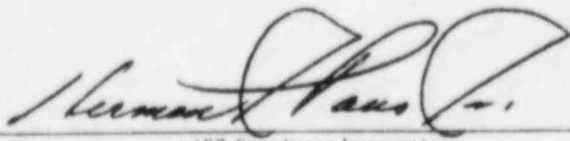


INSPECTION FINDINGS AND LICENSEE ACKNOWLEDGMENT

1. LICENSEE Petrotonomics Company P. O. Drawer 2450 Casper, Wyoming 82601	2. REGIONAL OFFICE U. S. ATOMIC ENERGY COMMISSION REGION IV, DIVISION OF COMPLIANCE 10395 W. COLFAX, ROOM 200 DENVER, COLORADO 80215
3. LICENSE NUMBER(S) SUA-551 (Docket No. 40-6659)	4. DATE OF INSPECTION <i>Sept 15, 1970</i>
5. INSPECTION FINDINGS <input checked="" type="checkbox"/> A. No item of noncompliance was found. <input type="checkbox"/> B. Rooms or areas were not properly posted to indicate the presence of a RADIATION AREA. 10 CFR 20.203(b) or 34.42 <input type="checkbox"/> C. Rooms or areas were not properly posted to indicate the presence of a HIGH RADIATION AREA. 10 CFR 20.203(c) (1) or 34.42 <input type="checkbox"/> D. Rooms or areas were not properly posted to indicate the presence of an AIRBORNE RADIOACTIVITY AREA. 10 CFR 20.203(d) <input type="checkbox"/> E. Rooms or areas were not properly posted to indicate the presence of RADIOACTIVE MATERIAL. 10 CFR 20.203(e) <input type="checkbox"/> F. Containers were not properly labeled to indicate the presence of RADIOACTIVE MATERIAL. 10 CFR 20.203(f) (1) or (f) (2) <input type="checkbox"/> G. A current copy of 10 CFR 20, a copy of the license, or a copy of the operating procedures was not properly posted or made available. 10 CFR 20.206(b) <input type="checkbox"/> H. Form AEC-3 was not properly posted. 10 CFR 20.206(c) <input type="checkbox"/> I. Records of the radiation exposure of individuals were not properly maintained. 10 CFR 20.401(a) or 34.33(b) <input type="checkbox"/> J. Records of surveys or disposals were not properly maintained. 10 CFR 20.401(b) or 34.43(d) <input type="checkbox"/> K. Records of receipt, transfer, disposal, export or inventory of licensed material were not properly maintained. 10 CFR 30.51, 40.61 or 70.51 <input type="checkbox"/> L. Records of leak tests were not maintained as prescribed in your license, or 10 CFR 34.25(c) <input type="checkbox"/> M. Records of inventories were not maintained. 10 CFR 34.26 <input type="checkbox"/> N. Utilization logs were not maintained. 10 CFR 34.27	
<div style="text-align: center;"> (AEC Compliance Inspector)</div>	
6. LICENSEE'S ACKNOWLEDGMENT The AEC Compliance Inspector has explained and I understand the items of noncompliance listed above. The items of noncompliance will be corrected within the next 30 days. <div style="display: flex; justify-content: space-between;"><div>(Date) _____</div><div>(Licensee Representative — Title or Position) _____</div></div>	

ORIGINAL: LICENSEE. COPIES: ☐ CO REGION ☐ CO HEADQUARTERS ☒ CO ENFORCEMENT

8507290409 850530
PDR FOIA
BURR85-229 PDR

A/ 5

SUPPLEMENTAL SHEET

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.
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.
3. A description of the area in which the mill is located, including the location and size of nearby inhabited areas, location of wells, streams and rivers, flood areas, levels of streams and rivers, and sources of water supply for the area. A topographical map with the above identifications is preferred.
4. A description of the method for restricting both the mill and the tailings system from unauthorized entry.
5. A description of the geological and hydrological characteristics which may affect the degree and mode by which liquid wastes may reach underground and/or surface waters. This should include estimates of local evaporation and seepage rates, depth of the local water table and permeability, characteristics of underlying material.
6. A description of your waste disposal processes. Where retention systems such as levees, dikes, ponds, etc., are used to prevent the release of liquid or solid wastes containing radioactive material to effluent areas, describe the retention capability and integrity of the system, conditions that might lead to accidental release of the waste, the environmental effects of such a release and your program of inspection and maintenance to prevent such accidental occurrences. This description should also include drawings showing the layout, heights, top width, side slopes, discharge, seepage control, protection of embankment surfaces, foundation design, typical cross-sections, characterization of fill material and a discussion of construction methods and specifications.
7. A description of the liquid effluent survey program (assuming plant effluents reach subterranean or surface water supplies), including the number, location and frequency of check samples and a step-by-step procedure for sample analysis of natural uranium, radium-226 and thorium-230.

8. A flow diagram of the mill production operation and a diagram of plant layout, indicating areas and points in the process where dust is generated.
9. A description of dust collection and ventilation equipment that are utilized during mill operation, including type, capacity and location of such equipment, e.g. air transfer points, crushing, grinding, etc. and an analysis of the efficiency of the equipment as designed to control or prevent the release of airborne radioactivity to the environs.
10. A description of the survey program which is followed to determine concentrations of airborne radioactivity within the mill, including the name, model number and capacity of sampling devices, and the step-by-step procedure for sample analysis.
11. In the description of your air sampling program, please include:
 - a. A description of each sampling location in respect to operating personnel;
 - b. a description of each sampling location in respect to the process operation;
 - c. the frequency for sampling each of the above locations.
12. A description of the procedure followed in determining the average daily and weekly exposures to airborne radioactivity for each employee who frequently or occasionally occupies areas where air contamination exceeds the values specified in 10 CFR 20.
13. If respirators are to be used in your program to control the exposures of personnel to within the limits specified in 10 CFR 20, an application for their use is to be submitted in accordance with Section 20.105 of 10 CFR 20.
14. A description of mill discharges, including stack heights, types and concentrations of effluents discharged, method for controlling release of radioactive material, and methods for determining the concentration of radioactive material released to the environs.
15. A description of the method for determining exposure of employees to external radiation. For film badge studies, indicate number and category of personnel involved in the program.

16. A copy of the nuclear radiological safety operation instructions supplied to employees. These instructions should include provisions for personal hygiene, including washing prior to eating or leaving the plant, instructions for wearing personnel monitoring devices, and instructions for cleaning up dust and spills within the plant.

ENVIRONMENTAL INFORMATION
PETROATOMICS COMPANY URANIUM MILLING FACILITY
Shirley Basin Area, Wyoming

The data and information presented herein were prepared to follow the outline as set forth in " Interim Guidelines for Preparing Environmental Information for Nuclear Facilities - Preliminary ". As that guide was prepared for all types of fuel cycle facilities there are obviously categories of environmental information covered in the guide which are not applicable to the Petroatomics Mill. When this has been the case we have so indicated in our response. The information supplied herein is keyed to, and uses, the same numbering system as in the guide.

I. Identification of all sources...

1. Propane/fuel oil fired boilers used for process and space heat.
2. Propane fired product dryer.
3. Hood ventilation of sample preparation area.
4. Slurry effluent from mill processing.

II. Description of air and water pollution control devices...

1. No need for a control device on the steam boilers has been demonstrated. The boilers are of very small size and burn clean fuel. Sampling and analyses of the effluents by an outside consultant have demonstrated them to be well below established State and Federal standards.
2. The multiple hearth propane fired product dryer has a wet scrubber installed which is in continuous operation.
3. The vent from the sample preparation area has not demonstrated a requirement for a control device due to the very low emission involved and the very limited time of usage.
4. The slurry effluent from the mill is contained in a "tailings pond" area which is enclosed and within a posted restricted area. There is no effluent from the restricted area. The possibility of ground water contamination is monitored with test wells as will be subsequently described.

III. Identification of each radiological and
non-radiological contaminant...

1. Emissions from the boiler stacks contain sulfur dioxide, nitrogen oxides and particulates which may be considered as contaminants, all non-radiological.
2. The product dryer emits primarily water in the form of steam. Minor quantities of uranium as entrained radioactive yellowcake particulates are also emitted.
3. Emissions from the sample preparation area which might be considered as a contaminant are dusts from the crushing of ore and other samples. This dust can be slightly radioactive, caused principally by the uranium in the samples.
4. The mill process effluent (tailings) contain uranium, radium and thorium which may be classed as radiological contaminants and acidic water which may be classed as a non-radiological contaminant.

IV. Estimation of emission rates and
concentration values...

1. The emission rate from the boiler stacks varies with the number of boilers in use, the fuel being used, and the rate at which they are being fired. The average rate of boiler firing is about 4 million BTU per hour. When firing with fuel oil the non-radiological contaminants in the stack emission are as follows:

Sulfur dioxide	$<4.3 \times 10^{-4}$ Lbs/million BTU
NOx	$<2.5 \times 10^{-3}$ Lbs/million BTU
Particulates	<0.01 Lbs per hour

When fired on propane all values are considerably lower. There are no radiological contaminants present in the effluent.
2. The product dryer operates an average of about 65% of the time. During the operating period analysis indicates that radiological airborne contaminants average $<1.0 \text{ u Ci U/ml} \times 10^{-13}$. This compares to the established MPC of $8.0 \text{ u Ci U/ml} \times 10^{-13}$. There are no other contaminants present in measurable amounts.
3. The emission rate and concentration of the sample preparation vent effluent are both so low that no values have been or need be, established.
4. The slurry liquid effluent from the milling facility which is retained in the tailings pond contains the following concentration of radiological contaminants:

U	$\sim 0.2 \text{ u Ci/ml} \times 10^{-5}$
Ra226	$\sim 30 \text{ u Ci/ml} \times 10^{-8}$
Th230	$\sim 120 \text{ u Ci/ml} \times 10^{-6}$

V. Measurement or calculation of maximum air concentration values and annual concentration-time integrals...

As is apparent from the values which have been indicated, they are all so low that it is difficult to determine with any meaningful degree of accuracy the concentrations which may be present at any distance away from the point of emission. This condition is typified by measurements made on airborne dusts surveyed at the nearest habitation (about 2 miles) which gave values of < 0.025 the MPC of $8 \text{ uCi U/ml} \times 10^{-13}$. Governmental radiation surveys confirm this low radiation level. Plant site boundaries vary from 1 to 3 miles distant from emission points.

VI. Determination of water concentration values...

The only water effluent is contained in the slurry discharge (tailings) from the mill. As has been previously indicated all of this is retained within a posted and fenced restricted area in a tailings pond. There is no discharge of this water. The only transport of these liquids to a non-restricted area which might be possibly expected would be migration or seepage into subsurface waters. This possibility has been monitored by three special wells which are strategically located down dip from the tailings pond since the initiation of operations in 1962. Data collected to date indicate that subsurface mixing and/or seepage of the effluent is inconsequential.

VII. Measurement of values of pollutants in soils...

Due to the low concentration values which we have experience in more than 12 years of operations we have not found a need to measure the possible radiological contamination in soils and consequently no values are available.

VIII. Measurement of values of radiological pollutants in vegetation...

Vegetation analyses have not been performed for essentially the same reason as indicated in Item VII.

IX. Measurement of values of radiological pollutants in bottom sediments...

As there are no discharge into rivers, streams or lakes, this item is not applicable.

X. Depending upon results obtained in items VI, VII, VIII and IX...

This item does not appear to be applicable.

XI. Estimation of 50 - year - dose commitments to individuals from each airborne radiological pollutant...

- XI (1) $< 0.2 \text{ u Ci U/ml} \times 10^{-13}$
- XI (2) $< 0.2 \text{ u Ci U/ml} \times 10^{-13}$
- XI (3) $< 0.2 \text{ u Ci U/ml} \times 10^{-13}$
- XI (4) $< 0.1 \text{ u Ci U/ml} \times 10^{-13}$
- XI (5) $< 0.06 \text{ u Ci U.ml} \times 10^{-13}$
- XI (6) Not applicable - no discharge

XI. continued (2nd Part)

The conditions as stipulated in the second part of this item result in an estimate of $< 0.1 \text{ u Ci U/ml} \times 10^{-13}$ due to high natural amount of air diffusion in this area of Wyoming. This represents less than $5.0 \text{ u Ci U/ml} \times 10^{-13}$ accumulation in a 50 year period. The annual mr offsite exposure (background) is estimated to be less than 200 mr/year. (< 10 rems in 50 years).

XII. Comparisons of the concentrations of non-radiological pollutants...

The concentration values of these possible pollutants are so far below TLV values that any probable effect on man, vegetation, fish, animal, and inanimate objects should be nil. Comparisons are indicated below for values at point of emission when boilers are fired with fuel oil. They would of course be less when propane is used and at locations other than at the stack.

Pollutant	Concentration at Stack	TLV
Sulfur dioxide	4.3×10^{-4} lbs/million BTU	0.8
NOx	2.5×10^{-3} lbs/million BTU	0.3
Particulates	0.01 lbs/hr	0.1

XIII. Description of environmental monitoring programs for air, water, soils, vegetation, bottom sediments, animals and fish...

Downwind surveys are conducted semi-annually from 6 locations. 4 samples are also collected from the closest area of habitation as has been previously described, on the same schedule. Dust sample pads are digested in nitric, perchloric and hydrofluoric acids and analyzed on a Jarrell-Ash fluorimeter. Each plate of analysis is checked for accuracy with a known standard and the results are accurate to $\pm .001\%$.

XIII. continued

The State of Wyoming calibrates instruments used for collection of air samples. Other instruments which are electronic, such as Geiger counters, are calibrated by commercial electronics firms. Instruments used in the actual analysis are checked with known standards prepared by the U. S. Bureau of Standards.

Both restricted and non-restricted area surveys of all types (air, water, film badges and Geiger counter) are carefully reviewed and discussed with management, for establishing a program to maintain compliance with governmental regulations. In view of the low pollutant concentrations and values (both radiological and non-radiological) which have been noted over the years of operation, it has not been indicated that monitoring and sampling on a greater scale has been necessary.

XIV. Identification of accidents in the plant that would have offsite effects...

Fire or boiler explosions are about the only accidents of sufficient magnitude to cause offsite effects which could be reasonably expected to occur at a milling operation of this type. Even though such an accident might be of major operational consequence, the offsite effects could not be expected to be very great. The remoteness of the location would further minimize the effects.

This operation did experience one fire of considerable size in its 12 years of operation. That fire resulted in no adverse offsite effects to man or environment. Positive protective measures, including a sprinkler-foam system, have subsequently been installed to eliminate a reoccurrence of similar accidents.

XV. Identification of accidents that may occur offsite, such as transportation accidents...

In the course of shipping natural uranium concentrates (yellowcake) to a conversion plant or for other purposes, the possibility of a mishap involving the carrier - either truck or train - obviously always exists. Such an accident would have to be of such magnitude, however, that the steel drums used for packaging and transport would rupture and spread yellowcake in a non-restricted area. This possibility is minimized by the control over transport which is exercised by the Department of Transportation. They specify drum size, type and strength as well as the loading and transport procedures. Additionally, since the U₃O₈ concentrates are not explosive or flammable and as the radiation is of Low Specific Activity (LSA designation by the Department of Transportation), little or no harm to the environment or person would be experienced.

XV. continued

Each cargo of uranium concentrates leaving this site is accompanied by a set of driver-carrier instructions as to procedures in the event of an accident. During the course of our operations over a period of more than 12 years and the more than 375 shipments, no offsite accidents have occurred.

XVI. Complete description of emergency procedures
for responding to an accident...

Appended hereto is a copy of the "Driver or Carrier Instructions" provided to the appropriate persons and accompanying each shipment leaving our plant site. As indicated above, because of the Low Specific Activity of the product radiation dangers to persons and environment are not serious, hence emergency procedures other than those indicated do not appear to be warranted.

XVII. Information on public opinion and reactions
of individuals or citizen's groups to the
existing facility,...

This operation began before the current wave of "environmentalism" and so called public participation therein. We have been a recognized and with few exceptions, a welcome member of the local, county and State community. There have been no problems with public acceptance and we are in fact welcomed for our contribution to the economy of the area.

We have always dealt openly with the public and in fact encourage visits and tours by individuals and groups. We supply speakers, literature, demonstrations etc. to civic, scholastic, governmental, environmental, sportsmen and other groups. As a citizen we contribute to community, charitable, educational, health and welfare, research and other such groups with both money, services and participation. In summary public opinion relative to this operation can be considered as good.

XVIII. Description of details of the construction of
waste retention ponds, tanks and burial
sites...

This operation has a waste retention pond (tailings pond) which has been in continual use throughout the life of the plant. No tanks or other burial sites are used.

The tailings retention pond is formed by an earthen, clay core dam keyed into underlying relatively impervious shale bed. The integrity of this dam has been demonstrated by its continuous use for more than 12 years without failure. Even so, it is backed up by a series of 3 catch basins, also constructed by earth fill dams, to collect and retain any seepage or overflow which might escape the main dam pond area which covers approximately 120 acres.

XVIII. continued

There is also an installed recycle pumping system in the back-up catch basins to return to the main pond any effluent which might get to the auxillary basins.

The normal water table and aquifer is approximately 300 feet below the pond surface. Possible seepage into this aquifer is monitored with wells specifically located for that purpose as explained in Item VI herein.

The radiological pollutants contained within the tailings pond area were identified in Item III herein and the concentrations of these pollutants are indicated in Item IV. herein. The only non-radiological pollutant sulfuric acid was also indicated in Item III. It is present in concentrations which vary from 2 to 6 grams per liter.

As was indicated in Item II (4), there is no effluent from this retention pond which is totally enclosed by fencing and posted as a restricted area. This operation additionally owns or controls all of the property surrounding the fenced and restricted area.

XIX. Provide description of any on-site sewage treatment facilities and permits.

The sewage system for the administrative offices, operation, cafeteria and other facilities is of septic tank type and is located within the restricted area of the tailings disposal pond but not within the actual pond. It has operated efficiently over the 12 year life of the operation without problems. No permits are needed as there is no discharge.

XX. Provide evidence of water discharge permit...

There is no water discharge, hence no permit required, hence not applicable.

XXI. Provide thermal water effluent monitoring data...

There is no thermal water effluent hence not applicable.

XXII.

Not applicable

General Comments

Briefly summarizing the impact of this facility on the environment. The following points, which are of the greatest significance, should be emphasized:

1. This facility has held a source material license and has been operating since 1962 without environmental problems.
2. We are located in a very remote area with an extremely low population density.
3. We are located in an area which is climatologically classified as semi-arid, with annual precipitation of less than 12 inches; which has extreme fluctuation in temperatures from minus 40° to plus 90° F.; very strong winds and frequent blizzard conditions; and a usual growing season of 90 to 100 days. Consequently vegetation and animals are adversely affected by these severe climatic conditions and both, vegetation and domestic as well as wild animal life population are minimal in the area.
4. Emission rates and concentration values of radiological pollution or contaminants are very low and well below MPC.
5. Control of radiological pollutant emissions has been demonstrated by the operator over the 12 years of facility operation.
6. Emission rates and concentrations of non-radiological pollutants are well below Threshold Limiting Values (TLV's).
7. The operator has demonstrated control of non-radiological pollutants throughout the life of the facility.
8. There has never been an accident either offsite or onsite which has had an adverse effect on the environment or people during the 12 year life of the operation.
9. Community relations and public opinion have been good.
10. We have continually been in compliance with the State of Wyoming Environmental Quality Act and other State air, land and water quality regulations.

Attachment - Driver or Carrier Instructions

JHW/11-18-74

DRIVER OR CARRIER INSTRUCTIONS

YOUR CARGO IS Uranium Concentrate
THIS MATERIAL:

1. Is not explosive.
2. Can be approached without danger. Radiation is insignificant.
3. Will not burn.
4. Should not be breathed.
5. Should not be swallowed or put in mouth.

IN THE EVENT OF ACCIDENT, AS SOON AS POSSIBLE:

1. Take preliminary precautions below. Display these instructions as necessary to local authorities on the scene to obtain their help. (See 3 below)
2. Evaluate the situation by answering all questions on reverse.
3. Call (or have local authority call for you) the Manager, Mill Superintendent, or Purchasing Agent, PETROTOMICS COMPANY, Shirley Basin, Wyoming, Telephone 234-9341, Casper, Wyoming or 356-4341 Shirley Basin Wyoming collect, and report all answers to questions on reverse. If possible, have local law or civil authority participate in call.
4. Make no other statements or phone calls except on instructions from your dispatcher or PETROTOMICS COMPANY.

PRELIMINARY PRECAUTIONS

- A. CONTAINERS ARE NOT LEAKING, are not seriously damaged. Container may or may not be thrown from vehicle. Vehicle may or may not be damaged.
1. Caution people not to tamper with the containers. Use civil authorities to help you if necessary.
 2. It is not necessary to have a specific distance between humans and the containers on truck, but for ease of controlling the situation, ask people to stay back 10 - 15 feet.
 3. If closed containers are lying on the road, obtain assistance from whatever civil authority is available to move containers to the side of the road.
 4. Assure local authorities that there is no danger in handling closed containers.

B. CONTAINERS ARE LEAKING OR DAMAGED TOO SERIOUSLY to be moved. Truck or railroad car may or may not be damaged.

1. Caution humans to stay away from the Material. Keep them at a distance of at least 25 feet. Extreme distance is not necessary. Use civil authorities to help if necessary.
2. Assure local authorities that there is no danger from radiation but that people should avoid breathing any dust from the material.
3. Avoid trackage of material by humans or vehicle. Obtain help from local civil authorities if necessary to re-route traffic around the spill area.
4. Keep material from running into streets, gutters, sewers, etc. if possible. A simple method for doing this might be to dig a trench around the material or throw up an earthen dike several inches high.
5. Prevent the material from being scattered by the wind by carefully covering it with canvas or dirt.
6. Avoid breathing dust from the material. When covering the material, obtain a simple respirator if possible. If none are available, work around the material in such a manner as not to stir up excessive dust.

C. FIRE involving vehicle or in immediate vicinity of vehicle.

1. Isolate the vehicle from other humans and property if possible. Use civil authorities for help.
2. Obtain fire fighting help from local group.
3. The material you are hauling will not burn.
4. Keep fire away from uranium containers if possible.
5. Use respirator if necessary to avoid breathing smoke from any fire involving your cargo because of possibility of airborne particles, if the drums are ruptured.
6. Do not spray water into open or leaking containers. There is no reaction with water, but a heavy stream of water will spread the material and make cleanup more difficult.

EVALUATION QUESTIONNAIRE

Name of individual in charge of train or truck

Carrier

Bill of Lading Number

Destination

Time and Place of Accident

Describe Preliminary Precautions You Have Taken

Describe any Spillage Leaking, or Damaged Containers

Name of any Law Officer or Civil Authority on the Scene

Are you under any arrest, restraint, or instructions from local authorities?

Is car or truck roadworthy?

Can you proceed to destination?

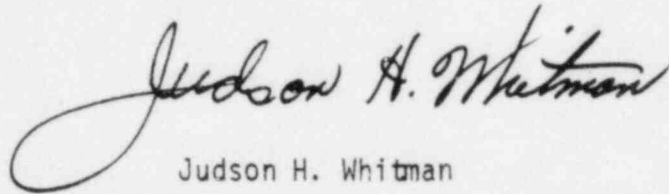
Where can you be reached by phone?

Additional Remarks:

We have held a Source Material License for the operation of this facility since 1962, when we became active in the milling of uranium ores, consequently there is no new impact involved. Because we expect to operate in the future with the same procedures and facilities as in the past, we anticipate that the environmental impact will also be the same as in the past. The Department of Environmental Quality, State of Wyoming, has, and will continue to monitor and control our effects upon the environment.

Yours very truly,

PETROTOMICS COMPANY

A handwritten signature in cursive script that reads "Judson H. Whitman". The signature is written in dark ink and is positioned above the printed name and title.

Judson H. Whitman

MANAGER

JHW/oiw

Attachments

cc: Messrs: J. R. Miller - 10 copies
P. E. Carlton
N. Mansour

A/8