

UNITED STATES ATOMIC ENERGY COMMISSION

APPLICATION FOR SOURCE MATERIAL LICENSE *file*

Pursuant to the regulations in Title 10, Code of Federal Regulations, Chapter 1, Part 40, application is hereby made for a license to receive, possess, use, transfer, deliver or import into the United States, source material for the activity or activities described.

1. (Check one) <input checked="" type="checkbox"/> (a) New license <input type="checkbox"/> (b) Amendment to License No. _____ <input type="checkbox"/> (c) Renewal of License No. _____ <input type="checkbox"/> (d) Previous License No. _____		2. NAME OF APPLICANT PETROTOMICS COMPANY	
		3. PRINCIPAL BUSINESS ADDRESS P. O. Box 184 Casper, Wyoming	
4. STATE THE ADDRESS(ES) AT WHICH SOURCE MATERIAL WILL BE POSSESSED OR USED Shirley Basin Carbon County, Wyoming P. O. Box 184 Casper, Wyoming			
5. BUSINESS OR OCCUPATION Mining & Milling Uranium Ore		6. (a) IF APPLICANT IS AN INDIVIDUAL, STATE CITIZENSHIP --	(b) AGE --
7. DESCRIBE PURPOSE FOR WHICH SOURCE MATERIAL WILL BE USED Magnesia Diuranate (Uranium Yellow Cake) to be delivered to Procurement Division of A. E. C. Grand Junction, Colorado			
8. STATE THE TYPE OR TYPES, CHEMICAL FORM OR FORMS, AND QUANTITIES OF SOURCE MATERIAL YOU PROPOSE TO RECEIVE, POSSESS, USE, OR TRANSFER UNDER THE LICENSE			
(a) TYPE	(b) CHEMICAL FORM	(c) PHYSICAL FORM (Including % U or Th.)	(d) MAXIMUM AMOUNT AT ANY ONE TIME (in pounds)
NORMAL URANIUM	Magnesia Diuranate (Uranium Yellow Cake)	- 1/4" dried Yellow Cake 65 - 77 % U.	120,000 Lbs. U ₃ O ₈ in Process & Yellow Cake Stockpile
URANIUM DEPLETED IN THE U-235 ISOTOPE	N/A	N/A	N/A
THORIUM	N/A	N/A	N/A
(e) MAXIMUM TOTAL QUANTITY OF SOURCE MATERIAL YOU WILL HAVE ON HAND AT ANY TIME (in pounds) 1,000,000 Lbs. U₃O₈ in mined ore and yellow cake form			
9. DESCRIBE THE CHEMICAL, PHYSICAL, METALLURGICAL, OR NUCLEAR PROCESS OR PROCESSES IN WHICH THE SOURCE MATERIAL WILL BE USED, INDICATING THE MAXIMUM AMOUNT OF SOURCE MATERIAL INVOLVED IN EACH PROCESS AT ANY ONE TIME, AND PROVIDING A THOROUGH EVALUATION OF THE POTENTIAL HAZARDS ASSOCIATED WITH EACH STEP OF THOSE OPERATIONS. Crushing, Grinding, Acid Leaching, Counter Current Decantation, Clarification, Solvent Extraction, Precipitation, Filtering and Drying of Raw Ore to Yellow Cake. Circ Inventory is estimated at 20,000 Lbs. U₃O₈, yellow cake stock at 100,000 lbs. U₃O₈ and 880,000 lbs. U₃O₈ in raw ore stockpile. Potential hazards similar to other operating uranium mills licensed by A. E. C.			
10. DESCRIBE THE MINIMUM TECHNICAL QUALIFICATIONS INCLUDING TRAINING AND EXPERIENCE THAT WILL BE REQUIRED OF APPLICANT'S SUPERVISORY PERSONNEL INCLUDING PERSON RESPONSIBLE FOR RADIATION SAFETY PROGRAM (OR OF APPLICANT IF APPLICANT IS AN INDIVIDUAL). Technical qualifications: either a graduate from a recognized university or technical school, experience in radiation desirable. Provision to attend training school in radiation will be provided if experience is lacking.			
11. DESCRIBE THE EQUIPMENT AND FACILITIES WHICH WILL BE USED TO PROTECT HEALTH AND MINIMIZE DANGER TO LIFE OR PROPERTY AND RELATE THE USE OF THE EQUIPMENT AND FACILITIES TO THE OPERATIONS LISTED IN ITEM 9; INCLUDE: (a) RADIATION DETECTION AND RELATED INSTRUMENTS (including film badges, dosimeters, counters, air-monitoring and other survey equipment as appropriate. The description of radiation detection instruments should include the type of radiation detected and the range(s) of each instrument.) See attached Section 11 (a)			
(b) METHOD, FREQUENCY, AND STANDARDS USED IN CALIBRATING INSTRUMENTS LISTED IN (a) ABOVE (for film badges, specify method of calibrating and processing, or name supplier.) See attached Section 11 (b)			

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TO FORM AEC-2

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SECTION 11 (a) EQUIPMENT AND FACILITIES TO MINIMIZE DANGER TO LIFE

Crushing Plant - Primary and Secondary

Provisions are being made in the design of this plant for inclusion of dust collecting equipment, if deemed necessary. Initially, the plant will operate without this equipment for the following reasons:

- (1) The average percent moisture in the ore to be fed to the crushing plants will be 6-12 percent.
- (2) An air-water fogging system will be used for washing down of primary and secondary crushing areas.

Radiation detection instruments and related equipment to be used in the crushing plants, sample preparation, fine ore bin, leaching areas, etc., are as follows:

- (1) An MSA Fixt-Flo air sampler and one Gast pump air sampler equipped with Whatman #41 (or equivalent) filter paper will be used for monitoring of air in these areas. The filter papers will be analyzed for total U_3O_8 content.
- (2) Both GA (general air) and BZ (breathing zone) air samples will be taken in the crushing plant areas.
- (3) Time studies on personnel for weighted exposure to airborne radioactive materials will also be made.

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Sample Preparation Room

This room is located in the ore bin area. Adequate ventilating and dust collection equipment will be provided. General and breathing zone air samples will be taken.

Fine Ore Bin Area

Both ore bins are fully covered and vented to atmosphere. Ore entering the bins will have a moisture content of 6-12 percent. An air-water fogging system will be used for any necessary clean-up of dust. General and breathing zone air samples will be taken in this area.

Leaching Area

All leaching agitators are covered. A forced air ventilating system will exhaust all gases to atmosphere. Periodic air samples of the general leaching area will be taken. It is anticipated that the radiation hazard will be negligible in this area since the operations are wet and carried out at ambient temperature.

Product Drying and Packaging Areas

The product drying area has been designed to minimize dust contamination. The drying and packaging areas are enclosed in separate rooms within the mill building. These areas are under negative air pressure which exhausts through a dust collection system to atmosphere.

The packaging operation is engineered to eliminate, as far as it is possible, personal exposure to "yellow cake", either by direct contact or

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inhalation. It is anticipated that the radiation level in this area will be well within the tolerances set forth in 10 CFR 20.

A MSA Fixt-Flo air sampler, or a Gast pump air sampler, equipped with Whatman #41 (or equivalent) filter paper will be used to obtain GA and BZ samples. Analysis of the filter papers for total U_3O_8 content will be made.

General

In addition to the above air sampling program, periodic surveys for gamma radiation in all working areas of the mill will be made using a Mt. Sopris Model SC 129 survey meter, or equivalent.

SECTION 11 (b) CALIBRATION OF INSTRUMENTS

The instruments listed in 11 (a) will be calibrated and standardized according to procedures outlined by the manufacturers of such equipment. Tentatively, it is suggested that a calibration check of these instruments be done prior to each plant survey.

SECTION 11 (c) VENTILATION EQUIPMENT WHICH WILL BE USED IN
PETROTOMICS MILL

- (1) A wet dust collection system for the ore sample preparation room.
- (2) A forced air ventilation system for leach agitator fumes.
- (3) A dry-wet dust collection system for the yellow cake drying and packaging areas.
- (4) Gravity ventilators throughout crushing and mill buildings.

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SECTION (12 C) PROGRAM & PROCEDURE TO COMPLY WITH PROVISIONS
OF 10 CFR 20

(1) Exposure of Personnel to Airborne Radioactivity

The dust survey will yield data from which a weekly average exposure can be computed. Employees working in the same operation are expected to be subjected to nearly identical exposures. The sequence of operations performed over a day is usually repeated daily, thus daily average exposure will be approximately equal to a weekly average exposure.

The first phase of our survey will consist of the collection of air samples throughout the plant. This will be accomplished with the use of a portable Gast pump air sampler employing a No. 41 filter Whatman paper disc. Exposed filter discs will be handled by forceps and stored in small envelopes to prevent contamination. The air flow will be at least 15 litres per minute. If conditions are dusty, slower flowrates will be used.

Samples will be designated as BZ or GA. This refers to the manner of sample collection. In the collection of BZ samples, the sampler will be held near the nose of the worker during operations. The time range for sampling will vary dependent upon the operations under test.

GA samples will be collected using a MSA Fixt-Flo air sampler for 10-30 minutes in areas normally occupied by employees for significant periods. The sampler will be in a fixed location. These samples will cover process

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areas, lunch rooms, mill offices, locker room and rest room. The sample will be taken 3-10 feet from the floor and clear of walls, equipment, etc., so that it will represent normal concentrations in the area being tested.

In order to compute the average daily exposure of an employee, both GA and BZ samples will be obtained. Time studies will also be made in order to properly weight the exposure in each area.

All samples will be analyzed by the approved procedure for such determinations. Outside laboratory checks on our own analysis for U_3O_8 will be carried out at suitable intervals.

Surveys will be carried out as frequently as deemed necessary to comply and meet radiation levels specified in 10 CFR 20.

(2) Exposure to External Radiation

Gamma radiation rates will be measured by a Mt. Sopris Model SC 129 (or Equivalent) survey meter. General area surveys will be made at the following locations at appropriate intervals:

- 1) Primary and secondary crushing plants.
- 2) Ore bins.
- 3) Sample preparation rooms.
- 4) Final product areas.

Occasionally, pipe and tank areas will be checked for accumulation of entrapped radiation material.

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If an employee exceeds 25% of the mpe, film badges will be provided for their use.

(3) Radioactive Material in Mill Wastes

Periodic air checks of exhaust systems will be made. The restricted tailings area will be inspected frequently for leakage or seepage. Samples of mill wastes will be analyzed for radiation products. The drainage area below the dam enters a live stream about 5 miles below the damsite. Samples of water will be taken above and below the entrance point and will be analyzed for Radium 226, Thorium, and Uranium.

(4) Unrestricted Areas

Periodic checks for radiation will be made outside the restricted mill area. A high volume air sampler will be used for such tests. Wind conditions and other weather data will be recorded.

(5) General

The tailings area will be fenced and the proper radioactivity signs posted at 50' intervals. All radioactive areas will be clearly marked. The entrances to the crushing plants and mill proper will carry such signs.

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ADDITIONAL INFORMATION
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ITEM 2

JOB DESCRIPTION

CODE

NOTE: IF ADDITIONAL SPACE IS NEEDED USE A SEPARATE SHEET.

TITLE AND LOCATION

OFFICIAL JOB TITLE

Mill Superintendent (Supr. Eng.)

LOCATION

Shirley Basin

DEPARTMENT

Production

K. EXTENT

JOB. DEPARTMENT

Uranium

SECTION

UNIT

QUALIFICATION

Grade 13 or 14

BASIC FUNCTION

Responsible for the supervision of the milling operations in Shirley Basin, Wyoming.

JOB REQUIREMENTS ILLUSTRATE BY SUCH ACTIVITIES AS

KNOW - HOW (KNOWLEDGE - HUMAN RELATIONS)

1. Plans, coordinates and supervises the procedures covering the milling operations in Shirley Basin.
2. Recommends additions to or reductions in the milling equipment to assure economical milling of ore.
3. Directs the metallurgical processes required for the production of a profitable, saleable product from our raw ore.
4. Assure compliance with governmental safety regulations including safeguards against radiation hazards.
5. Recommends milling programs for approval by the Project Manager.
6. Directs mill operation on a day by day basis.
7. Keeps informed on all new techniques and developments in the mining industry with special emphasis on milling.

PROBLEM SOLVING (GUIDANCE - TYPE)

Problem solving inherent in this job is typified in solving methods for efficient utilization of milling equipment, the addition of improved equipment, the techniques involved in attaining maximum recovery of product from the ore at minimum unit cost, recognizing the integrated economics of mining from raw material to saleable product.

ACCOUNTABILITY (FREEDOM TO ACT - IMPACT - MAGNITUDE)

Accountability is that of efficient and economic operation of the milling operation costing in excess of \$500,000.00 per year.

SUPERVISION RECEIVED (TYPE - DEGREE - TITLE OF SUPERVISOR)

Reports directly to the project manager.

SUPERVISION EXERCISED (TYPE - DEGREE - TITLES OF POSITIONS SUPERVISED)

Supervises Metallurgist, Mill Foreman, Chief Chemist directly.

RECRUITMENT REQUIREMENTS (EDUCATION - EXPERIENCE - SPECIAL SKILLS)

Graduate of recognized mining or metallurgical school having specialised in metallurgy or having had specific experience in metallurgy during 3 years of a total of five years operating experience in the mining industry.

TRAINING REQUIREMENTS (TYPE - METHOD - DURATION)

PREPARED BY

DATE

APPROVED BY SUPERVISOR

DATE

APPROVED BY DEPARTMENT MANAGER

DATE

JOB DESCRIPTION

CODE

TITLE AND LOCATION

Mill Metallurgist (Asst. Mill Supt.)

Shirley Basin

Production

Uranium

Grade 13

BASIC FUNCTION

Responsible for the supervision of the milling operation in the Shirley Basin, Wyoming as 2nd in command of the milling operation.

JOB REQUIREMENTS ILLUSTRATE BY SUCH ACTIVITY AS

KNOW - HOW (KNOWLEDGE) HUMAN RELATIONS

1. Plans, with the mill superintendent, procedures covering the milling operations in Shirley Basin.
2. Conducts studies and experimental work which can lead to recommendations for additions to, or subtractions from the milling equipment to assure economical milling of ore.
3. Directs the metallurgical process required for production of economical saleable product.
4. Directly responsible for health and radiation regulations.
5. Directs milling operation placement of operators with the mill foreman, on a day to day basis.
6. Assumes full responsibility for mill in the absence of the mill supt.

Solving methods for efficient utilization of basic milling equipment and economic studies of the effect of major or minor changes to the flow sheet. Must have an overall appreciation of the concept of lowest unit cost from mine to sale.

ACCOUNTABILITY (FREEDOM TO ACT - IMPACT - MAGNITUDE)

Accountability as that of efficient and economic operation of the milling operation, but will make recommendations through the mill superintendent.

SUPERVISION RECEIVED (TYPE - DEGREE - TITLE OF SUPERVISOR)

Reports directly to the mill superintendent.

SUPERVISION EXERCISED (TYPE - DEGREE - TITLES OF POSITIONS SUPERVISED)

Supervise mill foreman, radiologist, chief chemist and mill shifters.

RECRUITMENT REQUIREMENTS (EDUCATION - EXPERIENCE - SPECIAL SKILLS)

Graduate of a recognised school of metallurgy with at least 3 years of experience in milling or associated industry either in a practical or supervisory capacity.

TRAINING REQUIREMENTS (TYPE - METHOD - DURATION)

PREPARED BY

A 1

APPROVED BY SUPERVISOR

A 2

APPROVED BY DEPARTMENT MANAGER

A 3

JOB DESCRIPTION

Chief Chemist

x

Shirley Basin

Production

Uranium

MAJOR FUNCTIONS

Responsible for analytical work in connection with the milling operations of Shirley Basin.

REQUIREMENTS

1. Supervise the operation of analytical lab.
2. Sets up analytical procedures applicable to the operation of the mill.
3. Sets up analytical procedures suitable for ore control and mill feed control.
4. Aids in metallurgical research programs.
5. Aid in radiological monitoring and control.
6. Keeps up-to-date on all analytical methods relating to the mill operation and radiological control.

Solving methods for analytical work in connection with the mill operation, ore control, and improved product development.

ACCOUNTABILITY FREEDOM TO ACT IMPACT MAINTENANCE

Efficient and economical operation of the lab and analytical work relative to the metallurgical control stations.

SUPERVISION RECEIVED (TYPE - DEGREE - TITLE OF SUPERVISOR)

Reports directly to the metallurgist.

SUPERVISION EXERCISED (TYPE - DEGREE - TITLES OF POSITIONS SUPERVISED)

Supervises the lab technicians.

RECRUITMENT REQUIREMENTS (EDUCATION - EXPERIENCE - SPECIAL SKILLS)

Graduate of a recognized College or University, with three years analytical experience, preferably in uranium milling.

TRAINING REQUIREMENTS (TYPE - METHOD - DURATION)

PREPARED BY

871

APPROVED

871

REVIEWED BY DEPARTMENT MANAGER

871

JOB DESCRIPTION

CODE

TITLE AND LOCATION

ORIGINAL JOB TITLE

Radiologist

LOCATION

DEPARTMENT

M

REMARKS

DATE

LOCATION

DEPT

EVALUATION

BASIC FUNCTION

Responsible for radiological monitoring and control in the entire Petrotomics operational area of Shirley Basin.

JOB REQUIREMENTS ILLUSTRATE BY SUCH ACTIVITIES AS
KNOW - HOW (KNOWLEDGE - HUMAN RELATIONS)

1. Sets up radiological monitoring and control procedures in accordance with necessary government regulations.
2. Performs tests necessary to obtain data for radiological monitoring and control measures.
3. Sets up and maintains all records in these connections.
4. Works with state, federal or AEC officials in matters pertaining to radiology.
5. Prepares formal reports to the management covering these aspects.
6. Works with the mine and mill superintendents to make corrections to procedures which may be required to conform with these regulations.

Must understand procedures required to monitor radioactive hazards.

Responsible to the project manager on works under the direct supervision of the metallurgist.

Supervised by the Mill Metallurgist, and supervised by the Mine Superintendent when working in the Mine.

Helpers if necessary.

Must have Bs degree.

Should have majored in biology, bacteriology, radiology or associated subjects.

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ITEM 5. TAILINGS DAM - DESCRIPTION, INTEGRITY, CAPACITY, ETC.

Mill waste is in the form of a sand slurry. The liquid phase of the waste will be acidic and will contain dissolved radioactive materials. Concentrations of Uranium, Thorium and Radium will be determined and monitored after mill startup. All mill waste will be impounded in a restricted enclosure behind an earthen dam.

The dam was engineered and constructed to include a key on the footing to insure a positive seal. A bentonitic clay and sand mixture was used as fill for the dam. The surface of the impounded area above the dam is covered with a layer of bentonitic material that has a natural tendency to seal the surface when wet. Addition of the fine sands from mill waste will aid in sealing the bottom of the reservoir. All test drill holes in the tailings pond area have been plugged with cement to insure against seepage of radioactive waste to underground permeable sand strata. The tailings pond area has adequate capacity to impound 100 percent of the mill waste through 1966.

Periodic inspection of the dam will be made and the necessary maintenance will be accomplished to prevent overflow and seepage. A ditch will be maintained around the impounded area to divert the natural run-off of the area below the dam.

In the event seepage is detected or suspected below the dam, samples of the effluent will be analyzed for Uranium, Thorium, and Radium 226.

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The drainage area below the dam enters a live stream about five miles below the damsite. Samples of the water taken above and below the entrance of the drainage area to the live stream will be analyzed prior to mill start-up in order to obtain a radiological history. Samples will be taken again from these areas, after mill start-up, as a monitoring measure.

A check dam is located below the main tailings dam for the purpose of trapping effluents that may appear below the main dam.

The top of the main dam will be advanced well above the liquid level of the impounded area. The dam will be maintained at an elevation sufficient to impound above normal precipitation run-off within the tailings pond area below the diversion ditch.

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ITEM 7. DUST CONTROL SYSTEM fz

(A) Primary and Secondary Crushing Plants and Ore Bins

Since present available data indicates a high moisture content (6-12%) of incoming ore to the crushing plant, no dust collecting equipment is considered necessary. However, in order to facilitate its installation in case of a change in ore characteristics, the design of the chutes, hoppers, equipment, etc., is such that the dust collection equipment can be quickly installed. All engineering drawings of dust hoods, chutes and hoppers will include dust plenum locations.

Provision to totally enclose and ventilate all ore bins has been incorporated into the engineering design.

(B) Sample Preparation Room

A suitable wet dust collection system will be provided for all equipment operating in the sample preparation room. Each individual piece of equipment will be so constructed and arranged to limit dusting. All exhaust pipes will connect to the main dust collection header. The sample preparation bench will be hooded. The efficiency of the dust collection equipment will be such as to provide radiation tolerances well below the required minimums set forth in 10 CFR 20.

(C) Leaching Area

All gaseous fumes and mists will be vented to atmosphere through a plywood duct rising about 2' above the mill roof level. The wood vents will contain an air line to insure complete removal of all fumes. Each leaching

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agitator tank will be completely covered with wood.

This system should eliminate any obnoxious gases and fumes from the inside mill area.

(D) Product Drying and Packaging

This area of the plant has been engineered with a view to minimizing dust conditions and other forms of personal exposure to radiation. The Skinner roaster, the yellow cake barrel packing station, and all other possible dust areas are exhausted through a dry-wet dust collecting system. The dry dust collector is a Skimmer Centrifugal Precipitator, size 8, followed by a size 1-1/2 Roto-Clone wet type dust collector. It is anticipated that the operation of this circuit will be such that the radiation levels will be well within the limits set forth in 10 CFR 20.

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SECTION 8. PROGRAM & PROCEDURE TO COMPLY WITH PROVISIONS
OF 10 CFR 20

(1) Exposure of Personnel to Airborne Radioactivity

The dust survey will yield data from which a weekly average exposure can be computed. Employees working in the same operation are expected to be subjected to nearly identical exposures. The sequence of operations performed over a day is usually repeated daily, thus daily average exposure will be approximately equal to a weekly average exposure.

The first phase of our survey will consist of the collection of air samples throughout the plant. This will be accomplished with the use of a portable Gast pump air sampler employing a No. 41 filter Whatman paper disc. Exposed filter discs will be handled by forceps and stored in small envelopes to prevent contamination. The air flow will be at least 15 litres per minute. If conditions are dusty, slower flowrates will be used.

Samples will be designated as BZ or GA. This refers to the manner of sample collection. In the collection of BZ samples, the sampler will be held near the nose of the worker during operations. The time range for sampling will vary dependent upon the operations under test.

GA samples will be collected using a MSA Fixt-Flo air sampler for 10-30 minutes in areas normally occupied by employees for significant periods. The sampler will be in a fixed location. These samples will cover process

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areas, lunch rooms, mill offices, locker room and rest room. The sample will be taken 3-10 feet from the floor and clear of walls, equipment, etc., so that it will represent normal concentrations in the area being tested.

In order to compute the average daily exposure of an employee, both GA and BZ samples will be obtained. Time studies will also be made in order to properly weight the exposure in each area.

All samples will be analyzed by the approved procedure for such determinations. Outside laboratory checks on our own analysis for U_3O_8 will be carried out at suitable intervals.

Surveys will be carried out as frequently as deemed necessary to comply and meet radiation levels specified in 10 CFR 20.

(2) Exposure to External Radiation

Gamma radiation rates will be measured by a Mt. Sopris Model SC 129 (or equivalent) survey meter. General area surveys will be made at the following locations at appropriate intervals:

- 1) Primary and secondary crushing plants.
- 2) Ore bins.
- 3) Sample preparation rooms.
- 4) Final product areas.

Occasionally, pipe and tank areas will be checked for accumulation of entrapped radiation material.

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If an employee exceeds 25% of the mpe, film badges will be provided for their use.

(3) Radioactive Material in Mill Wastes

Periodic air checks of exhaust systems will be made. The restricted tailings area will be inspected frequently for leakage or seepage. Samples of mill wastes will be analyzed for radiation products. The drainage area below the dam enters a live stream about 5 miles below the damsite. Samples of water will be taken above and below the entrance point and will be analyzed for Radium 226, Thorium, and Uranium.

(4) Unrestricted Areas

Periodic checks for radiation will be made outside the restricted mill area. A high volume air sampler will be used for such tests. Wind conditions and other weather data will be recorded.

(5) General

The tailings area will be fenced and the proper radioactivity signs posted at 50' intervals. All radioactive areas will be clearly marked. The entrances to the crushing plants and mill proper will carry such signs.

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SECTION 9. ANALYSIS OF THE MILL RADIATION SURVEY PROGRAM

(a) Exposure of Plant Personnel to Airborne Radioactivity

The data collected from the airborne radioactivity survey will be tabulated under such headings as: Operating Area, Time Per Operation, Operations Per Shift, Number of Samples, Concentration, and Average Concentration times Total Time. Under "Location of Sample", the type of sample will be signified. The number of samples taken will be dependent upon area size, a minimum of two samples will be collected at each operation and in each area.

To calculate the average weighted exposure, the following formula will be used:

$$\frac{\sum (T \times C)}{\sum T}$$

\sum = sum

T = Time per shift

C = Average concentration

The average daily exposure will then be compared to the permissible values set forth in 10 CFR 20.

(b) Exposure of Plant Personnel to External Radiation Levels

All the data collected will be tabulated in a table having sub-section headings similiar to 9 (a). From these data the radiation count in mr/hr will be calculated and compared to the standards specified in 10 CFR 20.

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(c) The Concentration of Radioactive Material in Mill Wastes

From the plant radiation surveys of exhaust gases and tailings, various U_3O_8 contents will be tabulated as well as any Radium 226 and Thorium activity. The data assembled will be recorded and compared to the contamination limits outlined in 10 CFR 20. Similiar tabulations and calculations will be recorded for all air sampling of the unrestricted areas.

(d) Personnel Records

Personnel records will be kept according to Form AEC-4, "Occupational External Radiation Exposure History." The records and collected data will be issued and filed according to regulations set forth in 10 CFR 20.