Marvin M. Mann, Asst. Director for Compliance
Division of Inspection, Washington 25, D. C.

DEC 7 1959

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

REPORT OF COMPREHENSIVE MILL SURVEY - MINES DEVELOPMENT, INC. OF DELAWARE (EDGEMONT, SOUTH DAKOTA, URANIUM MILL) - LICENSE NO. R-174

LI:AMH

On September 28, 1959, a team representing the Division of Licensee Inspection, Idaho Operations Office, comprised of A. W. Holmes, LI:ID; J. M. Allan, LI:COO; and Paul McKnight, CS:CJ, began a survey of the mill operations of Mines Development, Inc., Edgemont, South Dakota. The survey included collection of airborne dust samples (to be analyzed for uranium) from all areas of the mill and associated buildings, and measurements of radiation levels in all areas. Since the effluent liquors from the mill operations are retained in tailings ponds for clarification and return to the mill, there is no release of these liquors to the environs other than seepage; therefore, no liquid samples for radium determinations were collected. However, as the possibility exists that there could be some seepage from these ponds, a sample was taken of the small natural stream that flows through the tailings area. This sample was submitted for radium determination.

The Mines Development, Inc. mill is located immediately adjacent to the town of Edgemont, South Dakota. The mill property is bounded on the west by the CB&Q Railroad which separates the mill property from the eastern boundry of Edgemont, on the north by U. S. Highway 85 Alternate and the Cheyenne River, and on the east by the Edgemont Sewage Works. The tailings and settling ponds are located between the Cheyenne River and the mill proper. As noted earlier, there is a small creek flowing in a northerly direction through the mill property and finally emptying into the Cheyenne River.

The physical plant is relatively new and in good mechanical repair, and housekeeping control appeared well managed. There was no visible evidence of dust accumulations in the crushing and sampling plant. Only one sample from this area indicated possible concentrations above MPC. General air samples taken in the sample bucking area indicate low concentrations while the breathing zone samples indicated a varying degree of concentrations, depending on the operation. The operator was observed wearing a respirator during various operations of sample preparation. The yellow cake packaging area is washed down several times per day to control dust accumulation. The general air samples,

AIRMAIL

(continued)

OFFICE ▶					
SURNAME ▶					
DATE ▶					

except for the period when the steam drier was being washed down, indicated levels below MPC, while the washing operation indicated a condition contributing to high level contamination. This washing operation is carried out at least once, and sometimes twice per shift as the need arises. The yellow cake packaging operator was observed wearing a respirator during the barreling operations.

The attached tables are compilations of analytical results obtained as a result of the survey of this mill. It should be noted that these data reflect conditions at the mill only at the time of the survey. While the data indicates good dust control, it is the opinion of this office that these results do not necessarily indicate average day-to-day operating conditions. Factors such as moisture content of the ore, type of ore being milled, etc., influence the conditions (particularly where dust is concerned) at any given time. During the period of the survey, the ore being processed had a sufficiently high moisture content to cause plugging of fine ore transfer points. The data from samples in the crushing and sampling area under different conditions could reflect higher levels of airborne dust.

The mill operates three shifts per day, seven days per week with the mill personnel working forty-eight hours per week. On this basis, the MPC for airborne natural uranium in a restricted area is calculated to be 4.17×10^{-11} uc/ml. The "times MPC" column has been calculated on this basis. Values less than 1.0 have not been entered in this column.

Two types of samples for airborne contamination were collected; namely, general air and breathing zone samples. General air samples are those samples taken in an area without regard to specific employee activity, whereas breathing zone samples were collected while an employee was performing a specific task, the sampling instrument being held as close as possible to the employee's breathing zone. Breathing zone samples were collected only in areas where there appeared to be a reasonable probability of airborne exposure to the employee due to a specific operation carried out by the employee.

The external radiation survey levels were measured using a Berkeley beta-gamma survey meter, Model 2570, calibrated by the Instrument Branch, Health and Safety Division, Idaho Operations Office. All readings were taken with the geiger tube unshielded, i.e., "open window."

Enclosures:
Survey Data

OFFICE ▶	BCC: R. D. Jaastgaard, ID	Liaison, AEC Headquarters				
	LI	LI				
SURNAME ▶	AWHolmes:fh	DIWalker				
DATE ▶	12/3/59					

Form AEC-318 (Rev. 9-53) U. S. GOVERNMENT PRINTING OFFICE 16—62701-2

MINES DEVELOPMENT, INC.
Edgemont, South Dakota

Survey Conducted By
Licensee Inspection Division
Idaho Operations Office
September 28-30, 1959

Uranium
General Air Samples

Location	No. of Samples	μc/ml x 10^{11} Low	High	Ave.	Times MPC
Ore Receiving					
Rail car unloading	3	.01	.15	.05	
Rail to truck loading	10	.02	.83	.27	
Scale room	1			.18	
Office and lunch room	2	.33	.33	.33	
Washroom	1			.31	
Locker room	1			< .01	
Crushing and Sampling Plant					
Main floor	7	.37	1.50	.60	
Bottom of No. 1 bucket sampler	2	.50	8.0	4.2	1.0
Second deck	4	.22	1.3	.56	
Third deck	4	.30	.43	.37	
Coarse Ore Bins					
Bottom level	4	.28	1.00	.55	
Fine Ore Bins					
Bottom level	7	.09	.43	.26	
Top level	2	.17	.37	.27	
Rod Mill					
General	7	.06	.90	.50	
Operator's desk	1			.43	
Classifiers	2	.50	.70	.60	
Mill Head Tank	3	.77	1.10	.96	
Acid Leach					
Main floor	3	.50	.70	.61	
Second floor	3	.54	.60	.57	
Third floor	4	.37	.70	.47	
Sand Slime Classifiers	6	.22	.76	.39	
Mixer, Settler, Extractor					
Second floor	5	.13	.63	.37	
Third floor	1			.83	

Mines Development, Inc.
Edgemont, South Dakota

General Air Samples
September 28-30, 1959

Location	No. of Samples	μc/ml x 10^{11} Low	High	Ave.	Times MPC
Solvent Extraction					
Main floor	3	.15	.63	.43	
Second floor	1			.77	
RIP Tanks	13	.13	4.00	.81	
Yellow Cake Precipitation					
Main floor	1			.83	
Yellow Cake Presses	3	.50	1.80	1.30	
Yellow Cake Drier	1			1.2	
Yellow Cake Packaging 2/	3	.31	.54	.39	
Yellow Cake Packaging 1/	2	12.0	12.0	12.0	2.9
Sample Bucking					
General	4	.22	1.70	.73	
Crushing and drying room	2	.11	1.50	.80	
Grinding room	2	.58	2.00	1.29	
Miscellaneous Areas					
Third level hot water makeup	1			1.10	
Mill control laboratory	1			.57	
Shift foreman's office	1			.14	
Small reagent mixer tank	1			1.60	
Acid storage tank	1			.70	
Supervisor's desk over No. 1 holding tank	1			.50	
Third level catwalk at filtrate of iron	1			.83	
Cyclone feed to thickener tank	1			.57	
Utilities Areas					
Carpenter and paint shop	1			2.40	
Truck shop	2	.22	.25	.23	
Electric shop	1			.32	
Mill shop	3	.18	.50	.30	
Vacuum pump	1			.47	
Store room	3	.04	.04	.04	
Change room	3	.08	.10	.09	
Boiler room	2	< .01	.01	< .01	
Laboratory Area					
Volumetric	2	.02	.02	.02	
Metallurgical	2	.03	.18	.10	

1/ Operator washing down steam drier overhead. No respirator worn during operation.

2/ Yellow cake packaging area - 90% occupancy

Mines Development, Inc.
Edgemont, South Dakota

General Air Samples
September 28-30, 1959

Location	No. of Samples	μc/ml x 10^{11} Low	High	Ave.	Times MPC
Stock room	1			.03	
Concentrate balance room	1			.16	
Fluorometric center	1			.02	
Change room	1			.01	
Hallway between offices	1			< .01	
Office Building					
General	3	< .01	.06	< .03	

Mines Development, Inc.
Edgemont, South Dakota

Breathing Zone Samples
September 28-30, 1959

Location	No. of Samples	µc/ml x 10^{11} Low	High	Ave.	Times MPC
Unloading rail car	1			1.2	
Sample Bucking Operator					
Emptying "Y" blendor and Jones splitter	2	4.1	6.1	5.1	1.2
Filling McCool Grinder	1			18.0	4.3
Emptying "Y" blendor and hand splitting	1			30.0	7.2
Loading "Y" blendor	1			1.7	
Filling and emptying "Y" blendor	2	.64	.92	.86	
Hand splitting sample	2	24.0	52.0	38.0	9.1
Unloading Braun Pulverizor	1			.47	
Yellow Cake Operator					
Changing drums	2	29.0	33.0	31.0	7.4
Changing drums and start to fill	1			30.0	7.2

Plant Effluent Sample
September 28-30, 1959

Location	Radium^{226} µc/ml	Thorium µc/ml
Liquid sample taken from small natural stream flowing through tailings area	$< 1.5 \times 10^{-8}$	0.3×10^{-8}

Mines Development, Inc.
Edgemont, South Dakota

External Radiation Survey
September 28-30, 1959

Location	mr/hr
Ore receiving bin #1	.2
Ore receiving bin #2	.2
Conveyor to crushing plant tower	.2
Transfer belt to sample tower	.1
Trash collection station	.2
Sample bucking room, grinder	.1
Sample bucking room, splitter	.3
Sample bucking room, drying oven	.2
Sample tower tail pulley	.05
Sample tower fine ore conveyor	.1
Top of sample tower bucket samplers	.1
Top of sample tower feed conveyor	.1
Top of sample tower jaw crusher	.2
Top of sample tower dust collector	.1
Top discharge to fine ore bins	.2
Equipment shop	.05
Electric shop, mill building	.08
Machine shop, mill building	.07
Machine shop, lathe and grinder	.07
Fine ore bins, bin "A"	.2
Fine ore bins, bin "B"	.3
Feed to rod mill	.3
Discharge from classifier	.3
Leaching tanks	.4
Sweco screen leach area	.2
Sand slime tanks	.05
RIP pulp pumps	.15
RIP pulp pumps sump	.2
Carpenter shop	.07
2 drums of liquid near yellow cake area	.4
Filled drums at yellow cake area	1.5
Yellow cake bench in druming area	.5
Yellow cake drum filling area	1.0
Mixer, settler tanks, bottom	.2
Scavenger tanks, bottom	.06
Scavenger tanks, top	.15
8 foot settler-stripping, top	.06
Top of mixer-settler tanks	.2
Tails return tanks	.2
Mill control laboratory	.15
RIP baskets and tanks	.15
Mixer-settler tank, top	.5
RIP tanks #8 and #9	.14
Sperry filter press #1, yellow cake	4.0
Sperry filter press #2, yellow cake	3.0
Yellow cake drier	.3
Yellow cake drier stack washer	1.0
Feed to RIP baskets	.1
Mill control feed platform for RIP	.4
RIP laboratory and lunch room	.2

Location	mr/hr
Shift foreman office	.08
Iron filtrate press	7.0
Mill hold tank	.05
Iron filtrate storage tank	.5
Top of leaching tanks	.4
Reagent feed to leach tank, top	.2
Tails cyclone	.3
Tails sands washing classifier	.25
Warehouse supply area	.03
Warehouse supply office	.05
Mill change room	.03
Mill change room lockers	.05
Boiler house	.05
Analytical laboratory supply	.03
Laboratory change room	.03
Laboratory general area, bench top	.3
Laboratory titration area	1.0
Laboratory balance room	.03
Laboratory calculation room	.07
Laboratory fluorometric room	.05
Laboratory plant engineer's office	.05
Incinerator, ash drum, outside	2.0
Incinerator, ash drum, inside	7.0
Old tailings pile next to fence	.17
Old tailings pile center, contact	.3
Old tailings pile center, at 1'	.2
Old tailings pile under old conveyor	.3
Stockpile area, extreme south	.7
Stockpile area, extreme east	.8
Stockpile area, Powder River	.5
Change room ore receiving building	.06
Ore receiving building, office	.2
Ore receiving building, bucking room	.1
Ore receiving building, crushing and drying	.4
Ore receiving building, scale room	.1
Stockpile of Triangle Enterprise	.5
Stockpile of Powder River	.5
Rail car unloading station, outside	.3
Rail car unloading station, tunnel	.4
Rail car unloading station, basement	.1
Rail car unloading station, over storage bins	.3
Second oldest tailings pond abandoned and fenced	.7
Second oldest tailings pond, at gate to area	.2
New tailings pond, after sand separation for mill water	.1
Sand slime separation pond	.15
Sperry filter frames, in scrap yard	4.0

ID-104
(R-1-55)

U. S. ATOMIC ENERGY COMMISSION
IDAHO OPERATIONS OFFICE
HEALTH AND SAFETY BRANCH

Serial No. 15231

ROUTINE ___ SPECIAL ___

IDO H & S SAMPLE RECORD SHEET

Sample from: Mines Development
JA Collected by: Edgemont S. Dak.
Date submitted:

Samples Received:
Analysis Completed: 23 Oct. 1959
Method: End Window ___ ; Prop. counter ✓ ; Spectrophotometric ___ ; Fluorometric ___ ; Polarographic ___ .

Analyzed by: WCP CCM H.B.

Sample No.	Date	Hour	Sample Description	Anal. for	Quant. used, ml.	U +6 or K+ Trans.	Count time, min.	Total Count.	Gross Count, c/m.	Bkgd., c/m.	Net count, c/m.	K40 corr., c/m.	Foreign activity c/m.	Foreign activity μc/ml x 10⁸ d/m
[redacted]	9/29		Water from Creek below tailings dam	Th	200		30	0+27	0.9±0.2	0+12 0.4±0.1	0.5±0.2			0.3
[redacted]														

Notified: ___ Time: ___ Resampling recommended: Yes ___ No ___

Approved: C.W.S by C.R. Ebersole
Chief, Analysis Section

ID-104
(R-1-55)

U. S. ATOMIC ENERGY COMMISSION
IDAHO OPERATIONS OFFICE
HEALTH AND SAFETY BRANCH

Serial No. 15277

ROUTINE ___ SPECIAL ___

IDO H & S SAMPLE RECORD SHEET

Sample from: Mines Development
Collected by: Edgemont S. D.
Date submitted: ______

Samples Received: ______
Analysis Completed: ______
Method: End Window ___ ; Prop. counter ___ ; Spectrophotometric ___ ; Fluorometric ___ ; Polarographic ___ .

Analyzed by: [illegible initials]
Sheet 1A of 4

Sample No.	Date	Hour	Sample Description	Anal. for	Quant. used, ml.	U +6 or K + Trans.	Count time, min.	Total Count.	Gross Count, c/m.	Bkgd., c/m.	Net count, c/m.	K40 corr., c/m.	Foreign activity	
6 [redacted]	9/29		water from Creek below tailings dam	Ra		1350 10-27	30	1X32+0		0+1			Ra^{226} [illegible] ×10⁻⁹ < 1.5	
[redacted]														

Notified: ______ Time: ______ Resampling recommended: Yes ___ No ___

Sample 1 BaSO₄ Ppt 8:20 10-27

Approved: CWS by E.R. Eberade
Chief, Analysis Section

ID-130
(8-59)

U. S. ATOMIC ENERGY COMMISSION
IDAHO OPERATIONS OFFICE
HEALTH AND SAFETY DIVISION
SAMPLE RECORD

Serial No. 14905

Sample from: MINES DEVELOPMENT

Address EDGEMONT S.D. | Collected by: J. ALLAN | Date: 9-28-55 | Analyzed by: [illegible] 10/4/56 | Date:

Sample No.	Hour	Sample Description	Sampling Rate L/M	Sampling Time Min.	Sampling Total Liters	Anal. No.	Quantity Used, ml.	Fluor. Read., sc. div.	Uranium present Total μμ curies	Uranium present μc/ml x 10"
0-417	150 200	CARPENTER & PAINT SHOP G.A. NEXT TO Yellow Cake AREA	30	10	300		.01/25	4.2	7.2	2.4
0-418	[illegible]	mill 2nd floor #2 Yellow Cake Filter Press - over Yellow Cake Pack	30	10	300		.01/25	3.3	5.3	1.8
0-419	[illegible]	mill 2nd floor - Btwn X-C Steam dryer #1 RIP Tank area	30	10	300		.01/25	2.5	3.6	1.2
0-420	[illegible]	Over Yellow Cake Bins area - Front of #2 Filter Press	30	10	300		.01/25	3.1	4.9	1.6
0-421	[illegible]	Front of #1 Filter Press next to S.E. Stairs	30	10	300		.01/25	1.5	1.5	0.50
0-422	[illegible]	Between #7 & #8 RIP TANKS - AISLE	30	10	300		.01/25	1.3	1.1	0.37
0-423	[illegible]	OVER ELUANT MAKE TANK #1, FRONT RIP #9	30	10	300		.01/25	1.4	1.3	0.43
0-424	305	BETWEEN #5 & #10 RIP TANKS AISLE	30	10	300		0.1/25	4.8	9.84	0.28
0-425	309	BETWEEN #2 & #3 RIP TANKS - AISLE	30	10	300		.01/25	1.3	1.1	0.37
0-426	319	AGAINST WALL BETWEEN RIP 4 & 5 TANKS	30	10	300		.01/25	1.4	1.3	0.43
0-427	325	OVER #1 ~~HOLDING TANK~~ TANK - SUP. DESK	30	10	300		.01/25	1.5	1.5	0.50
0-428	335	OVER S-X TANKS	30	10	300		.01/25	1.9	2.3	0.77
0-429	340	OVER #1 SODA-ASH SETTLER TANK	30	10	300		.01/25	1.7	1.9	0.63
0-430	350	OVER #3 S-A SETTLER TANK	30	10	300		.01/25	1.3	1.1	0.37
0-431	415	RIP FEED CONTROLS	30	10	300		0.01/25	2.4	3.4	1.1
0-432	422	RIP FEED PUMPS - WEST END	30	10	300		0.01/25	1.6	1.7	0.57

Standard 41 sc. div. per 0.05 mg. Blank 0.8 sc. div. Sensitivity 0.00124 mg/gram/sc. div.

CWS by E. R. Eberle
Chief, Analysis Branch
APPROVED

ID-130
(8 - 59)

U. S. ATOMIC ENERGY COMMISSION
IDAHO OPERATIONS OFFICE
HEALTH AND SAFETY DIVISION
SAMPLE RECORD

Serial No. 14909

Sample from: Mine Development

Address: Edgemont S.D.

Collected by: P. R. McKnight

Date: 9/28/59

Analyzed by: TC

Date:

Sample No.	Hour	Sample Description		Sampling Rate L/M	Sampling Time Min.	Sampling Total Liters	Anal. No.	Quantity Used, ml.	Fluor. Read., sc. div.	Uranium present Total μμ curies	Uranium present μc/ml x 10"
0-549	0335	3 level Catwalk over Mill Hole Tank	GA	30	10			0.01/25	1.9	2.3	0.77
[redacted]550	0346	3 level Catwalk over Leach tank #1	GA	30	10			0.01/25	1.8	2.1	0.70
551	0337	3 level Catwalk at Filtrate of Iron	GA	30	10			0.01/25	2.0	2.5	0.83
552	0350	3-d level Catwalk over Leach tank #3	GA	30	10			0.01/25	1.3	1.1	0.37
553	0350	3rd level Catwalk over Leach tank #4	GA	30	10			0.01/25	1.3	1.1	0.37
554	0358	3rd level Catwalk over Leach tank #1 Control Panel	GA	30	10			0.01/25	1.4	1.3	0.43
555	0404	Cyclone feed to Thickener tanks	GA	30	10			0.01/25	1.6	1.7	0.57
556	0412	Catwalk over Mill Head Tank	GA	30				0.01/25	2.2	3.0	1.0
557											
[redacted]558											
559											
560											
561											
562											
563											
0-564											

Standard 25 sc. div. per 0.05 mg. Blank 0.8 sc. div.; Sensitivity 0.0017 microgram/sc. div.

WS by E R Ebersole
APPROVED
Chief, Analysis Branch

ID-130
(8 - 59)

U. S. ATOMIC ENERGY COMMISSION
IDAHO OPERATIONS OFFICE
HEALTH AND SAFETY DIVISION
SAMPLE RECORD

Serial No. 14506

Sample from: MINES DEVELOPMENT CO.

Address: EDGEMONT SOUTH DAKOTA | Collected by: J. ALLAN | Date: 9-28-56 | Analyzed by: [illegible] | Date:

Sample No.	Hour	Sample Description	Sampling: Rate L/M	Sampling: Time Min.	Sampling: Total Liters	Anal. No.	Quantity Used, ml.	Fluor. Read., sc. div.	Uranium present: Total μμ curies	Uranium present: μc/ml x 10⁻⁷
O-401	950 10-	G.A. UNDER COURSE ORE BINS - AT CONVEYOR - NORTHSIDE	30	10	300		10.1/25	1.4	1.3	0.43
O-402	950 10-	G.A. UNDER COURSE ORE BINS - AT CONVEYOR - SOUTHSIDE	30	10	300		0.1/25	4.8 +0	0.84	0.28
O-403	1006 1016	EAST END OF COURSE ORE BINS - OPERATOR SITS TO PICK DEBRIS	30	10	300		10.1/25	1.5	1.5	0.50
O-404	1006 1016	UNDER MAG-PULLEY COURSE ORE BINS GA	30	10	300		10.1/25	2.2	3.0	1.0
O-405	1026 1036	SAMPLE PLANT - ABOVE CRUSHER	30	10	300		10.1/25	1.4	1.3	0.43
O-406	1076 1086	SAMPLE PLANT - ABOVE CRUSHER - 3RD level	30	10	300		10.1/25	1.4	1.3	0.43
O-407	1046	TOWER OVER ORE BINS - FINE - WEST SIDE	30	10	300		0.1/25	3.2 +1	0.51	0.17
O-408	1042	TOWER OVER ORE BINS - FINE - EAST SIDE	30	10	300		10.1/25	1.3	1.1	0.37
O-409	1030 10-	Mill 1st FLOOR AISLE NEXT TO SOLVENT STORAGE TANKS	30	10	300		10.1/25	1.5	1.5	0.50
O-410	1030	Mill 1st FLOOR - NEXT TO ACID LEACH TANKS BTW SCRUBBY STEAM	30	10	300		10.1/25	1.7	1.9	0.63
O-411		Mill - UNDER SOLVENT - EXT. TANKS	30	10	300		10.1/25	1.7	1.9	0.63
O-412		Mill - AISLE AREA NEXT TO S-X TANKS	30	10	300		0.1/25	3.0 +1	0.46	0.15
O-413	120	mill - next to RIP Pumps.	30	10	300		0.1/25	2.6 +1	0.38	0.13
O-414	121	mill next to Rep Pump - Aisle Carpenter Shop	30	10	300		10.1/25	6.5	17	4.0
O-415	132	mill - aisle between S. makeup T. & RIP Pump	30	10	300		10.1/25	1.7	1.9	0.63
O-416	135	mill - aisle between S. Makeup T. & RIP Pump	30	10	300		10.1/25	1.5	1.5	0.50

Standard 41 sc. div. per 0.05 μg. Blank 0.8 sc. div.; Sensitivity @ .00124 microgram/sc. div.

41 = 05

CWS by E.R. Eberle
APPROVED
Chief, Analysis Branch

ID-130
(8 - 59)

U. S. ATOMIC ENERGY COMMISSION
IDAHO OPERATIONS OFFICE
HEALTH AND SAFETY DIVISION
SAMPLE RECORD

Serial No. 14.12

Sample from: Mine Development

Address: Edgemont S.D

Collected by: P. R. McKnight.

Date: 9/28/59

Analyzed by: HC

Date:

Sample No.	Hour	Sample Description	Sampling: Rate L/M	Sampling: Time Min.	Sampling: Total Liters	Anal. No.	Quantity Used, ml.	Fluor. Read., sc. div.	Uranium present: Total μμ curies	Uranium present: μc/ml x 10"
0-501	9.40	Sample Tower Operator Desk Main Floor GA	30	10			0.01/25	1.3	1.1	0.37
0-502	9.40	" Tail Pulley of Fine Ore GA	30	10			0.01/25	1.4	1.3	0.43
0-503	940	" Bottom #1 Bucket Sampler GA	30	10			0.01/25	12	24	8.0
0-504	955	" Bottom #1 Bucket Sampler GA	30	10			0.01/25	1.5	1.5	0.50
0-505	955	" Bottom #2 Bucket Sampler GA	30	10			0.01/25	1.9	2.3	0.77
0-506	955	" Vezin Cutter Final GA	30	10			0.01/25	2.9	4.4	1.5
0-507	1010	" Transfer Belt to Fine Ore GA	30	10			0.01/25	1.3	1.1	0.37
0-508	1010	" Bottom #2 Bucket Sampler GA	30	10			0.01/25	1.3	1.1	0.37
0-509	1010	" Bottom Level of Tower South GA	30	10			0.01/25	1.3	1.1	0.37
0-510	1030	Base Fine Ore Bin #B Tail Pulley GA	30	10			0.1/25	3.0 +0	0.55	0.18
0-511	11	" Discharge to Rod Conveyor GA	30	10			0.1/25	2.1 +0	0.27	0.09
0-512		" Feed Conveyor to Rod Mill GA	30	10			0.1/25	3.4 +0	0.57	0.19
0-513	1045	" Bin A Feed to Rod Mill Conveyor GA	30	10			0.1/25	4.8 +0	0.84	0.28
0-514	1045	" Bin A & B Mixing Conveyor GA	30	10			0.01/25	1.4	1.3	0.43
0-515	1047	" Bin A Tail Pulley. GA	30	10			0.01/25	1.3	1.1	0.37
0-516	1055	Fine Ore Bin Conveyor to Rod Mill GA	30	10			0.1/25	4.9 +0	0.87	0.29

Standard: 4/1 sc. div. per 0.05 μg. Blank: 0.8 sc. div.; Sensitivity 0.0012 μgram/sc. div. (weight meter)

CWS by A. Eberhole Chief, Analysis Branch
APPROVED

ID-130
(8 - 59)

U. S. ATOMIC ENERGY COMMISSION
IDAHO OPERATIONS OFFICE
HEALTH AND SAFETY DIVISION
SAMPLE RECORD

Serial No. 14998

Sample from: Mines Development
Address Edgemont S. Dak

Collected by: CWH
Date: 9/28
Analyzed by: TC
Date:

all C.T. Lamp

Sample No.	Hour	Sample Description	Sampling Rate L/M	Sampling Time Min.	Sampling Total Liters	Anal. No.	Quantity Used, ml.	Fluor. Read., sc. div.	Uranium present Total μμ curies	Uranium present μc/ml x 10"
0-301	0940	Third deck "A" Sample Plant	28	20	560		0.01/25	1.6	1.7	0.30
[redacted]2	0941	Third deck "A" Sample Plant	30	20	600		0.01/25	1.7	1.9	0.32
-303	0948	Second deck - - - Near Center	20	20	400		0.01/25	3.2	5.1	1.3
-304	1004	Second deck - - - First Crush	20	20	600		0.01/25	1.4	1.3	0.22
-305	1007	Second deck - - - Control Box	30	20	600		0.01/25	1.7	1.9	0.32
-306	1010	Second deck - - - Final Crush	30	20	600		0.01/25	2.0	2.5	0.42
-307	1040	Truck Shop Bench	30	20	600		0.01/25	1.5	1.5	0.25
-308	1041	Truck shop Bat Ch. Bench	25	20	500		0.01/25	1.3	1.1	0.22
-309	1048	Electrician Shop	30	20	600		0.01/25	1.7	1.9	0.32
[redacted]	1	Control					0.1/25	1.7	0.19	—
-311	1113	Mill Shop S. Center	25	20	500		0.01/25	1.3	1.1	0.22
-312	1115	Mill Shop N Bench	30	20	600		0.01/25	2.2	3.0	0.50
-313	1118	Mill Shop N. E. Bench	30	20	600		0.01/25	1.3	1.1	0.18
314	1320	Stor Room - East Wall	30	20	600		0.1/25	2.1	0.27	0.04
315	1320	Stor Room Ofc	25	20	500		0.1/25	1.7	0.19	0.04
316	1320	Stor Room West wall	30	20	600		0.1/25	2.1	0.27	0.04

Standard 41 sc. div. per 0.05 μg. Blank 0.8 sc. div.; Sensitivity 0.00124 microgram/sc. div.

CWS by E R Oberholtzer Chief, Analysis Branch
APPROVED

ID-130
(8 - 59)

U. S. ATOMIC ENERGY COMMISSION
IDAHO OPERATIONS OFFICE
HEALTH AND SAFETY DIVISION
SAMPLE RECORD

Serial No. 14011

Sample from: Mines Development Co
Address: Edgemont, S. Dak.
Collected by: OWH
Date: 9/28
Analyzed by: TC & RC
Date:

Sample No.	Hour	Sample Description	Sampling Rate L/M	Sampling Time Min.	Sampling Total Liters	Anal. No.	Quantity Used, ml.	Fluor. Read., sc. div.	Uranium present Total μμ curies	Uranium present μc/ml x 10⁻⁹
O- 317	1353	Washroom -	25	20	500		0.1/25	2.8	0.42	0.08
[redacted]318	1353	Change room East side	30	20	600		0.1/25	3.4	0.55	0.09
319	1353	Change room West side	30	20	600		0.1/25	3.8	0.63	0.10
320	1420	Boiler Room near Mill Door	25	20	500		0.1/25	1.1	0.06	0.01
321	1420	Boiler Room near Water Softener	30	20	600		0.1/25	0.9	0.02	<0.01
322	1455	Sand Slime Class. Between #4 & #5	30	20	600		0.01/25	1.5	1.5	0.25
323	1455	" " " " #2 & #3	30	20	600		0.01/25	1.8	2.1	0.35
324	1455	" " " South End of #1	25	20	500		0.01/25	2.6	3.8	0.76
325	1522	" " " By Swico Screen	30	20	600		0.01/25	1.6	1.7	0.28
[redacted]326	1522	" " " Control Panel	30	20	600		0.01/25	1.4	1.3	0.22
327	1522	" " " NE Corner near #1	25	20	500		0.01/25	1.9	2.3	0.46
328		Control					0.01/25	0.9	0.21	—
329	1555	from Acid Leach Tanks near Hallway	30	20	600		0.01/25	2.5	3.6	0.60
330	1555	Over Acid Leach Tanks Walk (center)	30	20	600		0.01/25	2.4	3.4	0.57
331	1555	Over last Leach Tanks Control	25	20	100		0.01/25	3.1	2.7	0.54

Standard 41 sc. div. per 0.05 mg. Blank 0.8 sc. div. Sensitivity 0.00124 milligram, sc. div.

CWSky E.R. Eberside
APPROVED
Chief, Analysis Branch

ID-130
(8 - 59)

U. S. ATOMIC ENERGY COMMISSION
IDAHO OPERATIONS OFFICE
HEALTH AND SAFETY DIVISION
SAMPLE RECORD

Serial No. 14907

Sample from: Mines Development

Address: Edgemont S.D.

Collected by: P. R. McKnight

Date: 9/28/59

Analyzed by: HC

Date:

Sample No.	Hour	Sample Description	Sampling: Rate L/M	Sampling: Time Min.	Sampling: Total Liters	Anal. No.	Quantity Used, ml.	Fluor. Read., sc. div.	Uranium present: Total μμ curies	Uranium present: μc/ml x 10"
0-533	0153	Ground Floor Mixer Settler Extrac. Tanks GA	30	10			0.1/25	6.5	1.2	0.40
0-534	0156	Ground Floor Center Area Mixer Settler Extractors & Stripping Settlers. GA	30	10			0.1/25	5.2	0.93	0.31
0-535	0216	Sample Bucking Room During Splitting GA	30	10			0.1/25	4.3	0.74	0.25
0-536	0216	" " " Operators Desk GA	30	10			0.1/25	3.9	0.65	0.22
* 0-537	0816	Sample Bucking Operator & Fore. Emptying Y-Blender Splitter BZ	30	06			0.01/25	5.8	11	6.1
* 0-538	0220	" " " " BZ	30	05			0.01/25	31	62	41
0539	0235	Same as #0-536 GA	30	10			0.01/25	1.9	2.3	0.77
0-540	0237	Same as 0-535 GA	30	10			0.01/25	3.2	5.1	1.7
* 0-541	0240	Sample Bucking Oper. McCool Grinder Filling BZ	30	06			0.01/25	16	32	18
* [redacted]	0245	Sample Bucking Operator & Hank Emptying Y Blender Splitting Sample BZ	30	05			0.01/25	22	45	30
0-543	0310	Shift Foremans Desk 3rd level Office GA	30	10			0.1/25	2.8	0.42	0.14
0-544	0310	Mill Control Laboratory 3rd level GA	30	10			0.1/25	8.7	1.7	0.57
0-545	0312	Switch Panel over Mixer Tanks 3rd level GA	30	10			0.01/25	2.0	2.5	0.83
0-546	0322	3rd level Hot Water Makeup GA	30	10			0.01/25	2.3	3.2	1.1
0-547	0322	Catwalk over classifiers 3rd level GA	30	10			0.01/25	1.8	2.1	0.70
0-548	0325	Head of Stair 3rd level GA	30	10			0.01/25	2.3	3.2	1.1

Standard: 41 sc. div. per 0.05 μg. Blank 0.8 sc. div. Sensitivity 0.00124 microgram/sc. div.

* Respirator Worn by Operator xtra dry sample in drying oven over weekend.

CWS by [redacted]
Chief, Analysis Branch

APPROVED

ID-130
(8 - 59)

U. S. ATOMIC ENERGY COMMISSION
IDAHO OPERATIONS OFFICE
HEALTH AND SAFETY DIVISION
SAMPLE RECORD

Serial No. 1494

Sample from: Mines Development
Address: Edgemont S. D.
Collected by: P. R. McKnight
Date: 9/28/59
Analyzed by: [illegible]
Date:

Sample No.	Hour	Sample Description		Sampling: Rate L/M	Sampling: Time Min.	Sampling: Total Liters	Anal. No.	Quantity Used, ml.	Fluor. Read., sc. div.	Uranium present: Total μμ curies	Uranium present: μc/ml x 10"
0-517	1102	Fine Ore Conveyor Discharge to Rod Mill	GA	30	10			0.01/25	2.1	2.7	0.90
[redacted]518	1102	Rod Mill Operators Desk & Lunch Area	GA	30	10			0.01/25	1.4	1.3	0.43
0-519	1110	Below Catwalk to Rod Mill from Bins	GA	30	10			0.1/25	1.8+	0.21	0.06
0-520	1115	Rod Mill Discharge Platform Tails	GA	30	10			.01/25	1.8	2.1	0.70
0-521	1120	" " " Head	GA	30	10			.01/25	1.4	1.3	0.43
0-522	0109	Sump Pump Head Tanks Ground level	GA	30	10			.01/25	1.6	1.7	0.57
0-523	0109	Iron Reagent Feeder Platform " "	GA	30	10			.01/25	1.4	1.3	0.43
0-524	0109	Base Cyclone Separator "	GA	30	10			.01/25	1.4	1.3	0.43
0-525	0119	Classifier Under flow sumps.	GA	30	10			.01/25	1.5	1.5	0.50
[redacted]526	0121	Base Leaching Tank #1	GA	30	10			.01/25	1.8	2.1	0.70
0-527	0122	Base Leaching Tank #2	GA	30	10			.01/25	1.5	1.5	0.50
0-528	0130	Small Reagent Mixer-Tanks	GA	30	10			.01/25	3.1	4.9	1.6
0-529	0132	Acid Storage Tank Floor Level	GA	30	10			.01/25	1.8	2.1	0.70
0-530	0136	Vacuum Pump Area.	GA	30	15			.01/25	1.8	2.1	0.47
0-531	0143	Ground Floor Center Precip Tanks	GA	30	10			.01/25	2.0	2.5	0.83
0-532	0147	Ground Floor Mixer Settler Extractor	GA	30	10			0.1/25	2.6	0.38	0.13

Standard 41 sc. div. per 0.05 mg. Blank 0.8 sc. div. Sensitivity 0.0024 mg/sc. div.

CWS by E R Bennett
Chief, Analysis Branch
APPROVED

ID-130
(8 - 59)

U. S. ATOMIC ENERGY COMMISSION
IDAHO OPERATIONS OFFICE
HEALTH AND SAFETY DIVISION
SAMPLE RECORD

Serial No. 1113

Sample from: MINES DEVELOPMENT

Address EDGEMONT, S.D.

Collected by: J. ALLAN

Date: 9-28-59

Analyzed by: C [illegible]

Date:

Sample No.	Hour	Sample Description	Sampling: Rate L/M	Sampling: Time Min.	Sampling: Total Liters	Anal. No.	Quantity Used, ml.	Fluor. Read., sc. div.	Uranium present: Total μμ curies	Uranium present: μc/ml x 10"
2-433	434	RIP FEED PUMPS - FIRST END	30	10	300	1-A	0.01/25	1.4	1.3	0.43
[redacted]34	438	RIP FEED PUMPS - CENTER	30	10	300	2-A	0.01/25	1.3	1.1	0.37
435	825	NO RESPIRATOR YELLOW CAKE PKG AREA - 6A. - WHILE FILLING DRUMS	17.5	20	350	3-A	0.01/25	1.3	1.1	0.31
436	[illegible]	NO RESPIRATOR YELLOW CAKE PKG AREA - 6A - WHILE FILLING DRUMS	17.5	20	350	4A	0.01/25	1.3	1.1	0.31
437	[illegible]	NO RESPIRATOR YELLOW CAKE PKG AREA 6A. OPERATOR WASHING DRUM STEAM DRIER OVERLOAD	17.5	20	350	5A	0.01/25	20	41	12
438	[illegible]	NO RESPIRATOR YELLOW CAKE PKG AREA - 6A. - OPERATOR WASHING DRUM STEAM DRIER OVERLOADED	17.5	20	350	6A	0.01/25	21	43	12
439		CONTROL PAPER	—	—	—	7A	0.01/25	0.8	<0.2	—
440	913 [illegible]	YELLOW CAKE PKG AREA - 6A - IN DRUM STORAGE AREA	17.5	20	350	9A	0.01/25	1.7	1.9	0.54
441		YELLOW CAKE PKG AREA - B2 CHANGING DRUMS B-2	17.5	20	350	9A	0.01/25	49	102	29
[redacted]42		YELLOW CAKE AREA - B-2 - CHANGING DRUMS B-2	17.5	20	350	10A	0.01/25	55	114	33
443		YELLOW CAKE AREA - B2 - CHANGE DRUMS START FILL B-2	17.5	20	357	11A	0.01/25	50	104	30
444						7 Oct 59				
445										
446										
447										
448										

Standard 41 sc. div. per 0.05 μg. Blank 0.5 sc. div.; Sensitivity 0.00124 microgram/sc. div.

CWS by [illegible]

Chief, Analysis Branch

APPROVED

ID-130
(8 - 59)

U. S. ATOMIC ENERGY COMMISSION
IDAHO OPERATIONS OFFICE
HEALTH AND SAFETY DIVISION
SAMPLE RECORD

Serial No. 14010

Sample from: Mines Development Inc

Address: Edgemont, S. Dak

Collected by: SWD

Date: 9/29

Analyzed by: TC ✓ [illegible]

Date:

Sample No.	Hour	Sample Description	Sampling: Rate L/M	Time Min.	Total Liters	Anal. No.	Quantity Used, ml.	Fluor. Read., sc. div.	Uranium present: Total μμ curies	μc/ml x 10"
0-348	1445	BZ - Emptying ore car	30	15	450	606	0.01/25	3.3	5.3	1.2
[redacted]										
[redacted]										

Standard 41 sc. div. per 0.05 μg; Blank 0.8 sc. div.; Sensitivity 0.00124 microgram/sc. div.

CWS by [signature]
APPROVED
Chief, Analysis Branch

ID-130
(8 - 59)

U. S. ATOMIC ENERGY COMMISSION
IDAHO OPERATIONS OFFICE
HEALTH AND SAFETY DIVISION
SAMPLE RECORD

Serial No.

Sample from: Mines Developement

Address: Edgemont, S. D.

Collected by: P. R. McKnight

Date: 9/09/59

Analyzed by: JC RH

Date:

Sample No.	Hour	Sample Description		Sampling Rate L/M	Sampling Time Min.	Sampling Total Liters	Anal. No.	Quantity Used, ml.	Fluor. Read., sc. div.	Uranium present Total µµ curies	Uranium present µc/ml x 10"
0-557	0824	Scale Room	Ore Rec. Bldg. GA	30	10		38A	0.1/25	3.3	0.53	0.18
[redacted]	0830	Crushing & Drying Room	" GA	30	10		39A	0.01/25	3.0	4.6	1.5
559	0842	Grinding Room	" GA	30	10		40A	0.01/25	3.7	6.1	2.0
560	0842	Office & Lunch Area	" GA	30	10		41A	0.1/25	5.5	0.99	0.33
* 561	0846	Sample Bucking Operator Loading Y Blender	Ore Rec. Bldg. BZ [redacted]	30	02		42A	0.1/25	5.7	1.0	1.7
562	0854	Washroom adjac. to Office	Ore Rec Bldg. GA	30	12		43A	0.01/25	1.3	1.1	0.31
563	0855	Lock Room	Ore Rec. Bldg. GA	30	12		44A	0.1/25	0.8	<0.04	<0.01
* 564	0900	Bucking Operator Fill & Empty Y Blender	BZ	30	06		4KA	0.1/25	1.4	1.3	0.72
* 565	0902	Bucking Operator Hand Splitting Sample	BZ	30	03		46A	0.01/25	2.3	47	52
[redacted]	0912	Grinding Room	Ore Rec. Bldg. GA	30	12		47A	0.01/25	1.9	2.1	0.58
* 567	0913	Bucking Oper. Unloading	Brown Pulverizer BZ	30	06		48A	0.1/25	0.8	0.84	0.47
* 568	0916	"	Unloading Y Blender BZ	30	04		49A	0.1/25	5.8	1.1	0.92
569	0926	Crushing & Drying Room	Top of Ovens GA	30	12		50A	0.1/25	2.2	0.39	0.11
570	0930	Office & Lunch Room	Ore Rec Bldg. GA	30	10		51A	0.1/25	5.2	1.0	0.33
* 571	0942	Loading Y Blender after Pulverizing	BZ	30	03		52A	0.1/25	3.1	0.58	0.64
* 0-572	0958	Hand Splitting Sample for Pulverizer	BZ	30	05		53A	0.01/25	18	36	24

* Operator wore respirator - during each operation.

Standard 40 sc. div. per 0.05 µg; Blank 0.4 sc. div.; Sensitivity 0.0012 microgram/sc. div.

CWSley for E. H. Eberlein
Chief, Analysis Branch
APPROVED

ID-130
(8 - 59)

U. S. ATOMIC ENERGY COMMISSION
IDAHO OPERATIONS OFFICE
HEALTH AND SAFETY DIVISION
SAMPLE RECORD

Serial No. 14915

Sample from: Mines Development Co
Address: Edgemont S.D.
Collected by:
Date: 9/29
Analyzed by: [illegible]
Date:

Sample No.	Hour	Sample Description	Sampling: Rate L/M	Sampling: Time Min.	Sampling: Total Liters	Anal. No.	Quantity Used, ml.	Fluor. Read., sc. div.	Uranium present: Total μμ curies	Uranium present: μc/ml x 10"
0-332	0820	Volumetric Lab East Bench	30	20	600		0.1/25	1.0	0.11	0.02
[redacted]3	0820	" " West Bench	25	20	500		0.1/25	1.3	0 11	0.02
-334	[illegible]20	Met Lab East Bench	30	20	600		0.1/25	1.6	0.17	0.03
335	0835	Lab Stock Room	30	20	600		0.1/25	1.6	0.17	0.03
336	08[illegible]3	Met Lab West Bench	30	20	600		0.1/25	1.2	1.1	0.18
337	0845	Concentrate Balance Room	30	20	600		0.1/25	5.7	0 95	0.16
338	0847	Fluoro Control Room	21	20	500		0.1/25	1.2	0.08	0.02
339	0815	Lab Change Room	30	20	600		0.1/25	1.1	0.06	0.01
340	0913	Lab Hallway Bldg Office	30	20			0.1/25	0.8	<0.01	<0.01
[redacted]1		Control					0.1/25	0.8	<0.01	——
342	1021	Car Shed (unloading ore) ES	30	18			0.1/25	4.6	0.80	0.15
343	1021	Car Shed " " EN	25	18			0.1/25	1.1	0 06	0.01
344	1025	Car Shed " " WN	30	18			0.1/25	1.2	0.08	0.01
341	1200	Engineering Office	30	10			0.1/25	1.7	0.19	0.06
346	1200	South Entrance Hall - Office	25	10			0.1/25	1.2	0 09	0.03
347	1200	Office Next to Registration	30	10			0.1/25	1.1	0 02	<0.01

Standard 41 sc. div. per 0.05 μg; Blank 0.8 sc. div.; Sensitivity 0.012 microgram/sc. div.

Chief, Analysis Branch

APPROVED

ID-130
(8 - 59)

U. S. ATOMIC ENERGY COMMISSION
IDAHO OPERATIONS OFFICE
HEALTH AND SAFETY DIVISION
SAMPLE RECORD

Serial No. -

Sample from: Mines Development
Address: Edgemont S. D.
Collected by: P. R. McKnight
Date: 9/29/69
Analyzed by: TC NB DS
Date:

Sample No.	Hour	Sample Description	Sampling: Rate L/M	Sampling: Time Min.	Sampling: Total Liters	Anal. No.	Quantity Used, ml.	Fluor. Read., sc. div.	Uranium present: Total μμ curies	Uranium present: μc/ml x 10"
0-573	1020	Rail Unloading Facility Truck loading Conveyor Tail Pulley at	GA	30	10	300	28a	0.1/25	3.1	0.49	0.1
[redacted]574	1020	" " Tunnel Floor	GA	30	10	300	29a	0.1/25	3.4	0.76	0.2
575	1035	" " Tunnel exit	GA	30	10	300	30a	0.1/25	4.6	0.80	0.2
576	1094	" " 2nd Level Pan Feeder Apron	GA	30	10	300	31A	0.01/25	2.0	2.5	0.8
577	1033	" " 2nd Level Rear Feeder	GA	30	10	300	32A	0.1/25	1.4	1.3	0.4
578	1032	" " Discharge Apron feeder	GA	30	10	300	33A	0.1/25	5.9	1.1	0.3
579	1044	" " 2nd Level Ladder Hoisting	GA	30	10	300	34A	0.1/25	3.0	0.46	0.1
580	1045	" " Conveyor Tunnel Midway	GA	30	10	300	35A	0.1/25	3.1	0.44	0.1
581	1116	" " Conveyor Tunnel Lower	GA	30	10	300	36A	0.1/25	1.1	0.06	0.0
[redacted]582	1116	" " " " Upper	GA	30	10	300	37A	0.1/25	1.6	0.17	0.0
							Wtg				

Standard 41 sc. div. per 0.05 μg. Blank 0.8 sc. div. Sensitivity 0.00124 microgram/sc. div.

CWS by E M Edmonds Chief, Analysis Branch
APPROVED