:

It is Management's intention and desire to comply with all directives of regulatory agencies regarding safety. In addition, Management will set such other policies as it deems necessary for safe conduct of the operation. To enforce such safety provisions Management grants to its supervisors the same authority and disciplinary powers which apply to any other phase of the operation.

(4) Supervisor's Authority for Enforcement:

Violation of safety rules is an accepted grounds for discharge of an employee and is the final enforcement remedy. While the supervisor should strive to enforce safety by example, by teaching and by leadership, he must use his full authority in this respect if no other means will suffice. A supervisor must realize that in certain circumstances an employee may legitimately refuse to perform work which is unduly hazardous.



~~OFFICIAL USE ONLY~~

DOCKET NO. 40-665

H-1

THE ANACONDA COMPANY
New Mexico Operations - Grants, New Mexico

1/10/61

III. THE JOB ITSELF.

H. SAFETY.

Safety should be the first consideration. The safe way is not only the humanitarian way, it is also the most efficient and least expensive way of operating an industrial enterprise.

1. PURPOSE OF A SAFETY PROGRAM.

a. Humanitarian

Humanitarian consideration is the reason accepted by many for safety programs. What is implied, of course, is an employer's moral obligation to his employees to provide them with a safe place to work. Nobody, employer or otherwise, could with a free conscience say they did not care if another person were injured or killed. Consequently, there is humanitarian justification for safety. To best illustrate it, what happens when an employee is hurt?

First, there is the person's pain and suffering—nobody can pay for that. If the injury is severe there is a loss of physical ability—sometimes a complete loss, and that has been valued by law as compensable by a maximum weekly payment of \$38.00 for a maximum of 500 weeks. This shatters the family budget and could conceivably cause the loss of car, home, appliances, or furniture. Second is the reduction in the living standard of the dependent family made necessary by the loss of income. Third is the permanent reduction of income brought about by the residual disablement that lasts out the life of the injured employee.

b. Economic

Recognition that the highest purpose of safety work is the prevention of human injuries should not lead one to disparage the importance of cost reduction as a safety objective. Apart from humanitarian factors, enlightened management is more and more recognizing that "safety is good business..." The fact is, Safety Saves Money!

(1) Production Losses and Interference Due to Personal Injury:

What happens to the Company and the operation when an employee is injured? First, there is a blow to the

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general morale, and a loss of time and efficiency while the injured workman is cared for. Next comes the need to replace him which may require another employee to "double over" at higher pay for the overtime work. A replacement must be hired and trained and while this is happening there is necessarily a loss of efficiency.

It has been noted that there is more chance of a new employee, or an employee unfamiliar with the work, being injured. Therefore we must assume that one injury makes a second injury more probable.

(2) Compensation and Insurance Costs:

A single accident resulting in permanent total disability could cost our Company \$22,800.00 in compensation and insurance costs alone. In addition to these costs, it is conceivable that medical and hospital charges amounting to several thousand dollars would be paid by the Company.

Our own experience is a prime example of how safety saves on insurance and compensation costs.

Our compensation and insurance program is not such that we pay a flat premium and receive total coverage with the insurance company assuming the risk. We have compensation insurance with Travelers Insurance Company on what is called a "retrospective rating plan." In other words, we look back at our costs for the past year to determine what our insurance premium for that year shall be. It is, in effect, a "cost-plus" program wherein the insurance company receives a fee of 20 percent of our compensation costs for their administration. Thus we assume most of the risk ourselves and can only save money and avoid risk by our own actions.

Past costs in our operation illustrate the point more truly than any other example possibly could:

<u>Year</u>	<u>Compensation Costs</u>	<u>Insurance Premiums</u>
1958	\$57,088.00	\$68,506.00
1959	\$38,831.00	\$46,597.00
1960	\$20,227.00	\$24,274.00

Why were these savings made? There is one answer only—safety.

In 1958 there were 66 compensable lost-time injuries, in 1959 there were 35, and in 1960 there were 12.

In other words, if our safety program continues with this same effectiveness it will save our Company thousands of dollars each year in insurance premiums for compensation alone.

(3) Damage and Destruction of Facilities:

Oftentimes we think of safety only as it concerns human welfare, but there are accidents to things other than people. Safety is equally as concerned with damage to equipment and facilities.

To illustrate, using a hypothetical situation, a truck driver at the Jackpile falls asleep and drives off a bench. He is lucky and is not injured, but his truck is damaged sufficiently to put it out of production. Insurance adjusters assess the cost of repairing the truck at \$6,560.00. Insurance on this type of equipment carries a deductible of \$2,500.00. We pay that, and the insurance company pays \$4,060.00. Closed issue? Not by a long ways!

Repair parts for the truck are difficult to procure, so it sits unused and unavailable. The month before, the mine produced 1,041,538 tons at a haulage cost of 3.5¢ per ton. This month they are running one truck short, and that truck would haul 750 tons per shift for 75 truck-shifts in the month, a total of 56,250 lost tons of production. This month they produced 985,288 tons, but the overhead stays the same so the haulage cost per ton goes to 3.7¢ and this has cost the operation \$1,970.00 in overhead costs alone, not counting lost production and not counting possible premium increases by an insurance company against whom any such losses are filed.

Thus it can be seen why safety pays. Management displays an awareness of costs and an understanding of the human problems in production when they work unceasingly for a better, stronger safety program.

c. Other

It is clear that any condition which contributes to better labor-management relations has an important value to the employer.

(1) Maintaining Employee Morale:

An effective accident prevention program is evidence to employees that Management is interested in employee welfare. Such a program, therefore, promotes better labor-management relations.

Safety is largely a state of mind. As every supervisor knows, despite good working conditions, safe equipment, protective safeguards, and high standards of operation, accidents still happen. In most cases the frequency of accidents is related to the degree of safety mindedness and "esprit de corps" that has been instilled in the group. Maintenance of employee morale, therefore, is largely a matter of example set by the supervisor, his attitudes, and the pride he expresses in his crew and their safety achievements.

When the supervisor devotes careful attention to the mechanical aspects of accident prevention the job is only half done. He must also effectively communicate and enforce safety rules, analyze accident causes, correct hazards, conduct interesting and informative safety meetings, talk safety to his men, listen to their ideas, solicit their suggestions, reprimand and discipline when necessary, and give proper credit and praise when due.

The promotion of a sense of accomplishment and pride in establishing a department's or company's reputation as being "a good place to work" is an important phase of the safety program.

(2) Promoting Favorable Public Relations:

Public relations, it has been said, is "doing good and telling people about it." Where safety is concerned, the success of our public relations efforts in safety depends first on having a good safety program, and second, on informing others of its success. Since the supervisor is a member of the management team, people outside the Company will regard what he says about safety and what he does about it to be representative of the Company.

The scope of Anaconda's public relations efforts embraces many areas of which news plays an important part. News of safety achievements through both the spoken and written word is largely responsible for Anaconda's maintaining its reputation as a safe and desirable place to work. Job applicants who hear or read of Anaconda's safety achievements will come to us first when looking for work. Most workers seeking employment who have operated under extremely hazardous conditions and a de-emphasized safety program, seek work where safety efforts are aggressive, well-organized, and successful.

When a company's safety practices are not as good as the public thinks they should be, no amount of publicity will have much lasting effect in winning the public's favor.

Just as the public's attitude toward Anaconda is determined largely by the attitude of employees, much depends on the manner in which contacts and impressions with the public are made.

This explains the supervisor's responsibility in public relations of first informing himself and then seeing that employees have the facts. Only then can credit be properly reflected on the company for its safety efforts and achievements.

2. SAFETY RESPONSIBILITIES AND POLICIES.

a. Management

It is the responsibility of Management to provide and maintain an effective, comprehensive, and formal safety program.

To implement this program it is the policy of Management to assign and delineate responsibility while retaining the basic control of administration, interpretation, expenditures, and final decision on matters of major importance.

b. Supervisors

The supervisor in direct charge of a job has an absolute primary responsibility for the safety of all men working under his direction and for all equipment and areas under his supervision. Stated bluntly, if a man is hurt, some degree of responsibility will always fall on that man's supervisor. If we accept the theory that all accidents are avoidable, then every accident is someone's fault.

It follows then that the key man in any safety program is the supervisor. To perform his job properly in this respect, he must have:

- (1) A complete acceptance of responsibility for safety in his department,
- (2) Adequate authority to enforce all safety regulations,
- (3) A highly developed "safety consciousness",
- (4) A thorough knowledge of all possible safety hazards in the department,
- (5) A working knowledge of all phases of the safety program,
- (6) A consciousness of human frailties as related to safety.

c. Safety Engineer

The Safety Engineer acts in an advisory capacity on all matters pertaining to the administration of safety policies established by Management.

In discharging his duties, the Safety Engineer will:

- (1) Coordinate safety activities,
- (2) Keep and analyze accident records,
- (3) Conduct activities for stimulating and guiding the accident prevention program and maintaining the interest of supervisors and employees,
- (4) Supervise and appraise accident investigations,
- (5) Plan and direct a regular program of safety training and inspection,
- (6) Check and report on operations for compliance with applicable safety laws and codes and with the policies and standards prescribed by Management,
- (7) Issue regular reports showing safety performance.

d. Industrial Radiological Engineer

The Industrial Radiological Engineer acts in an advisory capacity on all matters pertaining to the administration of radiological health and safety policies established by Management.

In discharging his duties the Industrial Radiological Engineer will:

- (1) Coordinate radiological health and safety activities,
- (2) Maintain all necessary records of exposure to radiation and radioactive materials,
- (3) Make sufficient surveys and determinative investigations to evaluate any possible radiation hazard,
- (4) Plan and direct a program of radiological health and safety training and inspection,
- (5) Check and report on operations for compliance with applicable radiation protection laws and codes, and with the policies and standards prescribed by Management.

e. Plant Engineer

The Plant Engineer is responsible for design and construction of all plant structures and related equipment in accordance with accepted engineering and safety standards.

He will make periodic inspections of existing structures and related equipment and report his findings and recommendations to Management concerning the condition thereof.

f. Communications

In promoting safety, it is the responsibility of the Communications Office to obtain and effectively disseminate information regarding safety activities through Supervisor's News Bulletins, plant and mine newsboards, letters to employees' homes, press, and radio.

g. Employees

Cooperation in the safety program is the moral obligation of each individual employee. Ultimately the employee and his family suffer the greatest personal hardship through loss of work arising from personal injury or damage to equipment.

Some major responsibilities of the individual employee are as follows:

- (1) To work safely at his job,
- (2) To be alert for the safety of himself and fellow employees,
- (3) To have regard for the safety of the equipment and physical property with which he works,
- (4) To use his knowledge and influence to prevent accidents,
- (5) To become safety conscious and to report unsafe conditions and practices,
- (6) To make suggestions and recommendations for improvement of safety,
- (7) To read, understand, and observe all safety rules and regulations.

3. TYPES OF HAZARDS.

a. Industrial

(1) Definition:

The term industrial hazards as used herein is meant to include those occupational hazards which are common to all industry, and which cause immediate physical injury. Certain other hazards which may cause damage to health long after exposure such as ionizing radiation and silica dust are treated individually and in detail in subsequent sections of the handbook.

Industrial hazards might include, for example, such classifications as:

- Mechanical hazards
- Electrical hazards
- Chemical hazards
- Explosive hazards
- Traffic hazards
- Housekeeping hazards
- "Horseplay" hazards.

Company regulations regarding such hazards which are applicable to the operation as a whole are grouped in the General Safety Rule Book which has been supplied to every employee. Those regulations which apply only to particular departments are grouped in individual department rule books.

b. Radiological

(1) Definitions:

Radiological Health is the art and science of protecting human beings from injury by radiation.

Radioactivity is a naturally occurring process whereby the nucleus of an atom undergoes spontaneous disintegration in which energy is liberated in the form of radiation.

Radiation consists of the energy emitted in the form of particles and rays from the nucleus of an atom during radioactive disintegration. This radiation occurs in the following three forms.

Alpha particles are the least penetrating of the three forms of radiation and constitute no hazard unless they are emitted within the body of a person.

Beta particles are much more penetrating than alpha particles and constitute both internal and external hazards.

Gamma rays are the same as X-rays and have tremendous penetrating power and constitute both internal and external hazards.

Restricted area means any area to which access is controlled by the Company and shall not include any areas used as residential quarters.

Unrestricted area means any area into which entry is not controlled by the Company or any area used as residential quarters.

External radiation is from a source outside the human body.

Internal radiation is from a source within the human body.

(2) Standards:

Under State and Federal regulations, standards have been established which limit the amount of radiation to which a person may be exposed in a restricted area. Such standards limit radiation exposure to a level at which a person may be subjected for eight hours per day, five days per week, for a period of 50 years without experiencing any harmful effects. At the Bluewater Millsite the restricted area incorporates Company property north of the Anaconda Housing Community. This includes all buildings, stockpiles, and tailings ponds. Even though the mines are not classified as restricted areas, the same radiological standards apply for occupational exposure for employees working at these locations.

Standards have also been established which limit the amount of radiation to which a person may be exposed in an unrestricted area. In general, these standards are one-thirtieth of those specified for a restricted area.

(3) Types of Radiological Hazards:

Internal radiation hazards most generally result from air-borne radioactive material in the forms of dust and mist. This is the greatest potential hazard encountered in mining and milling uranium ore. Such material being capable of entering the body through the respiratory system manifests itself as an internal radiation hazard. An internal radiation hazard may also be the result of ingestion of radioactive materials with food or drink or while smoking.

External radiation hazards may be encountered wherever radioactive materials, which emit beta particles or gamma rays, are allowed to accumulate. For example, experience has shown that wooden equipment in contact with uranium-bearing solutions can accumulate sufficient radioactive material to result in an external radiation hazard. Normally, uranium ores, process solutions, and waste effluents do not constitute an external radiation hazard.

(4) Prevention and Removal of Radiological Hazards:

Internal radiation hazards must be controlled in part by limiting air-borne dust and mist. This is accomplished by such devices as adequate hooding, exhaust ventilation, dust collection systems, and operational changes which decrease the amount of dust or mist generated. Specially selected respirators are of value for limited use whenever abnormal conditions exist.

The internal radiation hazards which result from the ingestion of radioactive materials may be controlled only by strict adherence to the rules of personal cleanliness.

External radiation hazards are controllable by the three factors of time, distance, and shielding (commonly referred to as TDS). Limiting the time of exposure, increasing distance from the source of radiation, and placement of shields between the source and the person are the means employed. These combined factors as applied to the Bluewater operations are adequate to meet the standards as set forth in State and Federal regulations.

(5) Radiation Surveys:

Surveys to determine the concentration of air-borne radioactive materials are conducted by taking general area and breathing-zone air samples. General area samples are taken in areas where the air-borne radioactive materials are more or less uniformly distributed. Breathing-zone samples are taken for operations during which a person may be exposed to a specific source of air-borne radioactive material. External radiation surveys are conducted with the aid of film badges and Geiger counters. Film badges are of great value in that they continually record the radiation exposure of an individual and can be applied to any number of individuals. The Geiger counter is valuable for spot checks of radiation levels.

Environmental surveys are also made at the perimeter and outside of the restricted area to determine whether or not amounts of radioactive materials are entering the surrounding environment in excess of the limits established for an unrestricted area. Such surveys include both air and water samples.

Record keeping and reporting of radiation surveys by the Company are made mandatory by State and Federal regulations. These require the maintenance of records pertaining to external radiation exposure of individuals if such exposure exceeds 25% of the limit specified in the regulations. The Company also is required to maintain records of all other surveys made to evaluate possible radiation hazards. The Federal regulation requires the Company to make available to the employee certain information concerning his radiation exposure. The Company is required to give a written notice to any person who receives a radiation exposure in excess of any applicable limit as set forth in the regulation. If an employee so requests, the Company must advise him annually of his exposure to radiation.

(6) Radiological Safeguards:

The Company has available survey instrumentation to adequately evaluate any possible radiation hazard that may be encountered.

A fully equipped radiological laboratory is available for the determinative investigation of any possible radiation hazard.

Gaseous dilution and dispersion effect a safeguard by exhausting contaminated air to the atmosphere through elevated stacks.

The solid and liquid effluents from the milling process contain appreciable quantities of radioactive materials. As radiological safeguards, the solids are retained in a tailings pond within the restricted area and the liquid is disposed by means of an injection well.

Clothing worn by employees performing certain jobs in the mill may become contaminated with radioactive materials. As a safeguard against any possible external radiation hazard resulting, such clothing is decontaminated by special laundering procedures.

c. Respiratory

(1) Definition:

The term respiratory hazard as used herein is meant to include those occupational hazards which result from inhalation of the following:

- (a) Siliceous dusts,
- (b) Toxic dusts,
- (c) Irritating or poisonous vapors, mists, gases, or dusts.

(2) Types of Respiratory Hazards:

- (a) Siliceous dust hazards may be encountered wherever excessive amounts of rock dust are present in the air. Such conditions may exist in the crushing plant and bucking room of the mill and during drilling operations at the mine.
- (b) Typical of toxic dusts encountered in our operations are manganese dioxide, uranium ore dust, and yellow cake.
- (c) Typical of the irritating or poisonous vapors, mists, gases, and dusts which may be encountered in our operation are dry reagents, sulfur dioxide, sulfur trioxide, benzene, toluene, carbon tetrachloride, paint solvents, and carbon monoxide. Certain other substances which may give off irritating or poisonous vapors, mists, and gases are used in the chemical laboratory.

(3) Prevention and Removal of Respiratory Hazards:

It is Company policy to control respiratory hazards by all practicable means. This is accomplished by such devices as adequate hooding, exhaust ventilation, dust collection systems, wet drilling, and operational changes. Specially selected respirators are of value for limited use whenever abnormal conditions exist.

It is the responsibility of the supervisor to be aware of the hazards and methods of control for the dusts, gases, mists, and vapors which may be encountered in his department. He is also responsible to see to it that all employees under his supervision are properly protected.

d. Bacteriological

At New Mexico Operations, bacteriological hazards might be encountered in only a few areas. Specifically these would be:

(1) Contaminated Water Supply:

A program of water sampling at regular intervals has been carried on for many years. Samples are taken both at the source and the point of delivery of our water supply. These samples are analyzed by the New Mexico Department of Public Health to determine bacterial content. Should the sample show contamination, a check sample is taken. If this sampling should prove the water supply to be contaminated, steps are taken to eliminate the source of contamination or to render the water potable by filtration or chemical disinfection.

The water supply, at both the Mill and the Mine, is relatively free of bacterial contamination.

(2) Personal Facilities:

Drinking fountains which permit employees to drink from a flowing stream of water are considered sanitary. They should be used for drinking purposes only—not as a mouth-wash or disposal means for coffee grounds, or other trash. Under no circumstances will the use of a common drinking cup be permitted.

Washroom facilities which have no stoppers such as our "bird bath" type wash fountains eliminate standing water which can transmit disease from one employee to another.

Common hand towels are a means of transmitting disease. Washrooms are provided with paper towels with a disposal receptacle nearby.

All shower room floors are scrubbed daily. As an additional safeguard against infection, it is recommended that each employee wear his own wooden clogs in the shower room. Contrary to popular opinion, pans of antiseptic solution commonly seen at the entrance to some shower stalls are useless for killing organisms. Moreover, they are a nuisance to keep clean and are a potential breeder of bacteria.

Floors and fixtures in all toilet rooms are scrubbed daily to prevent the spread of disease.

Protective devices, such as respirators, which are worn by different employees or which are reconditioned and reissued, must be cleaned and sterilized before such use or reissue.

In all departments waste and trash receptacles are to be washed out regularly and maintained in a sanitary condition. Wherever possible these receptacles should have suitable covers.

The supervisor is responsible for the correction or reporting of any condition in his department which presents a bacteriological hazard.

A strict observance of the rules of personal cleanliness is the best formula for avoiding most bacteriological hazards.

4. SAFETY ADMINISTRATION.

a. Indoctrination and Training

As in other phases of the safety program, the responsibility for employee indoctrination and training rests upon the immediate supervisor.

(1) For the New Employee:

- (a) Acquaint him with the general safety rules.
- (b) Discuss specific rules and procedures applying to his job and to his department.
- (c) Emphasize that safety rules are to be obeyed and that repeated violations are cause for discharge.
- (d) Impress him with the importance of good housekeeping.
- (e) Encourage him to report any condition that he considers to be unsafe.
- (f) Acquaint him with available first-aid facilities.
- (g) Outline the personal safety equipment required on his job and instruct him as to how this equipment can be obtained.
- (h) Thoroughly impress upon him the fact that he is primarily responsible for his own safety on the job.
- (i) Instruct him in the use of safety devices and insist that such devices be used.
- (j) Inform him of any safety contests or award programs.
- (k) Encourage a feeling of interest and concern in the departmental and general safety records.
- (l) Inform him that his attendance at safety meetings and participation in first-aid training is mandatory when scheduled.

(2) As a Continuous Program for All Employees:

- (a) The supervisor will at all times govern his actions so as to present a good example of safe working habits.
- (b) Emphasize that the only right way to do a job is the safe way.

- (c) Be always observant and correct unsafe practices before they become habitual.
- (d) Constantly stress the importance of good housekeeping.
- (e) Periodically remind each employee of the hazards connected with his job in an effort to avoid a sense of false security, particularly in older employees, that may lead to a feeling that accidents can't happen on that particular job.
- (f) Encourage older employees to help new men establish and maintain good safety habits.
- (g) Instruct all employees in the use of, and reason for, newly developed safety devices as they become available and then insist that such devices be used.
- (h) Be always on the alert for horseplay and to stop such practices immediately when discovered.

The above safety reminders should be a part of the day-to-day contact with the men.

The regularly scheduled safety meetings present an opportunity to remind the men as a group of their safety obligation to themselves and to the company.

(3) Specific Training Programs:

(a) First-Aid Training

It is the Company policy at New Mexico Operations to provide for the training of all supervisors and hourly employees in first-aid in accordance with standards established by the Company.

Provision is also made for a continuous program to re-train 25% or more of the working force yearly in compliance with the New Mexico Mine Safety Code.

Administration of this program will be under the direction of the Safety Engineer. He may be supervised and further directed by Management, in cooperation with the department heads, as to the number, selection, and time of training of employees within each department of the New Mexico Operations. It will be the prime responsibility of the Safety Engineer to maintain records of training, and to develop training schedules as needed. It shall also be the responsibility of the

supervisors to maintain similar records for the employees within their departments so that they may coordinate and cooperate with the Safety Engineer in the execution of this program.

All supervisors must know and inform the employees they supervise that attendance at first-aid classes, when so scheduled, is mandatory and that hourly employees will be paid for any extra time spent in such classes.

(b) Other Training Programs

All supervisors and employees will participate in any additional safety training programs when scheduled to do so.

b. Inspections and Reports

(1) Safety Engineer:

The Safety Engineer will make periodic formal inspections of each department of the New Mexico Operations. When making such inspections, he is to be accompanied by the appropriate department head and any other supervisor directly concerned. The results of each inspection are to be indicated and explained by the Safety Engineer on a report form. Copies of the report are presented to Management as well as to the department supervisor as a matter of record and for any necessary action required.

(2) Industrial Radiological Engineer:

The Industrial Radiological Engineer will make periodic inspections and surveys for the purpose of evaluating any possible radiation hazards. Reports of these inspections and surveys are made to management and to certain governmental agencies.

(3) Supervisor:

Although a written report is generally not required, it is expected that each supervisor will make a continuing inspection of his department to determine and to improve the level of safety within that department. He should give particular attention to safety devices, practices, and attitudes.

(4) Employee:

It is expected that each employee will make a continuing inspection of his work place to detect hazards which may

THE ANACONDA COMPANY
New Mexico Operations
P.O. Box 638, Grants, New Mexico

PERIODIC SAFETY HAZARD INSPECTION REPORT

	Satisfactory	Unsatisfactory
1. Atmospheric Conditions: Dust, Gas, Fumes, Spray, Other	<input type="checkbox"/>	<input type="checkbox"/>
2. Chemical Substances: Liquids or solids, toxic in nature, etc.	<input type="checkbox"/>	<input type="checkbox"/>
3. Containers: Barrels, Boxes, Bottles, Cans, etc.	<input type="checkbox"/>	<input type="checkbox"/>
4. Conveyor System:	<input type="checkbox"/>	<input type="checkbox"/>
5. Electrical Conductors and Apparatus: Wires, Cables, Switches, Controls, Lamps, Transformers, Batteries, Fuses, etc.	<input type="checkbox"/>	<input type="checkbox"/>
6. Firefighting Equipment: Extinguishers, Sprinklers, Alarms, etc.	<input type="checkbox"/>	<input type="checkbox"/>
7. Guards and Safety Devices: All removable and fixed guards and safety devices or attachments.	<input type="checkbox"/>	<input type="checkbox"/>
8. Handtools (all kinds): Equipment that is held or carried when in use.	<input type="checkbox"/>	<input type="checkbox"/>
9. Hoisting Equipment: Cranes, Derricks, Airhoists, Hydraulic Jacks, Elevators, etc.	<input type="checkbox"/>	<input type="checkbox"/>
10. Inflammables and Explosives: Safe storage.	<input type="checkbox"/>	<input type="checkbox"/>
11. Machinery and parts thereof: Agitators, Grinders, Classifiers, other	<input type="checkbox"/>	<input type="checkbox"/>
12. Mechanical Power Transmission Systems: Shafts, Bearings, Gears, Pulleys, Cables, Belts, Sprockets, Ropes, etc.	<input type="checkbox"/>	<input type="checkbox"/>
13. Overhead Structures and Equipment: Structural parts or equipment that may fall from above.	<input type="checkbox"/>	<input type="checkbox"/>
14. Personal Protective Clothing and Equipment: Goggles, Gloves, Respirators, Hard Hats, etc.	<input type="checkbox"/>	<input type="checkbox"/>
15. Pressure Vessels, Boilers and Pipes: Objects subject to internal pressure from compression of liquids or gases.	<input type="checkbox"/>	<input type="checkbox"/>

Periodic Safety Hazard Inspection Report

	Satisfactory	Unsatisfactory
16. Pumps, Compressors, Blowers and Fans: Objects that move or compress liquid, air, gas.	<input type="checkbox"/>	<input type="checkbox"/>
17. Shaftways, Pits, Sumps, Floor Openings: All types of openings into which persons may fall or trip.	<input type="checkbox"/>	<input type="checkbox"/>
18. Walking and Standing Surface: Floors, Aisles, Stairs, Platforms, Scaffolds, Roads, Ladders, etc.	<input type="checkbox"/>	<input type="checkbox"/>
19. Warning and Signal Devices: Radio, Telephone, Buzzers, Bells, Lights, etc.	<input type="checkbox"/>	<input type="checkbox"/>
20. Vehicles and Carry Equipment: Motorized carts and nonmotorized equipment for transporting materials such as, trucks, trains, cars, etc.)	<input type="checkbox"/>	<input type="checkbox"/>
21. General Housekeeping and Miscellaneous	<input type="checkbox"/>	<input type="checkbox"/>

Explain all unsatisfactory ratings in remarks, referring to item number, the exact nature of unsafe condition, steps taken to correct it.

REMARKS: _____

Department Representative

Inspector

Date of Inspection

cause injury to himself or others. Hazards which he himself cannot correct should be reported to his supervisor immediately.

(5) Other:

Although a supervisor may not be directly involved in the inspection, he should know that safety inspections are made and reported to management by the following parties. The supervisor must also know that these agencies have the power to directly and adversely affect this operation if the findings of the following so justify:

- (a) U. S. Department of Labor,
- (b) U. S. Bureau of Mines,
- (c) U. S. Atomic Energy Commission,
- (d) New Mexico State Inspector of Mines,
- (e) New Mexico Department of Public Health,
- (f) New Mexico State Engineer,
- (g) Bureau of Safety, Butte Office of The Anaconda Company,
- (h) Workmen's Compensation Carrier
(The Travelers Insurance Company),
- (i) Factory Insurance Association,
- (j) Johnson & Higgins Insurance Brokers.

c. Meetings

Safety meetings are to be held by each department at such intervals and times as have been previously scheduled and agreed upon by the department head and the Safety Engineer but at intervals not less frequent than once each six weeks. Where departments change shifts, safety meetings are generally scheduled during the period that each shift is working days.

Attendance at safety meetings is mandatory for all employees with the absence of an employee from such meeting being duly approved and noted by his immediate supervisor. For this reason, where safety meetings are scheduled to be held or extend beyond the regular scheduled work shift, affected employee will:

First, be notified of the scheduled time of the safety meeting at least one day in advance of such meeting, and

Second, be paid the appropriate overtime for such time spent at a safety meeting beyond his regularly scheduled shift.

Although circumstances may in some cases dictate otherwise, the immediate supervisor of the employees attending a safety meeting is the chairman of such meeting and therefore responsible for conducting the meeting. The Safety Engineer, if present, attends in the capacity of an adviser only and in no way is responsible for the conduct of the meeting. However, it is to the benefit of the chairman to plan the program in advance of the meeting with his immediate supervisor and with the aid of the Safety Engineer.

To assist the chairman in conducting the safety meeting, a form is provided upon which to write the minutes of the meeting. Before the meeting, this form should be filled in to include the status of all "Unfinished Business" and "New Business" as recorded in the minutes of the previous safety meeting. Such information would then properly be classified as either "Finished Business" or "Unfinished Business." It is important that the status of such safety suggestions be accurately stated.

A suggested procedure for conducting a meeting is as follows:

- (1) A notation of the meeting time and a list of all those present should be made.
- (2) The minutes of the previous meeting should be read and approved.
- (3) The safety suggestions brought forth in the previous meeting which have been acted upon and finished should be discussed for the information of the group.
- (4) The safety suggestions that remain unfinished should likewise be discussed and the status of their completion stated.
- (5) The meeting should then be opened for discussion of any new safety suggestions. Each employee should be encouraged to participate by asking him personally for any safety ideas or suggestions. The names of the persons whose suggestions are accepted will be noted in the minutes.
- (6) After all new safety suggestions have been properly discussed and noted the remainder of the meeting can be devoted to any planned program as prepared by the chairman and/or the Safety Engineer.

UNFINISHED BUSINESS:

1.

NEW BUSINESS:

1.

GENERAL COMMENTS:

There being no further business, the meeting adjourned at _____,

Chairman

- (7) Upon completion of all safety business the meeting should be adjourned.

The chairman of a safety meeting should be cognizant of the following:

- (1) The safety meeting is basically the employee's meeting. It is not held exclusively for the benefit of the supervisor to lecture the employees.
- (2) Any discussion not related to safety must be discouraged. Such discussion, if desired, can be taken up after the close of the safety meeting.
- (3) Ideas or suggestions should be courteously received. If a suggestion is obviously impractical, the man and his suggestions should not be brushed off abruptly but rather a good and justifiable explanation for rejection should be given and in such a manner as to leave the person with a feeling of satisfaction and attentive consideration. A suggestion so declined should, of course, not enter the minutes as "New Business" but, if it is desired, could be reported and explained under "General Comments."

The minutes of the safety meeting should be completed by the chairman as soon after the meeting as practicable. Such minutes should then be discussed with the chairman's immediate supervisor for final editing before typing. Each safety suggestion appearing in the minutes must be accompanied by a statement of what has been done or what is intended to be done toward its completion. Such completion is mandatory for accepted suggestions and at the earliest practicable time.

d. Accidents

The Company maintains an ambulance at the Millsite and at the Jackpile Mine. These are equipped with resuscitators, splints, stretchers, and first-aid supplies, and are available at all times for employees on the job and to persons living in the housing areas at the Mill and the Mine.

Company ambulances should be operated only by designated personnel. At Millsite certain individuals have been named as qualified ambulance drivers. One of these people will drive when ambulance service is necessary. At the Mine, any supervisor is considered as being a qualified driver, and the senior supervisor present may assign any qualified person he desires to the job. However, care should be taken to determine that the person assigned for the purpose has a driver's license in his possession. Drivers must realize that high speed, in most cases, is not essential or desired. Company ambulances are equipped with flasher lights and sirens; however, the vehicles are subject to traffic laws applicable to

privately owned automobiles and the devices are only an assistance in obtaining right-of-way at intersections and under congested traffic conditions.

Ambulance service procedures differ somewhat at the two localities. However, in extreme emergencies the vehicles may be sent or taken to the scene by any responsible person. Care should be exercised to avoid confusion in instructing the driver as to the location of the accident and in passing on any other available information.

(1) Care of the Injured on the Job:

(a) Millsite

Immediately after the occurrence of an accident on the job involving injured personnel, the first supervisor on the scene will take charge and:

- (i) Ascertain the nature of the injury and make certain that adequate first aid is rendered.
- (ii) Contact Mill Repair Department to dispatch ambulance to the scene if necessary.
- (iii) Call Company nurse at TR 6-2360 during day shift Monday through Saturday or at TR 6-2364 at all other times and on holidays.

Describe nature of injury and follow instructions given by nurse.

- (iv) In the event the nurse is not immediately available, and the patient obviously needs hospital care, call Cibola Hospital, AT 7-4446, notifying them of the severity of the injury and that the patient is being brought to the hospital.
- (v) Personally check that all steps of the above procedure have been accomplished and that the ambulance is correctly dispatched to the proper destination.
- (vi) Notify his immediate supervisor and the Safety Engineer as soon as possible, giving them all pertinent information and actions taken in the matter.

(b) Mine

Immediately after the occurrence of an accident on the job involving injured personnel, the first

INSTRUCTIONS TO MILL REPAIR DEPARTMENT FOR
RECEIVING AND EXECUTING EMERGENCY CALL FOR AMBULANCE

I. Call Originating in Plant Area

- A. When emergency call is received by an employee of the Mill Repair Department, in the absence of the Department Foreman, he will follow the instructions as given by the Supervisor initiating the call and dispatch the ambulance as soon as possible to the designated location.
- B. In all cases, the name of the Supervisor initiating such a call should be obtained and noted.

II. From Source Other Than Plant Area

- A. When emergency call is received by any employee of the Mill Repair Department, he will immediately contact the Mill Repair Foreman to take the call. If such foreman is not readily available, he must contact any available Mill Foreman to take the call.
- B. The Supervisor taking the emergency call will obtain and record on the form provided, the following information:
 - 1. Name, telephone number and location of person originating the emergency call.
 - 2. Name and Company affiliation of person needing ambulance service.
 - 3. Nature of the emergency.
 - 4. Where and how soon ambulance is needed.
 - 5. Where person requiring ambulance service is to be taken.
 - 6. Name of person relaying this emergency call (Telephone Operator or Power Plant Operator).
 - 7. Your name and time and date message was received.
- C. The Supervisor taking the emergency call must decide if and how the ambulance can be dispatched in keeping with recognized Company policy.
- D. Upon dispatching the ambulance, he will properly instruct the man he has assigned to drive the ambulance and make sure that such driver has the above information. If the resuscitator is needed, a man familiar with its operation will also be assigned to accompany the driver along with any additional help that might be required.

INSTRUCTIONS TO SWITCHBOARD OPERATOR AND POWERHOUSE OPERATOR
FOR RECEIVING AND EXECUTING EMERGENCY CALL FOR AMBULANCE

- A. When taking emergency call, obtain and record on the form provided, the following information:
1. Name, telephone number and location of person originating the emergency call.
 2. Name and Company affiliation of person needing ambulance service.
 3. Nature of the emergency.
 4. Where and how soon ambulance is needed.
 5. Where person requiring ambulance service is to be taken.
 6. Your name and time and date message was received.
- B. Immediately contact the Mill Repair Department and ask for the Mill Repair Foreman. If such foreman is not readily available, ask for any available Mill Foreman.
- C. As soon as you have contacted and recognized supervisor, relay the above information being sure that he understands what has been said. Obtain the foreman's name and record on form described above.
- D. Special Instructions to Powerhouse Operator:
- If Mill is not operating, contact Mechanical Department Foreman on duty (this name you have on the "Foreman Schedule" and in the Log Book) and Jack Sabo, TR 6-2653 and pass the above information on to them.

REQUISITIONING AMBULANCE
AT JACKPILE MINE

At the Mine, anyone requesting the ambulance during day shift and on regular work days should contact the Mine Office by radio or any other available means, giving the location and all other pertinent information. The vehicle, ordinarily parked at the Office, will be sent directly to the scene and upon arrival will be placed at the disposal of the senior supervisor present. It is his responsibility to see that the injured is properly loaded and that the ambulance is dispatched to the final destination with a qualified driver (supervisor if possible) accompanied by sufficient responsible help to answer the needs of the emergency. Unless individual desires, or contrary instructions are received, the injured should be transported to the Bataan Memorial Hospital in Albuquerque.

During swing and graveyard shifts and on Sundays and holidays anyone requiring the ambulance should proceed to the Housing Area by the quickest available means where the vehicle is obtainable from the parking zone in front of House No. 3. Upon arrival at the required location the procedure to be followed will be the same as previously outlined.

In all cases, Mine Management should be notified, as soon as possible, when the use of the ambulance has become necessary. The arrangements for medical treatment will be made either by telephone or by written authority depending upon circumstances.

supervisor on the scene will take charge and:

- (i) Ascertain the nature of the injury and make certain that adequate first aid is rendered.
- (ii) Call ambulance to the scene if necessary.
- (iii) Notify Mine Management as soon as possible, giving all pertinent information and actions taken in the matter.

(2) Off the Job Emergencies:

(a) Millsite Housing

The switchboard and Power Plant operators have definite and exact instructions concerning the procedure to be followed upon receipt of a call for the ambulance and will accept the responsibility of notifying the correct personnel for the dispatching of the vehicle to the requested locality.

See instruction sheets covering the responsibilities of the switchboard operators, Power Plant operators, and Mill Repair foreman relative to ambulance service.

- (i) The Company's nurse is available for advice or consultation in the event of emergency. She may be contacted at TR 6-2360 from 7:00 A.M. to 3:30 P.M. Monday through Saturday or at TR 6-2364 on holidays and at all other times.

- (ii) Anyone requesting the Millsite ambulance should:

First, call TR 6-2387 any time of the day or night. The call will be answered by either the switchboard operator or the Power Plant operator.

Second, state "THIS IS AN EMERGENCY!" Give your name and location, the nature of the emergency and how soon and where the ambulance is required. Also, give any other information requested by the person taking the call.

(b) Mine Housing

If ambulance service is desired during day shift on regular work days the Mine Office should be contacted. During swing or graveyard shifts, on Sundays or holidays, arrangements should be made through the Mine Superintendent or his assistant. In the absence of both of these individuals the ambulance is to be

found in the parking zone in front of House #3. When the mine is working on swing or graveyard shifts, the mine foreman on duty should be notified upon the departure and return of the ambulance.

(c) Other

It is Company policy that if public ambulance services are not available in time of need by employees living within the Grants-Bluewater area, the Company ambulance will be made available to those employees and their dependents.

At the Mine, ambulance service is not available to Company personnel off Company premises except by decision of Mine Management.

The Company ambulance will not be sent out to meet requests originating from persons outside of the Company employ or its operations. In dire need or in catastrophic emergency, the Company ambulance may be made available but only on direct permission from the Manager or Assistant Manager.

In no case will the Millsite ambulance be dispatched to a destination further than the Cibola Hospital, unless approved by the Manager or Assistant Manager.

(3) Accident Investigation and Reports:

Management directives require two separate types of formal accident reports to be filed. They are:

First, Accident Report, and

Second, Report of Property, Vehicle, or Equipment Loss or Damage.

To insure the timely and proper reporting of all incidents, a short report form called, "Immediate Report of Incident", is to be used. This form, prepared in pocket-booklet size, is to be used by the shift supervisor to report any and all damage or injuries occurring on his shift, regardless of how minor they may be. Also, this method is to be used to report mishaps that result in "near misses" where equipment is almost damaged or persons almost injured. In this way the shift supervisor can share the responsibility for correcting hazardous practices or conditions with his department supervisor.

The "Immediate Report of Incident" is to be made out in duplicate. The original is to be given to the department

THE ANACONDA COMPANY
New Mexico Operations

██████████ ACCIDENT REPORT

Name of Injured _____ Payroll Number _____

Address of Injured _____

Occupation _____ Department _____

Date of Accident _____ Day _____ Time _____ A.M.
P.M.

Date Disability Began _____ Date Accident Reported _____

Machine, tool or thing causing injury _____

Kind of power (hand, electric, steam, etc.) _____ Was Safety appliance or regulation

provided _____ Was it in use at that time _____ Was accident caused by injured's failure to use or

observe safety appliance or regulation _____

Give a detailed story of the accident, what the injured man was doing, how and where the accident happened:

How could it have been prevented? _____

Was injured wearing prescribed safety equipment? _____ Worked longer than regular workday? _____

Hour employee started work _____ ^{a.m.} p.m. How long in present occupation? _____

Names and addresses of witnesses _____

Nature and Location of Injury (right or left) _____

Has injured man returned to work? _____ If so, give date _____

Name of Doctor _____

Hospital _____

Date of this report _____ Foreman on duty _____

Was employee outside or inside when injured? _____

What were light conditions at the area where injury occurred? _____

If poor, explain: _____

If outside, what were weather conditions? _____

If injured fell or wrenched muscles was floor or footing wet or slippery? _____

If slippery, with what and why? _____

Signature of Supervisor making this report: _____

EMPLOYEE'S STATEMENT OF HOW THE ACCIDENT HAPPENED:

Employee's Signature: _____

SAFETY ENGINEER'S OR INSURANCE ADMINISTRATOR'S STATEMENT OF INVESTIGATION:

Signature: _____

REPORT OF PROPERTY, VEHICLE,
OR EQUIPMENT LOSS OR DAMAGE

Complete description of unit:

Describe how the damage or loss occurred:

Describe the damage in detail:

Was fire involved?

If so, explain:

Time and place of incident: Date: _____ Time: _____ A.M., P.M.
Place: _____

Present location of damaged unit: _____

List persons directly involved:

(name)	(address)	
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Other witnesses:

Estimated cost of replacement or repair:

Was anyone injured?

If so, explain:

Was a "third party" (someone not employed by Anaconda) involved? _____

If so, list names and addresses:

Describe damage to "third party":

Who was responsible for the accident in your opinion?

How can a recurrence be prevented?

Signed: _____
(Supervisor)

The
TEN COMMANDMENTS
of reporting
Property, Vehicle and Equipment Loss or Damage

(1)...Prepare and submit without delay an "Immediate Report of Incident." Follow it within one or two days with this complete written report.

BE SURE YOU REPORT:

(2)...All damage, of any nature, in excess of \$100.

(3)...All losses, regardless of value, where personal injury is involved.

(4)...Any damage caused us by a "third party" (a person not employed by Anaconda).

(5)...Any damage that we may cause, or that is claimed by a "third party."

#

(6)...Always be absolutely certain there has been no personal injury when you report none. (Our payment of any property damage would then make us liable for a later claim of injury.)

(7)...Repair work cannot begin until the initial report of damage has been made. However, damaged equipment and property can be partially dismantled, if need be, to get a closer estimate of the amount of damage, PROVIDED THE DAMAGED PARTS ARE KEPT FOR INSPECTION BY OUR INSURERS.

(8)...Any "outside" repair bills should be forwarded to our Accounting Department promptly.

(9)...Be sure the Insurance Department is informed whenever new vehicles, boilers, furnaces, electric motors, or pit equipment is placed in use, or whenever old equipment of this type is discontinued in use.

##

IMMEDIATE REPORT OF INCIDENT

Equipment or Property, Loss or Damage.

Personal Injury.

Description of Damage: _____

Names of Injured: _____

Time & Date of Incident: _____ AM, PM _____. Date Reported to You: _____

Location Where Incident Occurred: _____

Personnel & Witnesses Involved: _____

Statement of How Incident Happened: _____

Date of This Report: _____ . Signature: _____

(Please Department Safety Insurance Mechanical
Routing: Initial) Supervisor _____, Engineer _____, Department _____, Department _____

supervisor by the end of the shift in which the incident is discovered. The duplicate remains in the booklet.

(a) Personal Injuries

When an employee is injured, the Shift Supervisor to whom the accident is reported should make an immediate investigation of the accident and, during the same shift, complete the "Immediate Report of Incident", and place it in the possession of his Department Supervisor.

When this is done the Department Supervisor will initial the report after noting its contents and promptly pass it along to the next departments on the routing list; namely, the Safety Department and the Insurance Department.

The Department Supervisor, Safety Engineer, and/or the Insurance Administrator will then instigate an investigation of the incident. When this has been done the Department Supervisor will complete the formal "Accident Report." This, along with the immediate report will be made a permanent part of Personnel records—in the Safety Department, if only first aid was required—and in the Insurance Department, if medical care or lost time resulted.

(b) Damage to Equipment

It is the primary responsibility of the Shift Supervisor to report all damage, thefts, or losses under his jurisdiction to his Department Supervisor, by means of an "Immediate Report of Incident."

By means of the routing list on this report the incident will then become known to the Safety Department, the Insurance Department, and the Mechanical Department.

All damage should be reported whether it puts the damaged equipment out of use or not.

If the damage or loss is of sufficient value, the Safety Engineer and/or the Insurance Administrator will contact the Department Supervisor and assist in the investigation and completion of the formal report and any insurance report that may be necessary.

e. Safety Incentive Programs

Safety incentive programs are any features of the over-all safety program that provide motivation or awards to the employee for participation in accident-free periods of operation or in some other way promoting safety. Such awards may be intangible, that is, through favorable public notice, or the knowledge that New Mexico Operations is a safe place to work; or, they may be in the form of tangible articles. Typical and current safety incentive programs that have been instituted at this operation are as follows:

- (1) The Accident-free Period Awards,
- (2) The Safety Suggestion Program,
- (3) The Safety Incentive Phone Call Program,
- (4) The Safety Poster Program,
- (5) The Safety Bulletin Board Program.

These programs, however, are subject to change or to complete elimination at any time by the Company.

Safety incentive programs are not to be considered as compensating employees for working safely. They are designed solely to stimulate the interest of employees in safety and to develop safety consciousness in employees and their families. It is clear that all of our people have much to gain, other than awards under these programs, by avoiding injuries. Expensive awards or payment in any form should not be expected of the Company. The Company contributes greatly when it provides safe working places, the services of a safety director and radiological engineer, wages for attending safety meetings and first-aid classes, safety devices, personal safety equipment and clothing, and countless other items. All of these facts should be pointed out by the supervisor when discussing safety awards with the employees in his department.

f. Enforcement of Safety

(1) Laws and Regulations - Types of Enforcement:

This section refers to the actions which may be taken by outside agencies to compel the Company to conduct a safe operation. Several Federal and State agencies are involved and each has various methods of enforcement which, however, will come under one or more of the following headings:

(a) Executive Action

This is a power granted by law to an authorized official or agency to take immediate action to remedy a hazardous situation.

(b) Criminal Action

This grouping refers to various laws which state certain safety violations to be criminal acts. Conviction in court results in the penalties set by law.

(c) Injunctive Action

An appropriate agency may secure a court injunction forbidding violation of safety regulations established by law. Once such an injunction is granted further violation constitutes contempt of court, and the court's authority, either to enforce its order or to penalize further violations, is for all practical purposes unlimited.

(d) Cancellation of contract or lease.

(2) Laws and Regulations - Enforcing Agencies:

(a) Atomic Energy Commission

The Atomic Energy Commission is concerned directly only with radiation safety. The appropriate regulations are set forth in Title 10 Part 20, Code of Federal Regulations, and have been partially described previously in the section entitled Radioactive Hazards. In addition to these standards the following section is pertinent.

Section 20.502 Additional Requirements

"The Commission may, by rule, regulation or order impose upon any licensee such requirements, in addition to those established in the regulations, as it deems appropriate or necessary to protect health or to minimize danger to life or property."

The Commission's power of enforcement can be either by criminal action or injunctive as set forth below.

Section 20.601 Violations

"An injunction or other court order may be obtained prohibiting any violation of any provision of the act or any regulation or order issued thereunder. Any person who wilfully violates any provision of the act or any regulation or order issued thereunder may be guilty of a crime and, upon conviction, may be punished by fine, or imprisonment, or both, as provided by law."

(b) Department of Labor

The Department of Labor is charged with enforcement of the safety provisions of the Walsh-Healey Act which applies to government contractors. The applicable portion of the law is as follows:

"No part of such contract may be performed nor will any of the materials, supplies, articles or equipment to be manufactured or furnished under said contract be manufactured or fabricated in any plants, factories, building or surroundings or under working conditions which are insanitary or hazardous or dangerous to the health and safety of employees engaged in the performance of said contract."

There are no direct actions provided under law which the Department of Labor might take to enforce this provision. Instead, the AEC would be notified that the company is in breach of contract and the AEC would acquire the right to cancel the contract.

(c) State Mine Inspector

Wherever the word "mine" is used in the following discussion it applies also to mills.

The State Mine Inspector may take immediate executive action in accordance with the following provision:

63-4-12. Ordering Dangerous Conditions in Mines
Removed or Removal of Workmen from Danger
Zones

"When any mine or portion of a mine, or machine, device, apparatus or equipment in the judgment of the inspector, is in so dangerous a condition from any cause, as to jeopardize life or health, he shall at once direct the management of the mine to remove the dangerous condition or safeguard the equipment forthwith; should the inspector find during his inspection of the mine, such dangerous condition existing therein, that in his opinion any delay in removing the workmen from such dangerous places or from the entire mine might cause loss of life or serious personal injury to the employees, the inspector shall have the right to request the representative of the operator accompanying the inspector to immediately withdraw all persons from such dangerous places or from the entire mine."

The State Mine Inspector may institute court action in accordance with the following provision:

63-29-1. Penalties for Violation of Act by Mine Operator, Official or Employee

"Any violation of any provision of this act by mine operator, mine official, miner, or other mine employee shall be deemed a misdemeanor and shall be punished by a fine of not more than two hundred (\$200) dollars or by imprisonment of not more than three (3) months in the county jail, or by both such fine and imprisonment. Each and every day's violation of any provision of this act shall be deemed a separate offense, and it shall be the duty of the mine inspector to institute proceedings in the proper courts in case of all such violations."

In case of repeated violations, the State Mine Inspector can obtain a court injunction to ensure enforcement of the code.

The code also has two provisions which specifically apply to every employee. These are as follows:

63-20-6. Safety Devices and Orders - Employees' Duty

"No mine employee or other person shall remove, displace, damage, destroy, carry off, or fail to use any safety device, safeguard notice or warning, provided for use in any mine employment or place of mine employment, or interfere in any way with the use thereof by any other person, or interfere with the use of any method or process adopted for the protection of any mine employee in such employment or place of employment, or fail to neglect to follow and obey safety orders promulgated by the mine operator or the mine inspector, and to do every other thing reasonably necessary to protect the life, health, safety, and welfare of employees, including himself."

63-20-7. Misdemeanors, Punishment - Intoxicants, Damage to Equipment, Violation of Danger Signs and Unauthorized Travel Prohibited

"Any employee violating the provisions of section 199 of article 34 (63-20-6) shall be deemed guilty of a misdemeanor punishable by a fine or imprisonment or both as set forth in another section of this act. No miner or other person shall carry into a mine intoxicating liquids or alcohol beverages or enter the mine under the influence of intoxicating

liquids; he shall not destroy any part of the machinery or equipment of the mine; no unauthorized person shall enter any part of the mine against a danger sign nor travel any haulageway in a mine where a manway is provided."

(d) State Department of Public Health

The State Department of Public Health is responsible for enforcement of the State Industrial Codes and State Regulations on Radiation. The Department has the following powers:

- (i) It may take immediate executive action by issuing a "cease and desist" order prohibiting any violation of the codes.
- (ii) If the "cease and desist" order is not obeyed it may:

First, institute criminal prosecution for violation of the code. Conviction results in penalties very similar to those specified in the mining code, or

Second, it may act through the State attorney general to obtain a court injunction forbidding such practices. This again subjects the violator to contempt of court proceedings.

(e) State Engineer

The State Engineer has "general supervision of the waters of the state." He has authority under a great number and variety of State laws to order the correction of unsafe practices in public or private water works or the correction of practices which might make water unsafe for use. If such condition is not corrected "within a reasonable time after notification" the violation shall constitute a misdemeanor and the State Engineer will give notice to the District Attorney that such a violation exists.

The District Attorney shall at once proceed against the owner, and all parties responsible therefor."

(f) Other Governmental Agencies

Mining leases on public land normally contain phrases similar to the following, "the lessee shall take appropriate steps for the preservation of the property and the health and safety of the workmen." Inspecting

agents might be any person or agency designated by the department granting the lease. For example, land might be leased from the Forest Service or the Bureau of Indian Affairs but the inspection agency designated by the Secretary of the Interior might be the Bureau of Mines or the U. S. Geological Survey. The final remedy for violation of such lease provisions would be cancellation of the lease.

(3) Enforcement by Management:

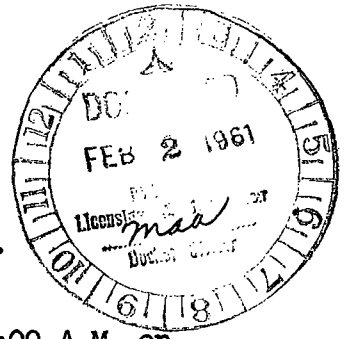
It is Management's intention and desire to comply with all directives of regulatory agencies regarding safety. In addition, Management will set such other policies as it deems necessary for safe conduct of the operation. To enforce such safety provisions Management grants to its supervisors the same authority and disciplinary powers which apply to any other phase of the operation.

(4) Supervisor's Authority for Enforcement:

Violation of safety rules is an accepted grounds for discharge of an employee and is the final enforcement remedy. While the supervisor should strive to enforce safety by example, by teaching and by leadership, he must use his full authority in this respect if no other means will suffice. A supervisor must realize that in certain circumstances an employee may legitimately refuse to perform work which is unduly hazardous.

January 23, 1961

MEMORANDUM



SUBJECT: Departmental Safety Rule Books

<u>TO</u> :	W. J. Roberts	A. C. McCumber
	T. M. Fitch	F. A. Welch, Jr.
	R. W. Miller	J. E. Sabo

MEETING: Conjointly with Mill-Mechanical Meeting at 10:00 A.M. on Friday, January 27th, 1961.

At the conclusion of the foreman conferences on "Safety" as a part of "The Job Itself" and before further development of any other sections under this general topic, we should like all departments at the Plant to prepare safety rules for the guidance of the employees in each such respective department or place of work.

This development and the printing of departmental safety rules should follow in a manner similar to that already completed at the Jackpile Mine.

Under the direction of each department head, we feel that this can be done and the job lightened by assignment to the foreman (foremen) of each division of mill operation, crushing, yellow cake, disposal, shops, acid manufacture, powerhouse, warehouse, bucking room, and etc., the initiatory job of citing and listing the safety rules now used or needed in his area of supervision. These could then be discussed by the respective departmental groups of supervision and finally edited with and approved by the department head and Jack Sabo or Ralph Wilde. The assembled and titled rules would then be ready for final reading, approval, and printing.

In the Yellow Cake Section and in ore handling or in mill operations and elsewhere, the avoidance and hazards of dust and mist generation should be pointed out under radiological and respiratory safety. This would also be true in the bucking room. In the Chemical Laboratory the hazards of dusts and gases and the handling of acids and other dangerous or toxic materials would also be covered.

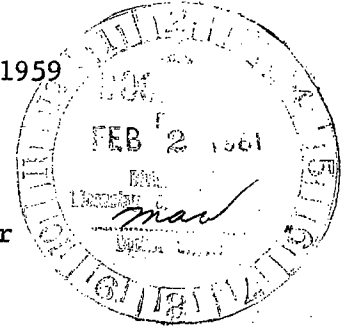
No doubt you may have some questions regarding this program at the Plant and which we may clear up by meeting together. Therefore, it is requested that we meet in the office conference room at 9:30 A.M. on Friday, January 27, 1961.

E. C. Peterson
Assistant Manager

ECP:cig
cc: A. J. F.
J. P. H.
R. M. W.

CONFORMED COPY

December 9, 1959



MEMORANDUM TO: E. C. Peterson, Assistant Manager
FROM : R. M. Wilde, Industrial Radiological Engineer
SUBJECT : Dust Control in the Bucking Room

From the results of the recent AEC air sampling survey, it is evident that air-borne uranium concentrations of greater than MPC were present in nearly all sections of the Bucking Room. It is believed that this situation is in part due to the cleanup methods presently being employed. It is therefore recommended that the following cleanup practices be followed:

1. Floors be cleaned with a vacuum cleaner rather than with a broom.
2. Floors be wet mopped at least once a day.

It is also recommended that a new hose and floor brush be purchased for the Bucking Room vacuum cleaner.

For the elimination of dust during the performance of specific operations in the Bucking Room, it is recommended that the missing dampers be replaced in the exhaust hood ducts and that the dampers in these ducts be kept closed except while the hoods are in use. It will, of course, be necessary to leave sufficient number of ducts open to prevent damage to the hood exhaust fan and motor.

It is believed that the above recommendations will help to reduce air-borne uranium contamination in the Bucking Room atmosphere. By your approval, the above outlined practices and recommendations are mandatory on the applicable supervisory personnel of the Bucking Room.

/S/ R. M. Wilde
Ralph M. Wilde

RMW:db
cc: A. J. Fitch
R. F. Burton
D. E. Huffmon

BUCKET NO. 40-665
Jilley

THE ANACONDA COMPANY

New Mexico Operations

P. O. Box 638, Grants, New Mexico



A. J. FITCH
MANAGER

December 28, 1960

Mr. H. L. Price, Director
Division of Licensing and Regulation
United States Atomic Energy Commission
Washington 25, D. C.

Dear Mr. Price:

In compliance with your request of December 1, 1960, for information concerning occupancy studies for determination of the exposure of each employee who works in areas having air-borne radioactive material above the maximum permissible concentrations, we are pleased to inform you that steps have been taken to correct this alleged violation.

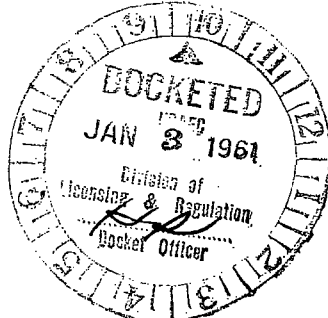
Enclosed you will please find a copy of a memorandum dated June 29, 1960, entitled "Working-Place Time-Distribution and Job Exposure Evaluation Studies of Certain Personnel in the Yellow Cake Section." Included as attachments to this memorandum are the working-place time-distribution and the job exposure evaluations for the employees who work in areas in the Yellow Cake Section having air-borne radioactive material above the maximum permissible concentrations.

Similar job exposure evaluations have been and will continue to be made on the basis of current air sampling surveys.

In addition to the above-mentioned items, we are currently completing the design of a totally enclosed and automated system for handling drums in the drum filling and sampling area of the Yellow Cake Section. This system is scheduled for installation in the early part of 1961. We sincerely expect that when this system is installed and in operation no employee will be working in an area having air-borne radioactive material above the maximum permissible concentration. If our expectations are not immediately realized, we will continue to make time studies and job exposure evaluations to demonstrate that the average exposure of employees to radioactive materials is below the maximum permissible concentration.

*copy provided
compliance
2/7/67
D.G.*

*OK by Mr. Price
for approval*



December 28, 1960

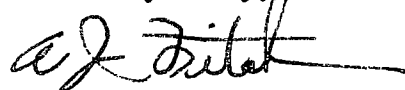
Mr. H. L. Price, Director
Division of Licensing and Regulation
United States Atomic Energy Commission
Washington 25, D. C.

The results of our air sampling surveys have shown that air-borne radioactive materials above the maximum permissible concentration were found in only one other area of the mill. This was the area immediately above the precipitation tanks. Excessive amounts of air-borne radioactive material were present in this area during the time the tanks were being filled and resulted from the mist that was created by the uranium-bearing solution dropping into the tanks from the filling lines. In order to remedy this condition, the filling lines were relocated near the tank bottoms so that the solution now enters the tank below the liquid surface. These modifications were completed on three of the tanks on November 18, 1960. Subsequent surveys have shown that the air-borne radioactive material in the area above the precipitation tanks is now below the maximum permissible concentration. Similar modifications are currently being considered for the filling lines of the two other tanks above which a similar, although marginal, condition has been found from time to time.

We trust the foregoing is sufficient to answer any questions which you may have concerning the alleged violation. We will be happy to supply any additional information which may be required.

The other information concerning certain aspects of our radiation safety program and facilities and equipment as requested in your letter is currently being compiled and will be submitted to you in the near future so that your review and radiation safety evaluation can be completed.

Yours very truly,



A. J. FITCH

AJF:cig

40-665
June 29, 1960

Jiley

MEMORANDUM TO: E. C. Peterson, Assistant Manager
FROM : R. M. Wilde, Industrial Radiological Engineer
SUBJECT : Working-Place Time-Distribution and Job Exposure
Evaluation Studies of Certain Personnel in the
Yellow Cake Section

From the results of the latest air sampling survey in the Yellow Cake Section, it is evident that air-borne uranium concentrations of greater than MPC are present only in the barrelling enclosure area and at the drum sampler. Therefore, the only persons exposed to air-borne uranium concentrations above MPC are those men working in these areas.

Attached are working-place time-distribution studies for the Dryer Operator and the Sample Room Operator. Certain operations are not performed on a daily basis, however, these operations were prorated to give an average time per day. The period of actual dryer operation for these time studies was taken as 6 hours or 75% of the shift. This is somewhat greater than the average dryer operating time. Therefore, the job exposure evaluations calculated from these time studies would indicate the maximum condition of exposure.

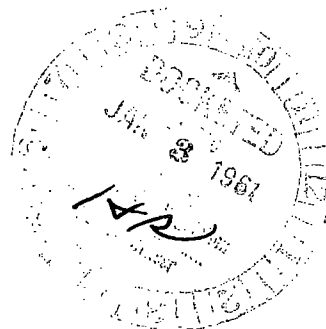
Also attached are the job exposure evaluations for the Dryer Operator and Sample Room Operator. In these evaluations, the respirator penetration factor of 20%, which is given in "General Handbook for Radiation Monitoring" USAEC, LA-1835 (3rd ed.), was used.

On the basis of these time studies and job exposure evaluations, the average exposure of the Dryer Operator and Sample Room Operator are well below MPC.

RMW:db
Attachments
cc: A. J. Fitch
W. J. Roberts
AEC-DLI File (2)

RMW

Ralph M. Wilde



June 29, 1960

WORKING-PLACE TIME-DISTRIBUTION

Job Title: Dryer Operator

Number of Shifts: 2

Men per Shift: 1

Total Hours per Man per Day: 8

Total Shifts per Man per Week: 6

<u>Places of Work</u>	<u>Minutes of Work per Shift</u>	<u>% of Total</u>
Repulp Tanks (general area) check pulp density check agitation adjust flow adjust pulp density	150	31.25
Dryers (general area) check operation adjust scraper blades	98	20.42
Sample Room (general area)	50	10.42
Change, Lunch & Shower Rooms (general area) change clothes eat lunch personal cleanup	60	12.50
Cleanup (general area) clean dust collectors clean dryers	75	15.62
Repairs and Adjustments in barrelling enclosure respirator worn	14	2.92
Check Fullness of Drums respirator worn	3	0.62
Remove Full Drums and replace empties respirator worn	30	6.25
TOTALS	480	100.00

Distribution to: A. J. Fitch
E. C. Peterson
W. J. Roberts
AEC-DLI File (2)

June 29, 1960

WORKING-PLACE TIME-DISTRIBUTION

Job Title: Sample Room Operator

Number of Shifts: 2

Men per Shift: 1

Total Hours per Man per Day: 8

Total Shifts per Man per Week: 6

<u>Places of Work</u>	<u>Minutes of Work per Shift</u>	<u>% of Total</u>
Drum Scale (general area) weigh full drums check scale	115	23.96
Sample Room (general area) weigh moisture samples record drum weights	215	44.79
Prepare Lot Composites	15	3.12
Change, Lunch & Shower Rooms (general area) change clothes eat lunch personal cleanup	60	12.50
Cleanup (general area) wash down floors	35	7.30
Sample and Lid Full Drums respirator worn	25	5.21
Remove Drums at Shutdown respirator worn	15	3.12
TOTALS	480	100.00

Distribution to: A. J. Fitch ✓
E. C. Peterson
W. J. Roberts
AEC-DLI File (2)

June 29, 1960

JOB EXPOSURE EVALUATION

Process Area: Yellow Cake Section

Job Title: Dryer Operator

1 man/shift 8 hours/shift 2 shifts/day 6 shifts/week

Place of Work	Time per Shift minutes (T)	Concentration no/ml x 10 ⁻¹¹ (C)	(T x C)
Repulp Tanks (GA) 1 sample	150	0.57	85.5
Dryers (GA) 3 samples	98	1.33	130.3
Sample Room (GA) 2 samples	50	0.39	19.5
Change, lunch & Shower Rooms (GA) 3 samples	60	0.33	19.8
Cleanup (GA) 4 samples	75	1.85	138.4
Repairs and adjustments respirator worn 3 samples	14	(22.74 x 0.20) 4.55	5 x 63.7 = 318.5
Check Fullness of Drums respirator worn 2 samples	3	(245.8 x 0.20) 49.2	5 x 147.6 = 738.0
Remove Full Drums respirator worn 5 samples	30	(22.74 x 0.20) 4.55	5 x 136.5 = 682.5

Total (T) = 480
 Total (T x C) = 2133
 MPC = 4.17 x 10⁻¹¹ no/ml

Weighted Average Concentration - 1.55 x 10⁻¹¹ no/ml
 Percent of MPC - 37.2%

= 4.42 x 10⁻¹¹ (no respirator)

Distribution to: A. J. Fitch
 E. C. Peterson
 W. J. Roberts
 AEC-DLI File (2)

June 29, 1960

JOB EXPOSURE EVALUATION

Process Area: Yellow Cake Section

Job Title: Sample Room Operator

1 man/shift 8 hours/shift 2 shifts/day 6 shifts/week

<u>Place of Work</u>	<u>Time per Shift minutes (T)</u>	<u>Concentration uc/ml x 10⁻¹¹ (C)</u>	<u>(T x C)</u>
Drum Scale (GA) 1 sample	115	0.37	42.6
Sample Room (GA) 2 samples	215	0.39	83.9
Prepare Lot Composites	15	(no sample)	
Change, Lunch & Shower Rooms (GA) 3 samples	60	0.33	19.8
Cleanup (GA) 2 samples	35	0.39	13.7
Sample and Lid Full Drums respirator worn 2 samples	25	(63.14 x 0.20) 5 x 12.63 = 1579.0	
Remove Drums at Shutdown respirator worn 5 samples	15	(22.74 x 0.20) 5 x 4.55 = 341.5	

Total (T) - 465*
 Total (T x C) - 544.1* = 2080.5
 MPC - 4.17 x 10⁻¹¹ uc/ml

Weighted Average Concentration - 1.17×10^{-11} uc/ml = 4.48×10^{-11} (no respir.)
 Percent of MPC - 28.1%

*The time for preparation of lot composites is not included because no sample was available for this operation. Samples will be taken of the lot compositing operation and included in a future job exposure evaluation for the Sample Room Operator. In order for the average daily exposure for this employee to be above MPC, the dust concentration during the lot compositing operation would have to be in the neighborhood of 100 times MPC. Such a condition is highly improbable.

Distribution to: A. J. Fitch
 E. G. Peterson
 W. J. Roberts
 AEG-DLI File (2)

THE ANACONDA COMPANY

New Mexico Operations

P. O. Box 638, Grants, New Mexico



DOCKET NO. 40-665
File Copy

A. J. FITCH
MANAGER

September 21, 1960

Mr. H. L. Price, Director
Division of Licensing and Regulation
United States Atomic Energy Commission
Washington 25, D. C.



Dear Mr. Price:

On July 5, 1960, we submitted an application to you for the amendment of our Source Material License No. R-138, to permit the disposal of our radioactive mill waste solutions by injection into underlying rock formations.

In the meantime, we have made additional improvements to our disposal system and are now prepared to continue disposal upon receipt of the license amendment. We appreciate, however, the considerable amount of time necessary to process applications of this sort, especially in view of the rapidly increasing activities in the entire atomic energy program. We are, nevertheless, anxious to proceed with the proper disposal of mill wastes, and would appreciate it very much if you would authorize us to do so on a strictly temporary basis, until you have had the opportunity to act on our application.

Yours very truly,

A. J. FITCH

AJF:MA

*cf sent Compliance 9-26-60
mat*

THE ANACONDA COMPANY

New Mexico Operations

P. O. Box 638, Grants, New Mexico



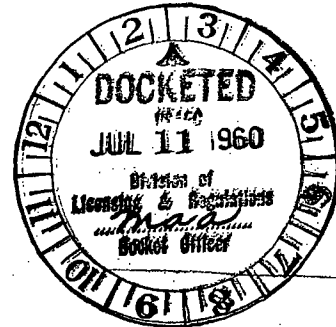
DOCKET NO. 40-665

File Copy

A. J. FITCH
MANAGER

July 5, 1960

Mr. H. L. Price, Director
Division of Licensing and Regulation
United States Atomic Energy Commission
Washington 25, D. C.



Dear Mr. Price:

As you no doubt recall, our Source Material License No. R-138 was amended by your office on November 17, 1959, to permit the disposal, for a period of ninety (90) days, of our uranium mill waste effluent, by injection through a deep well into underlying rock formations. This project was undertaken as an experiment to further explore the feasibility of this method of waste disposal for use throughout the life of our milling operations.

The 90-day test has been concluded and the results appear to confirm our belief that the procedure is safe and practical from the standpoint of protection of potable water supplies. We, therefore, now wish to apply to you for further amendment to our Source Material License to permit us to continue indefinitely, with the understanding that, should it become apparent in the future that there is any likelihood of our contamination of the potable water supplies, we will discontinue operation of the disposal system immediately.

See Reports File

To assist in your consideration of this application, there is enclosed a report entitled "Appraisal of Proposed Liquid Waste Disposal by Underground Injection," covering our investigations of deep-well disposal of our mill waste effluent. I believe that this report covers all pertinent matters in sufficient detail, but, should you wish any further information whatsoever, we would be pleased to have you so advise us.

Also enclosed, for your information, is a copy of a letter dated May 20, 1960, from Dr. Stanley J. Leland, Director of the New Mexico Department of Public Health, authorizing us, under certain conditions and insofar as the State of New Mexico is concerned, to continue our deep-well waste disposal.

Yours very truly,

A. J. FITCH

AJF:MA

Encl. - 1 copy each of Report and
Str 95-26, 60, Rec'd -

Copy of this ltr. only to R. Soc. Com.



40-665
File C

NEW MEXICO
DEPARTMENT OF PUBLIC HEALTH
SANTA FE

May 23, 1960

Mr. A. J. Fitch, General Manager
The Amosuda Company
Box 636
 Grants, New Mexico

Dear Mr. Fitch:

The Amosuda Company's request of April 22, 1960, seeking approval for the disposal of uranium mill liquid wastes by injection into permeable formations below those ordinarily used as sources for satisfactory quality of water supply in the Grants-Diamond area, has been given thorough consideration. The New Mexico Department of Public Health has discussed this matter in detail with representatives of the U. S. Geological Survey and the Office of the State Engineer, and has sought the advice of the State Radiation Technical Advisory Council.

Therefore, with the advice of the Radiation Technical Advisory Council, substantiated by the opinions of representatives of the State Engineer and the U. S. Geological Survey, approval for the continuation of liquid mill waste disposal by injection into the Yess formation strata 250 feet below the surface, is granted under the following conditions:

1. That the Amosuda Company will continue the well monitoring program as outlined in your letter of April 22, 1960, and that results of analyses be forwarded to the Department of Public Health as they become available.
2. That the company keep detailed records of the amount of water injected, pressures or water levels at the injection well, chemical and radiological analyses of water injected and that these records be transmitted to the Department quarterly.
3. That the company be prepared to undertake, at their own expense, the collection of additional data relative to movement, destination, and chemical and radiological quality of the injected water, or water displaced from injection aquifers as a result of injection, as may appear necessary at any time in the future to determine the facts necessary to intelligent decision by officials of the Department regarding waste disposal operations.

May 20, 1960

4. That this approval is granted for injection by gravity only; and if pressure injection should be considered, application for this change should be made to the Department for consideration and action before pressure injection is initiated.
5. That the company declare its intention regarding the injection rate and the amount of waste to be injected quarterly, and that should a significant increase be required in the future, an application to increase the injection rate and amount be made to the Department for consideration and action before proceeding under the new conditions.
6. That this approval is granted with the reservation that if at any time conditions indicate the injection of this water may endanger the health or safety of persons using the water, or that continued injection may result in significant deterioration of the chemical or radiological quality of private or public waters, it may be rescinded.

Members of the Department staff will continue to work with the Ammonia Company and will be available for consultation should questions of procedure arise. The attitude of interest and cooperation displayed by the staff of the Ammonia Company is commendable, and has resulted in an excellent example of the solution of a common problem by industry acting in concert with State and Federal agencies.

Sincerely,

Stanley J. Leland, M. D.
Director

SNJ/sp
cc: State Engineer
U.S.G.A., Albuquerque Office



THE ANACONDA COMPANY

New Mexico Operations

P. O. Box 638, Grants, New Mexico



DOCKET NO. 40-665

A. J. FITCH
MANAGER

April 7, 1960

Mr. H. L. Price, Director
Division of Licensing and Regulation
United States Atomic Energy Commission
Washington 25, D. C.

Dear Mr. Price:

Pursuant to your authorization dated November 17, 1959, we have been conducting experimental work on the disposal of our uranium mill waste water by injection through a deep well into underlying rock formations.

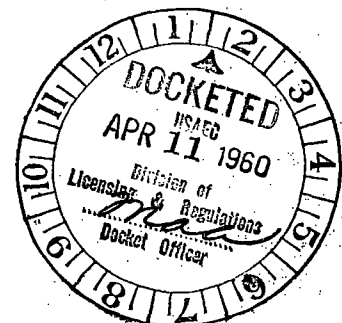
After more than fifty days of operation it appears to us that the method is entirely feasible and that it would be entirely safe to continue injection indefinitely. Accordingly, we plan in the near future to apply to you for proper licensing, but we first have arranged a meeting with the United States Geological Survey, the New Mexico Department of Public Health and the New Mexico State Engineer to discuss the matter. This meeting has been tentatively scheduled for 9:30 A.M., April 15th, at the office of the United States Geological Survey in Albuquerque, New Mexico.

We would appreciate it very much if you would find it convenient to have one of your men join us in this meeting. We would be pleased to change the date of the meeting, if necessary, to conform to your convenience.

Yours very truly,

A. J. FITCH

AJF:MA



THE ANACONDA COMPANY

New Mexico Operations

P. O. Box 638, Grants, New Mexico



DOCKET NO. 40-665

A. J. FITCH
MANAGER

January 20, 1960

File Copy

Division of Licensing and Regulation
United States Atomic Energy Commission
Washington 25, D. C.

Attention: Mr. H. L. Price, Director

Gentlemen:

This is to advise that we have today started the mill waste effluent disposal test, as authorized in your letter dated November 17, 1959.

Yours very truly,

A. J. FITCH

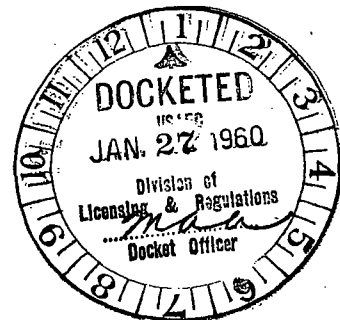
AJF:MA

cc: New Mexico Committee on Atomic Affairs

Mr. J. L. Williams
New Mexico State Engineer's Office

Mr. Charles G. Caldwell
New Mexico Department of Public Health

Mr. Duncan A. Holaday
U. S. Public Health Services



THE ANACONDA COMPANY

New Mexico Operations

P. O. Box 638, Grants, New Mexico

DOCKET NO. 40 665



File Copy

A. J. FITCH
MANAGER

October 9, 1959



Mr. H. L. Price, Director
Division of Licensing and Regulation
United States Atomic Energy Commission
Washington 25, D. C.

Dear Mr. Price:

In accordance with the request of your Mr. J. C. Delaney, in his letter to us of November 26, 1958, and to our recent discussion of the matter at your office, we submit herewith the following in support of our application for approval of our proposed method of disposing of our mill waste effluent by injection through a cased and cemented bore-hole into underlying rock formations:

- I. Analysis of mill waste effluent.
(Note Attachment I)
- II. Proposed plan of injection during the ninety day test.
(Note Attachment II)
- III. Description of the disposal well.
Location, specifications, geology, and hydrology.
(Note Attachment III)
- IV. Geology - Bluewater Valley and vicinity.
Surface geology and subsurface geology.
(Note Map Nos. 1, 6, and 7)
- V. Underground water use and population - Bluewater Valley and vicinity.
(Note Attachment IV)

Approval is at this time requested for disposal of the effluent by injection for a test period of ninety days only. Our reason for conducting such test is primarily to determine the potential capacities of the disposal zones prior to making the substantial expenditures for facilities which will be necessary for this method of disposal on a long-term basis. We also expect to derive additional important data on the performance of the disposal well from this test. We believe that it is extremely unlikely that the radioactive materials released into the disposal zones will reach any sources of water supply for the following reasons:

See Drawings see Rpts. file

Mr. H. L. Price

-2-

October 9, 1959

- A. Disposal well construction.
(Note Attachment A)
- B. Test injection pressures.
(Note Attachment B)
- C. Nature of the barrier zone between the potable aquifers
and the disposal aquifers.
(Note Attachment C)
- D. Area of invasion by the injection fluid as a result of
the ninety-day test.
(Note Attachment D)
- E. Neutralization capacity of the disposal zone rocks.
(Note Attachment E)
- F. Ion exchange capacity of the disposal zone rocks.
(Note Attachment F)
- G. Gross radium injected during the ninety-day test and
its underground distribution.
(Note Attachment G)
- H. Analysis of the potential disposal zone formation waters.
(Note Attachment H)

In the event that the results of the proposed test are favorable, we plan to submit for approval our proposal to continue this disposal method on an indefinite basis.

Yours very truly,



A. J. FITCH

AJF:MA
Encl.

Distribution to:

Mr. H. L. Price, Director
Division of Licensing and Regulation
United States Atomic Energy Commission
Washing 25, D. C. (3 copies)

New Mexico Committee on Atomic Affairs
c/o Mr. Howard Eberline
Post Office Box 279
Santa Fe, New Mexico (1 copy)

Mr. J. L. Williams, District Supervisor
State Engineer's Office
2436 San Mateo N. E.
Albuquerque, New Mexico (1 copy)

Mr. Charles G. Caldwell, Director
Environmental Sanitation Services
New Mexico Department of Public Health
Santa Fe, New Mexico (1 copy)

Mr. Duncan A. Holaday
Sanitation Engineering Director
Chief, Occupational Health Field Station
Division of Special Health Services
Box 2537, Fort Douglas Station
Salt Lake City 13, Utah (1 copy)

ATTACHMENT I

Analysis of mill waste effluent.

An analysis of the fluid to be injected during the ninety-day test is as follows:

Chemical analysis:

Iron	Fe	292 ppm
Manganese	Mn	414 ppm
Calcium	Ca	500 ppm
Magnesium	Mg	650 ppm
Sodium	Na	2,790 ppm
Sulfate	SO ₄	9,000 ppm
Chloride	Cl	460 ppm
Nitrate	NO ₃	80 ppm
Total Dissolved Solids		13,700 ppm
pH		2.2
Specific Gravity @ 60°/60° F.		1.010
Turbidity		0.45 ppm

Radiological analysis:

Gross Alpha	4.2x10 ⁻⁵ uc/ml.
Gross Beta	1 x10 ⁻⁴ uc/ml.
Radium	6,000 x10 ⁻⁹ uc/ml.
Uranium - natural	1.3x10 ⁻⁶ uc/ml.

ATTACHMENT II

Proposed plan of injection during the ninety-day test.

<u>Rate of Injection (Gallons per Minute)</u>	<u>Duration (Days)</u>	<u>Cumulative Gallons Injected</u>
100	2	288,000
200	4	1,440,000
300	8	4,896,000
400	10	10,656,000
500	15	21,456,000
800	40	67,536,000
—1,500	11	91,296,000

In the event of severe well-bore damage or any other unforeseen development, the injection program may be interrupted for remedial work on the well. If abnormal injection pressures build up, the injection program may be stabilized at a lower rate or abandoned altogether. Artificial injection pressures at the wellhead are not planned; however, a natural or gravity head up to a maximum of 100 p.s.i. is available. Chemical treatment and filtration of the injection fluid is anticipated.

ATTACHMENT III

Description of the disposal well.

a. Location. (Note Map Nos. 1 and 6)

SW 1/4 Section 8, Township 12 North, Range 10 West, N.M.P.M., or U.S.G.S. designation 12.10.8.300.

Map No. 1 shows the relative location of The Anaconda Company property and the test disposal well with the surrounding communities. Map No. 6 gives a similar relationship and also shows the mill waste pond and nearby fresh water wells.

b. Completion specifications. (Note Map No. 3)

The casing in both strings exceeds, in quality, the State requirements for water well completions. The casing and cementing operations were observed and approved at the well site by a representative of the New Mexico State Engineer's Office. Special high-sulfate-resistant cement was used in cementing the inner or injection string of casing. Thirteen disposal zones, totaling 468 linear feet, were opened through the well casing and cement by bullet perforations. As seen on Map No. 3, the thirteen zones occur between hole depths of 950 feet and 1,778 feet.

c. Geology. (Note Map Nos. 2 and 5)

The rock sequence, lithology, and age relationships may be seen on Map No. 2. The results of extensive laboratory analyses on the core for the hole interval 445 feet to 2,511 feet, with respect to vertical permeabilities, horizontal permeabilities, and porosities may be seen on Map No. 4.

d. Hydrology. (Note Map Nos. 4 and 5)

Reference to Map No. 4 will reveal the results of the drill stem tests (D.S.T.) for the hole intervals noted. Map No. 5, a generalized lithologic log of the test disposal well, also shows the chemical and radiological analyses results for formation water samples taken from the hole intervals as bracketed.

Preliminary pump tests on the test disposal well indicate a transmissibility within the disposal zones of plus 500,000 millidarcy-feet per centipoise, which is equivalent to 10,000 U.S.G.S. "T" units.

ATTACHMENT IV

Underground water use and population - Bluewater Valley and vicinity.
(Note Map Nos. 1 and 6)

Map No. 1 illustrates the location of irrigated farm lands, uranium ore milling plants, and the population densities in Bluewater Valley and vicinity. The water production or volume used by the various centers of population, industry, and agriculture is also shown on Map No. 1. The population and water use is concentrated along the main transportation arteries, U. S. Highway 66 and the Santa Fe Railroad. Nearly all of the water appropriated comes from underground sources as follows:

<u>Use</u>	<u>Aquifer</u>	<u>Approx. Gal. per Yr.</u>
Irrigation	San Andres-Glorieta)	1,954,972,800
	Chinle (negligible amt.))	
	Alluvium (negligible amt.))	
Uranium Industry:		
Anaconda and Homestake Plants	San Andres-Glorieta	681,940,250
Kermac and Phillips Plants	Morrison)	948,792,680
	Dakota)	
Town of Grants	San Andres-Glorieta)	419,750,000
	Chinle)	
	Alluvium)	
Town of Milan	San Andres-Glorieta	127,000,000
Misc. Population:		
Prewitt to McCarty	San Andres-Glorieta)	125,580,000
	Chinle)	
	Alluvium)	
McCarty to Cubero	Dakota)	41,975 000
	Alluvium)	
TOTAL ALL USERS		4,300,010,730

The farm irrigation water demand occurs from May through September. The greatest underground water appropriations are made within the Bluewater Valley at and between the towns of Bluewater and Grants, where the San Andres-Glorieta aquifer supplies the bulk of the water. Map No. 6 shows the location of wells that produce fresh water in the Bluewater Valley.

ATTACHMENT A

Disposal well construction. (Note Map No. 3)

The techniques and materials used in the casing and cementing operations of the test injection well minimize the possibility of vertical communication of fluids along the well bore outside the casing. Map No. 3 illustrates the construction of the completed well.

The surface string of casing, which protects the potable water aquifers, was set below the first thick bed of anhydrite for a better seal. The casing was centralized by steel sleeves so that a uniform sheath of cement would completely enclose the steel casing. A pure slurry of neat cement was circulated down through the casing and up along the outside to the surface of the ground.

The injection or inner string of casing was also centralized in the hole and cemented in a similar manner, except that a special high-sulfate-resistant cement was used.

The mill waste injection fluid will be separated from the potable aquifers by an inner steel casing 0.352 inch thick, a sheath of sulfate-resistant cement two inches thick, another steel casing 0.330 inch thick, and an outer sheath of neat cement at least two inches thick. This multiple lining extends from the surface to ninety-two feet below the lowermost sands of the fresh-water aquifer.

ATTACHMENT B

Test injection pressures.

Gravity injection, utilizing the available natural head, is planned for the test. Approximately 100 p.s.i. of natural head is available as a result of the disposal zone static water level being at 229 feet below the natural ground surface.

As a result of preliminary pumping tests within the disposal zones, the transmissibility of the combined disposal zones was determined to be sufficient to dissipate, without artificial injection pressure, the quantities of waste fluid to be disposed of. The use of even low artificial injection pressures would probably cause the operation of the disposal well to be uneconomic.

The tendency for the development of vertical communication from the injection zones to the overlying fresh-water aquifer during the test injection is minimized by the low injection pressures planned and the high transmissibility characteristics of the disposal aquifers.

ATTACHMENT C

Nature of the barrier zone between the potable aquifers and the disposal aquifers. (Note Map Nos. 1, 2, 4, and 5)

A relatively impervious sequence of rocks occurs in the 312-foot interval between the bottom of the potable aquifer and the top of the uppermost disposal zone, which creates a barrier to vertical fluid migration. Reference to Map No. 2 will show that between 638 feet, the bottom of the potable aquifer, and 950 feet, the top of the upper disposal zone, numerous anhydrite beds and gypsum (selenite) seams are present. The descriptions on Map No. 2 do not mention all of the small gypsum seams present in the core; however, on Map No. 2 the symbols in the lithologic column will illustrate the abundance of the gypsum. Examination of cores from this interval show that at the upper and lower contacts of the anhydrite thin beds of gypsum had developed, and that throughout the barrier interval many thin seams of gypsum were present in the core, occurring at numerous random angles to the bedding.

This indicates that gypsum from calcium sulfate-saturated underground water has been deposited in small joints and along bedding planes, rendering them relatively impervious to subsequent ground water movement. It seems reasonable to conclude that the interval between 638 feet and 950 feet would act as an impervious barrier even though a vertical hydrostatic gradient might exist across it. The invading waters would become saturated with calcium sulfate and would precipitate gypsum, which would occupy a larger volume than the original anhydrite because of the addition of two molecules of water. The result of the solution of anhydrite and the subsequent precipitation of gypsum would be a physical expanding and sealing action.

Although laboratory tests have not yet been conducted on the cores to substantiate this point, it is believed that if the mill waste fluids contact the anhydrite or gypsum (calcium sulfate), an exchange between the calcium and radium will occur, thereby reducing to some extent the radium concentration in the injected mill waste fluid.

Four drill stem tests conducted in this interval failed to reveal any significant formation pressures or the presence of recoverable formation fluids. These tests indicate a relatively dry interval between the potable aquifers and the proposed disposal zones. Map No. 5 shows the location of the four dry drill stem tests in relation to the overlying San Andres-Glorieta aquifer. It is interesting to note that Swab #7 between 671 feet and 681 feet, even though it bracketed a sandstone, failed to yield a recoverable sample of representative formation fluid after twelve hours of pumping. If this water sand, which has up to 100 millidarcy permeability and 18% porosity, was open to underlying or overlying water-bearing aquifers it should more than likely transmit recoverable fluid under such test conditions.

ATTACHMENT C (Continued)

In the drill stem testing and the water swabbing or pumping operations, approved oil field techniques were employed. Special highly sensitive low range pressure recording gauges were used in conjunction with safeguards to insure against the recording of any pressure which might have bypassed the packer seals into the zone being tested.

Reference to Map No. 4 shows low values for permeability to air for the 638 to 950-foot interval, and locally within this interval relatively nil permeability, for both the vertical and horizontal directions. Permeability to fluids will in most cases result in lower values than permeability to air tests.

To be most effective as a barrier, the anhydrite-gypsum facies must have sufficient areal extent to cover not only the disposal zones affected by the direct displacement of the invading mill waste fluids, but it also must cover the entire area affected by the pressure build-up caused by injection. This coverage does appear to exist in the environment of the test disposal well. The anhydrite-gypsum sequence has been observed along outcrops approximately eleven to twelve miles south and southwest of the test injection well site (note Map No. 1). A study of the electric logs taken from the Stella Dysart wildcat oil test, approximately eleven miles north of the test injection well site, indicates the probable existence of the same facies at that location.

ATTACHMENT D

Area of invasion by the injection fluid as a result of the ninety-day test.
(Note Map Nos. 1, 4 and 6, and Attachment II)

The volume of formation rock invaded by the mill waste fluid will not be great. Although 468 feet of the test injection well is perforated, it is estimated that there is available to these perforations approximately 563 vertical linear feet of disposal thickness. Extensive core analyses (note Map No. 4) have indicated an average rock porosity of 16.5% for the 563 feet of available disposal thickness. Using this average porosity, two theoretical calculations have been made to illustrate the possible position of the flood front at the end of the ninety-day test injection. The shape in plan of the invaded area cannot be predicted with accuracy but two cases have been assumed, a uniform 360° radial flow pattern and a confined 90° sector flow pattern. Several factors, including the heterogeneity of the disposal units, will probably cause an irregular shape of the flood periphery. In profile the flood front will advance selectively, being controlled to a great extent by the permeability characteristics of the individual lithologic disposal units. This occurrence has been considered where, in the extreme case of a 90° sector flood front, only 25% of the vertical disposal thickness has been used. Furthermore, in the 90° sector flood pattern, only 60% of the total rock porosity is used, which is probably conservative even though complete displacement of the formation waters by the injected fluid is not possible.

Average Injection Rate for 90 Days	Radii for Assumed Conditions	
	360° Flood Front 100% of Vert. Thickness 100% of Porosity	90° Flood Front 25% of Vert. Thickness 60% of Porosity
500 gpm	172 ft.	890 ft.
1000 gpm	244 ft.	1,260 ft.

The ninety-day injection test as outlined in Attachment II will average about 700 gpm; however, 500 gpm and 1000 gpm were used in the above calculations to better illustrate the possible minimum and maximum average injection rates for the actual test. The radii of the flood front for the two extreme patterns may be seen plotted on Map No. 6. Although the potentiometric gradient for the disposal zones is not known it is assumed that it will behave similar to that gradient in the overlying San Andres-Glorieta which existed prior to the heavy water demand, and that of the Entrada formation. There is evidence to suggest that the Entrada and San Andres-Glorieta gradients have a component to the southeast and a lesser component to the north. The stratigraphic location of the Entrada may be determined from the legend on Map No. 1. Recent large appropriations of water from the San Andres-Glorieta aquifer have reduced the southeast gradient and created erratic pressure lows near the large demand areas.

ATTACHMENT E

Neutralization capacity of the disposal zone rocks.

The neutralizing effect of the calcium carbonate content of the disposal zone rocks indicates that complete neutralization of the mill waste effluent will occur, with the possible reduction of the radium concentration.

The mill waste effluent has a pH of about 2.2. The disposal zones contain formation waters that have pH's between 7.4 and 8, which are thought to be representative of the pH of the rocks from which they come. A neutralizing chemical reaction will occur upon the introduction of the acid waste effluent into the neutral or basic disposal aquifers. The relative preponderance of disposal zone formation waters will reduce the acid waste effluent to a neutral or slightly basic solution and cause a partial precipitation of the dissolved salts from the effluent. This precipitation may reduce the radium content by entrainment. Future laboratory tests may confirm this. The entrainment principal is known to be valid under similar conditions. To illustrate the neutralizing capacity of the disposal rocks some calculations were made based on laboratory test work with drill cores taken from the disposal zones.

Estimated flood front radii where pH of injected fluid will be 7 at the end of the ninety-day test.

Injection rate for ninety-day test	Radii for Assumed Conditions	
	360° Flood Front	90° Flood Front
	100% of Vert. Thickness	25% of Vert. Thickness
	100% of Porosity	60% of Porosity
	100% Chemical Reaction	50% Chemical Reaction
500 gpm	10 feet	71 feet
1000 gpm	14 feet	105 feet

ATTACHMENT F

Ion exchange capacity of the disposal zone rocks.

In order to determine the ion exchange characteristics of the disposal zone rocks on the dissolved contaminants in the mill waste fluid, laboratory tests were undertaken. These tests are not complete, but preliminary results indicate a significant ion exchange capacity of the rocks.

The interval of sandstone core between the depths of 1,410.1 feet and 1,410.9 feet was flooded by the mill waste fluid and then analyzed for radium. The test core measured 22.54 cm in length and 8.8 cm in diameter. It had a porosity of 24.6% which is greater than the 16.5% average porosity for the 563 linear feet of disposal zone. This test core was flooded with 172 pore volumes or 58,570 cc of mill waste fluid. After adjusting for the radium in the unflooded core and the dissolved radium left in core pore volume, 2.8 disintegrations per minute of radium per gram of rock were held within the test sample. This amounts to 7.03×10^4 micromicrocuries of radium per cubic foot of rock. The core sample is not representative of the entire disposal zone, nor was the test conducted for a prolonged period of time; nevertheless, the results do have some significance.

Laboratory test results on formation clay samples taken at intervals throughout the hole below the San Andres-Glorieta aquifer indicate a significant, but not great, ion exchange capacity. Nineteen clay samples, representing very narrow seams of clay, and ranging from depths of 625 feet to 1,766 feet in the test disposal well had an ion exchange capacity that varied from 1.0 to 4.7 milliequivalents per milliliter of pore volume.

ATTACHMENT G

Gross radium injected during the ninety-day test and its underground distribution.

As outlined in Attachment II, approximately 91,296,000 gallons of mill waste effluent will be injected into the underground disposal zones during the ninety-day test. The radium content of this injected fluid will be approximately $6,000 \times 10^{-9}$ microcuries per milliliter or 2.27×10^{-8} grams per gallon. The total dissolved radium injected as a result of the ninety-day test will amount to approximately 2.07 grams. If the ion exchange capacity value for radium by the disposal zone rocks, as disclosed in Attachment F, is used, then approximately 2.94×10^7 cubic feet of disposal rock will retain the entire 2.07 grams of radium.

The ion exchange value as set forth in Attachment F is not representative of the entire disposal zone of 563 feet, but it is used here to illustrate a property of the disposal rocks that does exist to varying degrees. Further laboratory work will result in a more representative value.

Utilizing the foregoing figures, the radium front which will extend out from the well core, at the end of the ninety-day test, is calculated, considering a radial 360° flood pattern with 100% of the disposal thickness as an ideal case, and a restricted flood pattern of 90° with 25% of the disposal thickness as a more severe extreme. Total disposal thickness is 563 feet and porosity as used here is 24.6% whereas the average disposal zone porosity is 16.5%.

	360° Flood Front 100% of Vert. Thickness	90° Flood Front 25% of Vert. Thickness
91,296,000 gallons injected/2.07 gm. Ra.	129 ft.	515 ft.

ATTACHMENT H

Analysis of the potential disposal zone formation waters.
(Note Map No. 5)

The formation waters within the disposal zone aquifers were found to be brackish and not suitable for human consumption.

Chemical analysis by The Anaconda Company laboratory and radiological analysis by the Tracerlab laboratory for waters from the disposal zone formations are posted on Map No. 5.

THE ANACONDA COMPANY

New Mexico Operations

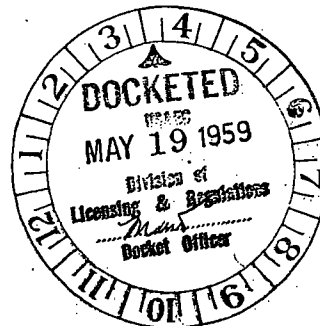
P. O. Box 638, Grants, New Mexico



DOCKET NO. 40-665

665
A. J. FITCH
MANAGER

May 14, 1959



United States Atomic Energy Commission
1901 Constitution Avenue, N. W.
Washington 25, D. C.

Attention: Division of Civilian Application

Re: Source Material License No.
R-138

Gentlemen:

On June 16, 1958, application was made for exemption from the requirements of Section 20.203(f)(2) of 10CFR Part 20 with respect to the labeling of shipping containers of uranium. This exemption was granted by your letter to us dated June 30, 1958.

On February 3, 1959, application was made for exemption from the requirements of Section 20.203(f) with respect to the labeling of containers located in processing buildings and used in our milling operations.

On February 6, 1959, a telephone call was received from your office advising that the exemption granted in your letter to us dated June 30, 1958, should be construed as covering all containers of any kind in our plants.

During a recent inspection tour of our mill, Dr. W. B. Johnston, Division of Licensee Inspection, Idaho Operations Office, advised us that the telephone call of February 6, 1959, was not sufficient confirmation for the granting of an exemption. On the advice of Dr. Johnston, I respectfully request that, for our records, you send us a written answer to our letter of application for exemption dated February 3, 1959.

Yours very truly,

A. J. FITCH

AJF:MA

CONFORMED COPY

40-665
February 23, 1959

MEMORANDUM TO: Acid Mill - IX Building Supervisors

SUBJECT : The Use of Protective Equipment in the Ion Exchange Building

The following protective equipment is available as required for use by personnel working in areas where such protection is needed. These items are available to the shift foreman and will be issued by request or when a job requires their use:

Safety Glasses	Rubberized Protective Clothing
Goggles	Cotton Protective Clothing
Face Shields	Rubberized Aprons
Respirators	Rubberized Gloves
Rubber Booties	Cotton Gloves

Cotton Protective Clothing (Coveralls) and Safety-Toed Rubber Booties:

Two pairs coveralls and one pair botties are standardly issued to every man at his time of hire. Any man may exchange an old pair of either item for a new one or otherwise be given another pair of either at the foreman's discretion. It is not mandatory for a man to wear these items except on such occasion as might be demanded by a supervisor in connection with some special job or service. However, if a man generally insists on not wearing either coveralls or botties he will in no wise be allowed to make a claim against the company for damage done to his own apparel.

Rubberized Gloves and Cotton Gloves:

One pair of either type of glove will initially be issued to every man. Type issued will depend on the particular job he is subjected to. As in the case of coveralls and botties, any man may exchange an old pair of gloves for a new one or otherwise be given another pair at the foreman's discretion.

At each of the following stations, protective clothing will be worn as indicated for the jobs indicated:

RIP Makeup Station:

1) During the addition of acid to RIP Makeup Tanks for pH adjustment, each operator will be required to wear an eye shield and rubberized gloves. One set of eye shields will be kept at this station.

2) A respirator will be worn by each man involved in makeup of magnesia slurry or copperas solution. Facilities for repairing and sterilizing respirators will be provided. Turn in old respirators to your foreman. Do not discard.

CONFORMED COPY

February 23, 1959

The Use of Protective Equipment in
the Ion Exchange Building

RIP Bank Station:

1) During the addition of acid to the rinse water at the banks, each operator will be required to wear a rubber coat, face shield, and gauntlet rubber gloves.

When not in use this equipment will be kept in the special cabinet placed in the middle aisle of the RIP bank section. Following the use of such equipment, it is to be returned clean to this cabinet.

Eluting Solution Makeup Station:

1) During the addition of acid to the Eluting Solution Makeup Tanks for pH adjustment, each operator will be required to wear an eye-shield and rubberized gloves. One set of eye-shields will be kept at this station.

Lime Slurry Makeup Station:

1) A respirator will be worn by each man involved in makeup of lime slurry. Respirators will be furnished by the foreman. Old respirators are to be returned to the foreman. Do not discard.

Clarification Press Work:

1) During cleaning of a press, the wearing of rubber pants has been standard practice and will be continued. Rubberized gloves are to be worn and not cotton. Following cleaning of a press, the pants are to be returned clean to a metal cabinet provided at the north wall of the building. Rubberized gloves are personal issue and are to be kept in employee's change room. The cabinet provided is for rubberized coats, pants, and aprons. This is not a change room.

Face shields or eye-shields are not necessarily required. However, all pressmen are to be conscious of location of eye-wash fountains.

Repair Work in Acid Areas:

With respect to any repair work in connection with both large and small acid storage tanks, acid pumps, and related piping, repairmen will be required to wear a rubber suit complete with face shield and rubber gloves. Such protective equipment is provided them by the Maintenance Department. In the event a repairman does not come properly equipped, the foreman may ask him to leave the section, and the department head will be immediately notified.

CONFORMED COPY

February 23, 1959

The Use of Protective Equipment in
the Ion Exchange Building

Special Jobs or Services:

On such occasion, the shift foreman will decide what particular clothing will be worn. This will apply to all men who have a job or service to perform in the IX Building whether members of the operating crew or members of an outside department.

Any man may also be required to wear a respirator in any area where, in the opinion of the shift foreman, a dust hazard exists.

Personal Hygiene:

All men working in the IX Building will be required to wash their hands before eating.

/s/ A. K. Veeder

A. K. Veeder, Ass't. Mill Sup't.
In Charge of IX

AKV:yjg

Distribution 4/6/59 to:

A.J.F.
E.C.P.
W.J.R.
F.A.W., Jr.
R.M.W.
J.O.M.

AKV (6)

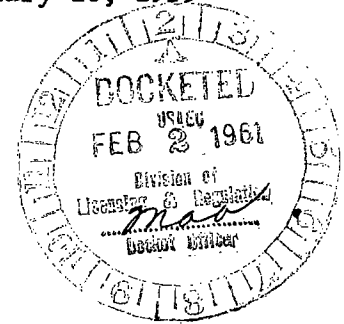
CONFORMED COPY

DOCKET NO. 40-665

February 18, 1959

MEMORANDUM TO: Crushing Plant Shift Bosses

SUBJECT : The Use of Protective Equipment



RESPIRATORS:

Respirators will be worn by all men working in areas where dust is apparent in the air they breathe.

Facilities for repairing, cleaning and sterilizing respirators has been provided for. Each man is to turn his used respirator in once each week to the shift boss who will issue him a clean, sterilized and repaired respirator.

SAFETY GLASSES AND GOGGLES:

Safety glasses will be worn by all men working in the following locations:

1. At the C-Plant ore grizzly when rock is being broken by sledge hammers.
2. In any area where flying sand or rock is apparent in the air.

Safety glasses or goggles will be issued by the shift boss and a repair service has been provided for damaged safety glasses. Damaged safety glasses are to be turned in for repair.

SAFETY BELTS:

Safety belts will be worn by all men working in the following locations:

1. When working out on the ore grizzlys.

Safety belts at the grizzlys have been provided.

SAFETY HELMETS:

Safety helmets will be worn by all men working in the following locations:

1. At the car shake out.
2. At the primary crusher building under the A-1 and A-2 conveyor belts when these belts are in operation.
3. In any area where there is a possibility of ore or rocks falling from overhead.

Safety helmets will be furnished by the Company for men working in these areas. The safety helmets furnished and now in the Primary Crusher Building in the A-Plant are to be left there for men coming on shift.

February 18, 1959

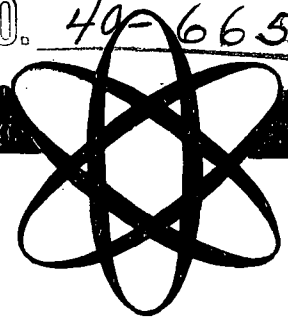
Failure to comply with the rules listed in this memorandum will be grounds for immediate discharge for personnel under your jurisdiction.

Amos Leach
General Crusher Foreman

AWL:bkh

cc: W.J.R.

THE SUPERVISOR'S
news bulletin



NEW MEXICO OPERATIONS

GRANTS, N. MEXICO

Volume IV - No. 13

June 15, 1959

RADIATION SURVEY STARTS JULY 6

Beginning July 6 and continuing for 26 consecutive weeks, a film badge survey will be conducted in all areas of the plant to determine the external radiation levels, if any, that may exist in our plant.

Surveys have been made in the past using sensitive instruments for the detection of beta and gamma radiation. Results of these instrument surveys indicate that it is extremely unlikely for any individual to receive an excessive amount of radiation exposure in our mill. Though useful in establishing general radiation levels, these surveys do not indicate the actual cumulative amount of radiation received by an individual over a period of time. The film badge program is designed to give a permanent record of the actual cumulative radiation exposure of individuals in all plant areas.

Film badges will not be worn by every employee. However, at least one person in each area of the plant will be given a film badge. Each individual who is to be supplied with a film badge will be sent on June 22, 1959 a copy of the attached letter explaining the purpose of the film badge with instructions for its proper use.

All employees in the Yellow Cake Section and Crushing Plant will be supplied with film badges as radiation levels may be highest in these areas. In other processing areas, one individual of each job classification will be supplied with a film badge. In the Warehouse, Office, Shops, and Service Departments selected individuals will be supplied with film badges. Thus, we will obtain a representative sampling of radiation exposure in all plant areas.

We have selected Tracerlab, Inc., as our film badge supplier. This company has a fine reputation for accuracy and integrity. However, the success of this program will depend, to a large extent, on the wholehearted cooperation of every individual who wears a film badge.

The assistance and cooperation of you as a supervisor will also be needed to assure that the program is carried out in such a manner that the results will be accurate and reliable beyond question.

You will from time to time be receiving information and instructions concerning film badges and other phases of the radiological health program. It will be your responsibility to convey this information to the men under your supervision.



Albert Fitch

THE ANACONDA COMPANY

New Mexico Operations

June 22, 1959

Dear - - - - - :

Announcement has been made of the establishment of a film badge program. This is to advise you that you have been selected as one of the individuals to whom a film badge will be issued.

The purpose of this letter is to give you an understanding of the proper use of the film badge so that accurate and reliable results may be obtained from this survey.

A film badge is a device which records on photographic film the quantity of radiation to which it is exposed. Exposure of photographic film to radiation results in a darkening of the film. This darkening of the film is a measure of the amount of radiation to which the film has been exposed and works in much the same way as exposing regular photographic film to light.

The film badges which will be supplied consist of a plastic holder that is divided into two compartments. Each of these compartments holds a film packet. The upper compartment holds a short-term film packet which will be replaced every two weeks. The used film packet will be evaluated for the amount of radiation exposure received during the period in which it was worn. Printed on lead foil on this film packet is the wearer's name, a code number and a six-digit number which specifies the date the packet was first used.

The lower compartment contains the cumulative film packet. This cumulative film remains in the film badge for approximately three months. At the end of this time, a new film badge of a different color will be supplied you. The cumulative film will be evaluated for the amount of radiation exposure which it received during the three months it was worn.

The film badge must be worn externally, completely uncovered and facing outward. The badges are supplied with an alligator clip so that the film badge may be conveniently attached to a breast pocket.

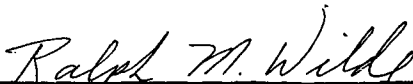
The film badge and film packets must be protected from excessive heat, pressure, and moisture. Where it is likely that badges might be damaged by moisture, the film badge will be enclosed in a small polyethelene sack.

It is most important that you do not attempt to remove the film packet from the film badge or to take the film badge apart. There are filters contained in the film badge which must be accurately positioned with relation to the film packet. Thus, any movement of the film may result in incorrect evaluation of radiation exposure.

Film badges will be worn whenever you are on shift. When the badges are not being worn, they will be stored on a rack in the Time Office. A control film badge for the recording of background radiation will also be stored on this rack. The film badge will replace the brass badge for hourly employees. That is, any hourly employee who is to wear a film badge will turn in his brass check at the Time Office each day and receive his film badge. At the completion of the working shift, the film badge will be turned in at the Time Office and the brass check returned to the employee. Salaried employees will also pick up and return their film badges at the Time Office.

This film badge program is being conducted to evaluate the external radiation to which employees may be exposed and thereby to forestall any possible overexposure. For this reason, it is in your best interest to protect the film badge from loss or damage and to follow all instructions given for the use and wearing of the film badge.

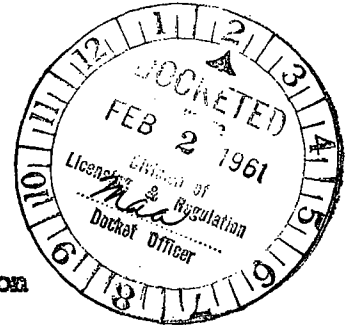
Thank you.



Ralph M. Wilde
Industrial Hygiene Engineer

DOCKET NO. 40-665
File Copy
January 6, 1959

MEMORANDUM TO: J. O. Marshall T. R. Beck
R. M. Wilde J. A. Abramo
W. J. Roberts A. W. Leach
D. C. Matthews W. R. Stern
J. R. Pate A. K. Veeder
R. D. Lynn T. M. Fitch
D. E. Dixon



SUBJECT : Operating Procedures for the Protection
Against Radioactive Contaminants.

At the risk of being repetitious, but in view of its importance, please find attached standard operating procedures for dust suppression and control of radioactive contaminants in crushing plants, sample preparation rooms, and yellow cake areas, that have been taken from the Winchester Report WIN-114 and given to all concerned in a more ready reference package. This has also been distributed to the Mechanical Department inasmuch as maintenance men are exposed to these same hazards.

Also included for those who have that need is a summation of radiation thresholds taken from the same publication, and all in conformance with Title 10 Part 20.

It is the duty and responsibility of every one of us to protect the employees of our plant operation from dust and radiation hazards and although we have developed perhaps excellent control throughout all of the plant operations it would be well to restudy the suggestions in the attached standards to make our control even more effective. This refers particularly to those details regarding the use and maintenance of respirators and other protective equipment and the frequent inspection, cleaning, and disinfection of such equipment, and which has already been detailed and put into effect in the Yellow Cake Section of the mill operation. Moreover, it is the further responsibility of Mr. J. O. Marshall, as Safety Engineer, to inspect our operations and to determine wherein our employees and their supervisors may not be adhering to good sound practice for the suppression and control of such hazards. This he will do in very close co-operation and joint study with everyone concerned and will make recommendations for improvement where any laxity or malfunction is discovered.

E. C. Peterson
Assistant Manager

ECP:cig

cc: A. J. F.

ATTACHMENTS ()

STANDARD OPERATING PROCEDURES FOR DUST SUPPRESSION AND CONTROL
OF EXPOSURE TO RADIOACTIVE CONTAMINANTS TO BE FOLLOWED BY
SAMPLE PLANT EMPLOYEES

I. Crusher operators, splitter operators, bucker and sample room operators

1. Buildings and equipment are to be kept clean at all times.
2. Vacuum cleaning is the method to be used to clean dust from floors, walls, ledges, pipes or other places where dust may collect.
3. Compressed air will be used only to clean out equipment between ore lots and when cleaning plugged chutes, etc., while sampling wet, sticky ore.
4. Respirators must be worn at all times when dusty conditions or suspected dusty conditions exist.
5. Lunch pails will be stored in change house where employees will eat their lunches.
6. All employees shall wash their face and hands thoroughly before eating.
7. Water will be applied at all available points when crushing dusty ore.
8. Dust collector will be running at all times while sampling and cleaning up.
9. Every effort shall be made by all employees to prevent dust from entering the body.

II. Truck drivers and loader operators.

1. Respirators must be worn at all times while loading or dumping dry dusty ore. Whenever possible, operators should load on the upwind side of operations, thus eliminating dust from blowing on them.
2. Loading areas, coarse ore bin at mill, and the area around the rejects bin will be kept clean at all times.
3. Lunch pails will be stored in change house where employees eating on the job will eat their lunches.
4. All employees will wash their face and hands thoroughly before eating.

STANDARD OPERATING PROCEDURES FOR DUST SUPPRESSION AND CONTROL
OF EXPOSURE TO RADIOACTIVE CONTAMINANTS TO BE FOLLOWED BY
CRUSHING SECTION EMPLOYEES

1. Building and equipment are to be kept clean at all times.
2. Vacuum cleaning is the method to be used to clean dust from floors, walls, ledges, pipes, and other places where dust may collect. Compressed air will not be used to clean up.
3. Respirators must be worn at all times when dusty conditions or suspected dusty conditions exist.
4. The Rotoclone will be in operation at all times while crushing and cleaning up. Check water level, baffles, mud drag and star feeder before starting.
5. The large doors to the crushing building will be closed at all times.
6. Lunch pails will be stored at Sample Plant change house, where lunch will be eaten.
7. Each employee shall wash his hands and face thoroughly before eating.
8. Every effort shall be made by each employee to prevent dust from entering the body.

STANDARD OPERATING PROCEDURE USED IN HANDLING PLANT HEAD, TAIL,
AND CONTROL SAMPLES IN THE PLANT BUCKING ROOM FOR PROTECTION
AGAINST DUST INHALATION AND/OR INGESTION

The pulverizers, crusher, blenders, and splitters are placed under hoods equipped with an exhaust system to remove dust and to prevent its spread into the surrounding area.

I. The sample bucker while preparing any sample involving dried material shall:

1. Wear a respirator at all times.
2. Turn on exhaust fan motor.
3. Adjust dampers in the hood exhaust system so the draft is sufficient to withdraw dust rising from the sample at any given step in the procedure of sample preparation.
4. Wear a respirator when handling head samples in and out of the drying oven, and when crushing samples in the gyratory crusher located in the ball mill area.
5. Keep all sampling equipment clean.
6. Wipe down hoods, ovens, motors, and fixtures with a damp cloth or sponge.
7. Keep floors and windows clean.
8. Keep sample discards cleaned up and rejects emptied on schedule.
9. Use vacuum cleaner as required to keep dust from accumulating.
10. Use air under hoods only and only when absolutely necessary.
11. Wash hands thoroughly with soap and water before eating or smoking and at the end of shift.

II. The product supervisor while working in the yellow cake barreling area shall follow standard operating procedures for dust suppression and control of exposure to radioactive contaminants for that area.

STANDARD OPERATING PROCEDURES FOR DUST SUPPRESSION AND CONTROL
OF EXPOSURE TO RADIOACTIVE CONTAMINANTS TO BE FOLLOWED BY
ALL PERSONNEL WORKING IN YELLOW CAKE AREAS

1. Persons working in or visiting the yellow cake areas shall wash their faces and hands thoroughly before smoking, eating, drinking, or chewing.
2. Due to the potential contamination problem, smoking, chewing, eating, or drinking shall be prohibited in the yellow cake areas.
3. Lunch pails, food, drinks, and smoking materials shall not be taken into these yellow cake areas.
4. All skin eruptions, cuts, open wounds, and abrasions shall be covered with a sterile bandage before entering and while working in these areas.
5. Employees working in the yellow cake areas shall shower and change clothes before leaving the plant area. In no case shall clothing worn in the yellow cake areas be worn outside of the plant area.
6. All employees working in the yellow cake areas shall endeavor to prevent yellow cake from entering the body. This will be accomplished by following all rules and practicing good personal hygiene at all times.
7. Employees working in this area shall shower, dry, and submit a urine sample before leaving on off days and immediately upon return to work after off days.
8. After each separate phase of this operation, the operators shall wash off their gloves, remove the gloves, and wash their faces and hands.
9. Maintenance personnel or other persons working or visiting in the yellow cake areas shall wash their shoes or boots thoroughly and remove their coveralls before leaving the area; this applies even though the person is leaving the area temporarily to obtain materials or supplies.
10. Protective clothing such as coveralls shall be kept as clean as possible. In event the coveralls become contaminated, they should be changed for clean ones.

11. Protective clothing such as coveralls, shoes, boots, or gloves shall not be removed from the yellow cake area.
12. Rubber gloves shall be washed with soap and water before they are removed from the hands at any time.
13. Employees shall keep two pairs of rubber gloves for wear, one pair to be washed thoroughly inside and out at the end of each shift so as to be drying during the following shift.
14. Protective goggles, safety glasses, or face shields shall be worn by employees when on duty in this area or any plant area, the same as applied to all plant employees and visitors in operating areas.
15. Respirators shall be worn at all times when the employees are in the barreling area during barreling operations, when the dryer oven doors are open, and when cleaning up. Respirators shall be turned in weekly for sterilization. This applies whether or not dust is visible in the air.
16. All persons required to use a respirator shall bring the respirator to the first-aid room to be sterilized before leaving the plant for two or more days off and shall obtain a clean respirator before returning to his regular duties after his "off" days.
17. The yellow cake barreling area, press area, and barrel storage area are to be kept free from dust on the equipment, pipes, ledges, and floors at all times.
18. Dust shall be removed with a vacuum cleaner or with a hose and water; never use brooms or blow down dust with compressed air.
19. Splashes and spills shall be cleaned up as soon as possible to prevent contamination of shoes, boots, or clothing.
20. Vent tubes to the scrubber or dust collectors shall be checked and cleaned, if needed, at least once each week and more often if necessary.
21. Doors and entrances to these areas shall be kept closed and chains shall be hooked except when actually in use.
22. All persons (including supervisors) who are visiting the area shall sign in and out in the book provided for this purpose.

STANDARD OPERATING PROCEDURE USED IN THE HANDLING OF CONCENTRATE
SAMPLES IN THE YELLOW CAKE PREPARATION ROOM FOR PROTECTION AGAINST
DUST INHALATION AND/OR INGESTION

- I. Yellow cake preparation room employees will comply with the following standard operating procedures:
 1. Coveralls and a respirator will be worn at all times by the yellow cake supervisor when handling yellow cake samples.
 2. Asbestos gloves will be worn while removing hot sample jars from the drying oven.
 3. The exhaust fan shall be in operation and dampers adjusted to exhaust dust from area under hood where sample transfer is being made.
 4. Entire area, including hoods, fixtures, furniture, and equipment, is to be kept clean by using dampened cloth, sponge, or vacuum cleaner only.
 5. Sample jars, lids, and pans are to be cleaned first with a 1:3 hydrochloric acid to water solution followed by thorough washing with fresh water.
 6. Rubber gloves shall be worn while washing and cleaning.
 7. Sample rejects are to be emptied regularly and drawers and cabinets kept free of yellow cake.
 8. Hands and face shall be thoroughly washed with soap and water after finishing preparation of samples, also before smoking or eating and before leaving area at the end of the shift.
- II. The product supervisor while working in the yellow cake barreling area shall follow standard operating procedures for dust suppression and control of exposure to radioactive contaminants for that area.

THE ANACONDA COMPANY

New Mexico Operations

P. O. Box 638, Grants, New Mexico



DOCKET NO. 40-665-

February 3, 1959

Atomic Energy Commission
1901 Constitution Avenue NW
Washington 25, D.C.

Attention: Division of Civilian Application

Reference: Source Material License No. R-138

Gentlemen:

Due to conditions which exist in the normal operations of processing uranium ores in our mill, we find that it would be extremely difficult to comply with Section 20.203(f) of 10CFR Part 20 with respect to labeling of containers in which natural uranium is transported, stored, or used.

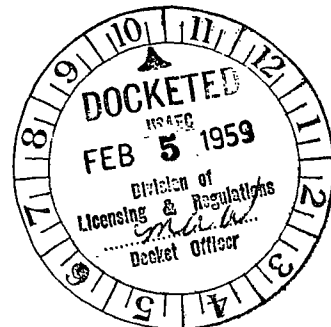
The ore processing methods which we employ require that the uranium contained in the ore flow in a continuous manner through all processing steps until it leaves the processing area either as uranium concentrate or tailings. In the course of this flow there are of necessity numerous storage bins, grinding mills, tanks, sumps, pipelines, and other containers which contain quantities of uranium in excess of ten times the quantity specified in Appendix C of Part 20.

All of the containers referred to in the above paragraph are located within our processing buildings. We have posted caution signs on all doorways to processing buildings in compliance with Section 20.203(e) of Part 20. These signs bear the radiation caution symbol and the words:

CAUTION
RADIOACTIVE MATERIALS

* *

IN THIS BUILDING
RADIOACTIVE MATERIALS
ARE BEING PROCESSED



In view of the difficulties which would be encountered in an attempt to comply strictly with Section 20.203(f), and in view of the fact

*T. W. ...
6-22-11*

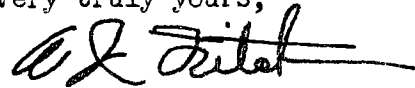
February 3, 1959

Page 2

that the containers are housed in buildings posted with radiation caution signs, we respectfully request that we be granted an exemption from the requirements of Section 20.203(f) for containers located in processing buildings.

In order to indicate the numerous vessels and containers involved in such compliance, flow sheets of the milling processes are attached which indicate such vessels and containers throughout plant operations. These flowsheets may be helpful to your realization of our problem of compliance.

Very truly yours,

A handwritten signature in cursive script, appearing to read "A. J. Fitch", with a long horizontal flourish extending to the right.

A. J. FITCH, MANAGER

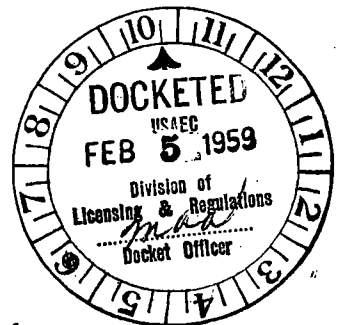
AJF:bkh

DOCKET NO. 40-665

THE ANACONDA COMPANY
BLUEWATER URANIUM PLANT
BLUEWATER, NEW MEXICO

FLOW SHEETS

TYPE "2"



CROSSLING PLANT

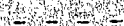
INDEX TO FLOW SHEET

1. Hopper Bottom Ore Cars (75 Tons Each)
2. Loader
3. Grizzly & Hopper
4. Belt Feeder
5. Grizzly
6. Jaw Crusher
7. Conveyor
8. Vibrating Screen
9. Double Impeller Impact Breaker
10. Automatic Sampler (Gerry - Jennings Type)
11. Sample Chute
12. Gyrotory Crusher
13. Tripper
14. Sandstone Ore Truck Bin
15. Sandstone Ore Bins
16. Hopper
17. Cone Crusher
18. Automatic Sampler (Utah Type)
19. Snyder Sampler
20. Elevator
21. Rolls Crusher
22. Limestone Ore Bin
23. Automatic Weight Recorder
24. Electric Magnet

LIST OF SYMBOLS AND ABBREVIATIONS



Solid lines indicate the route of the Uranium Oxide as it progresses toward its final state, yellow cake.



Dotted lines indicate recirculation and reagent lines.



Indicates a pump.



Indicates a sump.

A.Y.C.

Acid Plant Yellow Cake

C.A.C.

Carbonate Plant Yellow Cake

Flgs.

Failings (Waste)

W.W.

Wash Water

U_3O_8

Uranium Oxide

H_2O

Water

H_2SO_4

Sulphuric Acid

MnO_2

Manganese Dioxide

$Ca(OH)_2$

Slaked Lime

$NaCl$

Salt

MgO

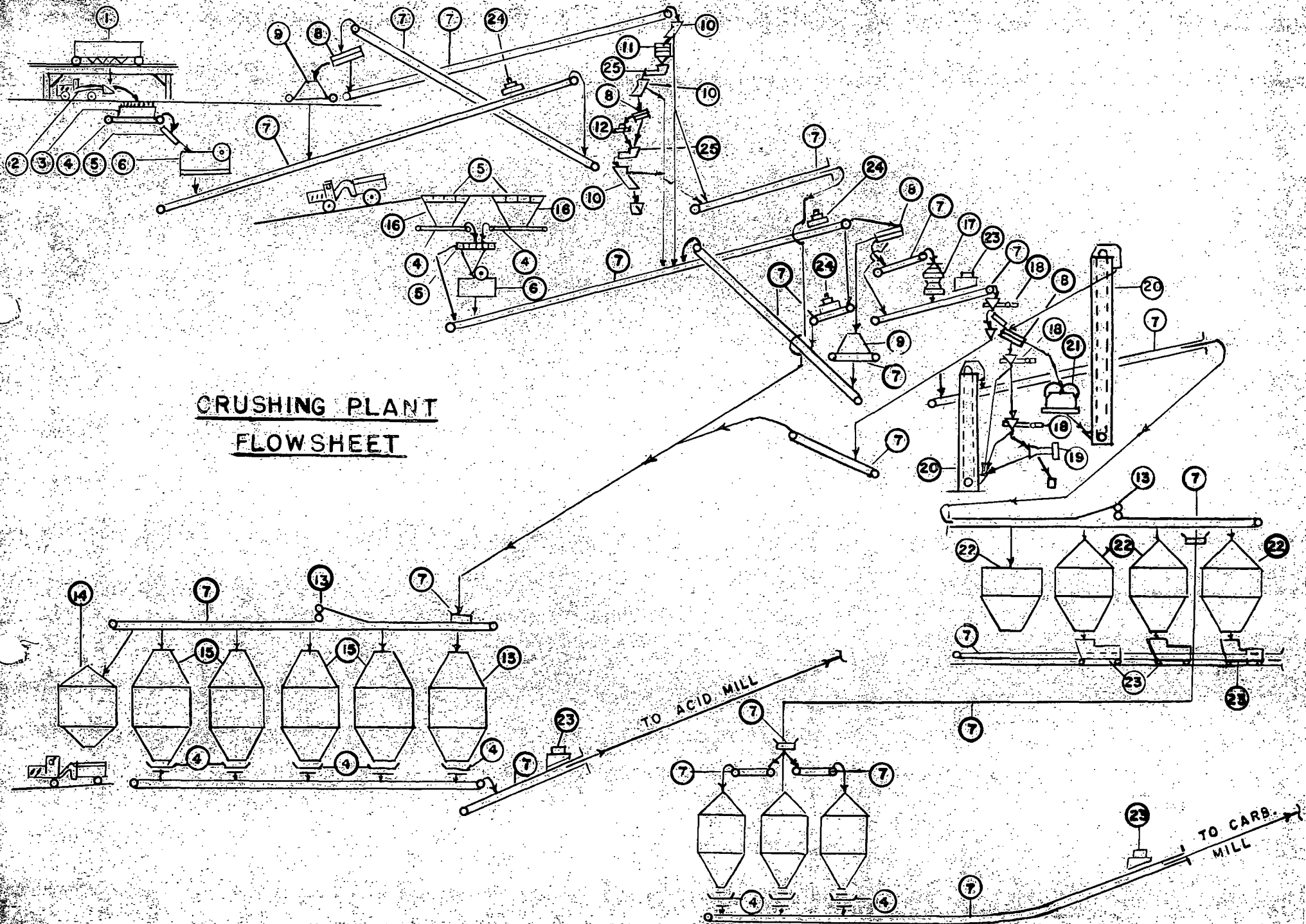
Magnesium Oxide

K_2O_4

Potassium Permanganate

$NaOH$

Caustic Soda



CRUSHING PLANT
FLWSHEET

TO ACID MILL

TO CARB. MILL

U₃O₈ LEACHING MILL ACID PROCESS

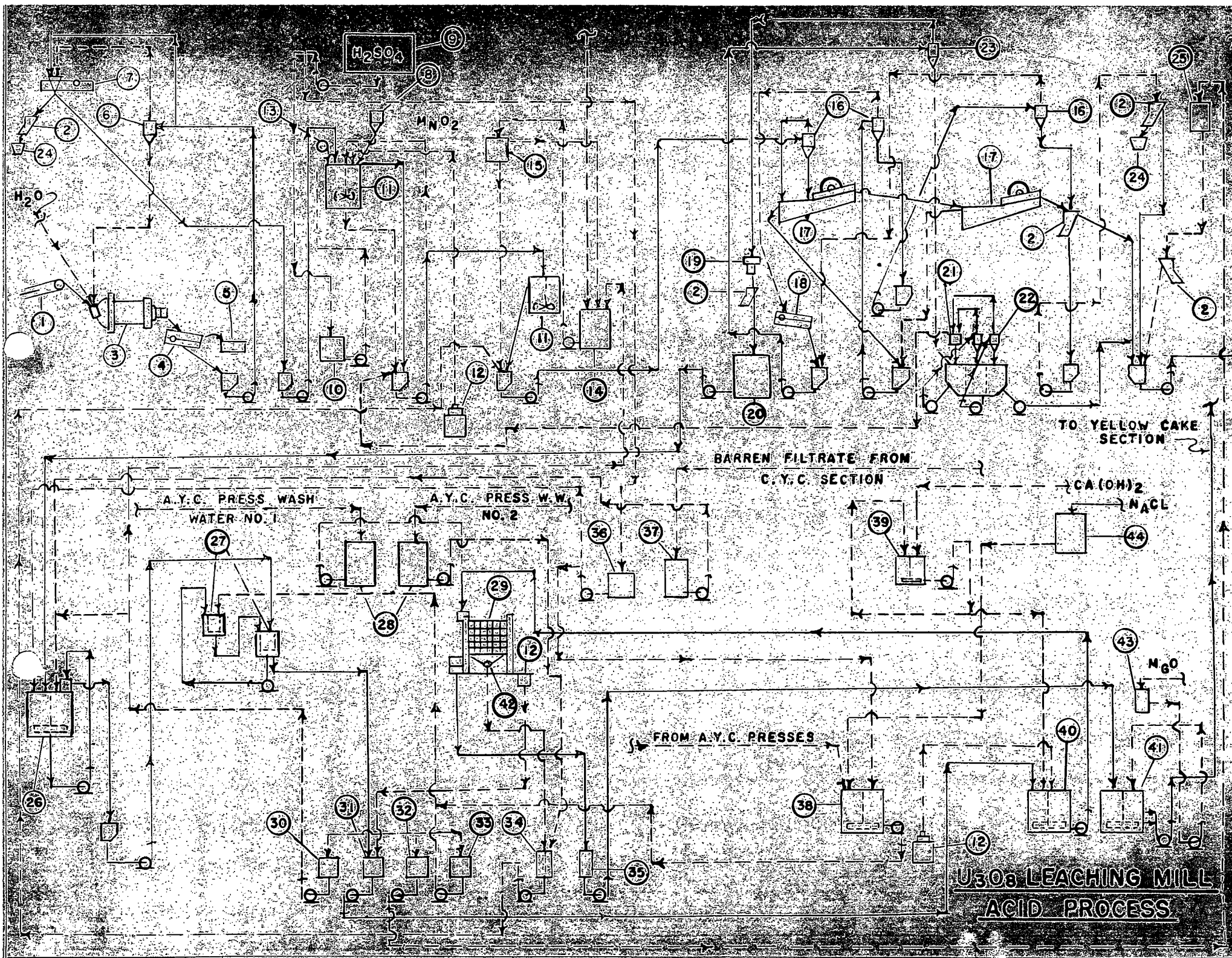
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1. Conveyor from Crushing Plant
2. Automatic Sampler
3. Rod Mill
4. Rod Mill Screen
5. Trash Cart for Screen Oversize
6. Clone
7. Sampler (in Sample Tower)
8. Automatic MnO₂ Feeder
9. H₂SO₄ Storage Tank
10. H₂SO₄ Daily Storage
11. Leach Tanks (18 Each Unit)
12. Floor Sumps
13. Steady Head Tanks (H₂SO₄)
14. R.I.P. Wash Collection Tanks
15. Steady Head Tanks
16. Clones
17. Classifiers (5 Each Unit)
18. Classifier Screens (for Classifier Overflow)
19. Sweco Screen (for Clone Overflow)
20. Clone Overflow Collection Tank
21. Clone Overflow Collection Box
22. Clones (2 Each Unit)
23. Clones (24 Each Unit)
24. Sample Bucket

U₃O₈ LEACHING MILL ACID PROCESS

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25. R.I.P. Tailings Surge Tank
26. R.I.P. Storage Tanks (6 each)
27. R.I.P. Basket Tanks (14 Tanks Each Unit)
28. Wash Water Storage Tanks
29. Clarification Filter Press
30. R.I.P. Drain Tank
31. Preg. Solution Tank
32. R.I.P. Tailings Sump Tank
33. Eluting Solution Sump Tank
34. Sludge Tank
35. Clarified Solution Sump Tank
36. Acid Daily Storage Tank
37. Barren Filtrate (Carb. Plant) Collection Tank
38. Eluting Solution Make-Up Tank (3)
39. Reagent Mixing Tank (3)
40. First Precipitation Tanks (3)
41. Second Precipitation Tanks (2)
42. Repulper
43. M_gO Mixing Tank
44. NaCl Storage Tank



**U₃O₈ LEACHING MILL
ACID PROCESS**

CARBONATE LEACH. PLANT P.S.

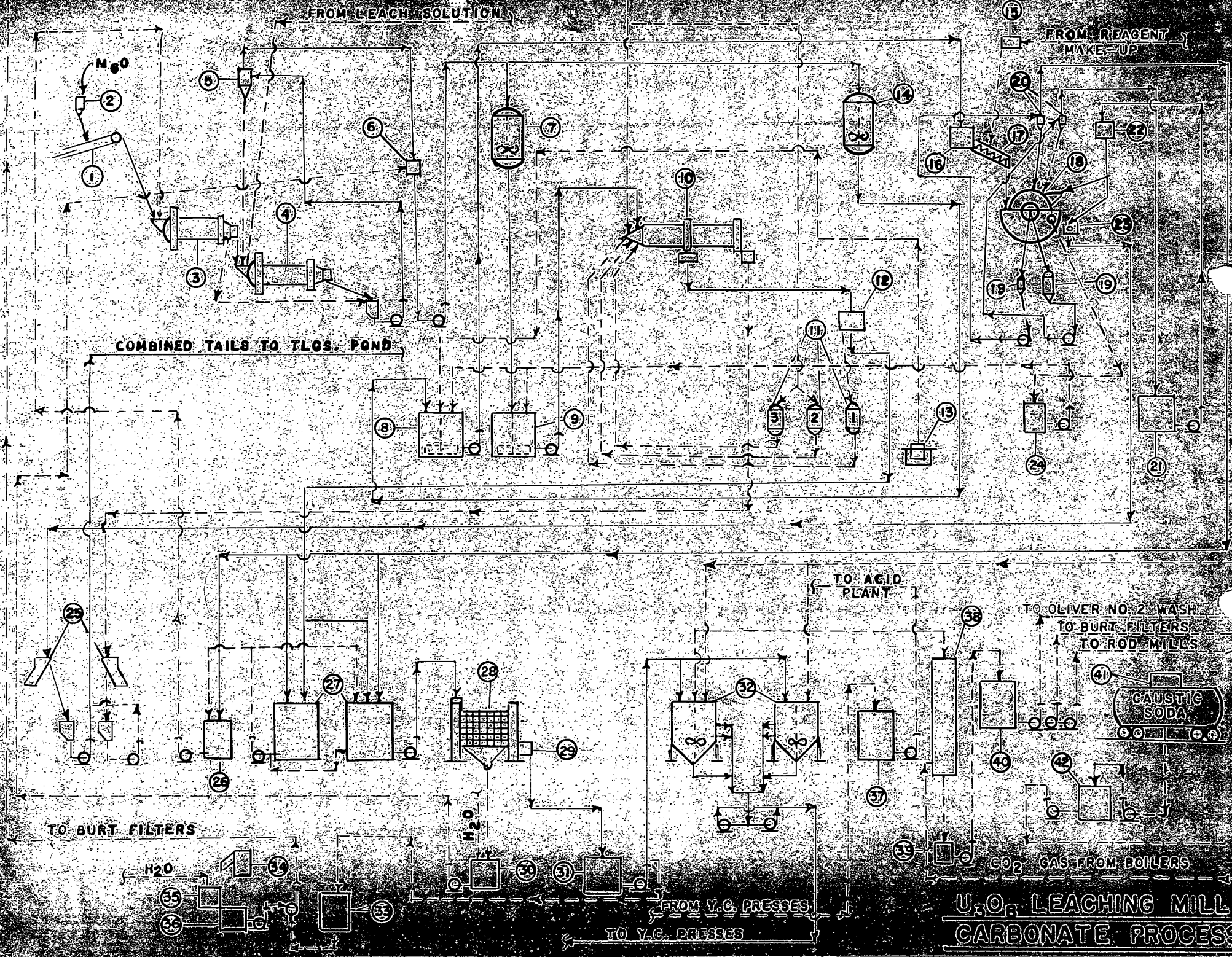
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1. Conveyor
2. Reagent Feeder
3. Rod Mill
4. Ball Mill
5. Clones
6. Rod Mill Discharge Sump
7. Autoclaves (6 for Burt Filters)
8. Surge Tank - Burt Filters
9. Surge Tank - Oliver Filters
10. Burt Filters (5)
11. Wash Tanks
12. Collector Tanks (3)
13. Floor Sump
14. Autoclaves (6 for Oliver Filters)
15. Reagent Mixing Tank
16. Pulp & Reagent Receiver
17. Mixing Launder
18. Oliver Filters (3)
19. Vacuum Receiver
20. Clones
21. Cooling Tank
22. Steady Head Tank
23. Repulpers
24. Emergency Dump Tank

CARBONATE LEACH. PLANT P.S.

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25. Automatic Samplers
26. Preg. Solution Tank
27. Preg. Solution
28. Clarification Presses (2)
29. Filtrate Launder
30. Sludge Sump
31. Sump Tank (for Clarified Preg.)
32. Precipitation Tanks (2)
33. Cooling Tanks
34. Reagent Feeder
35. Reagent Mixing Tank
36. Reagent Holding Tank
37. Barren Filtrate Tanks (2)
38. Carbonation Towers (3 - Each)
39. Regenerated Barren Solution Sump
40. Regenerated Barren Solution Tank
41. Caustic Soda Transport Car
42. Caustic Soda Storage Tank



**U₃O₈ LEACHING MILL
CARBONATE PROCESS**

YELLOW CAKE PLANT - CARB. LEACH. SECTION

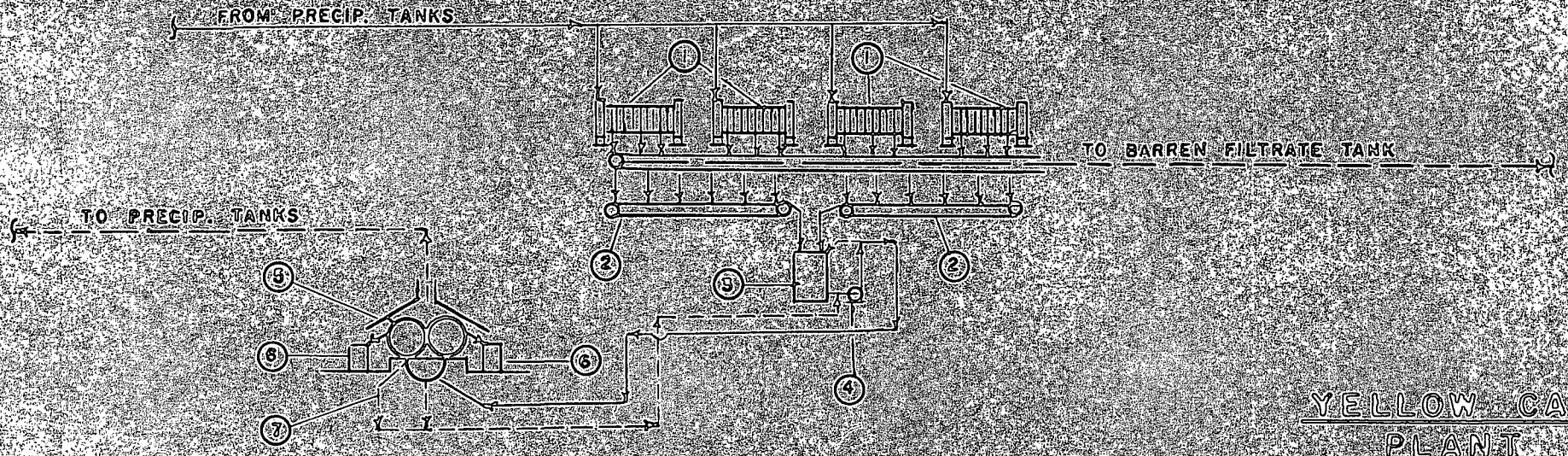
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1. Filter Presses
2. Yellow Cake Conveyors
3. Mixing Tank
4. Positive Displacement Pump
5. Drum Dryer
6. Yellow Cake Drums
7. Dryer Overflow

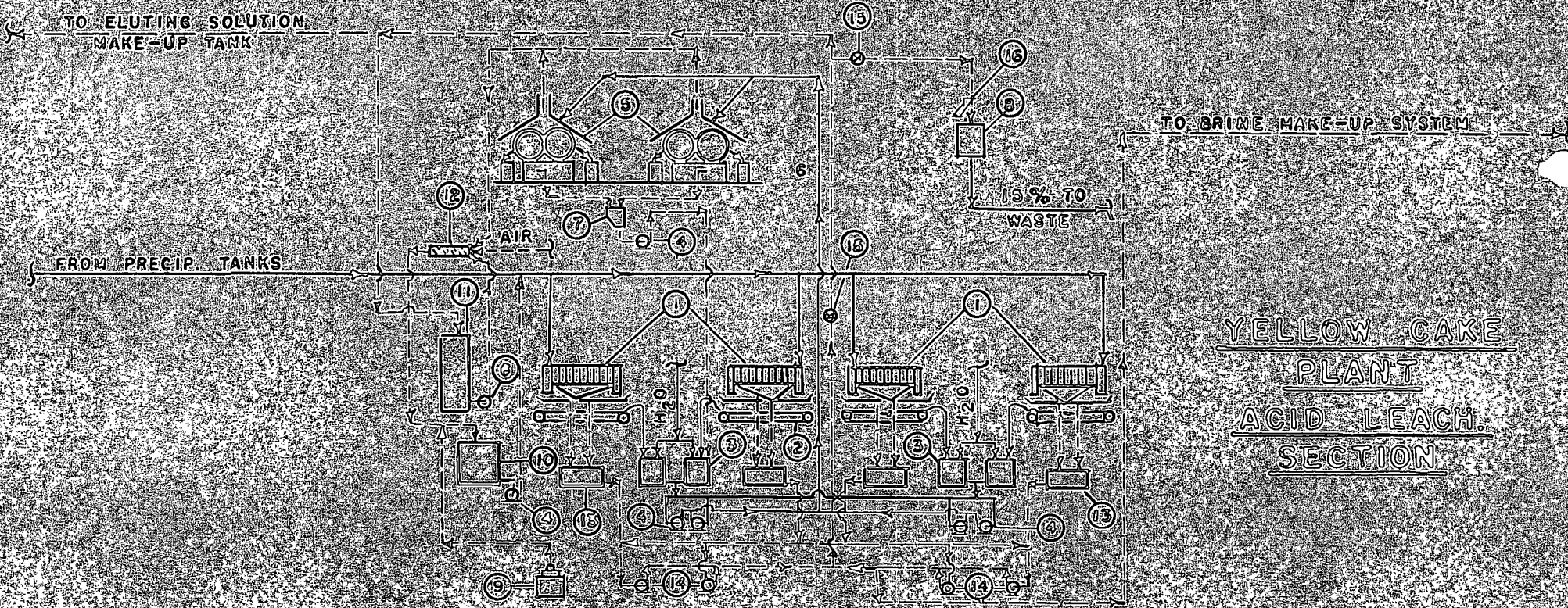
YELLOW CAKE PLANT - ACID LEACH. SECTION

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1. Filter Presses
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4. Positive Displacement Pumps
5. Drum Dryers
6. Steel Drums
7. Dryer Overflow System
8. Barren Filtrate Bleed-Off Tank
9. Floor Sump
10. Dust Collection Tank
11. Secondary H₂O Storage
12. Dust Collector (Microdyne)
13. Barren Filtrate Sump Tanks
14. Solution Pumps
15. Flowrators
16. Automatic Sampler



YELLOW CAKE
PLANT
CARB.-LEACH.
SECTION



YELLOW CAKE
PLANT
ACID-LEACH.
SECTION

Charles G. Caldwell, Director
Environmental Sanitation Services



P.O. Box 711
Santa Fe, New Mexico

DOCKET NO. 40-665

NEW MEXICO
DEPARTMENT OF PUBLIC HEALTH

SANTA FE

January 8, 1959

Docket No. 40-665
L&R:CPM

RE: Underground Injection Disposal
Wastes for Anaconda Company,
Bluewater, New Mexico

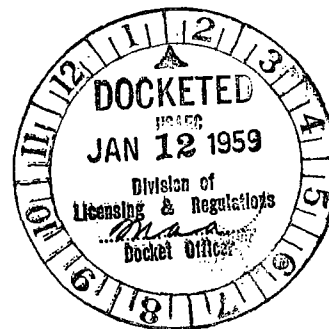
Mr. J. C. Delaney
Chief, Nuclear Materials Section
Licensing Branch
Division of Licensing & Regulation
Atomic Energy Commission
Washington 25, D. C.

Dear Mr. Delaney:

This letter will acknowledge your letter of November 26, 1958, to Dr. Stanley J. Leland, Director of the New Mexico Department of Public Health, in regard to the injection of uranium mill waste waters in a deep well as a means of final disposal. This method is being proposed by the Anaconda Co. for its uranium mill at Bluewater, New Mexico.

We have had very close contact with the Anaconda Co. in regard to this proposed means of liquid waste disposal, as they have encountered very serious difficulties in waste disposal since the mill was placed in operation. This past Fall a conference was held with representatives of the Anaconda Co., the Office of the State Engineer of New Mexico, and the New Mexico Department of Public Health. It was agreed that the well would be drilled on experimental basis only so that adequate geological information would be obtained on formations well below any water aquifer suitable for domestic, irrigation, or industrial uses.


We have delayed answering your letter as it had been our understanding that the Anaconda Co. had dropped this proposed method of waste disposal. However, a recent contact with the office of the State Engineer indicates they plan to go ahead as originally planned. The State Engineer has informed us that they have approved the application of the Anaconda Co. at Bluewater, New Mexico, for the drilling of an experimental well for liquid waste disposal.



Mr. J. C. Delaney
Page 2
January 8, 1959

Under the above conditions, with the approval of the Office of the State Engineer of New Mexico, we feel that the drilling of an experimental well under the additions as cited above is satisfactory. We have also worked with the U. S. Geological Survey on this problem, and we feel that between the various state agencies a proper evaluation can be made from ~~information~~ information obtained through the drilling of an experimental well. The Anaconda Co. has been very cooperative with us in making an effort to find a satisfactory solution for liquid waste disposal at its Bluewater uranium mill.

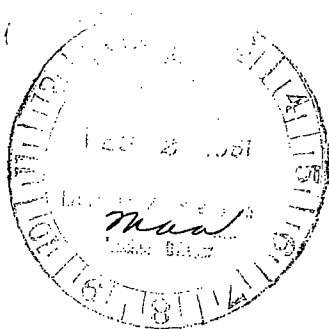
Very truly yours,



Robert P. Lowe, Assistant Director
Environmental Sanitation Services

RPL/pg

CONFORMED COPY



DOCKET NO. 40-665

December 17, 1958

MEMORANDUM TO: Yellow Cake Supervisors

SUBJECT: The Use of Protective Equipment and the Practice of Personal Hygiene in the Yellow Cake Section.

All of the protective equipment listed by Mr. Roberts in his memorandum of November 6, 1958, is available as needed by men working in the Yellow Cake Section.

The following rules will apply to all men who are required to work in the Yellow Cake Section whether members of the operating crew or members of an outside department. Failure to obey these rules will be grounds for immediate discharge for personnel under your jurisdiction. In the case of service personnel, upon infraction of these rules the man will be asked to immediately leave the section and I will be informed at once of the circumstances so that appropriate action can be taken.

HARD HATS:

Hard hats will be worn by all operating personnel. Spare hats are available for temporary use by members of outside departments when working where there is a possibility of yellow cake falling or dripping from overhead.

COTTON PROTECTIVE CLOTHING (COVERALLS):

Coveralls will be worn by all operating personnel. Service personnel will be provided with coveralls as necessary and at the discretion of the Yellow Cake Shift Boss. Coveralls issued on this basis will not be worn from the section and will be returned to the shift boss when the job is finished.

SAFETY-TOED RUBBER SHOES:

Safety-toed rubber shoes will be worn as necessary by all men working in the Yellow Cake Section.

Service department personnel will obtain rubber shoes through the foreman of their own department.

RESPIRATORS:

Respirators will be worn by all men working in the following locations:

The Use of Protective Equipment and the Practice of
Personal Hygiene in the Yellow Cake Section.

December 17, 1958

1. Under an operating dryer.
2. On the floor dryers.
3. At the furnace.
4. Sampling drums.
5. Discarding samples.
6. In any area where, in the opinion of the Yellow Cake Shift Boss, a dust hazard exists.

Facilities for repairing and sterilizing respirators are to be provided so it will be possible to furnish respirators to men from outside departments on a temporary basis.

RUBBERIZED GLOVES:

Rubberized gloves will be worn by all operating personnel and service department personnel as necessary.

Cotton gloves will no longer be issued to Yellow Cake personnel as they tend to become saturated with yellow cake and may irritate the hands.

GOGGLES AND SAFETY GLASSES:

These items will be kept by the shift boss and issued on request or when a job requires their use. This equipment will be returned to the shift boss when the work requiring its use is finished.

PERSONAL HYGIENE:

All men working in the Yellow Cake Section will be required to wash their hands before eating or smoking.

The last 15 minutes of each shift has been provided to allow every member of the operating crew to take a shower before leaving the job. Since this time is part of the working day it is required that each man actually take a shower as part of his job.

/S/ T. R. Beck
T. R. Beck, Ass't. Mill Sup't.
In Charge of Carbonate Mill

TRB:cig
cc: A.J.F.
E.C.P.
W.J.R.
F. Welch
R. Wilde
J. O. Marshall

THE ANACONDA COMPANY

New Mexico Operations

P. O. Box 638, Grants, New Mexico



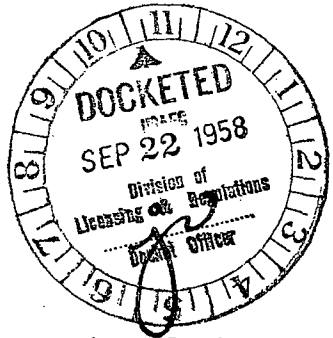
A. J. FITCH
MANAGER

September 11, 1958

United States Atomic Energy Commission
1901 Constitution Avenue N. W.
Washington 25, D. C.

Attention: Division of Civilian Application

Gentlemen:



The Anaconda Company operates a uranium ore processing plant near Grants, New Mexico, under Source Material License No. R-138. The entire production of uranium concentrate from this plant is sold and delivered to the Atomic Energy Commission at its receiving station at Grand Junction, Colorado.

Waste material from this plant, consisting of a slurry of finely ground ore residue and aqueous solution, is discharged to an area adjacent to the plant at the rate of approximately 14,514 tons per day. In this disposal area the ore residue settles, leaving the relatively clear solution which must be further disposed of, at the rate of approximately 1,800 gallons per minute.

In addition to chemicals from processing, this solution contains small amounts of radioactive material, the greatest of which is uranium, in the amount of approximately .005 gram per liter. A small amount of radium (approximately 300 micromicrocuries per liter) is also present.

We are presently considering disposing of this solution by injection, through a cased and cemented bore hole, into a suitable rock stratum which lies several hundred feet below the surface. Preliminary geologic investigation indicates that the injected solution would remain confined to this particular stratum and that contamination of existing sources of water supply would be highly improbable. Test work, to be conducted during the drilling of the bore hole, would serve to confirm these indications.

The purpose of this letter is to request the Commission's approval of the aforementioned method of disposal of the contained radioactive materials. We would appreciate your early consideration and reply.

Yours very truly,

AJF:MA

A. J. FITCH

THE ANACONDA COMPANY

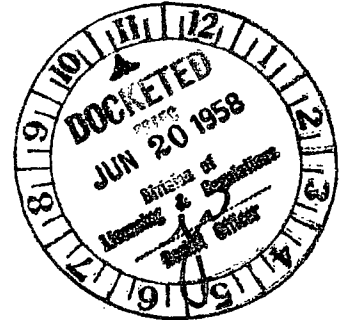
New Mexico Operations

P. O. Box 638, Grants, New Mexico



A. J. FITCH
MANAGER

June 18, 1958



Mr. J. C. Delaney, Chief
Materials Section, Licensing Branch
Division of Licensing and Regulation
United States Atomic Energy Commission
Washington 25, D. C.

Dear Mr. Delaney:

In accordance with your request of March 31, 1958, the following additional information is submitted in support of our application for renewal of Source Material License No. R-138:

1. Our procedure for safeguarding employees against dust and contamination exposure through the escape of radioactive materials in the processing of such materials is as follows:
 - I. Prosecution of regulations as specified in Title 10 Part 20.
 - II. Time study breakdowns have been made relative to the various plant sections.
 - III. Personnel exposure breakdowns have been made relative to employee assignment.
 - IV. Periodic radiation and contaminant surveys have been made and will continue to be made to determine exposures under variable changes in physical content in ore stream and process.
 - V. Educational and instructional program to be prosecuted by supervisors.
 - VI. A report, accumulative and supplementary in nature, has been prosecuted to amass data relative to exposures of radiation and contaminants.
 - VII. A full time safety engineer prosecutes a safety first program.

2. A general description of types of instruments we have available to perform necessary health and safety surveys is as follows:

I. Dusts:

A. Sampling.

1. All glass standard and midget impingers with calibrated pumps and ejectors.

B. Quantitation.

1. Number concentration
 - a) Standard microprojector at 1000x
 - b) Midget microprojector at 1000x
2. Particle Size
 - a) Sampling
 - (1) Electrostatic Precipitator
 - (2) Thermo Precipitator
 - (3) Owens jet sampler
 - b) Quantitation
 - (1) Standard microprojector at 10,000x
 - (2) Sedimentation-Whitby Method
3. Free Silica content
 - a) Sampling
 - (1) Electrostatic Precipitator
 - (2) Residual
 - b) Quantitation
 - (1) X-ray refraction

II. Radiation:

A. Gamma radiation

1. Scintillator Model 111B calibrated against known radium source at variable distances.

B. Radon and Daughters

1. Sampling
 - a) Millipore samplers with calibrated volume displacement equipment
 - b) Filter paper samplers with calibrated volume displacement equipment

June 18, 1958

2. Quantitation

- a) Juno Model 6 Serial #1110 with D.P.M. curve for three scales calibrated at U. S. Public Health Laboratory, Salt Lake City, Utah. Source for field check on hand.
- b) Working Level determinations as per Public Health Publication #494.

C. Contaminants

Complete sampling and quantitation equipment is available for dusts, gases, fumes, mists and vapors.

3. The waste product from processing will consist of finely ground ore solids combined with an aqueous solution. This solution will be discharged at the rate of approximately 14,514 tons per day (3,500 tons of solids and 11,014 tons of solution) to an isolated disposal area adjacent to the plant.

Radioactive materials present in these products will consist of approximately .16 pound of uranium per ton of solids, and approximately .03 pound of uranium per ton of solution, together with the daughter products which were contained in the ore when fed to process. Comparative radiometric and chemical analyses of the ore to be processed indicate that a state of approximate equilibrium exists. It is expected, therefore, that the daughter products being discharged will be normal to an ore of this type.

It is intended that the excess water will be removed by solar evaporation. The surface of the remaining ore solids and residue from evaporation will be treated to dampen radiation and reduce removal by wind.

I shall be pleased to hear from you should additional information be desired.

Yours very truly,



A. J. FITCH

AJF:MA



RECEIVED

JUN 20 1958

U. S. A. E. C.

Division of Licensing
and Regulations

THE ANACONDA COMPANY

New Mexico Operations

P. O. Box 638, Grants, New Mexico



A. J. FITCH
MANAGER

June 16, 1958

Mr. H. L. Price, Director
Division of Licensing and Regulation
United States Atomic Energy Commission
Washington 25, D. C.

Re: DLR:RFE
40-665

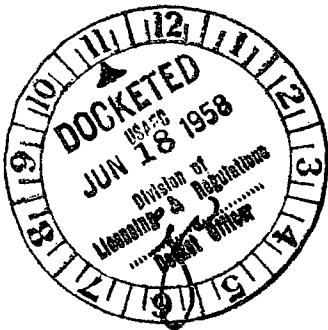
Dear Mr. Price:

In accordance with your request of May 23, 1958, that your office be notified of the action taken to correct certain deficiencies noted in the AEC inspection on January 7, 1958, of our operations at Grants, New Mexico, I am pleased to submit the following:

A. Surveys of our operations were conducted jointly during the periods of November 30 to December 3, 1957, and March 3 to 12, 1958, by representatives of the United States Public Health Service, New Mexico Department of Health, United States Atomic Energy Commission, and ourselves. A full report is now at hand containing the data derived from these surveys. An additional survey is scheduled to be conducted in early July this year. It is believed that we will be able to demonstrate that our operations are in full compliance with Part 20, Title 10, Code of Federal Regulations.

B. Posting with proper caution signs of all areas and rooms in our plant as required by Section 20.203(e)(2) has been accomplished.

We find it impossible under the present circumstances to fully comply with the requirements of Section 20.203(f)(2) in that our contract with the Commission for the production of uranium concentrate sets forth rigid specifications for shipping containers which do not permit the application of the labels required. I respectfully request, therefore, that we be granted exemption from the requirements of Section 20.203(f)(2) with respect to shipping containers.



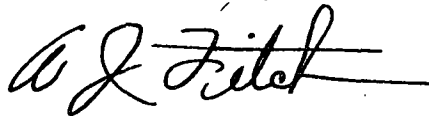
Mr. H. L. Price, Director

-2-

June 16, 1958

I shall be pleased to hear from you should the foregoing fail to set forth all of the information desired.

Yours very truly,

A handwritten signature in cursive script, appearing to read "A. J. Fitch", with a horizontal line extending to the right from the end of the signature.

A. J. FITCH

AJF:MA

