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ORNL 353
SERIES A:

AEC RESEARCH AND DEVELOPMENT REPORT

OPERATIONS DIVISION

MONTHLY REPORT

FOR

MONTH ENDING APRIL 30, 1949

BY

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[redacted]

OAK RIDGE NATIONAL LABORATORY

OPERATED BY
CARBIDE AND CARBON CHEMICALS CORPORATION
FOR THE
ATOMIC ENERGY COMMISSION
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OPERATIONS DIVISION

MONTHLY REPORT

for

Month Ending April 30, 1949

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DATE ISSUED

MAY 20 1949

O A K R I D G E N A T I O N A L L A B O R A T O R Y

operated by
Carbide and Carbon Chemicals Corporation
for the
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SUMMARY

1. Lost pile operating time averaged 9.3% as compared to 7.3 for the previous month. (Page 4.)
2. The glass wool filters in the #4 cell of the exhaust air filter house were changed. Small quantities of radioactive particles were measured on both the glass wool and paper filters. (Page 6.)
3. Antimony-beryllium sources are being prepared for distribution on the Radioisotope Program. (Page 7.)
4. Radioisotope production continued normally with no serious difficulties. (Pages 8 to 12.)
5. The Tank Farm chemical waste evaporator is about 90% completed. Equipment testing has been started. The concentration of waste solutions will probably start about the middle of May, 1949. (Page 14.)
6. RaLa Run #32 using 76 Hanford slugs was completed and shipped on April 22, 1949. About 3,800 curies, isolated as the nitrate, were produced with a chemical yield of 63.4%. Los Alamos measured the product at 4,400 curies and stated that the quality appeared excellent. (Pages 15 to 17.)
7. The new concrete cell ventilation duct which replaces the old duct under the A and B Cells was completed this month. (Page 15.)
8. A total of 461 radioisotope shipments were made during April, a decrease of 10% from March. Since August, 1946, the start of the Distribution Program, 7,524 shipments have been made. (Page 18.)
9. C^{14} labeled organic compounds prepared at Los Alamos, Berkeley, and Oak Ridge are being distributed on the Radioisotope Program. (Page 18).
10. Construction work on the Radioisotope Production Area continues. The 75% completion stage was reached by the end of the month. (Page 20.)

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A. PILE DEPARTMENT

I. Operating Data:

	APRIL 1949	MARCH 1949	YEAR-TO-DATE 1949
Total Accumulated KWH	2,532,586	2,686,447	10,347,490
Average KW/operating hour	3876.30	3893.40	3923.03
Average KW/24-hour day	3517.48	3610.82	3592.88
Percent Lost Time	9.3%	7.3%	8.4%
Approx. Excess Pile Reactivity	130-140 inhours	130-140 inhours	
Slugs Charged	73	236	1872
Slugs Discharged	63	236	1822
Product Made (grams)	92.43	98.04	350.64
Product Discharged (grams)	8.09	5.89	140.70

II. Pile Operation:

The pile-down time averaged 9.3% for the month as compared to 8.4% for the year-to-date. This slight increase was due largely to the replacement of the glass wool filters in the air exhaust system.

A ruptured slug was found in Channel 2276 during visual scanning on April 4, 1949, and was discharged without any difficulty. It had been in the pile for 1,647 days at an approximate temperature of 190°C. Neither the gummed tape instrument nor the probe had given any appreciable indication of the presence of a ruptured slug.

The gaseous fission product decay instrument was not in operating condition at the time of the rupture and, therefore, could not be evaluated. While some work has been done in an attempt to determine its sensitivity as a scanning device, it is not expected that it can be evaluated properly until it has been used on several ruptures.

The aluminum tube failed in Hole 12 water system on April 10, 1949, permitting water to fill the sample irradiation space of that hole. The tube was removed on April 25, 1949, and it is expected to be replaced with a new unit near the end of the coming month.

The removal of the water and water tube from Hole 12 gave a 40-50-inhour increase in the pile reactivity. However, a recent calibration of the regulating rods has shown that the old calibration was approximately forty inhours too high when excess pile reactivity was in the current pile reactivity range. Use of the new calibrations was started at the end of this month resulting in the excess pile reactivity remaining at 130-140 inhours.

Essentially all of the excess pile reactivity will be consumed during the coming month by insertion of a new water tube in Hole 12 and the installation of the fuel assembly evaluation experiment in Hole 11 by Argonne National Laboratory. This means that installation of any other experiment or material requiring an appreciable number of inhours will be contingent on removal of some of the material or experimental equipment from the pile or the charging of additional uranium.

III. Filter House:

The pressure losses encountered in the Filter House at date of initial use and until the end of the month are as follows:

	F.G. #50 GLASS WOOL FILTERS		C.W.S. #6 PAPER		ACROSS HOUSE	
Date	Inches w.g.	% Increase	Inches w.g.	% Increase	Inches w.g.	%Increase
11-15-48	1.1	-	1.0	-	3.3	-
11-30-48	1.5	36	1.1	10	3.8	15
12-15-48	2.4	60	1.2	9	4.7	24
12-31-48	3.4	41	1.3	8	5.8	23
1-15-49	4.2	19	1.3	6	6.8	17
1-31-49	4.8	12	1.3	0	7.2	6
2-15-48	5.2	8	1.3	0	7.4	3
2-28-49	5.4	4	1.4	7	7.7	4
3-15-49	5.4	0	1.4	0	7.8	1
3-31-49	5.4	0	1.4	0	7.8	0
4-15-49	4.7	-13	1.5	7	7.2	-8
4-30-49	3.2	-32	1.7	13	6.1	-13
OVERALL INCREASE	2.1	191	0.7	70	2.8	85

Pressure losses reflect the two partial changes of filter medium made during the month.

A water leak of about seventy gallons of water per hour from the canal in the Filter House into No. 3 A.A.F. cell was detected on April 2, 1949. The leak was due to a spot of concrete about four inches wide and approximately one foot long that appeared to be very inadequately banded with cement.

Fifteen A.A.F. pockets (glass wool) were removed on April 4, 1949, in order to repair the concrete and replaced with fifteen pockets loaded with a layer of F.G. #25 backed up with a layer of F. G. #50.

All the A.A.F. filters in No. 4 cell were removed on April 25, 1949, and replaced with pockets loaded with a layer of F.G. #25 backed up with a layer of F.G. #50 instead of the previous loading of two layers of F.G. #50. One frame containing five C.W.S. #6 units (paper) was also removed from No. 4 cell at the same time in order to determine the amount of radioactivity collected in the cells since November 15, 1948.

Preliminary data indicate that all A.A.F. cells have approximately one hundred and fifty millicuries of beta activity and sixty millicuries of gamma activity. Initial results indicate one hundred and ten millicuries of beta and gamma activity caught on all C.W.S. #6 paper.

The gummed tape instrument was placed between the glass wool filters and the C.W.S. #6 paper filters. It has been operated for several days and it also indicates that some radioactive particulate matter is passing through the glass wool filters, which apparently is retained on the paper filters.

IV. Fan Operation:

The fans operated normally throughout the entire month.

V. Radioisotopes:

The following table is a comparison of the radioisotope and research samples charged into the pile during April, 1949, with those handled in March, 1949:

	MARCH, 1949		APRIL, 1949	
	Research	Radioisotopes	Research	Radioisotopes
Stringers 13, 14, and 16	12	81	9	125
Hole 22 (Pneumatic Tube)	57	5	57	3
All Other Holes	6	8	4	13
TOTAL BY GROUPS	75	94	70	141
TOTAL FOR MONTH	169		211	

At the end of April, 1949, there were 371 cans of target material in Stringers 13, 14, and 16, compared to 336 cans of target material in these stringers at the end of March, 1949.

VI. Experimental Work:

The neutron flux from one of the antimony-beryllium sources fabricated for distribution in the Radioisotope Program was measured by activating and counting indium foils. The flux through one inch of paraffin was 4.26×10^4 neutrons/cm^2/second after a 69-day activation in the pile at 75% of maximum flux and a subsequent 16-day cooling period to reduce the 2.8-day Sb^{122} activity. This value agrees very well with a calculated value of 4.4×10^4 neutrons/cm^2/second. The total flux from the source was 7.8×10^6 neutrons/second. The sources consist of 32-gram solid cylinders of antimony contained in a cup of beryllium having a wall thickness of 3/16". The whole assembly is clad in aluminum.

Measurements of the gamma intensity and shielding requirements were also made. The eleven-inch diameter portable spherical lead

shield already built is completely adequate with minor improvements to be made in the plug arrangement. Five additional shields are being built.

B. CHEMICAL SEPARATIONS AND ISOTOPE DEVELOPMENT DEPARTMENTS

I. Radioisotopes:

1. Iodine (I^{131} - 8d)

Eighteen uranium slugs were processed and approximately 8,570 mc shipped. All products were within specifications.

Pile Hole #1869 (92% flux) was made available on April 18, 1949, for I^{131} production. The previous flux for I^{131} production was 77%. This increase in flux has increased the I^{131} yield from the uranium about 14%. At present rate of shipment, three uranium slugs per week from the 92% flux hole should be sufficient.

2. Phosphorus (P^{32} - 14.3d)

Ten, 2000-gram cans of irradiated sulfur were processed and 6,016 millicuries shipped. All products were with specifications.

The equipment shielding on all but one point of relatively high radiation has been increased this month. Radiation from these sources has been cut by a factor of about 2.

Phosphorus Development Work

Design work on new P^{32} separation equipment for the Isotope Area is approximately 20% complete.

A new evaporator has been designed, employing a one-liter container lined with 0.003" of gold. Large P^{32} absorption losses now experienced on the glass surface are expected to be reduced with this new evaporator.

Experimental work was continued on the preparation of leak-free, Clinton-type slugs containing sulfur for fast neutron irradiation. It is expected that several of these will be ready for insertion into the pile during the coming month.

3. Carbon (C^{14} - 5100y) - from $Ca(NO_3)_2$

No runs were made, there being a sufficient supply on hand.

C^{14} Development Work - Be_3N_2 Process

The first run was made using sodium hydroxide instead of barium hydroxide for scrubbing out $C^{14}O_2$. These two scrubbers, one before and one after the copper oxide furnace, were backed up by a standard barium hydroxide scrubber. Complete removal of $C^{14}O_2$ was obtained in the sodium hydroxide scrubbers, but later precipitation of the $BaC^{14}O_3$ was incomplete because of the high OH^- ion concentration. It will be necessary to reduce the OH^- ion concentration by addition of NH_4Cl in order to obtain a high $BaC^{14}O_3$ yield.

Further studies were made on the recovery of beryllium from the waste solution. The concentration of H_2SO_4 is increased in the waste solution to approximately 30%, resulting in the precipitation of anhydrous $BeSO_4$. The $BeSO_4$ is contaminated with

NH_4SO_4, but it is probable that further clean-up of the recovered beryllium will be relatively easy.

Work was done in cooperation with the Instrument Department on the calibration of gas chambers, both for assaying C^{14} samples and monitoring the air around C^{14} operations.

4. Sulfur (S^{35} - 87d)

A routine separation of sulfur as $SO_4^=$ was made from Hanford KCl. The product was not assayed, but stored for use, since a large amount of S^{35} is on hand. The separation was made to obtain a supply of K^{40} and Cl^{36}.

5. Fission Products

Run #ss-12 was in progress at the end of the month. This run is routine with the exception that 40" of Dowex 50, 100-120 mesh resin, is being used instead of IR-1 resin in the finishing column. Special emphasis is being placed on comparison of the running times and purity of fractions obtained with the two types of resin.

a. Zr-Cb (Zr^{95}-65d, Cb^{95}-35d)

No further Zr-Cb purifications were made there being an adequate supply on hand. Approximately 30 mc of pure Cb^{95} were produced and shipped.

b. Yttrium (Y^{91}-57d)

About 500 mc are in process. This material was highly contaminated with Fe, Cr, and Ni. The iron was removed by TTA extraction and the Ni and Cr by electrolytic deposition.

c. Rare Earths (Nd^{147}-11d, 61^{147}-3.7y, Pr^{143}-14d)

One order was received for Pr; the stock solution has been depleted by decay so it will be necessary to obtain this material from ss-12, now in progress.

d. Cerium ($Ce^{141-144}$-28d, 280d)

Approximately 200 mc of purified Ce^{144} (old stock) were produced. Two curies of $Ce^{141-144}$ are being purified, final samples are in for analysis.

6. Ruthenium (Ru^{106}-1y)

Two final concentrations were made this month to yield about 450 mc.

No more runs will be made until the present stockpile of Ru^{106} is gone. It is felt that the present equipment is not adequately shielded for safe routine production and that the condition cannot be corrected until the processing equipment is redesigned and moved into the new Radioisotope Area.

Ruthenium Development Work

Satisfactory techniques have now been developed, both for plating out radioactive ruthenium metal and covering these surfaces with a thin layer of gold.

7. Calcium (Ca^{45} - 180d)

Twenty-five microcuries of Ca^{45} is now in the final purification stage.

8. Strontium (Sr^{89-90}-55d, 30y)

New equipment is being fabricated for complete remote control work on strontium. The ten-curie batch now in process will be held up until this equipment is ready.

9. Iron (Fe^{55-59}-4y, 44d)

None processed. There is a supply on hand.

10. Potassium (K^{40} - $4x10^{8}y$)

Ten grams of KCl enriched in K^{40} by Hanford irradiation were sent to Y-12 for further enrichment of the K^{40}.

11. Chlorine (Cl^{36} - $10^{6}y$)

Separated Cl^{36} of the highest specific activity yet obtained was made from Hanford KCl. Analytical data are given below.

Total Cl^{36}---------342 microcuries
Concentration------3.61 microcuries/ml
Specific Activity--380 microcuries Cl^{36}/gram Cl
Total Chloride-----9.46 mg/ml
Total Solids-------0.00 mg/ml.

12. Miscellaneous

Fifty-two special Co needles were prepared for irradiation.

Seven cans of irradiated gold were opened for a customer.

University of California cans of miscellaneous target compounds which had been irradiated at Hanford are being opened and shipped to a customer as a special service.

About 30 mc of Ce^{144} were evaporated onto a special source holder furnished by a customer.

II. Tank Farm and Burial Ground:

1. Wastes Discharged to White Oak Creek

a. Approximately 145.96 curies of beta activity were discharged from the Settling Basin this month. This was an average of 4.87 curies per day.

b. Flow manometers were put into operation on the new diversion box to the Settling Basin on April 21, 1949. Prior to this date, an assumed flow rate of 380,000

b. gallons per day was used; this figure was based on the average flow of the old diversion box for its last two weeks of operation.

c. During the months of January and March, 266 curies of beta activity were discharged to the East Pond from W-6. After settling for a period of more than a month, it was found by analysis that only an eighth of the activity remained in the supernate. In order to made room in W-6 tank for the concentrate from the new evaporator, the East Pond supernate was pumped into the Settling Basin in order that W-6 may be emptied to the East Pond.

d. About twenty-five tons of lead from the Burial Ground were decontaminated preparatory to being recast and reused in the new Isotope Area.

e. About 42,000 gallons of free space remains in the chemical waste system at the end of the month.

f. The following table shows the discharge of activity to the White Oak Creek:

Discharged From	Gallons	Curies
Settling Basin	12,403,000	145.96
Retention Pond	381,700	.17

2. Waste Tank Inventory

CHEMICAL WASTE

Tanks	Gallons Capacity	Gallons In	Gallons Out	Discharged To	Free Space
W-5,6	340,000	84,000	58,800	White Oak Creek	42,000
		METAL WASTE			
W-4,7,8, 9,10	713,000	7,760	0	- -	103,688.

[redacted]

3. Special Wastes

a. Three shipments of alpha contaminated material from Dayton.

b. Ten drums and two pots of uranium waste and eleven pots of chemical waste were received from Chicago.

c. A total of 1,580.08 kg of uranium was added to the metal storage system this month. Of this, the Hot Pilot Plant transferred 1,447.65 kg and RaLa 132.43 kg.

4. Maintenance and Construction

a. The diversion box project is complete with the exception of landscaping.

b. The construction of the evaporator is about 90% complete. The operating gallery is complete with the exception of the inside sheeting and painting. The process piping is complete, the service piping about 90% complete, and instrumentation about 50%. The tie-in between the evaporator and W-6 has been made. Preliminary tests have been made on the steam headers, evaporator coils, jets, and steam spargers and the few leaks found were repaired. The water condensers were also tested for leaks. Further tests are not feasible until the instrumentation is complete.

III. RaLa (Ba^{140} - 12.5d):

The new cell ventilation duct which replaced that section of the duct under Cells A and B was completed and placed in use during RaLa Run #32. The performance has been satisfactory and a higher vacuum resulted in the cells even when maintaining the former fan damper settings. Following the run, however, it was found that the Cell B entrance had a very high radiation level probably caused by the air sweep depositing hot particles in the previously "cold" corridor.

The new two-speed starter has been installed on the cell fan motor to replace the temporary shunt starting box which was made necessary by the changing of the 10 HP fan motor to 20 HP motor at the time of the filter house installation.

The emergency by-pass off-gas line connecting the A-4-205 system with the A-16 off-gas system previously reported as being collapsed was opened by use of steam pressure. Apparently an accumulation of ammonium nitrate had completely blocked passage through the line.

Los Alamos reported that Run #31 product contained some foreign material which interfered with their "milkings". However, the product content of the run was so great that even with the losses suffered in the milkings, the final yield was sufficient for their needs.

Run #32 was begun on April 17, 1949, with the charging of 76, four-inch, Hanford slugs to the dissolver. A slight decay of one day was encountered on the run start-up due to the delay of the railroad car.

No difficulties whatsoever were encountered in the operation of the run which followed normal procedure with but three exceptions. The exceptions were as follows:

1. A 5% HNO_3 wash was used following the first coating removal to wash the dissolver and the slugs of silica and copper bonding material.
2. A third metathesis was employed to guarantee complete conversion from the sulphate form to the carbonate form.
3. The amount of fuming nitric used for the acid purification step was increased by 20%.

Last Separation Time was reached at 5:00 p.m. on April 21, 1949. The product content was 3,800 curies as determined by a 15-hour skyshine. The product was shipped in the nitrate form and was the largest run produced to date. The shipment was dispatched to Los Alamos on April 22, 1949, at 11:00 a.m. Los Alamos reported the quality of run as being one of the finest ever produced. They measured it at 4,400 curies. The analytical summary of the run follows:

Slugs Loaded: 76, four-inch, Hanford slugs.
Slugs Dissolved: 75.7 " " " .

	CURIES	PERCENT
Total Curies Dissolved*	5,989	100.0
Cell A Losses	1,410	23.5
Cell B Losses	510	8.5
Losses Accounted For	1,920	32.0
Material Balance through B-6		94.8
Product Shipped (Skyshine)	3,800	63.4-
Material Balance through Skyshine		95.5
Losses Unaccounted For through Skyshine		4.5

* All curies corrected to L.S.T.

Two instances of high air count occurred during the run and steps are being taken to enclose the A-16 fan barricade evacuating the atmosphere through the present cell vent filters to the fan and stack. It is hoped that this improvement will completely remedy

the situation. No air counts of any significance were found to come from the sampling operations.

A special glassware rinse was taken and stored to allow the RaLa to decay. An investigational study to determine the long half-life radioactive contaminants is planned.

A partial plug occurred in the A-4 scrubber waste line to the chemical waste tank. As a result, a decreased flow of caustic was necessary through the scrubber to avoid back-up of hot liquids in the building hot drains. The line was unplugged following completion of the runs.

Run #33 is scheduled for shipment on May 27, 1949.

C. ISOTOPE CONTROL DEPARTMENT

I. General:

There were 461 isotope shipments during the month of April compared with 514 during March. The fewer working days in April than in March are largely responsible for this decrease.

The breakdown according to separated and unseparated material is as follows:

	MARCH 1949	APRIL 1949	TOTAL August, 1946, to April, 1949, Inc.
Separated Material 706-D Area	399	357	5,825
Unseparated Material 100 Area	115	104	1,699
	514	461	7,524

The breakdown according to non-project, project, and foreign shipments for March and April is as follows:

	March	April
Non-Project	392	354
Project	85	64
Foreign	37	43
	514	461.

II. C^{14} Labeled Compounds:

Labeled compounds containing C^{14} which were produced at Los Alamos and Berkeley are now being distributed by ORNL. At present these compounds include the following:

Sodium valerate-1-C 14	Radiation Laboratory, Berkeley		
Calcium glycolate-1-C 14	"	"	"
Alanine-1-C 14	"	"	"
Benzonic Acid-Carboxyl-C 14	"	"	"
Sodium propionate-2-C 14	"	"	"
Sodium heptanoate-1-C 14	"	"	"
Sodium butyrate-1-C 14	"	"	"
Sodium caproate-1-C 14	"	"	"
Glycine-1-C 14	"	"	"
Sodium propionate-3-C 14	"	"	"

II. C^{14} Labeled Compounds: - Continued

Calcium glycolate-2-C 14	Radiation Laboratory, Berkeley
Alanine-2-C 14	" " "
Nicotinic Acid-Carbonyl	Scientific Laboratory, Los Alamos
Nicotinamide-Carbonyl	" " "
Urea	" " "
Anthranilic Acid-Carbonyl	" " "
Pentobarbitol (nembutal)-2-C 14	" " "
Glycine-2-C 14	Radiation Laboratory, Berkeley
Sodium butyrate-Carbonyl	" " "
Sodium valerate-Carbonyl	" " "
Sodium caproate-Carbonyl	" " "
Sodium heptanoate-Carbonyl	" " "

In addition, C^{14} labeled formaldehyde is being produced by the Chemistry Division at ORNL and is being distributed. A number of other labeled compounds including formic acid, phenanthrene, and styrene are expected to be available soon.

Methanol C^{14} and Acetic Acid-1-C^{14} have been prepared in considerable quantities for use as intermediates in synthesizing other compounds but are not being distributed off the project because they are available from commercial institutions.

III. Activation Analyses:

The Chemistry Division has had for some time a small program on activation analyses and at least one sample has been submitted by a commercial organization for analysis by this method. This was a sample of aluminum from the Reynolds Metal Company for analysis of sodium. In order to determine what other work of this type may be expected, the Isotopes Division of the AEC will send out inquiries to various commercial organizations which have expressed interest in this service in the past and the requestors will be asked to submit samples.

IV. Radioactive Cobalt:

The first large sample of Hanford-irradiated cobalt is expected at ORNL about May 28, 1949. A number of requests for high activity cobalt sources are outstanding including 20 curies for Brookhaven National Laboratory. It may be possible to fill this request with cobalt irradiated at ORNL although the specific activity will not be as high as is desired.

V. Special Services:

The first irradiation with fast neutrons has been requested by the Socony Vacuum Laboratories.

A large irradiation of gold for the Bureau of Standards is being prepared to be sent to Hanford. Also some gold irradiated for a year at X-10 is being made available to the Bureau. The Bureau wishes to separate the Hg^{198} formed for use as a wave length standard.

An increasing number of requests are being received for irradiation of low-boiling organic compounds. Since the lowest available temperature is higher than the boiling point in many cases and since so much decomposition takes place that it is not safe to seal in ampoules, aluminum cans with release valves have been prepared. This is not entirely satisfactory since it is likely that a considerable amount of the compound will leak past the release valve due to the vapor pressure. A water-cooled irradiation channel for such irradiation is desirable.

VI. Radioisotope Production Area:

In the Isotope Processing Area, construction work continued on all buildings. The work in the office building included completion of the air ducts, electrical conduits, sprinkler system, and the roof.

Also the frame work for the office walls was completed and plastering of the walls started. The work in the analytical building included pouring of the concrete roof and walls in the east end of the building, pouring of the concrete floor slabs for all rooms, and completion of approximately one-half of the block and brick walls. Also the air ducts, ceiling framing, electrical conduits, and service piping were started. In the process buildings approximately one-half the interior aluminum walls were installed, the pyrofill roofs were completed, and most of the electrical conduits were installed; the inside service piping was started.

Outside piping work included completion of the process and filtered water piping except for tie-ins and the stack area, and installation of approximately seventy percent of the outside distilled water lines. The brick exhaust stack was completed except for the stainless steel pan in the bottom.

L. B. Emlet, Director
Operations Division

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VII. Source and Fissionable Material Accountability:

Following is a summary of shipments and receipts of S. F. Materials for the month of April, 1949:

SHIPMENTS

Shipped To	Material	Content
Argonne National Laboratory	Pu in 1.3 M $Al(NO_3)_3$	7.65 gm Plutonium
" " "	Plutonium	7.07 gm Plutonium
" " "	30 Normal Uranium X Slugs	35.10 kg Uranium
" " "	7 Normal Uranium X Slugs	8.19 kg Uranium
" " "	Solution (Nitrate)	9.67 gm Plutonium
Brookhaven National Laboratory	U_3O_8 Normal Uranium	20.50 gm Uranium
C&CCC, Y-12 Area	Enriched U_3O_8 (94.96% Enrichment)	296.79 mg Uranium (281.83 mg 235)
" "	U_3O_8 Enriched Uranium (94.8% Enrichment)	50.70 mg Uranium (48.06 mg 235)
C&CCC, K-25 Area	UNH Solution	4.19 kg Normal U
General Electric Company	U-Al Alloy Fuel Plates	8,559.00 mg Enriched U
" " "	Enriched Uranium	(4,608.00 mg Enriched 235)
" " "	Depleted Uranium	8,451.00 mg
" " "	50 Normal Uranium X Slugs	58.50 kg Uranium
USAEC, GE Nucleonics Project	Irradiated Uranium	72.50 gm Uranium

RECEIPTS

Received From		
Argonne National Laboratory	UNH Solution	40.97 kg Uranium 6,600.00 mg Plutonium
" " "	UNH Solution	100.11 kg Uranium 13.85 mg Plutonium
" " "	UNH Solution	80.18 kg Uranium 62.13 mg Plutonium
General Electric Company	Uranium Slugs, Depleted	135,133.54 gm Uranium 13.02 gm Plutonium 928.36 gm 235
" " "	Uranium Binary Alloys	6.84 kg Uranium
C&CCC, K-25 Area	(UX_1 Solution)	.38 kg Uranium
	Hanford Waste Scrap, Depleted U (Radioactive Glass and Paper)	13.00 gm Uranium.