

MATERIALS LICENSE

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 36, 39, 40, and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations, and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

302370

Licensee		3. License Number
1. Black Beauty Francisco Mine		13-26785-01
2. P. O. Box 347 Francisco, IN 47649-0347		4. Expiration Date
		April 30, 2007
		5. Docket or Reference No.
		030-34405
6. Byproduct, Source, and/or Special Nuclear Material	7. Chemical and/or Physical Form	8. Maximum Amount that Licensee May Possess at Any One Time Under This License
A. Californium-252	A. Sealed Source (Amersham Model CVN.CY6 or Frontier Technology Model 100 Series)	A. 9 sources not to exceed 108 millicuries total
B. Cesium-137	B. Sealed Sources (Isotopes Products Labs Model 225 CDC.704 and CDC.705)	B. 2 sources not to exceed 25 millicuries each
9. Authorized Use:		
A. and B. To be used in Gamma-Metrics Bulk Material Analyzer Model 2000 source holder for measurements of elemental analysis of coal and measurements of density/weight.		

CONDITIONS

10. Licensed material shall be used only at the licensee's facilities located at Black Beauty Francisco Mine, County Road 850, Francisco, Indiana.
11. The Radiation Safety Officer for this license is Russell Hill.
12. Licensed material shall only be used by, or under the supervision and in the physical presence of, Russell Hill or Carl Consalus or individuals who have successfully completed the manufacturer's training program for gauge users, have been instructed in the licensee's routine and emergency operating procedures and who have been designated by the Radiation Safety Officer.

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MATERIALS LICENSE
SUPPLEMENTARY SHEET

License Number

13-26785-01

Docket or Reference Number

030-34405

13. A. Sealed sources and detector cells shall be tested for leakage and/or contamination at intervals not to exceed 6 months or at such other intervals as specified by the certificate of registration referred to in 10 CFR 32.210.
- B. Notwithstanding Paragraph A of this Condition, sealed sources designed to emit alpha particles shall be tested for leakage and/or contamination at intervals not to exceed 3 months.
- C. In the absence of a certificate from a transferor indicating that a leak test has been made within 6 months prior to the transfer, a sealed source or detector cell received from another person shall not be put into use until tested.
- F. The leak test shall be capable of detecting the presence of 0.005 microcurie of radioactive material on the test sample. If the test reveals the presence of 0.005 microcurie or more of removable contamination, a report shall be filed with the U.S. Nuclear Regulatory Commission in accordance with 10 CFR 30.50(b)(2), and the source shall be removed immediately from service and decontaminated, repaired, or disposed of in accordance with Commission regulations. The report shall be filed within 5 days of the date the leak test result is known with the U.S. Nuclear Regulatory Commission, Region III, ATTN: Chief, Nuclear Materials Safety Branch, 801 Warrenville Road, Lisle, Illinois 60532-4351. The report shall specify the source involved, the test results, and corrective action taken.
- G. The licensee is authorized to collect leak test samples for analysis by Gamma-Metrics. Alternatively, tests for leakage and/or contamination may be performed by persons specifically licensed by the Commission or an Agreement State to perform such services.
- H. Tests for leakage and/or contamination shall be performed by the licensee or by other persons specifically licensed by the Commission or an Agreement State to perform such services.
14. Sealed sources or detector cells containing licensed material shall not be opened or sources removed from source holders by the licensee.
15. The licensee shall conduct a physical inventory every 6 months to account for all sources and/or devices received and possessed under the license.
16. Installation, initial radiation survey, relocation, removal from service, maintenance, and repair of devices containing sealed sources shall be performed by or by persons specifically licensed by the Commission or an Agreement State to perform such services. Installation, replacement, and disposal of sealed sources shall be performed only by persons specifically licensed by the Commission or an Agreement State to perform such services.

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**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License Number
13-26785-01

Docket or Reference Number
030-34405

17. Prior to initial use and after installation, relocation, dismantling, alignment, or any other activity involving the source or removal of the shielding, the licensee shall assure that a radiological survey is performed to determine radiation levels in accessible areas around, above and below the gauge with the shutter open. This survey shall be performed only by persons authorized to perform such services by the Commission or an Agreement State.
18. The licensee shall operate each gauge within the manufacturer's specified temperature and/or environmental limits such that the shielding and shutter mechanism of the source holder are not compromised.
19. The licensee shall assure that the shutter mechanism is locked in the closed position during periods when a portion of an individual's body may be subject to the direct radiation beam. The licensee shall review and modify as appropriate its "lock-out" procedures whenever a new gauge is obtained to incorporate the device manufacturer's recommendations.
20. Each gauge shall be tested for the proper operation of the on-off mechanism and indicator, if any, at no longer than 6-month intervals or at such longer intervals as specified by the manufacturer and approved by NRC.
21. The procedures contained in Gamma-Metrics' instruction manual for the Model 2000 device shall be followed and a copy of this manual shall be made available to each person using or having responsibility for the use of the device.
22. The licensee may not possess and use materials authorized in Items 6, 7, and 8 until:
 1. The licensee has constructed the facilities and obtained the equipment described in the application and supporting documentation; and
 2. The U. S. Nuclear Regulatory Commission, Region III, ATTN: Chief, Materials Licensing Branch, 801 Warrenville Road, Lisle, IL 60532-4351 has been notified that activities authorized by the license will be initiated.
23. Within 30 days of the date of a decision not to complete the facility, acquire equipment, or possess and use authorized material, the licensee must notify the Commission in writing, of the decision.

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MATERIALS LICENSE
SUPPLEMENTARY SHEET

License Number

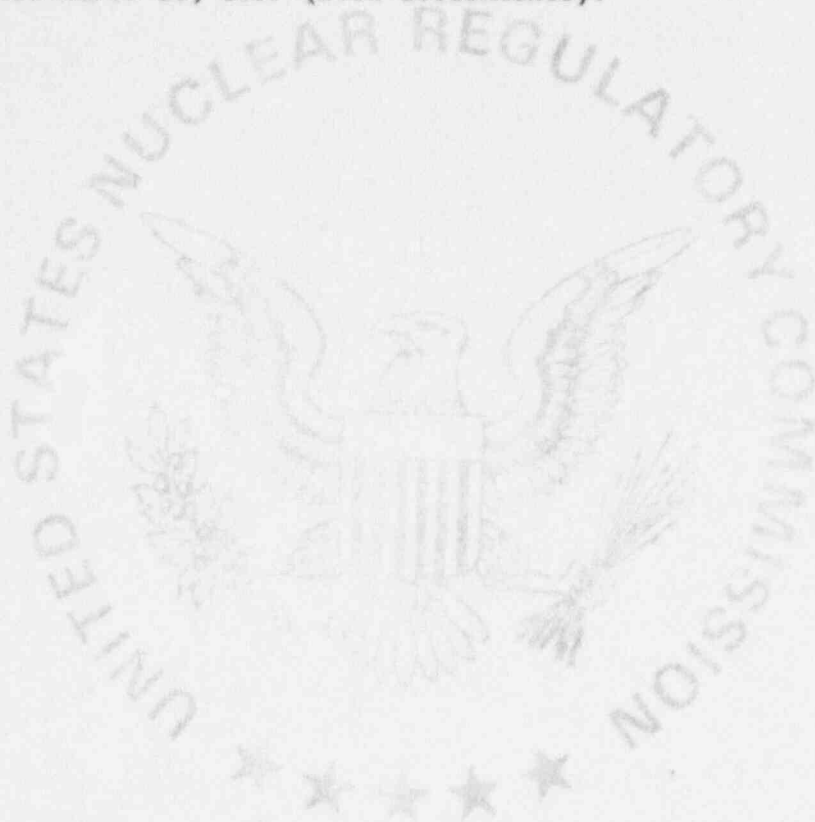
13-26785-01

Docket or Reference Number

030-34405

24. Except as specifically provided otherwise in this license, the licensee shall conduct its program in accordance with the statements, representations, and procedures contained in the documents, including any enclosures, listed below. The U.S. Nuclear Regulatory Commission's regulations shall govern unless the statements, representations, and procedures in the licensee's application and correspondence are more restrictive than the regulations.

A. Letter dated March 25, 1997 (with attachments).



FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Date April 2, 1997

By

Anthony R. Martin
Nuclear Materials Licensing Branch, Region III

COPY

29

(FOR LFMS USE)
INFORMATION FROM LTS

BETWEEN:

License Fee Management Branch, ARM
and
Regional Licensing Sections

Program Code: _____
Status Code: 3
Fee Category: _____
Exp. Date: 0
Fee Comments: _____
Decom Fin Assur Req'd: _____
.....

LICENSE FEE TRANSMITTAL

A. REGION

1. APPLICATION ATTACHED
Applicant/Licensee: BLACK BEAUTY FRANCISCO MINE
Received Date: 970226
Docket No: 3034405
Control No.: 302370
License No.:
Action Type: New Licensee

2. FEE ATTACHED
Amount: 550
Check No.: 76238

3. COMMENTS

Signed D. Hersey
Date 2-28-97

B. LICENSE FEE MANAGEMENT BRANCH (Check when milestone 03 is entered / /)

1. Fee Category and Amount: 3P 550

2. Correct Fee Paid. Application may be processed for:
Amendment _____
Renewal _____
License _____

3. OTHER

Signed SC
Date 3/3/97

MAR 07 1997

Log	<u>Mar 2 III</u>
Remitter	_____
Check No.	<u>76238</u>
Amount	<u>550</u>
Fee Category	<u>3P</u>
Type of Fee	<u>App</u>
Date Check Rec'd	<u>3/3/97</u>
Date Completed	<u>3/3/97</u>
By:	<u>SC</u>

1997 MAR -3 AM 11:42

NRC FORM 313
(9-85)
10 CFR 30, 32, 33, 34,
35 AND 40

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED BY OMB
3150-0120
Expires 5-31-87

APPLICATION FOR MATERIAL LICENSE

INSTRUCTIONS: SEE THE APPROPRIATE LICENSE APPLICATION GUIDE FOR DETAILED INSTRUCTIONS FOR COMPLETING APPLICATION. SEND TWO COPIES OF THE ENTIRE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW.

FEDERAL AGENCIES FILE APPLICATIONS WITH:

U.S. NUCLEAR REGULATORY COMMISSION
DIVISION OF FUEL CYCLE AND MATERIAL SAFETY, NMSS
WASHINGTON, DC 20555

ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS, IF YOU ARE LOCATED IN:

CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, MAINE, MARYLAND, MASSACHUSETTS, NEW HAMPSHIRE, NEW JERSEY, NEW YORK, PENNSYLVANIA, RHODE ISLAND, OR VERMONT, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION I
NUCLEAR MATERIAL SECTION B
821 PARK AVENUE
KING OF PRUSSIA, PA 19406

ALABAMA, FLORIDA, GEORGIA, KENTUCKY, MISSISSIPPI, NORTH CAROLINA, PUERTO RICO, SOUTH CAROLINA, TENNESSEE, VIRGINIA, VIRGIN ISLANDS, OR WEST VIRGINIA, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION II
MATERIAL RADIATION PROTECTION SECTION
101 MARIETTA STREET, SUITE 2900
ATLANTA, GA 30333

IF YOU ARE LOCATED IN:

ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR WISCONSIN, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION III
MATERIALS LICENSING SECTION
709 ROOSEVELT ROAD
GLEN ELLYN, IL 60137

ARKANSAS, COLORADO, IDAHO, KANSAS, LOUISIANA, MONTANA, NEBRASKA, NEW MEXICO, NORTH DAKOTA, OKLAHOMA, SOUTH DAKOTA, TEXAS, UTAH, OR WYOMING, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION IV
MATERIAL RADIATION PROTECTION SECTION
811 RYAN PLAZA DRIVE, SUITE 1000
ARLINGTON, TX 76011

ALASKA, ARIZONA, CALIFORNIA, HAWAII, NEVADA, OREGON, WASHINGTON AND U.S. TERRITORIES AND POSSESSIONS IN THE PACIFIC, SEND APPLICATIONS TO:

U.S. NUCLEAR REGULATORY COMMISSION, REGION V
MATERIAL RADIATION PROTECTION SECTION
1450 MARIA LANE, SUITE 210
WALNUT CREEK, CA 94596

PERSONS LOCATED IN AGREEMENT STATES SEND APPLICATIONS TO THE U.S. NUCLEAR REGULATORY COMMISSION ONLY IF THEY WISH TO POSSESS AND USE LICENSED MATERIAL IN STATES SUBJECT TO U.S. NUCLEAR REGULATORY COMMISSION JURISDICTION.

1. THIS IS AN APPLICATION FOR (Check appropriate item)

- ☒ A. NEW LICENSE
☐ B. AMENDMENT TO LICENSE NUMBER _____
☐ C. RENEWAL OF LICENSE NUMBER _____

2. NAME AND MAILING ADDRESS OF APPLICANT (Include Zip Code)

Black Beauty Francisco Mine
P.O. Box 347
Francisco, IN 47649-0347

3. ADDRESS(ES) WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED.

County Road 850
Francisco, IN 47649

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

Eric P. Fry, Environmental Affairs Manager

TELEPHONE NUMBER

(812) 424-9000

SUBMIT ITEMS 5 THROUGH 11 ON 8 1/2 x 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.

5. RADIOACTIVE MATERIAL

a. Element and mass number, b. chemical and/or physical form, and c. maximum amount which will be possessed at any one time.

6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.

7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING AND EXPERIENCE.

8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.

9. FACILITIES AND EQUIPMENT.

10. RADIATION SAFETY PROGRAM.

11. WASTE MANAGEMENT.

12. LICENSED FEES (See 10 CFR 170 and Section 170.31)

FEE CATEGORY

AMOUNT

ENCLOSED \$ 550.00

13. CERTIFICATION (Must be completed by applicant). THE APPLICANT UNDERSTANDS THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE BINDING UPON THE APPLICANT.

THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF THE APPLICANT, NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS PARTS 30, 32, 33, 34, 35, AND 40 AND THAT ALL INFORMATION CONTAINED HEREIN IS TRUE AND CORRECT TO THE BEST OF THEIR KNOWLEDGE AND BELIEF.

WARNING: 18 U.S.C. SECTION 1001 ACT OF JUNE 25, 1948, 62 STAT. 749 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

SIGNATURE—CERTIFYING OFFICER

TYPED/PRINTED NAME

TITLE

DATE

Eric P. Fry

Environmental Affairs Mgr. 02/24/97

14. ANNUAL RECEIPTS

15. NUMBER OF EMPLOYEES (Total for entire facility excluding outside contractors)

16. WOULD YOU BE WILLING TO FURNISH COST INFORMATION (Labor and/or other hours) ON THE ECONOMIC IMPACT OF CURRENT NRC REGULATIONS OR ANY FUTURE PROPOSED NRC REGULATIONS THAT MAY AFFECT YOUR (NRC regulations permit it to protect confidential commercial or financial—proprietary—information furnished to the agency is confidential)

YES

NO

FOR NRC USE ONLY

TYPE OF FEE

FEE LOG

FEE CATEGORY

COMMENTS

AMOUNT RECEIVED

CHECK NUMBER

PM: 2-24-97

RECEIVED

FEB 26 1997

REGION III

APPROVED BY

DATE

302370



Black Beauty Coal Company

February 24, 1997

U.S. Nuclear Regulatory Commission Region III
Materials Licensing Section
790 Roosevelt Road
Glen Ellyn, IL 60137

Dear Sir or Madam:

Please find attached our material license application and check for \$550.00. Due to some confusion in scheduling and requirements, we need to have the license approval as soon as possible in order to receive the equipment. The start-up date for our plant is in mid March.

If you have any questions or comments, please feel free to contact me.

Sincerely,

Eric P. Fry
Environmental Affairs Manager
BLACK BEAUTY COAL COMPANY

EPF:lrh
Attachments

RECEIVED
FEB 26 1997
REGION III

FEB 26 1997

5.

Element and Mass Number (A)	Chemical and/or Physical Form (B)	Name of Manufacturer and Model Number (if sealed source) (C)	Maximum number of millicuries which will be possessed at any one time (D)
1. Californium 252	Sealed source	Amersham model CVN.CY6 or Frontier Technology Model 100 series	125 millicuries in sources
2. Cesium 137	Sealed source	Isotope Product Labs Model 225 CDC.704 and CDC.705	25 millicuries in 2 sources

6. Describe use of radioactive material

1. To be used as components of a GAMMA-METRICS Bulk Material Analyzer, Model 2000, for the measurement of elemental analysis of coal.
2. To be used as components of a GAMMA-METRICS Bulk Material Analyzer, Model 2000, for the measurement of density/weight.
7. Russell Hill and Carl Consalus will receive training by GAMMA-METRICS upon receipt of equipment on site.
8. Trainees: Field Representative
c/o GAMMA-METRICS
5788 Pacific Center Blvd.
San Diego, CA 92121

Training Duration: one day

Date for schedule training:

Tentative Date: March 15, 1997

9. See Attachment A.
10. Radiation and protection program to be provided at site by GAMMA-METRICS on--sealed source paper wipe leak test performed by GAMMA-METRICS field engineer every three months.

Personal Monitoring Devices:

Type	Supplier	Exchange Frequency
Film Badge	Radiation Detection Co. 162 Wolfe Road Sunnyvale, CA 94088-3414	Quarterly

11. Depleted/spent sources will be returned manufacturing vendor for proper disposal.
12. \$550.00

ATTACHMENT A

SAFETY EVALUATION OF DEVICE

Corrected Copy

NO: CA305D10LS

(Amended Page 2 and 10, September 5, 1991) *KEJ*
(Amended Page 1, August 7, 1989) *PBP*
(Amended Page 1, September 24, 1991) *KEJ*
(Amended Page 1, February 8, 1991) *KEJ*
DATE: June 28, 1985
Page 1 of 10

DEVICE TYPE: Bulk Materials Elemental Analyzer

MODEL: 2000

FEB 19 1992

MANUFACTURER/DISTRIBUTOR: GAMMA-METRICS, Inc.
5788 Pacific Center Blvd.
San Diego, CA 92121

SEALING SOURCE MODEL DESIGNATION: Monsanto Model MRC 2765 (Cs-252)
Amersham Models CVM-CY5 (Cs-252)
CDC-704, and CDC-705 (Cs-137)
Frontier Technology Corporation
Model 100 Series (Cs-252)
Isotope Products Lab Model 225 (Cs-137)

ISOTOPE: Californium-252

MAXIMUM ACTIVITY: 200 micrograms (108 mCi)
(in nine sources)

Cesium-137

25 micrograms in two sources

LEAK TEST FREQUENCY: Six Months

PRINCIPAL USE: Other

CUSTOM DEVICE: YES

X NO

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES

SAFETY EVALUATION OF DEVICE

(Amended Page 2 and 10, September 5, 1991)

NO.: CA 305D1015

DATE: June 28, 1985

PAGE: 2 of 10

DEVICE TYPE: Bulk Material Elemental Analyzer.DESCRIPTION:

Summary Description: The Gamma Metrics Bulk Materials Analyzer is a (Prompt gamma neutron activation analyzer) elemental analyzer designed for continuous use by the coal, cement, fertilizer, and chemical industries. The device consists of three major elements: (1) The Source Handling Assembly, (2) The Material Handling, Shielding & Housing Assembly, and (3) The Associated Electronics Assembly.

(1) Source Handling Assembly:

The source handling assembly maintains correct geometry of the neutron sources with respect to detectors during normal operation and retracts them to a shielded location for maintenance or in the event of a system malfunction. Loss of power to the source handling assembly will automatically return the neutron sources which return to their storage location.

(2) Material Handling, Shielding & Housing Assembly:

Material handling is accomplished by standard handling mechanisms which provide a continuous flow of material through a chute in the analyzer thus passing the sample through a neutron field where the prompt emission of capture gamma rays occurs.

A combination of borated paraffin neutron, and lead or bismuth gamma shielding is provided to reduce radiation dose equivalent rates to less than 0.5 rem per year to any person inside or outside the housing assembly. Occupancy of the area beneath the analyzer is physically restricted to meet the above dose limitation.

The housing assembly is a metal and fiberglass structure (7.7 Ft. H X 11.5 Ft. W X 8.0 Ft. D) which contains all of the above subsystems and is of a rugged design for use in an outside industrial environment. Entrance to the housing is controlled by a locked door. The only access to the radioactive sources other than during assembly is through the housing door.

(3) Associated Electronics Assembly:

The associated electronics assembly converts the prompt gamma ray data measured by detectors located opposite the neutron sources into data useful to the user. This assembly also responds to a high temperature alarm by instituting storage of the neutron sources and remote operator notification.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO: CA-305D101S

DATE: June 28, 1985

PAGE: 3 of 10

DESCRIPTION: (Associated Electronic Assembly) cont'd.

Indicators of source status are located within the housing and are prominently displayed on the electronics panel. A red light labeled "ON" and green light labeled "OFF" indicate the status of the neutron sources during operation.

LABELING:

The Model 2000 Bulk Materials Analyzer bears the following permanent label:

CAUTION: RADIOACTIVE MATERIALS.

Along with a radiation symbol meeting the requirements of Section 20.203, 10 CFR Part 20, the label also contains the company name Gamma-Metrics, Inc. as well as the isotopes and activities (including the measurement dates). The label contains a reference to the Gamma-Metrics Bulk Materials Analyzer Radiological Safety Procedures Manual with regard to operator radiation safety. This label is located just inside of the access door (See Figure 2).

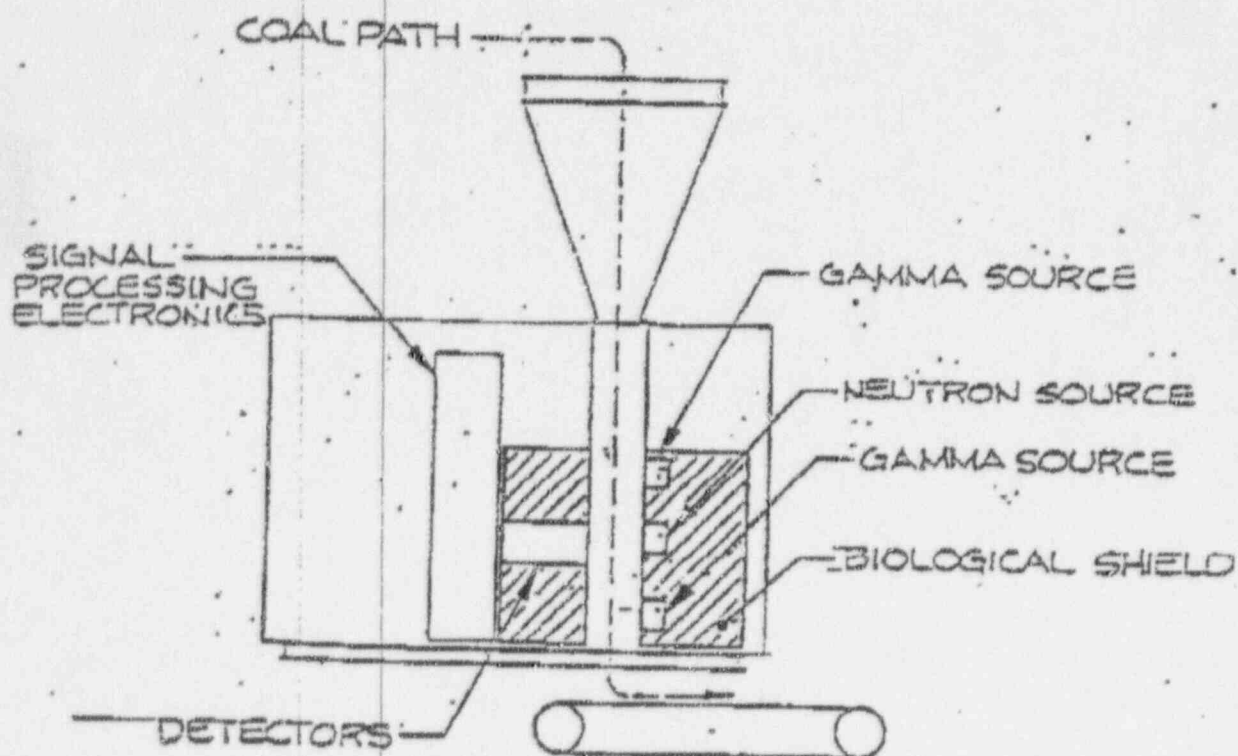
DIAGRAM: See Figures:

- (1) Simplified drawing
- (2) Top and Side view
- (3) Typical installation

NO: CA 305D1015

DATE: June 28, 1985

PAGE 4 OF 10

FIGURE 1

ON/OFF INDICATOR
PANEL

DATE: June 28, 1985

PAGE 5 OF

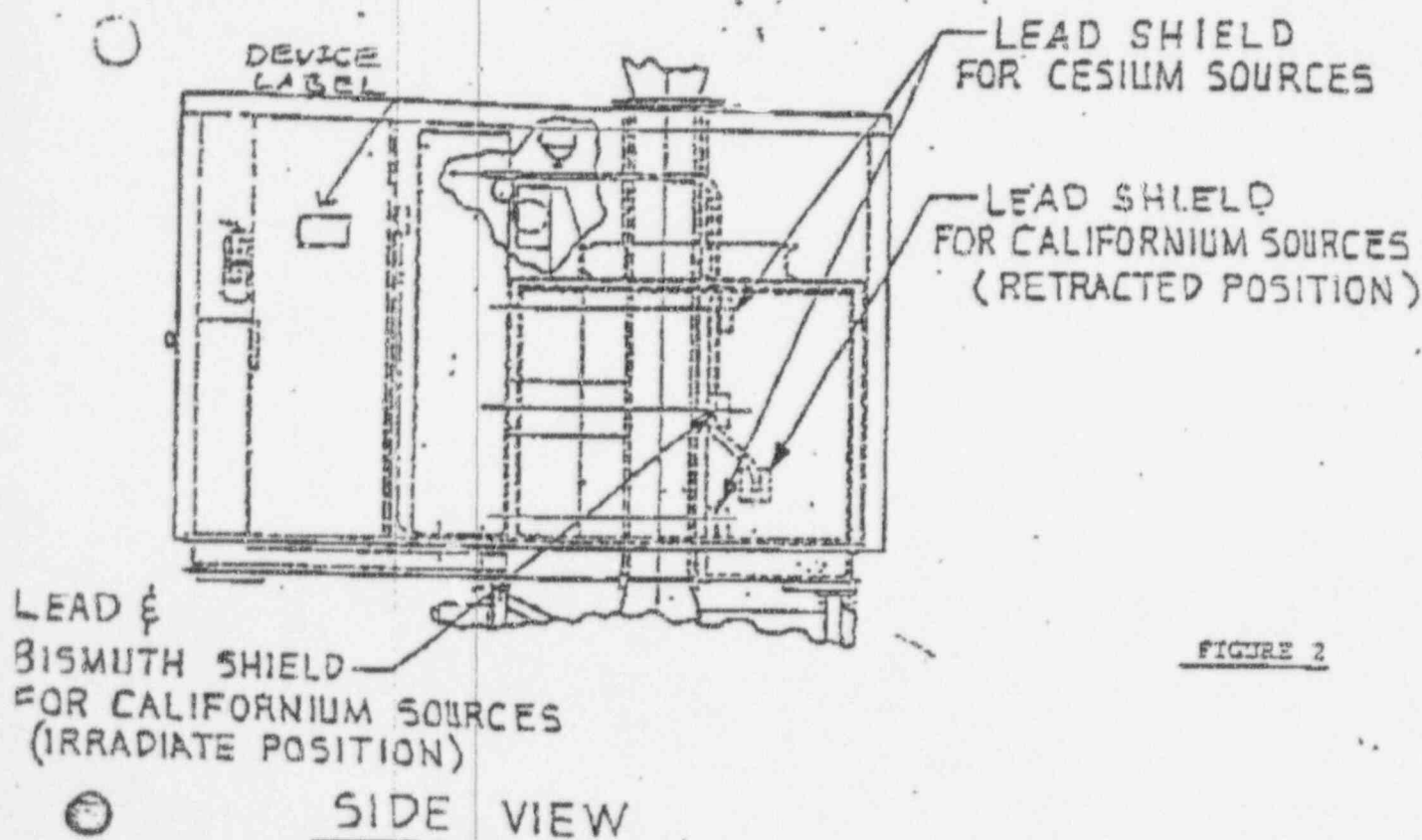
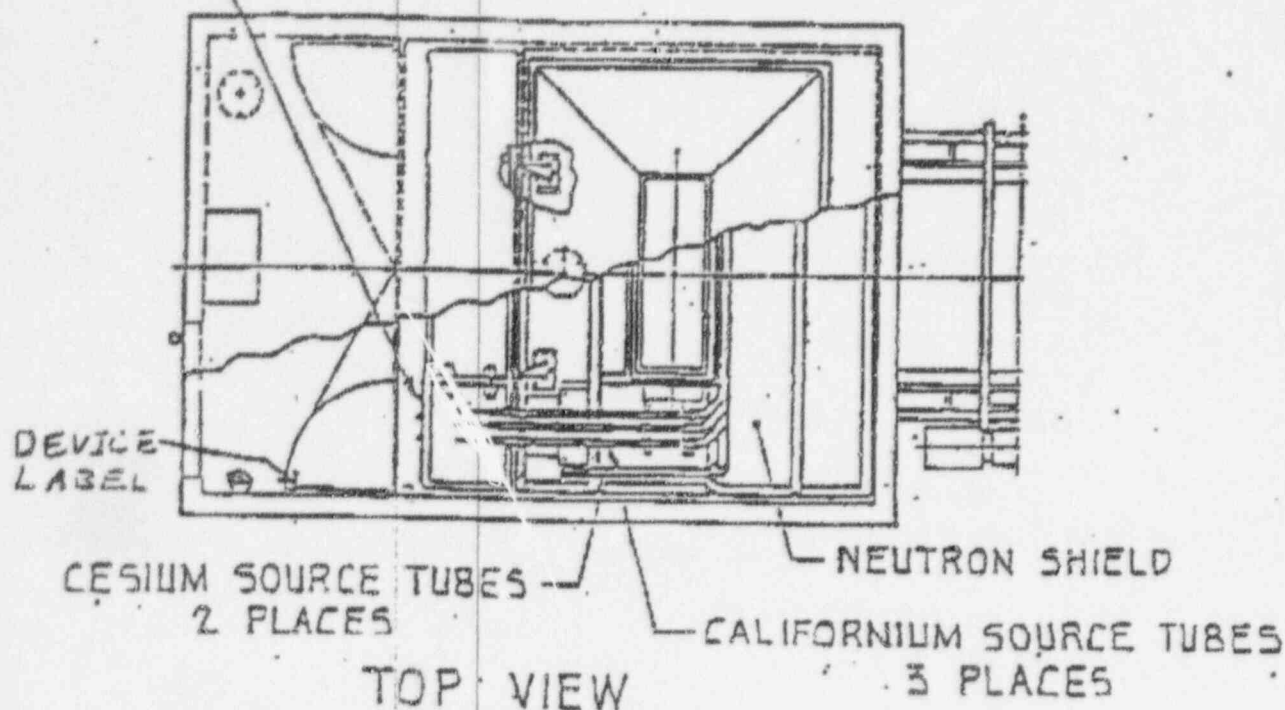


FIGURE 2

TYPICAL INSTALLATION

DATE: June 28, 1985

PAGE 6 of 10

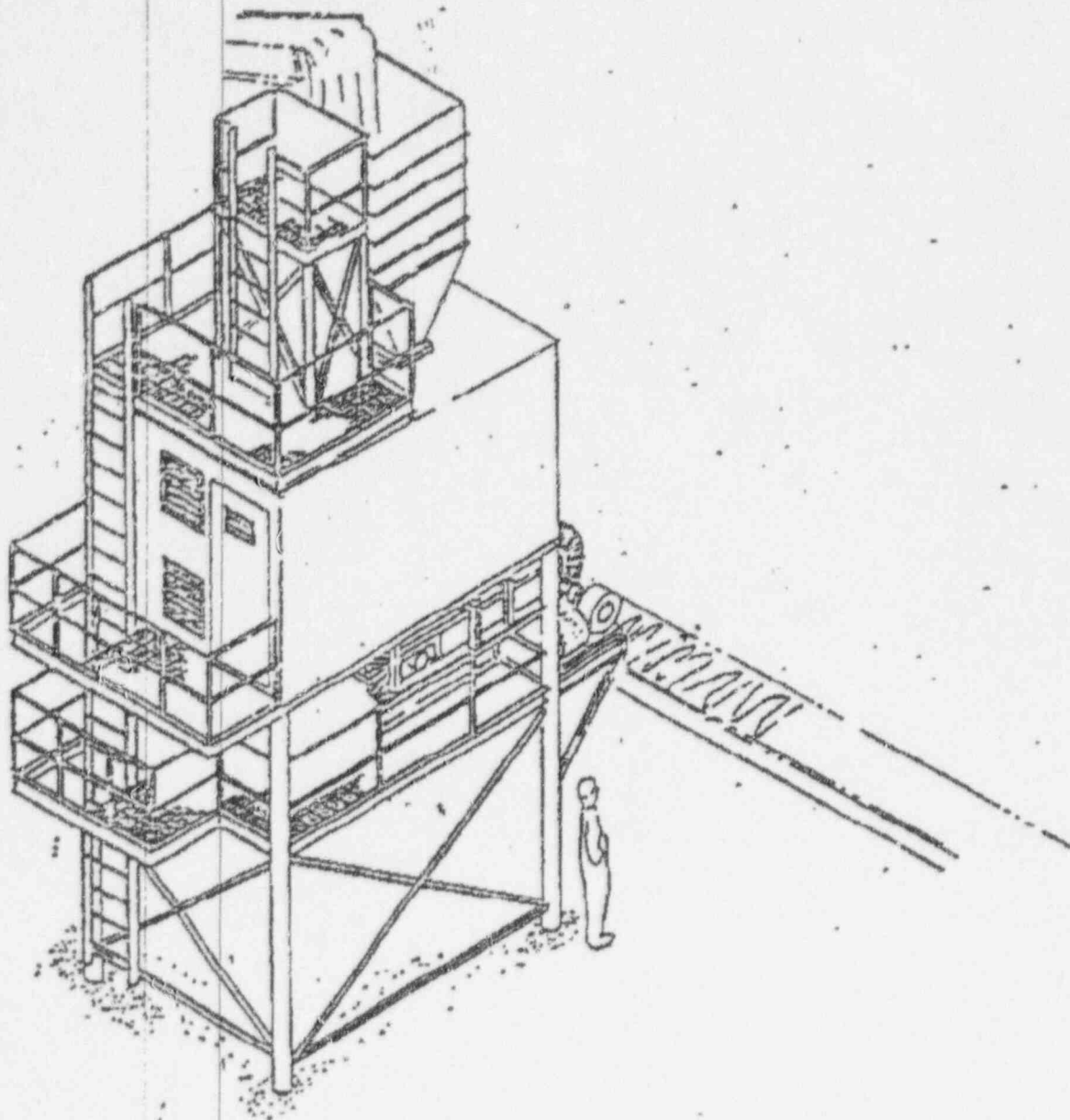


Figure 3.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO: CA 305D1015

DATE: June 28, 1985

PAGE: 7 of 10

DEVICE TYPE: Bulk Material Elemental Analyzer.

CONDITIONS OF NORMAL USE:

Planned Use: The Gamma Metrics Model 2000 Bulk Materials Analyzer will be used by the coal, cement, fertilizer, and chemical industries. This will include mining operations, batching and distribution operations, and other industrial uses. The units (including radioactive sources) will be delivered by common carrier. Installation shall be performed by Gamma-Metrics.

Environment: Since the units may be situated in outside industrial environments, they are designed for a wide spectrum of weather conditions ranging from snow and ice to 75 MPH wind forces. The device is capable of tolerating a temperature range of -40 to 130 degrees Fahrenheit.

PROTOTYPE TESTING:

The first production unit was loaded with 100 micrograms of Cf-252 and 20 millicuries of Cs-137. The assigned ANSI classification for this loading is ANSI-24-763-553-R1. Due to the materials of construction, a fire test was not performed. A loading of 200 micrograms (Cf-252) and 15 millicuries (Cs-137) would have an ANSI Classification ANSI-24-653-342-R. Most units will be loaded with 100 micrograms of Cf-252.

EXTERNAL RADIATION LEVELS:

(All measurements made by ion chamber and BF-3 "Snoopy" rem-meter)

Normal Loading:

Table I: 100 micrograms Cf-252
 20 millicuries Cs-137
 (mRem/hr)

	<u>5 cm</u>	<u>30 cm</u>	<u>100 cm</u>
<u>Chute loaded</u>			
Source On	1.58	1.13	1.00
Source Off	3.37	2.66	0.86
<u>Chute unloaded</u>			
Source Off	5.29	3.05	1.13

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO: 305D101S

DATE: June 28, 1985

PAGE 6 of 10

DEVICE TYPE: Bulk Material Elemental Analyzer.

EXTERNAL RADIATION LEVELS: (cont'd)

MAXIMUM LOADING:

Table II: 200 micrograms Cf-252,
15 millicuries * Cs-137
(mRem/hr.)

	<u>5 cm</u>	<u>30 cm</u>	<u>100 cm</u>
<u>Chute loaded</u>			
Source on	3.09	2.07	1.58
Source off	6.36	5.36	1.68
<u>Chute unloaded</u>			
Source off	10.04**	5.71	2.13

* Less Cs-137 is needed with 200 micrograms of Cf-252.

** The dose rates increase underneath the unit, as the sources move towards the storage mode (See Figure 2 for source locations).

QUALITY ASSURANCE AND CONTROL:

Gamma-Metrics provided a summary of the Quality Assurance Program, referencing 10 CFR 50, Appendix B and ANSI N45.2. These procedures are outlined in the Gamma-Metrics Quality Assurance Manual to ensure quality of design, material, workmanship and documentation.

LIMITATIONS AND/OR OTHER CONSIDERATION OF USE:

- The Model 2000 shall be distributed only to persons specifically licensed by the NRC or Agreement States.
- The device shall be leak tested at six (6) month intervals using techniques capable of detecting 0.005 microcuries of removable contamination.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO: CA 305D1015

DATE: June 28, 1985

PAGE 9 of 10

DEVICE TYPE: Bulk Material Elemental Analyzer

LIMITATIONS AND/OR OTHER CONSIDERATIONS OF USE: (cont'd)

- C. These devices shall not be subjected to environmental conditions exceeding those specified in the ANSI-24-763-553-R1 classification.
- D. Instructions to users: A Radiological Procedures Manual is provided and summarizes basic radiation safety with respect to the use of the device.
- E. Installation and Relocation: This must be provided by the manufacturer or other specifically licensed organization.
- F. Emergency Procedures: As a fire could substantially compromise the shielding, specific instructions should be described and posted.
- G. Source exchange due to decay shall only be performed by Gamma-Metrics or other specifically licensed organization.
- H. Maintenance is provided at six-month intervals by the manufacturer and should be a licensee commitment.
- I. This registration sheet and the information contained within the references shall not be changed or transferred without the written consent of the California Department of Health Services.

SAFETY ANALYSIS SUMMARY:

Based on our review of the information and test data cited below, we conclude that the Model 2000 device design is acceptable for licensing purposes.

A "Failure Modes and Effects Analysis" provided an assessment of numerous failure modes and their mitigation by various safety systems.

The external dose rates average less than 0.5 mRem/hr at 5 cm, although the tables list the maximum values for purposes of establishing the ANSI classification

Even in the event that a fire destroys the shielding, the sources should maintain integrity due to their own ANSI classifications which exceed those required for the intended use (C 64545, C64444)

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

(Amended Page 2 and 10, September 5, 1991)

NO: CA 10501015DATE: June 28, 1985Page 10 of 10DEVICE TYPE: Bulk Material Elemental AnalyzerREFERENCES:

The following supporting documents for the Model 2000 Bulk Materials Elemental Analyzer are hereby incorporated by reference and are made a part of this registry document:

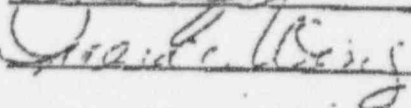
- 1) Gamma-Metrics letter with attached "Manufacturers Information Sheet" and supporting documentation dated November 20, 1984 (including QA Procedures).
- 2) Gamma Metrics letter dated May 13, 1985.
- 3) NBS Handbook No. 129, American National Standard N.538-1979, "Classification of Industrial Ionizing Radiation Gauging Devices".
- 4) Gamma Metrics letters dated July 26, 1985, and November 20, 1985.
- 5) Gamma Metrics letter with attachment dated July 25, 1991.

DATE:

12/9/85

REVIEWED BY:DATE:

12/12/85

CONCURRENCE:ISSUING AGENCY:

California Department of Health Services

U.S. Department
of Transportation

Research and
Special Programs
Administration

400 Seventh Street, SW
Washington, D.C. 20590

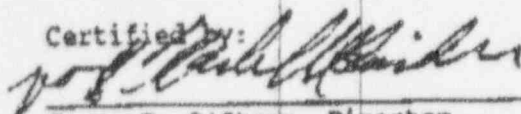
IAEA CERTIFICATE OF COMPETENT AUTHORITY
SPECIAL FORM RADIOACTIVE MATERIALS
CERTIFICATE NUMBER USA/0367/S, REVISION 4

This certifies that the sources described have been demonstrated to meet the regulatory requirements for special form radioactive material as prescribed in the regulations of the International Atomic Energy Agency and the United States of America for the transport of radioactive materials.

1. Source Identification - Frontier Technology Corporation Model 10 Series and Model 100 Series.
2. Source Description - The Series 10 sources are single encapsulations measuring 5.5 mm (0.217") OD x either 12 mm (0.47") or 25 mm (0.98"). The Series 100 sources are double encapsulations (inner capsule is a Series 10) measuring 9.4 mm (0.37") OD x approximately 25 mm (0.98") or 38 mm (1.48") in length. Both the Series 10 and 100 source capsules are manufactured of 304L stainless steel or zircalloy. Series 100 sources may have a special stud attachment, or may have an extended length with or without an attachment hole as illustrated and described on the attached drawings. These features are identified by prefix and suffix letters in the source model numbers which are also identified on the attached drawings.
3. Radioactive Contents - These sources consist of not more than 0.2 TBq (5.4 Ci) of Californium 252 in the form of Cf-Pd cermet or Cf-Pd alloy.
4. Expiration Date - This certificate expires September 30, 2000.

This certificate is issued in accordance with paragraph 803 of the IAEA Regulations and Section 173.476 of Title 49 of the Code of Federal Regulations, in response to the petition and information dated August 8, 1995 and September 12, 1995 submitted by Frontier Technology Corporation, Xenia, OH, and in consideration of other information on file in this Office.

Certified by:



James K. O'Steen, Director
Office of Hazardous Materials
Technology

OCT 3 1995

(DATE)

Revision 4 - Issued to authorize the use of special attachments on the Series 100 capsule, and to extend the expiration date.

1 "Safety Series No. 6, Regulations for the Safe Transport of Radioactive Materials, 1973 Revised Edition, as amended," published by the International Atomic Energy Agency (IAEA), Vienna, Austria.

2 Title 49, Code of Federal Regulations, Parts 100 - 199, United States of America.

Frontier Technology Corporation Model 100

The Model 100 series of neutron sources are doubly-encapsulated sources which employ a Model 10 series source as the primary encapsulation. Model 100 series sources have an outside diameter of 0.370/0.371 inches, and are available in two lengths, both of which are available with or without a 10-32 threaded stud on one end. The longer length version with the stud is equivalent to the Savannah River SR-CF-100 series capsules. Outer capsule material may be either type 304L stainless steel or Zircalloy-2. Closure is by TIG welding.

Thirty-two versions of the standard length source and thirty-two versions of the shortened source are possible as the result of various combinations of inner and outer capsule materials and orientations, and the presence of or lack of the threaded stud. All sixty-four versions of the Model 100 series are certified by the USDOT as Special Form, and all have been approved for licensing purposes by the USNRC for general uses.

Nominal dimensions for the Frontier Technology Corporation Model 100 and Model 100S sources are shown below:

	Model 100	Model 100S
outside diameter	0.370/0.371 inch 9.398/9.423 mm	0.370/0.371 inch 9.398/9.423 mm
inside diameter	0.234/0.235 inch 5.953/5.982 mm	0.234/0.233 inch 5.953/5.982 mm
inside length	1.02 inches 30.6 mm	0.52 inch 13.2 mm
outside length w/stud	1.48 inches 37.59 mm	0.97 inch 24.6 mm
outside length w/o stud	1.28 inches 32.5 mm	0.77 inch 19.55 mm
Maximum content: Californium-252	10 milligrams	4 milligrams

APR 03 1997

Eric P. Fry
Environmental Affairs Manager
Black Beauty Francisco Mine
P. O. Box 347
Francisco, IN 47649-0347

Dear Mr. Fry:

Enclosed is your NRC Material License Number 13-26785-01 in accordance with your request.

Please review the enclosed document carefully and be sure that you understand all conditions. If there are any errors or questions, please notify the U.S. Nuclear Regulatory Commission, Region III office so that we can provide appropriate corrections and answers.

Please be advised that your license expires at the end of the day, in the month, and year stated in the license. Unless your license has been terminated, you must conduct your program involving byproduct materials in accordance with the conditions of your NRC license, representations made in your license application, and NRC regulations. In particular, note that you must:

1. Operate in accordance with NRC regulations 10 CFR Part 19, "Notices, Instructions and Reports to Workers; Inspections," 10 CFR Part 20, "Standards for Protection Against Radiation," and other applicable regulations.
2. Not possess and use materials authorized in Items 6, 7, and 8, on the license until:
 - a. You have constructed the facilities and obtained the equipment described in the license application and supporting documentation; and
 - b. You have notified the U. S. Nuclear Regulatory Commission, Region III, ATTN: Chief, Nuclear Materials Safety Branch, in writing, that activities authorized by the license will be initiated.
3. Notify NRC, in writing, within 30 days:
 - a. When an authorized user or Radiation Safety Officer permanently discontinues performance of duties under the license or has a name change; or
 - b. When the licensee's mailing address changes (no fee is required if the location of byproduct material remains the same).

302370

4. In accordance with 10 CFR 30.36(b) and/or license condition, notify NRC, promptly, in writing, and request termination of the license:
 - a. When you decide to terminate all activities involving materials authorized under the license; or
 - b. If you decide not to complete the facility, acquire equipment, or possess and use authorized material.
5. Request and obtain a license amendment before you:
 - a. Receive or use byproduct material for a clinical procedure permitted under Part 35 but not permitted by your license issued pursuant to this Part;
 - b. Permit anyone, except a visiting authorized user described in 10 CFR 35.27, to work as an authorized user under the license;
 - c. Change Radiation Safety Officers;
 - d. Order byproduct material in excess of the amount, or radionuclide, or form different than authorized on the license;
 - e. Add or change the areas of use or address or addresses of use identified in the license application or on the license; or
 - f. Change ownership of your organization.
6. Submit a complete renewal application with proper fee or termination request at least 30 days before the expiration date of your license. You will receive a reminder notice approximately 90 days before the expiration date. Possession of byproduct material after your license expires is a violation of NRC regulations. A license will not normally be renewed, except on a case-by-case basis, in instances where licensed material has never been possessed or used.

In addition, please note that NRC Form 313 requires the applicant, by his/her signature, to verify that the applicant understands that all statements contained in the application are true and correct to the best of the applicant's knowledge. The signatory for the application should be the licensee or certifying official rather than a consultant.

You will be periodically inspected by NRC. Failure to conduct your program in accordance with NRC regulations, license conditions, and representations made in your license application and supplemental correspondence with NRC will result in enforcement action

E. Fry

-3-

against you. This could include issuance of a notice of violation, or imposition of a civil penalty, or an order suspending, modifying or revoking your license as specified in the General Policy and Procedures for NRC Enforcement Actions, 10 CFR Part 2, Appendix C. Since serious consequences to employees and the public can result from failure to comply with NRC requirements, prompt and vigorous enforcement action will be taken when dealing with licensees who do not achieve the necessary meticulous attention to detail and the high standard of compliance which NRC expects of its licensees.

Sincerely,

Original Signed By
Evelyn R. Matson
Nuclear Materials Licensing Branch

License No. 13-26785-01
Docket No. 030-34405

Enclosure: License No. 13-26785-01

DOCUMENT NAME: M:\03034405.CL7

To receive a copy of this document, indicate in the box: "C" = Copy without attachment/enclosure "E" = Copy with attachment/enclosure "N" = No copy

OFFICE	DNMS/RIII <i>AM</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
NAME	ERMatson:brt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DATE	04/2/97	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

OFFICIAL RECORD COPY

NRC FORM 313

(9-85)

16 CFR 30, 32, 33, 34,
35 AND 40U.S. NUCLEAR REGULATORY COMMISSION
APPROVED BY OMB
3150-0120
Expires: 5-31-87

APPLICATION FOR MATERIAL LICENSE

INSTRUCTIONS: SEE THE APPROPRIATE LICENSE APPLICATION GUIDE FOR DETAILED INSTRUCTIONS FOR COMPLETING APPLICATION. SEND TWO COPIES OF THE ENTIRE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW.

FEDERAL AGENCIES FILE APPLICATIONS WITH:

U.S. NUCLEAR REGULATORY COMMISSION
DIVISION OF FUEL CYCLE AND MATERIAL SAFETY, NMSS
WASHINGTON, DC 20555ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS, IF YOU ARE
LOCATED IN:CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, MAINE, MARYLAND,
MASSACHUSETTS, NEW HAMPSHIRE, NEW JERSEY, NEW YORK, PENNSYLVANIA,
RHODE ISLAND, OR VERMONT, SEND APPLICATIONS TO:U.S. NUCLEAR REGULATORY COMMISSION, REGION I
NUCLEAR MATERIAL SECTION B
631 PARK AVENUE
KING OF PRUSSIA, PA 19406ALABAMA, FLORIDA, GEORGIA, KENTUCKY, MISSISSIPPI, NORTH CAROLINA,
PUERTO RICO, SOUTH CAROLINA, TENNESSEE, VIRGINIA, VIRGIN ISLANDS, OR
WEST VIRGINIA, SEND APPLICATIONS TO:U.S. NUCLEAR REGULATORY COMMISSION, REGION II
MATERIAL RADIATION PROTECTION SECTION
101 MARIETTA STREET, SUITE 2900
ATLANTA, GA 30323

IF YOU ARE LOCATED IN:

ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR
WISCONSIN, SEND APPLICATIONS TO:U.S. NUCLEAR REGULATORY COMMISSION, REGION III
MATERIALS LICENSING SECTION
799 ROOSEVELT ROAD
GLEN ELLYN, IL 60137ARKANSAS, COLORADO, IDAHO, KANSAS, LOUISIANA, MONTANA, NEBRASKA,
NEW MEXICO, NORTH DAKOTA, OKLAHOMA, SOUTH DAKOTA, TEXAS, UTAH,
OR WYOMING, SEND APPLICATIONS TO:U.S. NUCLEAR REGULATORY COMMISSION, REGION IV
MATERIAL RADIATION PROTECTION SECTION
611 RYAN PLAZA DRIVE, SUITE 1000
ARLINGTON, TX 75011ALASKA, ARIZONA, CALIFORNIA, HAWAII, NEVADA, OREGON, WASHINGTON
AND U.S. TERRITORIES AND POSSESSIONS IN THE PACIFIC, SEND APPLICATIONS
TO:U.S. NUCLEAR REGULATORY COMMISSION, REGION V
MATERIAL RADIATION PROTECTION SECTION
1450 MARIA LANE, SUITE 210
WALNUT CREEK, CA 94596

PERSONS LOCATED IN AGREEMENT STATES SEND APPLICATIONS TO THE U.S. NUCLEAR REGULATORY COMMISSION ONLY IF THEY WISH TO POSSESS AND USE LICENSES IN STATES SUBJECT TO U.S. NUCLEAR REGULATORY COMMISSION JURISDICTION.

1. THIS IS AN APPLICATION FOR (Check appropriate item)

☒

A. NEW LICENSE

B. AMENDMENT TO LICENSE NUMBER _____

C. RENEWAL OF LICENSE NUMBER _____

2. NAME AND MAILING ADDRESS OF APPLICANT (Include Zip Code)

Black Beauty Francisco Mine
P.O. Box 347
Francisco, IN 47649-0347

3. ADDRESS(ES) WHERE LICENSED MATERIAL WILL BE USED OR POSSESSED.

County Road 850
Francisco, IN 47649

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

Eric P. Fry, Environmental Affairs Manager

TELEPHONE NUMBER

(812) 424-9000

SUBMIT ITEMS 5 THROUGH 11 ON 8 1/2 x 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.

5. RADIOACTIVE MATERIAL

a. Element and mass number, b. chemical and/or physical form, and c. maximum amount
which will be possessed at any one time.

6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.

7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR
TRAINING AND EXPERIENCE.

8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.

9. FACILITIES AND EQUIPMENT.

10. RADIATION SAFETY PROGRAM.

11. WASTE MANAGEMENT.

12. LICENSEE FEES (See 10 CFR 170 and Section 170.311)
FEE CATEGORYAMOUNT
ENCLOSED \$

550.00

13. CERTIFICATION. (Must be completed by applicant) THE APPLICANT UNDERSTANDS THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE
BINDING UPON THE APPLICANT.THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF THE APPLICANT, NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION IS
PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PARTS 30, 32, 33, 34, 35, AND 40 AND THAT ALL INFORMATION CONTAINED HEREIN,
IS TRUE AND CORRECT TO THE BEST OF THEIR KNOWLEDGE AND BELIEF.WARNING: 18 U.S.C. SECTION 1001 ACT OF JUNE 25, 1948, 62 STAT. 749 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION
TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

SIGNATURE - CERTIFYING OFFICER

TYPED/PRINTED NAME

TITLE

DATE

Eric P. Fry

Environmental Affairs Mgr. 02/24/97

14. VOLUNTARY ECONOMIC DATA

A. ANNUAL RECEIPTS

< \$750K	\$1M - 3.5M
\$750K - \$500K	\$3.5M - 7M
\$500K - \$750K	\$7M - 10M
\$750K - 1M	> \$10M

B. NUMBER OF EMPLOYEES (Total for
entire facility including outside contractors)

C. NUMBER OF BEDS

9. WOULD YOU BE WILLING TO FURNISH COST INFORMATION (Labor and/or 1991 hours)
ON THE ECONOMIC IMPACT OF CURRENT NRC REGULATIONS OR ANY FUTURE
PROPOSED NRC REGULATIONS THAT MAY AFFECT YOU? (NRC regulations permit
it to protect confidential commercial or financial proprietary information furnished to
the agency in confidence)

YES

NO

FOR NRC USE ONLY

TYPE OF FEE

FEE LOG

FEE CATEGORY

COMMENTS

APPROVED BY

AMOUNT RECEIVED

CHECK NUMBER

RECEIVED

MAR 27 1997



Black Beauty Coal Company

March 25, 1997

Ms. Evelyn Matson
U.S. Nuclear Regulatory Commission Region III
Materials Licensing Section
799 Roosevelt Road
Glen Ellyn, IL 60137

Dear Ms. Matson:

Please find enclosed revisions to our material license application for our Francisco Mine,
Project #302070-302370

If you have any questions or comments, please feel free to contact me.

Sincerely,

Eric P. Fry /lrh

Eric P. Fry
Environmental Affairs Manager
BLACK BEAUTY COAL COMPANY

EPF:lrh
Enclosure

RECEIVED

MAR 27 1997

MAR 27 1997

REGION III

5.

Element and Mass Number (A)	Chemical and/or Physical Form (B)	Name of Manufacturer and Model Number (if sealed source) (C)	Maximum number of millicuries which will be possessed at any one time (D)
1. Californium 252	Sealed source	Amersham model CVN.C70 or Frontier Technology Model 100 series	125 millicuries in sources
2. Cesium 137	Sealed source	Isotope Product Labs Model 225 CDC.704 and CDC.705	25 millicuries in 2 sources

6. Describe use of radioactive material

- To be used as components of a GAMMA-METRICS Bulk Material Analyzer, Model 2000, for the measurement of elemental analysis of coal.
- To be used as components of a GAMMA-METRICS Bulk Material Analyzer, Model 2000, for the measurement of density/weight.

7. Russell Hill and Carl Consalus will receive training by GAMMA-METRICS upon receipt of equipment on site.

8. Trainees: Field Representative
c/o GAMMA-METRICS
5788 Pacific Center Blvd.
San Diego, CA 92121

Training Duration: one day

Date for schedule training:

Tentative Date: March 15, 1997

9. See Attachment A.

10. Radiation and protection program to be provided at site by GAMMA-METRICS on--sealed source paper wipe leak test performed by GAMMA-METRICS field engineer every three months.

Personal Monitoring Devices:

Type	Supplier	Exchange Frequency
Film Badge	Radiation Detection Co. 162 Wolfe Road Sunnyvale, CA 94088-3414	Quarterly

11. Depleted/spent sources will be returned manufacturing vendor for proper disposal.

12. \$550.00

5.

Element and Mass Number (A)	Chemical and/or Physical Form (B)	Name of Manufacturer and Model Number (if sealed source) (C)	Maximum number of millicuries which will be possessed at any one time (D)
1. Californium 252	Sealed source	Amersham model CVN.CY6 or Frontier Technology Model 100 series	125 millicuries in sources
2. Cesium 137	Sealed source	Isotope Product Labs Model 225 CDC.704 and CDC.705	25 millicuries in 2 sources

6. Describe use of radioactive material

1. To be used as components of a GAMMA-METRICS Bulk Material Analyzer, Model 2000, for the measurement of elemental analysis of coal.
2. To be used as components of a GAMMA-METRICS Bulk Material Analyzer, Model 2000, for the measurement of density/weight.
7. Russell Hill and Carl Consalus will receive training by GAMMA-METRICS upon receipt of equipment on site.
8. Trainees: Field Representative
c/o GAMMA-METRICS
5788 Pacific Center Blvd.
San Diego, CA 92121

Training Duration: one day

Date for schedule training:

Tentative Date: March 15, 1997

9. See Attachment A.
10. Radiation and protection program to be provided at site by GAMMA-METRICS on--sealed source paper wipe leak test performed by GAMMA-METRICS field engineer every three months.
11. Depleted/spent sources will be returned manufacturing vendor for proper disposal.
12. \$550.00

1st
Replacement
Page

5.

Element and Mass Number (A)	Chemical and/or Physical Form (B)	Name of Manufacturer and Model Number (if sealed source) (C)	Maximum number of millicuries which will be possessed at any one time (D)
1. Californium 252	Sealed source	Amersham model CVN.CY6 or Frontier Technology Model 100 series	125 millicuries in sources
2. Cesium 137	Sealed source	Isotope Product Labs Model 225 CDC.704 and CDC.705	25 millicuries in 2 sources

6. Describe use of radioactive material

1. To be used as components of a GAMMA-METRICS Bulk Material Analyzer, Model 2000, for the measurement of elemental analysis of coal.
2. To be used as components of a GAMMA-METRICS Bulk Material Analyzer, Model 2000, for the measurement of density/weight.
7. Russell Hill and Carl Consalus will receive training by GAMMA-METRICS upon receipt of equipment on site. Russell Hill will be designated the Radiation Safety Officer.
8. Trainees: Field Representative
c/o GAMMA-METRICS
5788 Pacific Center Blvd.
San Diego, CA 92121

Training Duration: one day

Date for schedule training:

Tentative Date: March 15, 1997

9. Equipment is contained in a modified shipping container with the dimensions:

Length - 158 inches

Width - 96 inches

Height - 102 inches

An entry port and an exit port exist on the top and bottom with the approximate dimensions 18"x 24". A door is provided for entry and kept locked. The radiation safety officer is the only individual provided with a key to this lock. See Attachment A.

10. Radiation and protection program to be provided at site by GAMMA-METRICS on--sealed source paper wipe leak test performed by GAMMA-METRICS field engineer every three months. Signs will be posted at the analyzer entry and exit ports with the wording "Radioactive Material". The analyzer will remain locked at all times. For emergency fire procedures, see Attachment B.
11. Depleted/spent sources will be returned manufacturing vendor for proper disposal.
12. \$550.00

2nd
replacement
page

ATTACHMENT A

SAFETY EVALUATION OF DEVICE

Corrected Copy

(Amended Page 2 and 10, September 5, 1991) *KES*
(Amended Page 1, August 7, 1989) *PBP*(Amended Page 1, September 24, 1991) *KES*
(Amended Page 1, February 8, 1991) *KES*

DATE: June 28, 1985

Page 1 of 10

HQ: CA305D10LS

DEVICE TYPE: Bulk Materials Elemental Analyzer

MODEL: 2000

FEB 19 1992

MANUFACTURER/DISTRIBUTOR: GAMMA-METRICS, Inc.
5788 Pacific Center Blvd.
San Diego, CA 92121

SEALED SOURCE MODEL DESIGNATION: Monsanto Model MRC 2765 (Cs-252)

Amersham Models CVN.CYS (Cs-252)

CDC.704, and CDC.705 (Cs-137)

Frountier Technology Corporation
Model 100 Series (Cs-252)

Isotope Products Lab Model 225 (Cs-137)

ISOTOPE: Californium-252

MAXIMUM ACTIVITY: 200 micrograms (108 mCi)
(in nine sources)

Cesium-137

25 milligrams in two sources

LEAK TEST FREQUENCY: Six Months

PRINCIPAL USE: Other

CUSTOM DEVICE: YES

X NO

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES

SAFETY EVALUATION OF DEVICE

(Amended Page 2 and 10, September 5, 1991)

NO.: CA 305D1015

DATE: June 28, 1985

PAGE: 2 of 10

DEVICE TYPE: Bulk Material Elemental Analyzer.DESCRIPTION:

Summary Description: The Gamma Metrics Bulk Materials Analyzer is a (Prompt gamma neutron activation analyzer) elemental analyzer designed for continuous use by the coal, cement, fertilizer, and chemical industries. The device consists of three major elements: (1) The Source Handling Assembly, (2) The Material Handling, Shielding & Housing Assembly, and (3) The Associated Electronics Assembly.

(1) Source Handling Assembly:

The source handling assembly maintains correct geometry of the neutron sources with respect to detectors during normal operation and retracts them to a shielded location for maintenance or in the event of a system malfunction. Loss of power to the source handling assembly will automatically return the neutron sources which return to their storage location.

(2) Material Handling, Shielding & Housing Assembly:

Material handling is accomplished by standard handling mechanisms which provide a continuous flow of material through a chute in the analyzer thus passing the sample through a neutron field where the prompt emission of capture gamma rays occurs.

A combination of borated paraffin neutron, and lead or bismuth gamma shielding is provided to reduce radiation dose equivalent rates to less than 0.5 rem per year to any person inside or outside the housing assembly. Occupancy of the area beneath the analyzer is physically restricted to meet the above dose limitation.

The housing assembly is a metal and fiberglass structure (7.7 Ft. H X 11.5 Ft. W X 8.0 Ft. D) which contains all of the above subsystems and is of a rugged design for use in an outside industrial environment. Entrance to the housing is controlled by a locked door. The only access to the radioactive sources other than during assembly is through the housing door.

(3) Associated Electronics Assembly:

The associated electronics assembly converts the prompt gamma ray data measured by detectors located opposite the neutron sources into data useful to the user. This assembly also responds to a high temperature alarm by instituting storage of the neutron sources and remote operator notification.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO: CA-305D101S

DATE: June 28, 1985

PAGE: 3 of 10

DESCRIPTION: (Associated Electronic Assembly) cont'd.

Indicators of source status are located within the housing and are prominently displayed on the electronics panel. A red light labeled "ON" and green light labeled "OFF" indicate the status of the neutron sources during operation.

LABELING:

The Model 2000 Bulk Materials Analyzer bears the following permanent label:

CAUTION: RADIOACTIVE MATERIALS.

Along with a radiation symbol meeting the requirements of Section 20.203, 10 CFR Part 20, the label also contains the company name Gamma-Metrics, Inc. as well as the isotopes and activities (including the measurement dates). The label contains a reference to the Gamma-Metrics Bulk Materials Analyzer Radiological Safety Procedures Manual with regard to operator radiation safety. This label is located just inside of the access door (See Figure 2).

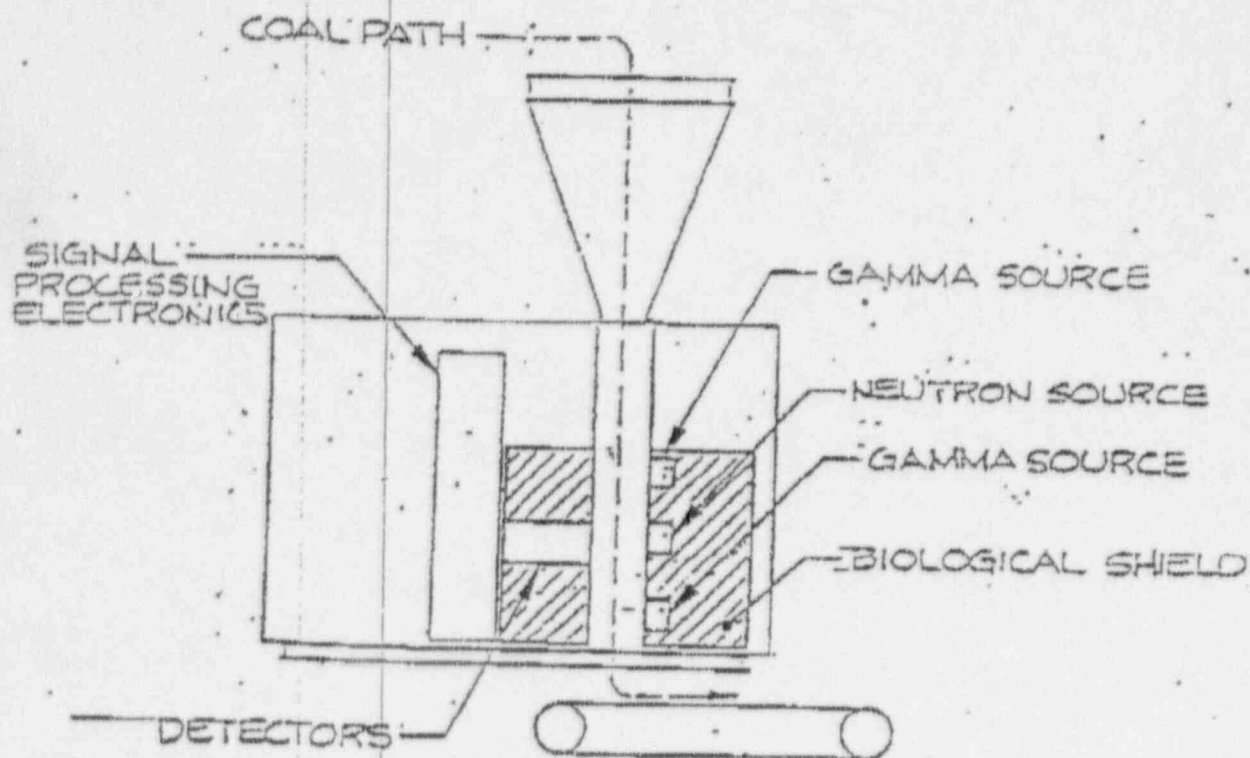
DIAGRAM: See Figures:

- (1) Simplified drawing
- (2) Top and Side view
- (3) Typical installation

NO: CA 305D1015

DATE: June 28, 1985

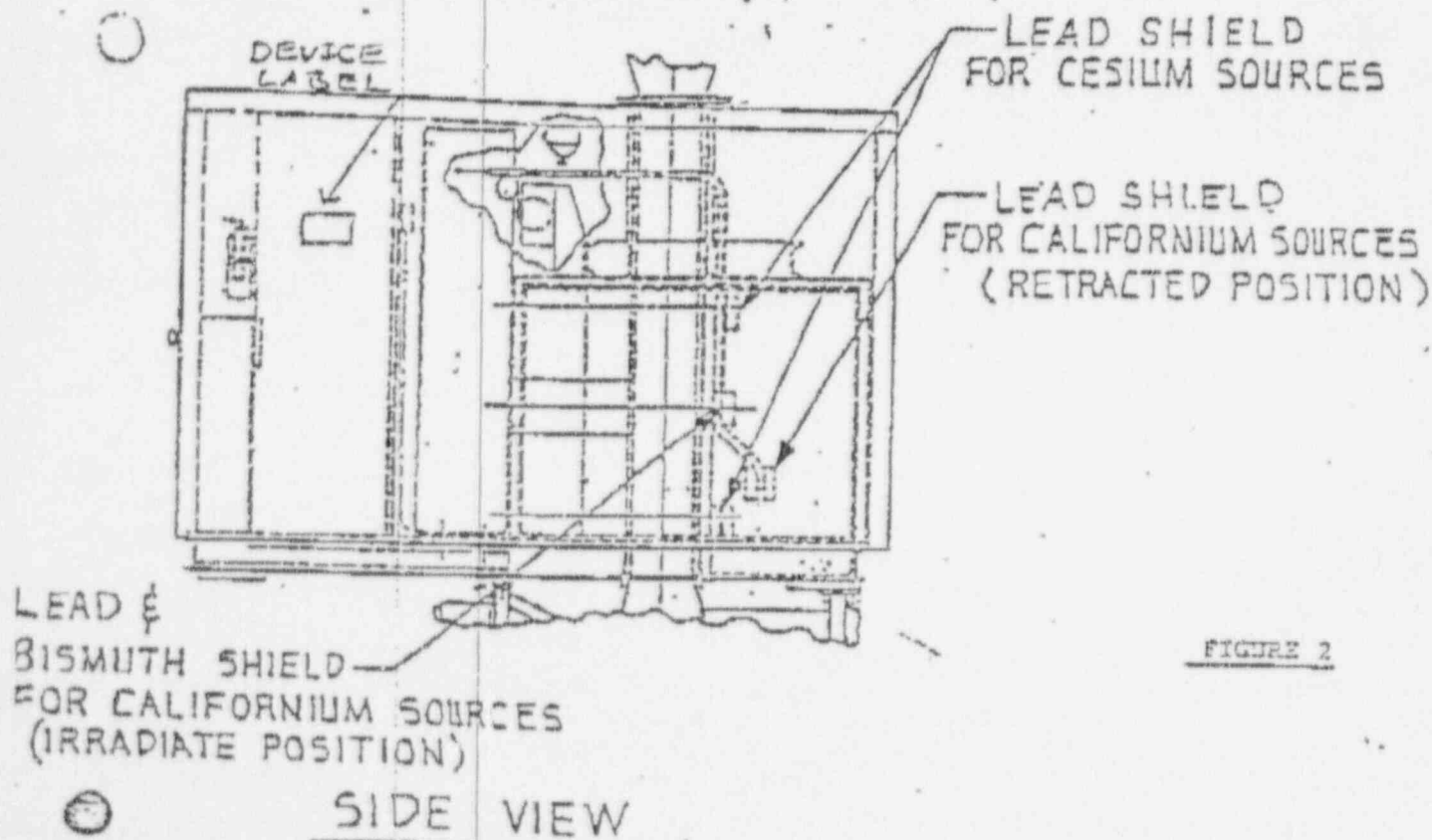
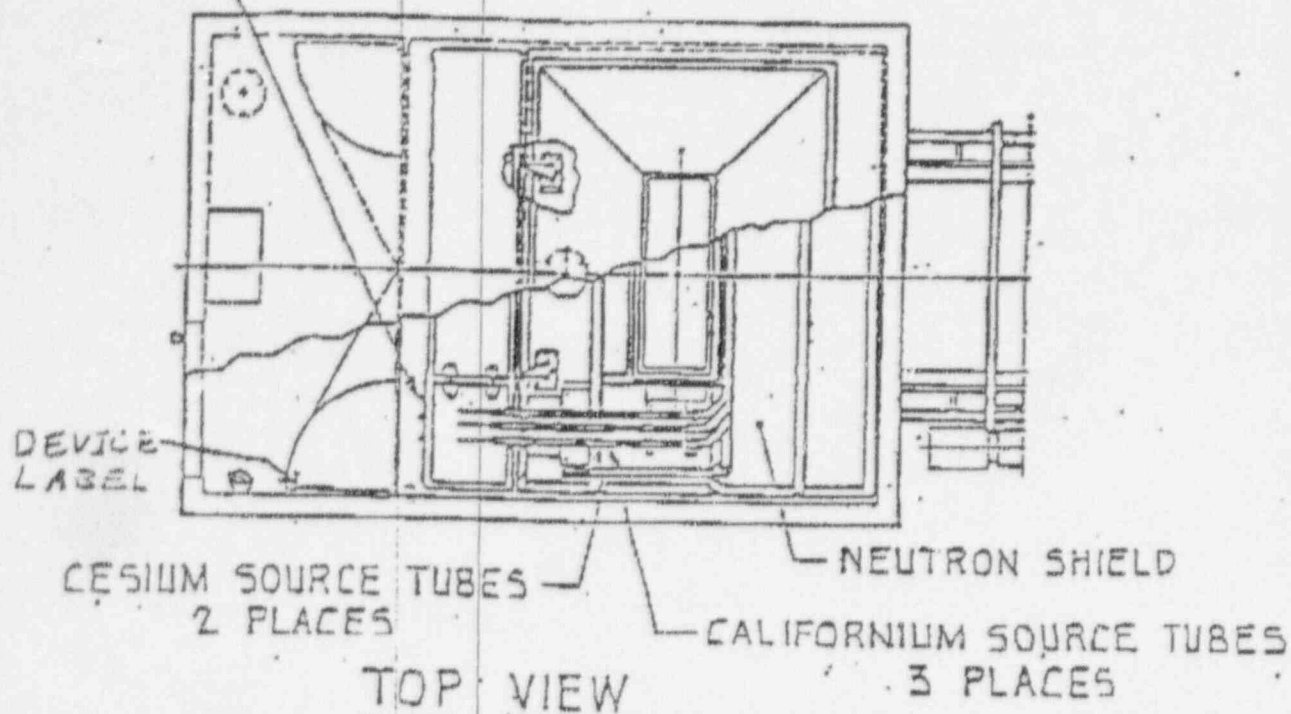
PAGE 4 of 10

FIGURE 1

ON/OFF INDICATOR
PANEL

DATE: June 28, 1955

PAGE 5 of

FIGURE 2

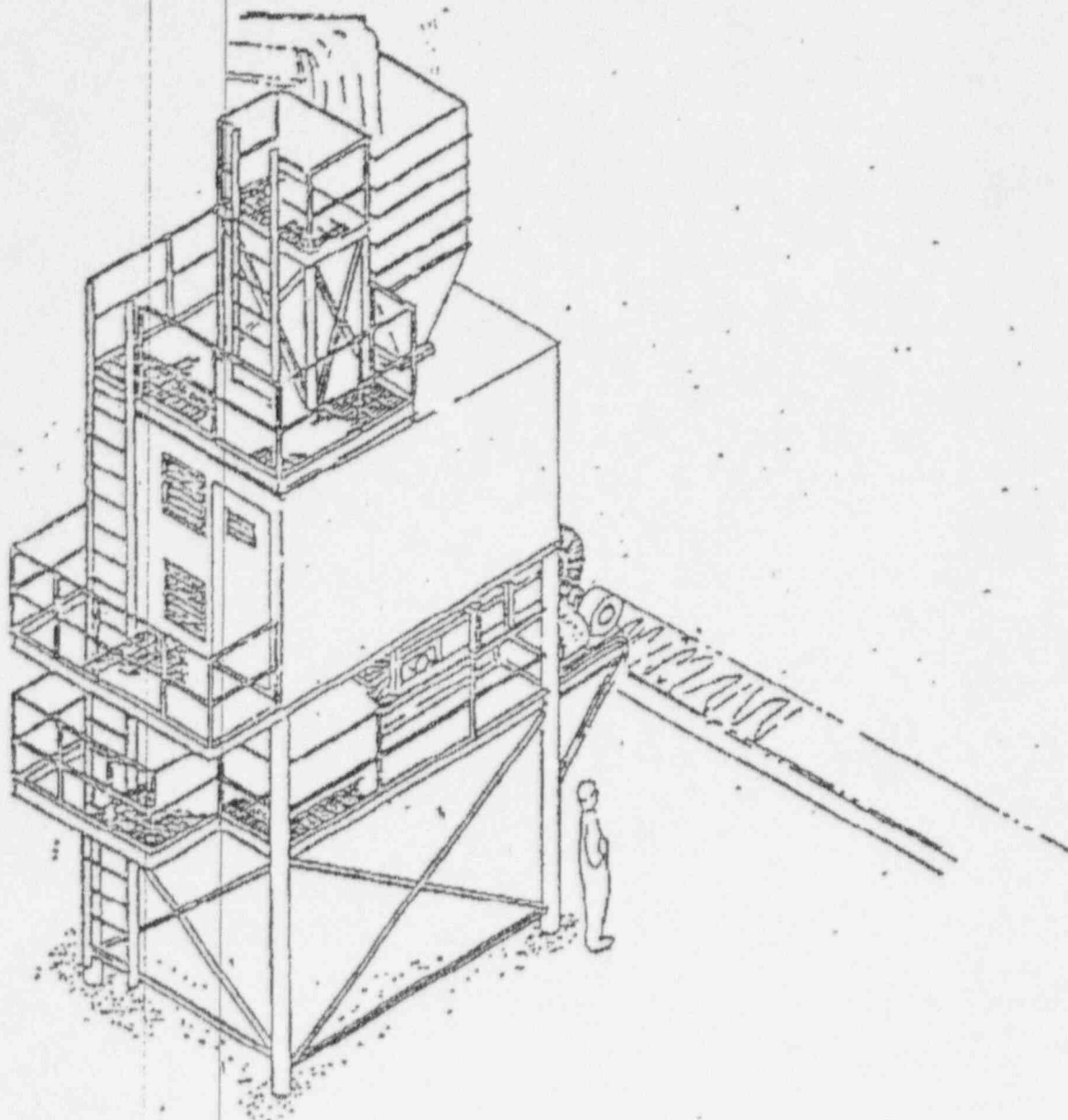
ICAL INSTALLATIONDATE: June 28, 1985PAGE 6 of 10

Figure 3.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO: CA 305D1015

DATE: June 28, 1985

PAGE: 7 of 10

DEVICE TYPE: Bulk Material Elemental Analyzer.

CONDITIONS OF NORMAL USE:

Planned Use: The Gamma Metrics Model 2000 Bulk Materials Analyzer will be used by the coal, cement, fertilizer, and chemical industries. This will include mining operations, batching and distribution operations, and other industrial uses. The units (including radioactive sources) will be delivered by common carrier. Installation shall be performed by Gamma-Metrics.

Environment: Since the units may be situated in outside industrial environments, they are designed for a wide spectrum of weather conditions ranging from snow and ice to 75 MPH wind forces. The device is capable of tolerating a temperature range of -40 to 130 degrees Fahrenheit.

PROTOTYPE TESTING:

The first production unit was loaded with 100 micrograms of Cf-252 and 20 millicuries of Cs-137. The assigned ANSI classification for this loading is ANSI-24-763-553-R1. Due to the materials of construction, a fire test was not performed. A loading of 200 micrograms (Cf-252) and 15 millicuries (Cs-137) would have an ANSI Classification ANSI-24-653-542-R. Most units will be loaded with 100 micrograms of Cf-252.

EXTERNAL RADIATION LEVELS:

(All measurements made by ion chamber and BF-3 "Snoopy" rem-meter)

Normal Loading:

Table I: 100 micrograms Cf-252
 20 millicuries Cs-137
 (mRem/hr)

	<u>5 cm</u>	<u>30 cm</u>	<u>100 cm</u>
<u>Chute loaded</u>			
Source On	1.58	1.13	1.00
Source Off	3.37	2.66	0.86
<u>Chute unloaded</u>			
Source Off	5.29	3.05	1.13

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO: 305D101S

DATE: June 28, 1985

PAGE 8 of 10

DEVICE TYPE: Bulk Material Elemental Analyzer.

EXTERNAL RADIATION LEVELS: (cont'd)

MAXIMUM LOADING:

Table II: 200 micrograms Cf-252,
15 millicuries * Cs-137
(mRem/hr.)

	<u>5 cm</u>	<u>30 cm</u>	<u>100 cm</u>
<u>Chute loaded</u>			
Source on	3.09	2.07	1.58
Source off	6.36	5.36	1.68
<u>Chute unloaded</u>			
Source off	10.04**	5.71	2.13

* Less Cs-137 is needed with 200 micrograms of Cf-252.

** The dose rates increase underneath the unit, as the sources move towards the storage mode (See Figure 2 for source locations).

QUALITY ASSURANCE AND CONTROL:

Gamma-Metrics provided a summary of the Quality Assurance Program, referencing 10 CFR 50, Appendix B and ANSI N45.2. These procedures are outlined in the Gamma-Metrics Quality Assurance Manual to ensure quality of design, material, workmanship and documentation.

LIMITATIONS AND/OR OTHER CONSIDERATION OF USE:

- The Model 2000 shall be distributed only to persons specifically licensed by the NRC or Agreement States.
- The device shall be leak tested at six (6) month intervals using techniques capable of detecting 0.005 microcuries of removable contamination.

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

NO: CA 305D1015

DATE: June 28, 1985

PAGE 9 of 10

DEVICE TYPE: Bulk Material Elemental Analyzer

LIMITATIONS AND/OR OTHER CONSIDERATIONS OF USE: (cont'd)

- C. These devices shall not be subjected to environmental conditions exceeding those specified in the ANSI-24-763-553-R1 classification.
- D. Instructions to users: A Radiological Procedures Manual is provided and summarizes basic radiation safety with respect to the use of the device.
- E. Installation and Relocation: This must be provided by the manufacturer or other specifically licensed organization.
- F. Emergency Procedures: As a fire could substantially compromise the shielding, specific instructions should be described and posted.
- G. Source exchange due to decay shall only be performed by Gamma-Metrics or other specifically licensed organization.
- H. Maintenance is provided at six-month intervals by the manufacturer and should be a licensee commitment.
- I. This registration sheet and the information contained within the references shall not be changed or transferred without the written consent of the California Department of Health Services.

SAFETY ANALYSIS SUMMARY:

Based on our review of the information and test data cited below, we conclude that the Model 2000 device design is acceptable for licensing purposes.

A "Failure Modes and Effects Analysis" provided an assessment of numerous failure modes and their mitigation by various safety systems.

The external dose rates average less than 0.5 mRem/hr at 5 cm, although the tables list the maximum values for purposes of establishing the ANSI classification

Even in the event that a fire destroys the shielding, the sources should maintain integrity due to their own ANSI classifications which exceed those required for the intended use (C 64545, C644)

REGISTRY OF RADIOACTIVE SEALED SOURCES AND DEVICES
SAFETY EVALUATION OF DEVICE

(Amended Page 2 and 10, September 5, 1991)

NO: CA 105D1015

DATE: June 28, 1985

Page 10 of 10


DEVICE TYPE: Bulk Material Elemental Analyzer

REFERENCES:

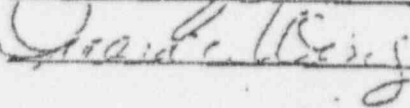
The following supporting documents for the Model 2000 Bulk Materials Elemental Analyzer are hereby incorporated by reference and are made a part of this registry document:

- 1) Gamma-Metrics letter with attached "Manufacturers Information Sheet" and supporting documentation dated November 20, 1984 (including QA Procedures).
- 2) Gamma Metrics letter dated May 13, 1985.
- 3) NBS Handbook No. 129, American National Standard N.538-1979, "Classification of Industrial Ionizing Radiation Gauging Devices".
- 4) Gamma Metrics letters dated July 26, 1985, and November 20, 1985.
- 5) Gamma Metrics letter with attachment dated July 25, 1991.

DATE: 12/9/85

REVIEWED BY: 

DATE: 12/12/85

CONCURRENCE: 

ISSUING AGENCY: California Department of Health Services

U.S. Department
of Transportation
Research and
Special Programs
Administration

400 Seventh Street, SW
Washington, D.C. 20590

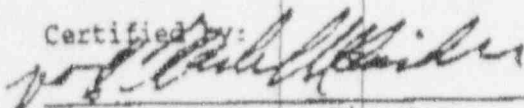
IAEA CERTIFICATE OF COMPETENT AUTHORITY
SPECIAL FORM RADIOACTIVE MATERIALS
CERTIFICATE NUMBER USA/0367/S, REVISION 4

This certifies that the sources described have been demonstrated to meet the regulatory requirements for special form radioactive material as prescribed in the regulations of the International Atomic Energy Agency¹ and the United States of America² for the transport of radioactive materials.

1. Source Identification - Frontier Technology Corporation Model 10 Series and Model 100 Series.
2. Source Description - The Series 10 sources are single encapsulations measuring 5.5 mm (0.217") OD x either 12 mm (0.47") or 25 mm (0.98"). The Series 100 sources are double encapsulations (inner capsule is a Series 10) measuring 9.4 mm (0.37") OD x approximately 25 mm (0.98") or 38 mm (1.48") in length. Both the Series 10 and 100 source capsules are manufactured of 304L stainless steel or zircalloy. Series 100 sources may have a special stud attachment, or may have an extended length with or without an attachment hole as illustrated and described on the attached drawings. These features are identified by prefix and suffix letters in the source model numbers which are also identified on the attached drawings.
3. Radioactive Contents - These sources consist of not more than 0.2 TBq (5.4 Ci) of Californium 252 in the form of Cf-Pd cermet or Cf-Pd alloy.
4. Expiration Date - This certificate expires September 30, 2000.

This certificate is issued in accordance with paragraph 803 of the IAEA Regulations and Section 173.476 of Title 49 of the Code of Federal Regulations, in response to the petition and information dated August 8, 1995 and September 12, 1995 submitted by Frontier Technology Corporation, Xenia, OH, and in consideration of other information on file in this Office.

Certified by:



James K. O'Steen, Director
Office of Hazardous Materials
Technology

OCT 3 1995

(DATE)

Revision 4 - Issued to authorize the use of special attachments on the Series 100 capsule, and to extend the expiration date.

1 "Safety Series No. 6, Regulations for the Safe Transport of Radioactive Materials, 1973 Revised Edition, as amended," published by the International Atomic Energy Agency (IAEA), Vienna, Austria.

2 Title 49, Code of Federal Regulations, Parts 100 - 199, United States of America.

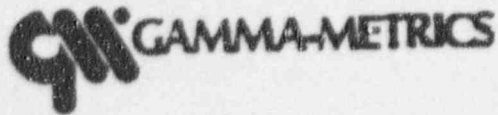
Frontier Technology Corporation Model 100

The Model 100 series of neutron sources are doubly-encapsulated sources which employ a Model 10 series source as the primary encapsulation. Model 100 series sources have an outside diameter of 0.370/0.371 inches, and are available in two lengths, both of which are available with or without a 10-32 threaded stud on one end. The longer length version with the stud is equivalent to the Savannah River SR-CF-100 series capsules. Outer capsule material may be either type 304L stainless steel or Zircalloy-2. Closure is by TIG welding.

Thirty-two versions of the standard length source and thirty-two versions of the shortened source are possible as the result of various combinations of inner and outer capsule materials and orientations, and the presence of or lack of the threaded stud. All sixty-four versions of the Model 100 series are certified by the USDOT as Special Form, and all have been approved for licensing purposes by the USNRC for general uses.

Nominal dimensions for the Frontier Technology Corporation Model 100 and Model 100S sources are shown below:

	Model 100	Model 100S
outside diameter	0.370/0.371 inch 9.398/9.423 mm	0.370/0.371 inch 9.398/9.423 mm
inside diameter	0.234/0.235 inch 5.953/5.982 mm	0.234/0.233 inch 5.953/5.982 mm
inside length	1.02 inches 30.6 mm	0.52 inch 13.2 mm
outside length w/stud	1.48 inches 37.59 mm	0.97 inch 24.6 mm
outside length w/o stud	1.28 inches 32.5 mm	0.77 inch 19.55 mm
Maximum content: Californium-252	10 milligrams	4 milligrams



**EMERGENCY PROCEDURES
for
Installed Bulk Material Analyzers**

This procedure is intended for customers of GAMMA-METRICS who have one or more Bulk Material Analyzers installed on their premises. This includes all models of Bulk Material Analyzers as well as the FastLab[®] Sample Analyzer. This procedure assumes there is a site license for radiation sources and the sources are installed in the analyzer(s).

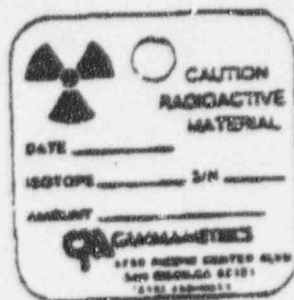
In the event of an accident resulting in structural damage to the analyzer, such as fire or any other situation that could cause one or more of the radiation sources to be exposed, follow this procedure:

1. In the case of a Bulk Material Analyzer, if possible, empty the chute of material (which will automatically cause the sources to be stored).
2. Turn off the power.
3. Notify the on-site Radiation Safety Officer (RSO).
4. Rope off the area around the analyzer at a distance to be determined by the RSO (normally about 50 feet from any possible area of radiological contamination).
5. Restrict access to the roped-off area to all non-essential personnel.
6. Call GAMMA-METRICS as soon as possible and ask for the Radiation Safety Officer or the BMA Field Service Department.
7. Notify the appropriate governmental authorities responsible for emergency response activities.

WARNING! Under no circumstance should anyone attempt to handle or repair the damaged analyzer until all radioactive materials are accounted for and removed from the analyzer.

Regulation

Regulations have been set up by the federal, state, and international governments to keep the exposure of personnel working with radioactive materials as low as reasonably achievable (ALARA). GAMMA-METRICS designed the Bulk Material Analyzer and FastLab to comply with these regulations. Part of the regulation compliance requires the labelling of radioactive material. The following figure shows a typical radiation label that should be attached to any radiation handling device that currently has a radiation source attached.



No other postings are required when the sources are correctly installed in the analyzer since the exterior doserates are below those which require posting. The on-site Radiation Safety Officer is required to know all other regulations that may be site specific.

Source Control

The BMA is set up with safety features that prevent people working around the equipment from accidentally coming in contact with radioactive sources.

Access Control -

Sources are locked into the analyzer with key access controlled by the Radiation Safety Officer.

Handling Assembly -

Source handling devices are provided with the analyzer to maintain a safe distance at all times from the radioactive sources.

Power Loss -

The BMA has a stored and deployed position for the radioactive sources. The deployed position requires material in the spout as added shielding. In the case of a power failure, the sources will immediately drop into the stored position as a fail-safe precaution.

Encapsulation -

The radioactive sources are sealed inside stainless steel capsules to prevent spreading of radioactive contamination.

Fire -

The source capsules can withstand most fires or small explosions. After any such event that could damage the capsule, however, they must be checked for leakage.

Leak Tests -

GAMMA-METRICS provides a leak test service for all radioactive sources at customer sites.

UNITED STATES NUCLEAR REGULATORY COMMISSION
REGION III
CONVERSATION RECORD

(X) TELEPHONE (X) OUTGOING () INCOMING () CONVERSATION

TIME: 4:30pm

DATE: 3/24/97

NAME OF PERSON(S) CONTACTED:

ORGANIZATION:

TELEPHONE NO.:

Eric Fry
Black Beauty Francisco Mine
812-424-9000

SUBJECT:

New license application.

SUMMARY:

The NRC needs that following additional information:

1. Lock Out Procedures

Lock out procedures are necessary to assure that gauge shutters are closed and locked and therefore, radiation levels are reduced before personnel enter a vessel or area to perform maintenance or repairs where a gauge is in use. This is to ensure that personnel are not inadvertently exposed to the radiation produced by the gauges. Please supplement your procedures with site specific information as follows:

- A. If the reactor vessels are large enough for a person to enter, you must describe how access to the radiation areas inside the vessels will be controlled. Warning signs or locked access ports are often necessary. Describe any such signs or security measures.
- B. Please define which departments or personnel may perform maintenance or repairs in the vessels or near the gauges. Describe how these individuals will be trained specifically in lock out procedures. Please define who will provide the training, when it will be provided, any annual refresher training, training of new employees, etc.

2. Emergency Procedures

- A. Please submit a description of emergency procedures that will be followed in the event of a fire or other disaster effecting the gauges. Fires can damage the shielding on the gauges and expose the radiation source. You must make plans on how to protect individuals from potential exposure to radiation. Please include the names and telephone numbers of the organizations that you will contacted in such an event. It is important that this information be available for your immediate use should an emergency occur.
- B. Please include in your procedures to instructions for making the required notifications of incidents to the NRC pursuant to the regulatory requirements of 10 CFR 20.2201, 20.2202, 20.2203 and 10 CFR 30.50. Copies are available from this office upon request.

ACTION REQUIRED:

Please respond in writing within 15 days, provide two copies of your response and refer to Control No. 302370.

ACTION TAKEN

NAME OF PERSON DOCUMENTING CONVERSATION

SIGNATURE

DATE

Evelyn R. Matson

3/24/97

630-829-9822



Black Beauty Coal Company

March 19, 1997

Ms. Gidget Watson
U.S. Nuclear Regulatory Commission Region III
Materials Licensing Section
799 Roosevelt Road
Glen Ellyn, IL 60137

RE: Material License Permit Application Addendum

Dear Ms. Watson:

Since sending your our material license application dated February 24, 1997, we have been informed by GAMMA-METRICS that film badges have not been required for this equipment. We would like to drop this language from our application. (See attached).

If you have any questions or comments, please feel free to contact me.

Sincerely,

Eric P. Fry
Environmental Affairs Manager
BLACK BEAUTY COAL COMPANY

EPF:lrh
Attachment

RECEIVED
MAR 21 1997
REGION III

5.

Element and Mass Number (A)	Chemical and/or Physical Form (B)	Name of Manufacturer and Model Number (if sealed source) (C)	Maximum number of millicuries which will be possessed at any one time (D)
1. Californium 252	Sealed source	Amersham model CVN.CY6 or Frontier Technology Model 100 series	125 millicuries in sources
2. Cesium 137	Sealed source	Isotope Product Labs Model 225 CDC.704 and CDC.705	25 millicuries in 2 sources

6. Describe use of radioactive material

1. To be used as components of a GAMMA-METRICS Bulk Material Analyzer, Model 2000, for the measurement of elemental analysis of coal.
2. To be used as components of a GAMMA-METRICS Bulk Material Analyzer, Model 2000, for the measurement of density/weight.

7. Russell Hill and Carl Consalus will receive training by GAMMA-METRICS upon receipt of equipment on site.

8. Trainees: Field Representative
c/o GAMMA-METRICS
5788 Pacific Center Blvd.
San Diego, CA 92121

Training Duration: one day

Date for schedule training:

Tentative Date: March 15, 1997

9. See Attachment A.

10. Radiation and protection program to be provided at site by GAMMA-METRICS on--sealed source paper wipe leak test performed by GAMMA-METRICS field engineer every three months.

11. Depleted/spent sources will be returned manufacturing vendor for proper disposal.

12. \$550.00



UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION III
801 WARRENVILLE ROAD
LISLE, ILLINOIS 60532-4351

March 3, 1997

Eric P. Fry
Environmental Affairs Manager
Black Beauty Francisco Mine
P. O. Box 347
Francisco, IN 47649-0347

SUBJECT: ACKNOWLEDGEMENT OF CORRESPONDENCE
(Application Dated 02/24/97)

Dear Licensee:

In response to your request, we have completed the initial processing, which is an administrative review of your application for a(n):

☒ New License ☐ Amendment ☐ Renewal
☐ Termination ☐ Auth User (Amendment not required)
☐ Other _____

No administrative deficiencies were identified during this initial review. However, it should be noted that a technical review may identify omissions in the submitted information.

It appears that your request is routine (see 1-3 below, as applicable).

1. New and amendment actions are normally processed within 90 days, unless we find major deficiencies, or policy issues requiring central program office assistance.
2. Renewal actions are normally processed within 180 days, however, under timely filing (before expiration), you may continue to operate under your existing license.
3. Termination actions are normally processed within 90 days, unless confirmatory surveys following decontamination/decommissioning activities are involved.

A copy of your correspondence has been forwarded to our Licensing Fee and Debt Collection Branch (301/415-6097) for approval of the fee category and amount, if required.

If you have a compelling safety or business-related reason for requesting expedited review, please contact the Materials Licensing Branch at (630) 829-9887. We will try to complete your request as soon as practicable. Any correspondence about this request should reference the control number.

Nuclear Materials Support Branch

Mail Control No. 302370
License No. 13-26785-01