

COMPLIANCE INVESTIGATION REPORT

Division of Compliance

Region IV

Subject: Atlas Corporation
Atlas Minerals
Moab, Utah
License No. SUA-917

Complaint - Allegation that contaminated coveralls used by
mill employees had radioactively contaminated the Moab
sewer system.

Period of Investigation: December 27-28, 1971

9612200230 720128
PDR ADOCK 04003453
C PDR

Investigator:

John J. Ward

John J. Ward, Investigation Specialist

1-28-72

Date

Reviewer:

Glen D. Brown

Glen D. Brown, Senior Radiation Specialist

Date

1/28/72

REASON FOR INVESTIGATION

A letter of complaint, addressed to AEC by an employee of the licensee, claimed that the Moab sewer system was contaminated.

SUMMARY OF FACTS

The complainant alleged that the Moab sewer system had been contaminated because coveralls used by employees in the Atlas uranium mill had been washed by a Moab laundry and at homes, with resultant contamination of the city sewer.

Investigation on December 27 and 28, 1971, at the Atlas mill, and in Moab disclosed no evidence of contamination of the sewer system or likelihood of contamination of employees' homes. Coveralls used by the licensee's employees in the precipitation process are supplied by the licensee. Five surveys of these, taken by the licensee between April and September, 1971, showed little, or no, radiation above background. Analysis of the sludge and effluent from the Moab sewer plant showed no detectable content of uranium. No items of noncompliance were observed. There has been no publicity.

DETAILS

Introduction

1. By letter dated December 7, 1971, to the Atomic Energy Commission (Exhibit A), Mr. Von R. Atwood, an employee of the licensee, expressed concern that the Moab, Utah, sewer system and the homes of the licensee's employees were contaminated. He stated he believed this was caused by the laundering of coveralls used by employees in the licensee's uranium mill's processing of uranium concentrate (yellowcake).
2. Mr. Atwood was contacted by telephone, after receipt of letter, by this investigator and advised that a routine inspection of the Atlas mill was scheduled later in the month and that the matter of coverall contamination and the laundering practices would be specifically examined at that time. He was told that he would be personally contacted after the inspection to advise him of the results, and an appointment to see him was made for the evening of December 27.
3. On December 27, Mr. Glen D. Brown, Senior Radiation Specialist, and this investigator visited the Atlas mill and made an inspection of the mill's use of coveralls and the laundering practices. Mr. Atwood was interviewed the evening of December 27 at his home by Mr. Brown and this investigator. Mr. Brown completed the inspection of the mill on December 28, while this investigator visited the Moab city sewage plant and the Moab Laundry and Linen Supply Company. Samples of the sewage plant's effluent and precipitated solids were taken on that day as well as samples of the mill's effluent released to the Colorado River and samples of the Colorado River, upstream and downstream from the mill. These were later sent to the Health and Safety Division, ID, for analysis.

Interview with Von R. Atwood

4. Mr. Von R. Atwood was interviewed in his home in Cedar Hills, Moab, Utah, on December 27, 1971, between 7:30 and 9:00 p.m. He was visited by Mr. Glen D. Brown, Senior Radiation Specialist, and this investigator, for discussion of matters raised in his letter to the Atomic Energy Commission of December 7, 1971. Pulp Mr. Atwood stated that he works in the Resin-in-Pump (RIP) process at the plant; in the past, he has worked in the precipitation process and that he obtained the address of the Region IV (Denver) Office from the Form AEC-3 posted in the plant. He stated he did not really know whether there was a problem resulting from yellowcake contamination of coveralls, but merely wanted to establish what the facts were and if there possibly could be a contamination of the sewer. He had reasoned that with all of the persons working at the plant and having their coveralls washed that the yellowcake material being washed from this clothing would all come down together at the municipal sewage plant and, in effect, be concentrated. He mentioned specifically that he thought this contamination would remain in the sludge from the sewage plant which apparently is dispensed for fertilizer in the community and he assumed, therefore, there could possibly be a continuing radiation problem resulting from the use of this sludge removed from the sewage plant.

5. Mr. Brown and this Investigator advised Mr. Atwood that an inspection had been commenced at the plant that afternoon and that we had specifically looked at the licensee's provision of coveralls and the procedures they have for laundering these items. He was told that the precipitation workers, one on each shift, are furnished coveralls, six pair each, and that these are changed daily and stored in a barrel at the warehouse. They are laundered at weekly intervals. He was told that our looking into this had determined that the company, on its own, had made surveys of these coveralls, which had not been required by license condition or 10 CFR Part 20, and that these surveys, five of them having been made in 1971, showed that there was no contamination, i. e., that the coveralls did not measure more than background or at the most 0.005 mr/hr over background. He was told that this did not represent a contamination problem, there was no reason that the coveralls could not be released to the laundry, and such low concentrations could not be detected in the laundry waste water. He was also told that any uranium in solution would be so diluted from other sewage that there could be no detection of the material at the municipal sewage plant. He was told, however, that we would obtain some of the sludge product of the sewage plant and will make an analysis of it and advise him of the results.
6. Mr. Atwood's question about the responsibility of the company in subject matters was discussed with him and it was explained that the company is required by 10 CFR Part 20 to keep all emissions below the maximum permissible concentrations and to report any exposures of personnel.
7. Mr. Atwood explained that he had originally been concerned because he has a son-in-law who works in the mines and his daughter has brought this man's clothes to Mr. Atwood's house for laundering. He had not permitted the laundering in his house because he was afraid of the dust contained in the miner's coveralls. He seemed to have been confused with the publicity generated in the radon surveys being conducted in Grand Junction and these were explained to him. It was explained that the so-called radon problem at Grand Junction resulted from several tons of tailings material which had been used for foundations of building and that he should realize that very miniscule amounts of material that might be brought in on coveralls or work clothes and laundered in his home would not, by any stretch of the imagination, present any problems of radon emission.
8. Mr. Atwood did not seem to be making a request that the company furnish coveralls for all individuals; he seemed seriously and conscientiously concerned that there could be a contamination to the municipal sewage system. This, despite the fact that he lives in an area where there is no sewage system and his home has a septic tank disposal system. He was apparently afraid that his septic tank would be, or might possibly be, contaminated and create a radioactive problem in the vicinity. Fundamental discussion of radioactivity ensued in which it was explained the normal radon level in the valley in the uranium-bearing areas of Moab could be detected and the forms of natural radiation were explained to him. His watch, which he said contained some luminous paint was examined and surveyed by Mr. Brown and he was shown that the radioactivity was essentially background. Apparently, if his watch is luminous, it must contain tritiated paint.

9. Mr. Atwood was advised that our inspection would continue on December 28, and that we would see him at work in the plant and if there were any further questions he might have we would be glad to answer his questions at that time. He explained that he was also concerned about a possible radiation hazard resulting from a pipe which conducts tailings to the tailings pile which runs under a catwalk in the process area where he works. He stated he had been told by other employees that there is a high radiation level resulting from the material which had built up in the pipe, coating its interior wall. He was told that a survey would be made during our inspection of this pipe and that he would be shown or told the results of that survey.
10. Mr. Atwood was thanked for his making inquiries of the Atomic Energy Commission. The function of the Division of Compliance was explained and he was told that he should not hesitate to recontact the Commission if he had any further questions of what he may consider potential hazards from his work in the plant. He was told that the licensee had done very well in comparison to other licensees of the same type in protecting the environment and anticipating problems that might occur. The situation of their surveying coveralls, for example, was explained as illustrative of their efforts to comply with 10 CFR Part 20 release limitations in de-minimus standards informally suggested by the Division of Compliance.

Inspection at Atlas Minerals, December 27, 1971

11. Mr. Glen D. Brown and this Investigator made an inspection of the subject license to determine from the Investigator's standpoint specifically what the facts were in regard to the laundering of coveralls and regard to the supplying of coveralls and laundering procedures for them. It was learned that the company instituted a regular procedure of a monthly report and a quarterly report to management which gives the results of the various samplings made by the radiation safety department of the licensee. The quarterly report includes environmental air sampling. Mr. William Badger, General Superintendent, and Mr. J. A. Oliver, the Process Metallurgist, stated that the release limit for coveralls was 0.2 mr/hr. He stated that everybody in the precipitation department and product canning department is furnished coveralls. This amounts to one operator per shift for a total of four people for whom six pair of coveralls each are provided. They also provide an extra set of six coveralls for use of maintenance people who have to work in the precipitation and product handling area.
12. There is a separate report of the surveys of the coveralls made whenever this is done. During 1971, this was done five times, commencing on April 26, 1971. The records showed that the background was 0.030 mr/hr and the radiation level on the coveralls in the barrel being held for laundering registered 0.023 to 0.02 mr/hr on May 11, 1971. The background was 0.030 mr/hr and the coveralls registered 0.035 mr/hr on May 24 and July 9, 1971. On September 17, 1971, the coveralls did not register anything above background, which was measured at between 0.020 and 0.030 mr/hr. Mr. Badger stated that the coveralls are changed daily and put in the barrel in the back of the warehouse. They are laundered twice a week by the Moab Laundry and Linen Supply Company. Mr. Badger stated that other personnel provide their own coveralls; some of them used coveralls and this laundering was done at their homes. He stated that the film badges used by these persons are kept in a lead-lined box and are not kept near the coveralls.

The coveralls are changed daily and discarded daily. He stated that the coveralls are checked with a Model IIB scintillator for beta and gamma emission and are kept in a barrel in the back of the warehouse until taken to the laundry weekly. There were two or three coveralls in the barrel at the time of inspection. Mr. Brown's survey of these with a Frieske-Hoepfner survey instrument showed no beta or gamma activity above background.

Inspection at Atlas Minerals

13. A special survey was made of the RIP area, and in particular a survey was made of the 14-inch tailings line that extends to the rear of the plant, under the catwalk in the RIP area. This was the particular area referred to by Mr. Atwood. A beta-gamma radiation survey was made at three points on this pipe, including two which Mr. Atwood specifically pointed out when he came up during the time that the investigator was making the survey. The radiation level was 3 to 5 mr/hr, averaged for the three points. An additional person was contacted at Mr. Atwood's request.
14. This was the precipitation operator, Ernie Lisonbee. Mr. Lisonbee stated that he had a question concerning the area where he was working, on precipitation tank #3, and asked for a radiation survey at that tank. A radiation survey was made, which showed a reading of less than 1 mr/hr at a spill on top of the tank, which apparently had concerned him. Mr. Lisonbee had other questions: He wanted to know why the licensee had not notified him of his radiation exposure. He was told that he could have this upon request. He was told of the procedure whereby the licensee is not required to automatically give this to a person, except in cases where there has been a possible exposure, as determined from his film badge or other reason, i.e., a high-count air sample. Mr. Lisonbee also raised the question concerning the dumping of sample bottles on the trash pile at the rear of the property. He stated that if the samples they take in the final precipitation process are quite high in radioactivity he wondered whether there was a problem concerned with radon emission from the waste pile where these sample bottles are thrown. The situation of radon decay was explained to him. He was told that a survey would be made of the waste pile and if there was any problem he would be notified. He was told this would be done at the same time as a sample was taken of the mill's effluent at the riverside.
15. Mr. Lisonbee also had a question concerning nuclear testing in Nevada and whether the AEC monitored such tests. He was told of the role of the Public Health Service and various contractor organizations, including the University of Utah, which maintain continuous monitoring. He was told of the present situation whereby tests are conducted only underground. On the rare occasions when there has been leakage from these underground shots he was told that it had been confined primarily to the test site and if he hears of radioactivity being detected from weapons tests that these conceivably could be from Chinese testing which is still done in the atmosphere. He raised questions as to why there has to be testing and was told that we weren't in the testing program, but that all testing in the U.S. is done underground to prevent any problem of contamination and that this is insured by the monitoring setup throughout the United States. This was put in proper perspective for him, by explaining that the indications received by the monitoring stations record an infinitesimal amount of radiation that should be of no concern to himself.

Mr. Lisonbee raised the question concerning the need to make tests such as the Cannikin shot at Amchitka. He was informed, as he could read from the newspapers as I had, that this is felt to be essential from the standpoint of developing defensive weapons. They have to be tested to make sure they will work and the AEC goes to great effort and expense to insure that there is no hazard to safety or contamination of the environment.

16. Mr. Atwood then recontacted the investigator to thank him for the efforts in his behalf and stated he was much relieved to learn of the findings. He stated that he had addressed an identical letter to that received by the Denver Office to the AEC Washington office. He stated he was telling me this because he didn't want me to think he had gone over our heads to accomplish some results. It was explained to him that we would be glad to look at anything else that he wanted to question. He was told that we would look at the trash pile and that I had taken samples from the sewage plant that morning and these would be analyzed and if there was any reason for concern about possible contamination of the sewer system he would be notified. Mr. Atwood implied by his statements that the company does not keep employees informed of situations and that for many of the questions they have, they feel the company doesn't care what they believe about it or know what the true situation is. He was advised that it was unfortunate if there was poor communication, but in any case he should always feel free to contact the AEC if he should have any further question concerning radiation safety.

Inspection at the Moab Sewage Plant - December 28, 1971

17. Mr. Matthew Hellman is the operator at the City of Moab's disposal plant at W. 4th N. It is located on the south bank of the Colorado River, approximately one-half mile ^{upstream from the mill,} which is on the north bank of the river. Mr. Hellman stated he has been employed as plant operator for approximately a year and prior to that had been a painter for Atlas Minerals for thirteen years. Mr. Hellman explained that the sewage plant was designed to handle a much larger capacity than the present population of the city requires and that one digester is being held in reserve. He stated there has never been any occasion when the plant's capacity was exceeded or when untreated sewage has been released to the river. He stated digested sludge is pumped out of the digesters every three weeks into concrete lined settling ponds where the liquid is allowed to evaporate. The dried sludge residue is then scraped up with a front loader and stockpiled in another concrete lined unused pond. He stated that local alfalfa farmers occasionally pick up the material for fertilizer, but little use of it is made by the local populace. He stated most Moab residents "turn up their noses" at it. He said he uses large quantities of it on the rose bushes he grows on the property. Mr. Hellman allowed the investigator to take samples of the effluent liquid, with contained solids, from the freshest pond, and the dried solids stockpiled for fertilizer.

Survey of the Sample Bottle Waste Pile and Water Sampling

18. On the afternoon of December 28, this investigator made a survey of discarded sample bottles on a waste pile in an outside storage area of the Atlas mill. No radiation above background could be detected. A sample of the mill's effluent water stream was taken at a point about 100 yards from where it enters the river.

Samples of river water were taken upstream about one mile from the Atlas mill at Tex's landing, and downstream 3.5 miles at roadside.

Contact at the Moab Laundry

19. A personal contact was made at the Moab Laundry and Linen Supply Company at 111 E. First Street. The manager there stated he launders the coveralls from Atlas Minerals and that the laundry waste water is discharged to the Moab City sewer.

Results of Analyses

20. The samples taken from the Moab sewage plant, the Atlas mill, and the Colorado River were sent to the Health and Safety Division, ID, for analysis on December 29. The sewage samples were analyzed for natural uranium and the other samples were tested for ^{230}Th and ^{226}Ra as well as natU . The results are shown on the sample record sheets attached (Exhibit B). The amount of natU in the sewage effluent and the two Colorado River samples is less than 1.3×10^{-8} $\mu\text{Ci/ml}$, which is the lower detectable limit of the counting equipment. All other elements in all samples were present in less than maximum permissible concentrations.

Attachments:
Exhibits A & B

December 7, 1971

United States of America
Atomic Energy Commission
Region IV, Division of Compliance
10395 West Colfax Avenue
Denver, Colorado 80215

Dear Sirs:

I am writing you in regard to radio active contamination of the Moab, Utah sewer system and the homes of the employees of the Atlas Minerals Uranium Mill, located in Moab, Utah.

I am an employee at Atlas Minerals, in my estimation this problem exists, and I have been concerned about this problem for some time.

The company doesn't furnish coveralls or washing facilities for the employees, with the exception of one circuit which is called precipitation. The precipitation operators are furnished coveralls. When they get dirty they are taken to the Moab City Laundry for washing. The other employees take there clothing home to be cleaned. I don't like taking home anything that might be harmful to my family or surroundings.

Would you inform me as to the responsibility of the company in such matters.

Thanking you in advance for any information you might be able to send me on this matter.

Von R. Atwood

Box 922
Moab, Utah 84532

EXHIBIT A

REV. 8-59/ 10395 West Colfax Ave., Room 200
Denver, Colorado 80215

IDAHO OPERATIONS OFFICE
ANALYTICAL CHEMISTRY BRANCH

ROUTINE SPECIAL X

SAMPLE RECORD SHEET

SERIAL NO. 54502

SAMPLE FROM: Atlas uranium mill

SAMPLES RECEIVED: 1/3/72

ANALYZED BY: RB, DP

COLLECTED BY: J. J. Ward

ANALYSIS COMPLETED: 1/7/72 1/13/72

DATE SUBMITTED: 12/29/71

SAMPLE			SAMPLE DESCRIPTION	ANAL. FOR	INST. USED	QUANT. USED ml	TIME CNTD.	COUNT TIME min	TOTAL COUNT	GROSS COUNT C/	BKGD. C/	NET COUNT C/	Net cph Blank + Yield Corr.	RESULTS <u>mc/ml</u>
NO.	DATE	HOUR												
1			Moab sewer plant effluent	U nat		0.1				1.6	1.2	0.4		$< 1.3 \times 10^{-8}$
2			Moab sewer plant solids	U nat		1.25g				44	1.8	42.2		2.3×10^{-6} <u>mc/kg.</u>
3			Colorado River, upstream	U nat						1.8	1.2	0.6		$< 1.3 \times 10^{-8}$
				Th230	Gross ± 6	500	0800 1-7	60	55		4	51	42 \pm 9	$< 2 \times 10^{-8}$
				Ra226	Em	500	1520 1-13	60	329		13	326	328 \pm 19	$(2.9 \pm 0.2) \times 10^{-9}$
4			Colorado River, downstream	Unat						1.8	1.2	0.6		$< 1.3 \times 10^{-8}$
				Th230	Gross ± 7	500	0800 1-7	60	130		1	129	124 \pm 13	$< 2 \times 10^{-8}$
				Ra226	Em	500	1315 1-13	60	266		10	256	258 \pm 18	$(2.2 \pm 0.2) \times 10^{-9}$

NOTIFIED JJ Ward

TIME: 0915 10 Jan 72

RESAMPLING

YES

RECOMMENDED:

NO

APPROVED: SM Lombard

SECTION CHIEF

EXHIBIT B -

10-104

(REV. 8-68)

U. S. Atomic Energy Commission
Region IV, Division of Compliance
10395 West Colfax Ave., Room 200
Denver, Colorado 80215

ROUTINE ☐ SPECIAL ☒

U.S. ATOMIC ENERGY COMMISSION

IDAHO OPERATIONS OFFICE

ANALYTICAL CHEMISTRY BRANCH

SAMPLE RECORD SHEET

REFERENCE: HEALTH & SAFETY
DIVISION

54503

SERIAL NO.

SAMPLE FROM: Atlas uranium millSAMPLES RECEIVED: 1/3/72ANALYZED BY: RB, DPCOLLECTED BY: J. J. WardANALYSIS COMPLETED: 1/7/72 1/13/72DATE SUBMITTED: 12/29/71

SAMPLE			SAMPLE DESCRIPTION	ANAL. FOR	INST. USED	QUANT. USED ml	TIME CNTD.	COUNT TIME min	TOTAL COUNT	GROSS COUNT C/	BKGD. C/	NET COUNT C/	Net cph Blank & yield corr.	RESULTS D/ mc/ml
NO.	DATE	HOUR												
5			Atlas effluent to river	Unat		0.1				52	1.2	56.8		3.4×10^{-7}
				* Th230	Gross X #8	500	0800 1-7	60	839		2	837	907 ± 32	$(2.6 \pm 0.2) \times 10^{-8}$
			²³⁰ Th Blank = 10 ± 4 net cph											
				Ra226	Em	500	1415 1-13	60	2048		12	2036	2056 ± 45	$(1.79 \pm 0.04) \times 10^{-8}$
			²²⁶ Ra Blank = 1 ± 6 net cph @ K20, 1/13											
			* Result from gross count in conjunction w/α-spectrum											

NOTIFIED: J. J. WardTIME: 0915 10/11/72

RESAMPLING

YES ☐

RECOMMENDED:

NO ☐APPROVED: J. M. Lombard

SECTION CHIEF

EXHIBIT B-2

MEMO ROUTE SLIP Form AEC-08 (Rev. May 14, 1947)		See me about this. Note and return.	For conr. For signature.	For action. For information.
TO (Name and unit)	INITIALS	REMARKS		
L. L. Johnson, DDT	LL	SUBJECT: ATLAS CORPORATION		
AS P. P. P.	1/1/69	ATLAS MINERALS		
		MOAB, UTAH		
		LICENSE NO. SUA-917		
TO (Name and unit)	INITIALS	REMARKS		
AS P. P. P.	AS	Attached for your information is a copy of a		
4. Docket Files	1/5/69	memo dated December 26, 1968 from J. J. Ward,		
		Region IV to J. R. Roeder concerning a fire		
		which occurred in the mill.		
TO (Name and unit)	INITIALS	REMARKS		
FROM (Name and unit)	REMARKS			
R. Handler, CO				
PHONE NO.	DATE			
7347	1/3/69			

USE OTHER SIDE FOR ADDITIONAL REMARKS

C43-16-79903-1

GPO : 1967 -277-337

Utah Atlas Uranium Mill Fire Damage \$1 Million

MOAB, Utah—Fire broke out at the Atlas Uranium Mill here about 5 a.m. Christmas Day, destroying about 40,000 gallons of kerosene-like solvent and causing an estimated \$1 million damage.

contain the fire in the storage area.

The plant employs more than 100 persons and extracts uranium from ore mined in the Moab area.

A company spokesman said only nine employees were on the job when the fire broke out, and no one was injured. Cause of the fire was unknown.

LARGE TANKS

The fire erupted in a series of large tanks used to store the solvent. The main building of the mill was not damaged by the fire.

Witnesses said the fire was so intense it buckled steel beams that supported the tanks. Local volunteer firemen and employees were called to help

Denver Post

December 25, 1968

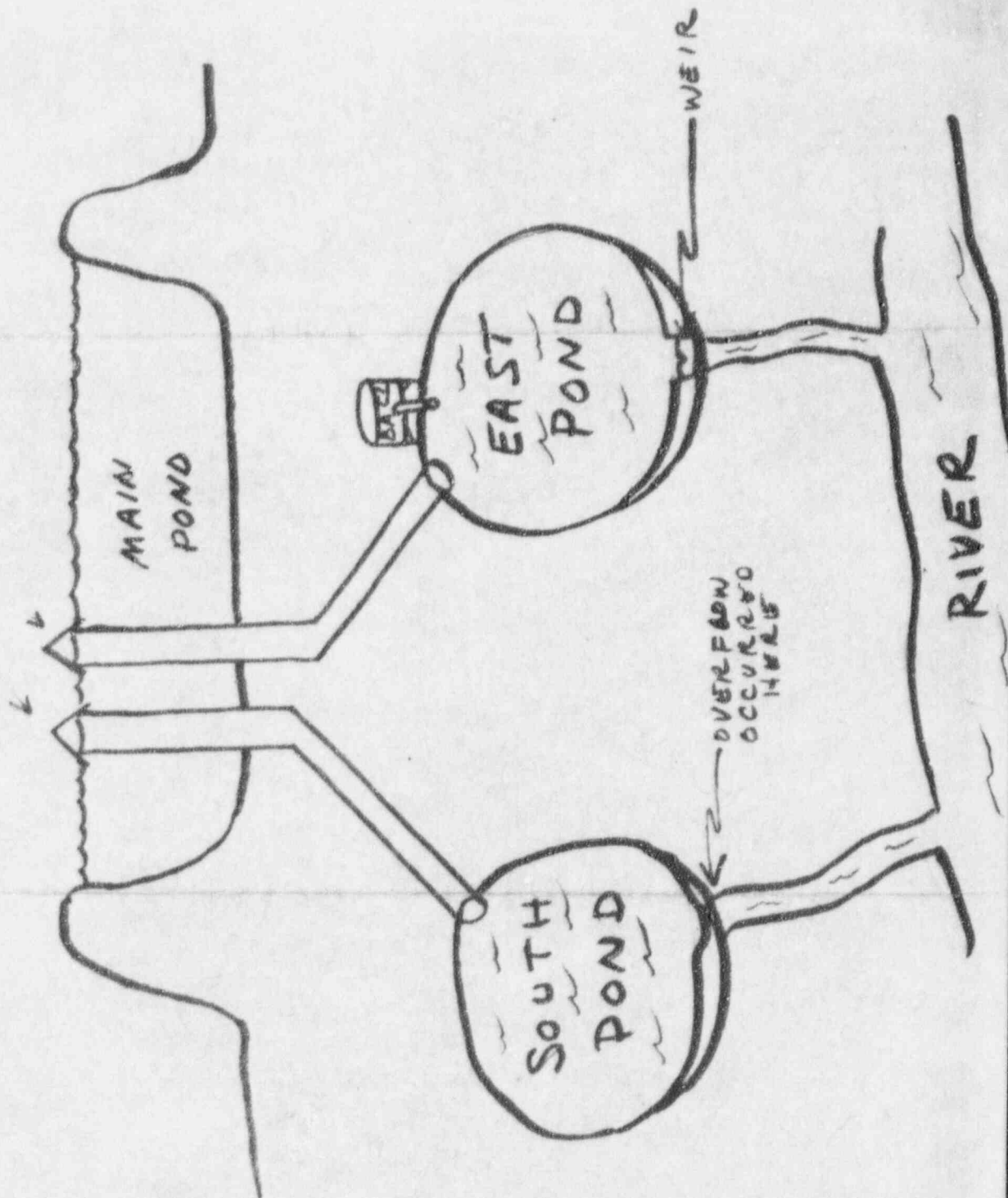


MEMO ROUTE SLIP Form AEC-93 (Rev. May 14, 1947)		See me about this. Note and return.	For concur For signature	For action. For information.
1- TO (Name and unit) D. A. Nussbaumer DML:S&SNMB <i>[Signature]</i>	INITIALS DATE	REMARKS RE: ATLAS MINERALS DIVISION ATLAS CORPORATION MOAB, UTAH 40-3453 LICENSE NO. R-161		
2- TO (Name and unit) Enforcement Branch SLR <i>[Signature]</i>	INITIALS DATE	REMARKS Attached for your information is a copy of a memo dated Feb. 8, 1967 by Region IV, CO, to Files, reporting a release of tailings pond liquid to the Colorado River.		
TO (Name and unit) <i>[Signature]</i>	INITIALS DATE	REMARKS		
FROM (Name and unit) R. G. Page SLR:EB	REMARKS Attachment: Cpy memo 2/8/67			
PHONE NO. 7422	DATE 2-20-67			

USE OTHER SIDE FOR ADDITIONAL REMARKS

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

DECANT TOWERS



U.S. ATOMIC ENERGY COMM.
REGULATORY
MAIL & RECORDS SECTION

1967 FEB 13 AM 11 52

RECEIVED

ROUTING SLIP TO DIVISION OF MATERIALS LICENSING

2-2-72

~~C. R. Buchanan~~
~~Materials Branch~~

~~Layfield~~ ~~Harmon~~

~~James~~
Docket files

J. C. Malero
Materials Branch

D. A. Nussbaumer
Fuel Fabrication & Transportation Branch

R. B. Chitwood
Irradiated Fuel Branch

The following Compliance inspection/investigation report is submitted
for your information:

Licensee:

Atlas Minerals
Moab Utah

License No:

SCA-917, 40-3453

Date of Insp/Inv:

12/27-28/71

Gen W. Roy

Gen W. Roy, Chief
Materials & Fuel Facilities Branch
Division of Compliance