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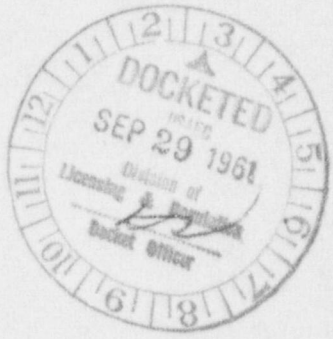
VANADIUM CORPORATION OF AMERICA

DURANGO, COLORADO

September 26, 1961



L&R:ND

Mr. J. C. Delaney, Chief
Nuclear Materials Branch
Division of Licensing and Regulation
U. S. Atomic Energy Commission
Washington, D. C.

Subject: License Application for Monument Concentrator at Monument No. 2 Mine, Arizona

Dear Mr. Delaney:

Supplementing our letter of April 13, 1961, we are giving below additional data requested.

1. The qualifications and experience of the personnel in this organization assigned the responsibility for developing, conducting and administering the radiation safety program for each upgrader

NAME: R. C. Vesper

TITLE: Director of Safety and Radiation Control

HIGHEST ACADEMIC DEGREE: High School, 1943

EXPERIENCE AND QUALIFICATIONS:

Laboratory Technician, Metals Reserve Plant, Durango, Colorado 1943-1945

Laboratory Technician
Root-Norton, Assayers & Chemists, 1945-1948
Durango, Colorado

Vanadium Corporation of America, 1948-present
Durango, Colorado
Responsibilities have included:
Chemist in charge of laboratories of both Naturita and Durango VCA mills

Assistant Mill Superintendent at both Naturita and Durango VCA mills

Since July 1, 1959, Director of Safety and Radiation Control at VCA uranium and milling facilities at Monument, Naturita and Durango.
He has immediate supervision of two (2) full time personnel who perform air sampling and respirator maintenance. Since August 1960 he

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has been assisted in the coordination of the safety and radiation control program by Dr. R. F. Bell and Mr. J. C. Gilliland University of Colorado Medical Center, Denver, Colorado, who are retained by the company as medical consultants.

NAME: ROBERT F. BELL

TITLE: Consultant to Company

HIGHEST ACADEMIC DEGREE: M. D., University of Colorado, 1937

POSITION IN UNIVERSITY: Assistant Clinical Professor
Acting Head of Division of Industrial Medicine, University of Colorado Medical Center

SCIENTIFIC EXPERIENCE: Residencies: 1 year - University of Maryland Hospital, Baltimore, Md., 1 year - Sheppard Enoch Pratt Hospital, Baltimore, Md., 1 year - Salt Lake Clinic, Salt Lake City, Utah; 1 year - (Preceptorship) Dr. K. C. Sawyer, Denver, Colo.

Teaching Appointments: Clinical Instructor in Physical Diagnosis of Chest, Johns Hopkins University - 1 year; Clinical Instructor, University of Colorado - 5 years; Assistant Clinical Professor, University of Colorado - 10 years.

Industrial Physician with E. I. duPont de Nemours & Co., Inc. - 10 years, the last 6 years of which was in the capacity of Medical Supervisor.

From 1951 to present time: Acting Head of Division of Industrial Medicine, in addition to maintaining a private practice; duties with Division include medical consultation with industry, teaching, and administration.

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NAME:	James C. Gilliland
HIGHEST ACADEMIC DEGREE:	B.S., Chemical Engineering, University of Nebraska, 1949 M.S., Industrial Hygiene Engineering Harvard University, 1950
POSITION IN UNIVERSITY:	Assistant Professor of Industrial Hygiene Engineering in Department of Medicine
SCIENTIFIC EXPERIENCE:	Industrial Hygiene Engineering Consultant with the Division of Industrial Medicine - 9 1/2 years. Duties include both field and laboratory evaluations of the many factors involved in offering a general industrial hygiene service to industry. He also performs extrinsic research activities and acts as statistician for the Division.
RELATIONSHIP TO COMPANY:	To assist Dr. Bell in his capacity as consultant.

2. Description of the area in which the upgrader is located, including the location and size of nearby inhabited areas, locations of streams and rivers, and sources of water supply for the plant:

Refer to the accompanying map, VCA Monument 2 Surface, Dist. 8. The nearest inhabited area, other than immediate to mill site, is Mexican Hat, Utah, approximately 17 miles distant. The nearest surfaced highway passes through Mexican Hat. There are no surface streams or rivers in this area. Water for plant use is obtained from 130 feet deep wells with a pond water source in Cane Valley being used as an auxiliary supply. Water for domestic use is supplied from the wells. The amount of radioactivity in the domestic water will be evaluated quarterly.

3. Description of the method for restricting both the plant and tailings area from unauthorized entry:

Due to the remote location of this mill, the very low grade uranium ore being upgraded, the low level of radioactivity contained in the solid and liquid plant tailings, the non-existence of a liquid tailings pond, controlled access by means of fence enclosure is not considered necessary. The mill and tailing area will be posted with approved caution signs and labels. We, therefore, apply for exemption from fencing requirements for this upgrading operation.

4. The ultimate control or disposition of solid and liquid plant tailings:

All solids not utilized as concentrate are discharged directly into the tailings area. Any liquid mill effluent is discharged onto the tailings sands. This results with complete absorption of any liquid effluent without the foundation of a tailings pond. The amount of solids tailings is approximately 460 tons per operating day. The amount of liquid tailings is in the order of 57 gallons per minute.

5. A description of the liquid effluent survey program if water or other liquids are used in the upgrading process:

Daily samples will be obtained at the extreme tails discharge and composited for analysis on a monthly basis.

6. Description of the equipment used to remove solid radio-active material and soluble radium if tailings are discharged directly in a ground or surface water supply:

There is no direct discharge of tailings to a ground or surface water supply.

7. Flow diagram of the upgrading process and a diagram of plant layout, indicating areas and points in the process where dust is generated:

See flow diagram sheet and VCA Monument 2 Concentrator, Dist. 8 map.

8. Description of dust collection and ventilation equipment that are to be used when the plant is in operation, including the type, capacity and locations of such equipment, e.g. ore transfer points, crushing, grinding, etc.:

There is no specific mechanical dust collection and ventilation equipment provided. Dust suppression at the ore receiving and crushing areas is achieved by the use of water and water sprays.

9. Description of the survey program which will be followed to determine concentrations of airborne radioactivity within work areas, including the make, model number and capacity of sampling devices, and the step-by-step procedures for sample analysis:

Equipment to be used for the collection of airborne radio-activity samples within work areas is:

Gast Mfg. Co. line operated pump, Model AD-140
Millipore filters, Type HA plain, 29 mm. diameter

9. (continued)

Sampling will be performed at a flow rate of 10-11 liters per minute. Sampling pumps are calibrated with a 0.25 cubic foot per revolution wet test meter.

The collected sample is directly counted in an Eberline Scintillation Alpha Counter, Model SAC-1. The count obtained is related to dpm by appropriate calculation and eventually expressed as uc/ml gross alpha or uranium activity.

10. Description of the procedure to be followed in determining the average daily and weekly exposures to airborne radio-activity for each employee who may frequently or occasionally occupy areas where the air contamination exceeds MPC values specified in 10 CFR 20:

If the results of the survey program indicate an average airborne radio-activity level in excess of MPC values for any area, time studies on employees who frequent the area will be performed. These time studies will then be correlated with the individual worker's area concentration levels to obtain a weighted average exposure.

Referring to the VCA Monument 2 Concentrator map, a maximum number of samples per quarter will be obtained at the following locations:

Sample Location No.	Sample Location	No. of Samples Per Quarter
2	Grizzly	3
3	Crusher	3
4	Crusher Ore Bin	3
5	Feed to Rod Mill	2
8	Filters	2
9	Discharge of Primary Drier	3
10	Feed and Discharge of Secondary Drier	6

11. Description of plant discharge stacks including stack heights, types and concentrations of effluents expected to be discharged, method for controlling release of radioactive material, and methods for determining the concentration of radioactive material released to the environs:

The only two stacks at this upgrading operation are on the primary and secondary driers. Both stacks are approximately 25 feet in height. The

11. (continued)

concentration of radioactive effluents from these stacks is expected to be relatively low due to the moisture content of the concentrate. The discharge from the primary drier contains approximately 20% moisture. The discharge from the secordary drier contains 8-10% moisture.

The predominant wind direction is parallel to the air-strip as shown on VCA Monument 2 Surface map. This wind direction allows the stack effluent to be carried away from the inhabited areas. As stated previously, there are no dust collectors serving the drier stacks.

During each quarter high volume samples will be obtained at the periphery, 1/2 mile and 1 mile from the production facility. These samples will be taken in a direction which is downwind, and at 90°, 180° and 270° from downwind. Samples will be evaluated by alpha scintillation counting of an aliquot acid digestion of the collection filters.

Stack sampling and diffusion calculations will be performed only if the non-production area sampling show elevated average concentrations.

12. Description of the method for determining exposure of employees to external radiation:

Due to the very low grade ore being processed at this upgrader, no film badge program will be commenced unless the results of beta-gamma surveys with a portable survey meter indicate that badging may be necessary. Application for exemption from film badging will be made to your office as soon as supporting information is obtained.

13. A copy of the written radiological safety operating instructions supplied to employees:

Enclosed is copy of the above instructions.

Yours very truly,

VANADIUM CORPORATION OF AMERICA

Fred A. Brinker

Fred A. Brinker
General Manager, Western Division

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Trans. w/ltr dtd. 9-26-61

VANADIUM CORPORATION OF AMERICA

DURANGO, COLORADO

To: ALL EMPLOYEES Subject: RADIATION IN Monument Concentrator

The following information has been prepared in the interest of the health, safety and education associated with radioactive materials, dust and radiation surveys.

Various Federal Agencies, including Atomic Energy Commission, require all handlers of radioactive materials to conduct and keep records of radiation surveys made throughout the plant.

Maximum limits of dust and radiation are set forth in (10 CFR Part 20) of the Federal Register. These have been established by several combined agencies. These limits have a built-in safety factor to give employees additional safety from levels which may be physiologically dangerous.

In the following discussion the idea will be to discuss (in general terms) some of the problems we face in handling radioactive materials in the Monument plant, also rules that must be followed to minimize your exposure to this material.

AIRBORNE HAZARDS

DUST AND ALPHA TYPE RADIATION

Alpha radiation is a non-penetrating type of radiation. It will not penetrate clothing or skin. In order to be a hazard it must be taken through the mouth or nose. This can be done in several ways, by eating, smoking, or by working in dusty areas without respirators or other type of protection. Samples are taken of the contaminated air and are analized to determine your exposure to Alpha type radiation.

Dust is also a source of silicosis. This is another reason for protection from airborne contamination. So, if there is no dust in the air, there will be no danger of silicosis or alpha radiation.

BETA, GAMMA TYPE RADIATION

EXTERNAL RADIATION

Gamma and Beta radiation are the penetrating types. Exposures to this type of radiation is entirely external, or in other words through the skin and through the body itself.

Our plant has no problem from external radiation since the levels are well below any danger point, however surveys are made at frequent intervals to monitor this radiation.

VANADIUM CORPORATION OF AMERICA

DURANGO COLORADO

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To: ALL EMPLOYEES Subject: RADIATION IN MONUMENT PLANT

INDIVIDUAL RESPONSIBILITY

Protection from radiation and radioactive dusts cannot be effectively accomplished without the cooperation of the worker himself. Everyone is asked to follow these simple rules:

1. Each employee should do his best to elimate dusty conditions.

   a. Use care in sweeping and cleanup so not to cause dust to become airborne.

   b. Wear respirator for cleanup or any condition where airborne dust is present. Your responsibility is to use respirator when needed and to keep it in good repair. Change filters when needed.

   c. Good housekeeping is essential to keep exposures low.

2. Before taking anything into the mouth, hands and face should be washed thoroughly. This is true throughout the operation. Also remember smoking is likely to cause some ingested dust.

3. Eating and lunch storage should not be done in the plant.

4. Good personal hygiene throughout the plant is necessary to minimize exposures.

More specific information is available on any or all of the points discussed above. In addition, feel free to discuss these radiation problems with your supervisor or the Plant Safety Engineer.

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APERTURE CARD/PAPER COPY AVAILABLE THROUGH NRC FILE CENTER

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