

VOID SHEET

TO: License Fee Management Branch

FROM: RTI

SUBJECT: VOIDED APPLICATION

Control Number: 255315

Applicant: Univ. of P.R.

Date Voided: 3/15/94

Reason for Void: Applicant withdrew request
(see letter dtd. 3/1/94
fee exempt.

Deane O'Heim 3/15/94
Signature Date

Attachment:
Official Record Copy of
Voided Action

FOR LFMB USE ONLY

Final Review of VOID Completed:

- Refund Authorized and processed
- No Refund Due
- Fee Exempt or Fee Not Required

Comments: _____

Log completed
Processed by: Rem

310061

9404070252 940315
PDR ADOCK 03001182
C PDR

ML20

University of Puerto Rico
Mayaguez Campus
College of Agricultural Sciences
AGRICULTURAL EXPERIMENT STATION
P.O. Box 21360
Rio Piedras, Puerto Rico 00928

Address all correspondence to: Agronomy and Soils

phone: (809) 767-9705

fax: (809) 758-5158

March 1, 1994

Mr. Earl G. Wright
Senior License Reviewer
Nuclear Materials Licensing Section
U.S. Nuclear Regulatory Commission, Region II
101 Marietta Street, N.W. Suite 2900
Atlanta, Georgia 30323-0199

REGARDING: Renewal and ammendment of Licence No. 52-01986-01

Dear Mr. Wright:

Enclosed please find a document titled "Requested modifications to materials license No. 52-01986-10", which substitutes a document under the same title submitted with our license renewal application of September 27, 1993.

All sections pertaining to our proposed field test with C¹⁴-labelled ametryn, and which raised some concern in the NRC as indicated in your letter of January 24, 1994 (Reference no. 255315), have been omitted in the new ammendment request. It is our understanding that this action removes the concerns of NRC regarding ammendment and renewal of our License.

Please let me know if any further information is needed.

Sincerely,

Victor Snyder

Victor Snyder, Ph.D.
Radiation Safety Officer

xc: Nimia Irizarry
Rafael Montalvo Zapata

File control # 255578

*255315 (amend request
which is void renewal
EGW)*

(FOR LFMS USE)

INFORMATION FROM LTS

BETWEEN:

LICENSE FEE MANAGEMENT BRANCH, ARM
AND
REGIONAL LICENSING SECTIONS

PROGRAM CODE: 03121
STATUS CODE: 0
FEE CATEGORY: EX 3M
EXP. DATE: 19930930
FEE COMMENTS: 170.11(A)(4)
DECDM FIN ASSUR REQD: N

LICENSE FEE TRANSMITTAL

A. REGION

1. APPLICATION ATTACHED

APPLICANT/LICENSEE: PUERTO RICO, UNIVERSITY OF
RECEIVED DATE: 930525
DOCKET NO: 3001182
CONTROL NO.: 255315
LICENSE NO.: 52-01986-01
ACTION TYPE: AMENDMENT

2. FEE ATTACHED

AMOUNT: -----
CHECK NO.: -----

3. COMMENTS

SIGNED *James C. Klein*
DATE *5-12-93*

3. LICENSE FEE MANAGEMENT BRANCH (CHECK THE FEE CODE 03 IS ENTERED)

FEE EXEMPT

1. FEE CATEGORY AND AMOUNT: *EX-3M 170.11(A)(4)*

2. CORRECT FEE PAID. APPLICATION MAY BE PROCESSED FOR:

AMENDMENT
RENEWAL -----
LICENSE -----

3. OTHER -----

SIGNED *[Signature]*
DATE *6-2-93*

10/1/93

UNIVERSITY OF PUERTO RICO
MAYAGUEZ CAMPUS
COLLEGE OF AGRICULTURAL SCIENCES
AGRICULTURAL EXPERIMENT STATION
P. O. BOX 21360
RÍO PIEDRAS, PUERTO RICO 00926

Address all correspondence to:
Office of the Director

Phone 767-9705

May 12, 1993

RECEIVED BY LFDCB	
Date	June 1, 1993
Log	June 1 II
By	JA
Date Completed	6-2-93

Mr. John Potter
Chief, License Section
U.S. Nuclear Regulatory Commission
Region II, Nuclear Materials Safety Section
101 Marietta Street, Suite 2900
Atlanta, GA 30323

Thru Prof. *José A. Quiñones*
Dean and Director
College of Agricultural Science

Dear Mr. Potter:

Enclosed please find a copy of Materials license from University of Puerto Rico, Mayaguez Campus, Agricultural Experiment Station at Río Piedras. As you will notice that our current authorized use under condition A, covers the storage use only. However, we have recently received some funds to conduct both field and laboratory aspects of herbicide studies involving the use of ^{14}C labeled isotopes. Both studies will be conducted by Dr. Lii-Chyuan Liu, a plant physiologist and weed scientist at the Crop Protection Department of the Agricultural Experiment Station, University of Puerto Rico in Río Piedras.

The field study will be concerned with the use of ^{14}C ring-labeled ametryn (total specific activity 15mCi.) on tanier plants at the Corozal Substation, Barrio Padilla, Highway 159, Km. 7 Hm. 2, Corozal, P.R. The objective of this study is to generate residue and metabolism data required for the re-registration of ametryn in three root and tuber crops (tanier, yam and cassava) under IR-4 interregional project.

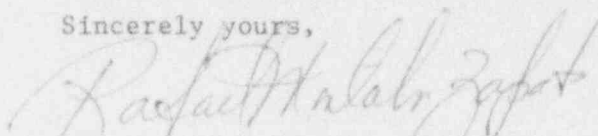
The laboratory study will be concerned with the use of ^{14}C -carboxyl labeled picloram (Total specific activity 82.6 uCi.) to determine soil adsorption of picloram by our pasture soils at the Agricultural Experiment Station, Barrio Venezuela, Caguas-Carolina intersection (Highway 1 and 3), Río Piedras, P.R. The objective of this study is to identify the vulnerable soils likely to cause groundwater contamination in Puerto Rico.

We are planning to initiate both experiments in the latter part of June, 1993. For your information we are submitting a photocopy of the protocol for ametryne/tanier and dalapon/soil, respectively. Your prompt

FEE EXEMPT

authorization on these amendments with only minor changes on respective items of the license will be greatly appreciated. We request that the maximum limit of carbon-14 isotope be increased from the original 10 mCi. to 26 mCi. The procedures for handling and using carbon-14 isotope will remain the same as those specified in our previous applications. There will be no change on the maximum limit of other radioisotopes and their related procedures. Should you need any additional information on this matter, please let me know. I shall be glad to furnish it. Thank you very much.

Sincerely yours,



Rafael Montalvo-Zapata
Assistant Director for Research

Enclosure

c Dr. Angel A. Custodio
Dr. Lii-Chyuan Liu
Miss Nimia Irizarry

PROTOCOL FOR AN AMETRYN EXPERIMENT ON TANIER

OBJECTIVE: To provide residue and metabolism data of ametryn in tanier for reregistration of this herbicide on three tropical root crops.

JUSTIFICATION: Ametryn, the only effective preemergence herbicide registered for weed control in tanier (Xanthosoma spp), yam (Dioscorea spp) and cassava (Manihot esculentus) in Puerto Rico and Florida, requires reregistration. The Ciba-Geigy Corporation will not support research needed for its reregistration due to the high cost involved in studies concerned with residue and metabolism data. An cooperative project between the University of Puerto Rico and University of Florida has been proposed and selected for funding during 1993 (\$ 55,495) by the National Agricultural Pesticide Impact Assessment program, Southern Region, United States Department of Agriculture (USDA). The proposed research is to generate residue and metabolism data of ametryn in tanier as required by the Environmental Protection Agency (EPA) for the reregistration purpose. Under this cooperative project, Puerto Rico will carry out the field aspect of the research and Florida, the greenhouse and laboratory phases of the same herbicide. This protocol covers only the field aspect of experimentation to be conducted by Puerto Rico.

PROJECT LEADER

Dr. Lii-Chyuan Liu, Plant Physiologist, Agricultural Experiment Station, College of Agricultural Sciences, University of Puerto Rico, Mayaguez Campus.

SITE OF EXPERIMENTATION AND INITIATION DATE

Corozal substation, Agricultural Experiment Station, UPR, located in Barrio Padilla, Highway 159 Km 7, Hm 2, in northcentral region of Puerto Rico, will be the site of this experiment. Corozal substation represents the typical root crop growing region in Puerto Rico. It is a field research center isolated from the large urban area with little possibility of herbicide contamination to the nearby community. The initiation date of the experiment is scheduled for June, 1993.

EXPERIMENTAL DESIGN AND HERBICIDE APPLICATION

The field experimental will consist of two treatments (Ametryn at recommended rate of 4 lbs ai/A and untreated control). As the radioactive ametryn will be used, we have to reduce the number of replication to only one in order to minimize any radioactive contamination problem that may occur under multiple replication situations. Individual plot will be established on a selected site which can be supervised continuously during the course of the experiment. The individual plot will measure 6' x 10' = 60 sq. feet. Each plot will contain two 10-foot long rows spaced at 3 feet apart. The planting distance within each row will be 1.5 feet between tanier plants. Each plot will contain 12 tanier plants. The tuber pieces of tanier cultivar, Allela, will be planted during the month of June, 1993.

Immediately after the planting, ^{14}C labeled ametryn at 4.0 lbs ai/A will be applied preemergence as a broadcast spray over the soil surface within the plot. A R & D portable Co₂ sprayer attached to a twin-nozzle boom will be used for herbicide spray. Prior to the actual spraying, the sprayer will be calibrated with water to determine the volume of water needed for the spray according to the standard operating procedure established by Inter-Regional project-4 (IR-4). The speed of travel will be timed by a mininome (a beating device) to maintain a constant speed. The applicator will wear water-proof protective clothing, gloves, boots and gozzles during the application process. The quantity of ametryn needed for 60 sq. feet of plot area is calculated as follows:

$$4 \text{ lbs} = 4 \times 453.6 \text{ gm} = 1,814.4 \text{ gm}$$

$$\frac{1,814.4 \text{ gm}}{43,560 \text{ sq. ft.}} = \frac{x}{60 \text{ sq. ft.}} \quad x = 2.50 \text{ gm}$$

(Quantity of ametryn needed for the plot)

This small quantity of ametryn (2.50 gm) will be prepared as ^{14}C ring-labelled form with a specific activity of 15.0 mCi./2.50 gm by the Ciba-Geigy Corporation and shipped to us for use.

A cyclone fence (50' x 100') will be built to enclose the entire experimental area for the prevention of the entry of unauthorized personnels. A radioactive warning sign will be posted on the cyclone fence. Soil mounds will first be piled up to surround the treated plot and then at the base of the entire cyclone fence to prevent any lateral movement of radioactive herbicide away from the experimental site (Fig. 1).

AGRONOMIC AND PESTICIDE MANAGEMENT

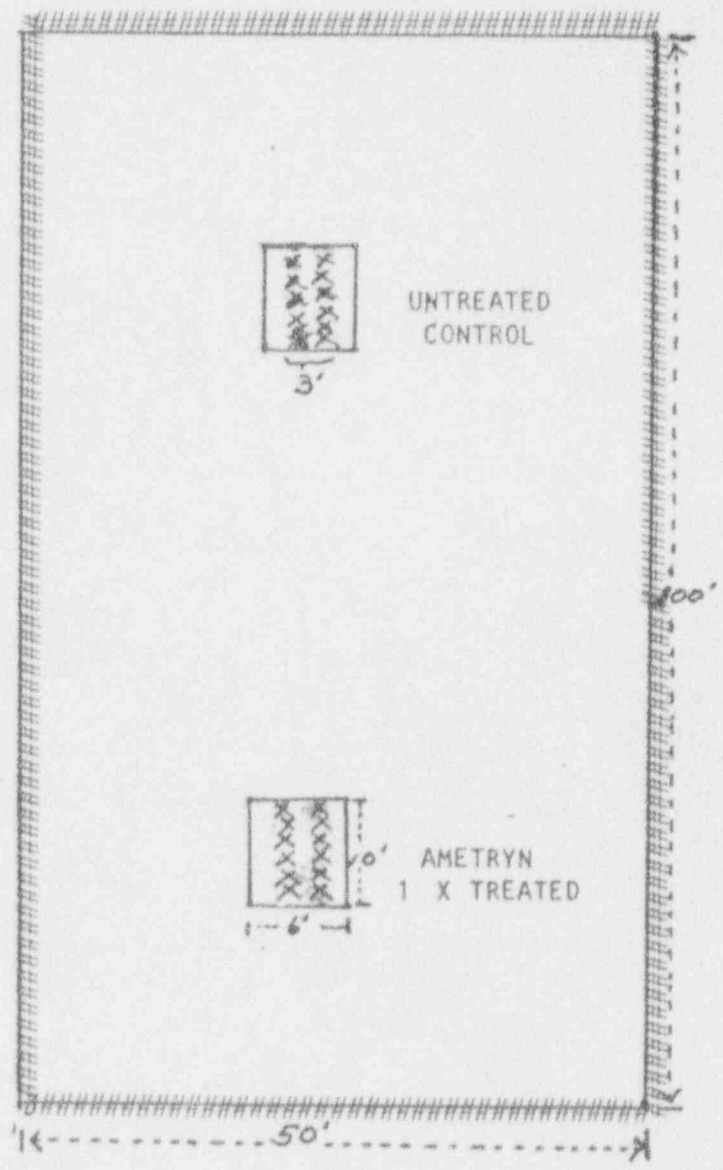
All agronomic practices will follow the standard recommendation for growing root crop in Puerto Rico. The same will apply to all pest managements. Any pesticides with similar chemical structure to ametryn will not be used here. Protective clothing, gloves and boots will be worn by workers while working inside the experimental area. Untreated control will be handweeded as needed. Supplementary weedings will be needed for ametryn treated plot. Precautions will be taken all the time after herbicide spray to avoid radioactive contamination.

SAMPLING AND HANDLING OF PLANT MATERIAL AFTER HARVEST

Persons participating in harvesting tubers will wear protective clothing, gloves and boots. Both untreated and treated plots will be divided into 4 quadrants with flagging tapes. Starting with untreated plots, three roots will be collected from each subplot with a total of 12 roots for the entire plot. Afterwards, the treated plot will be similarly sampled for equal number of roots. Soil from roots will be removed by either using a soft brush or lightly rinsing with tap water. Further cutting into section sampling with a knife may be needed to reduce the sample size. Place all samples in plastic-lined bag with identification number, name of Florida cooperater, treatment dosage, application date and harvesting /sampling dates. All root samples will be frozen as soon as possible after harvesting. The left-over roots and vines will be air-dried in the field and stored as radioactive wastes. All the herbicide application and sampling equipments will follow

the standard decontamination procedures before they can be used again. The contaminated clothings, gloves, protective devices and sprayer will be disposed following the standard guideline for radioactive material disposal.

Prepared by Lii-Chyuan Liu



x TANIER PLANTS ### CYCLONE FENCE

Figure 1. Field map for an ametryn field experiment

PROTOCOL FOR ADSORPTION OF PICLORAM BY SOIL STUDY

OBJECTIVE: To determine adsorption characteristics of picloram by major pasture soils in Puerto Rico.

JUSTIFICATION : Picloram is a highly mobile herbicide and widely used by local farmers for controlling weeds. Its potential for groundwater contamination is practically unknown under our high rainfall conditions. The Institute of Water Resources, University of Puerto Rico through the Department of Interior of the United States has provided us a financial aid of \$ 20,000 to conduct a study on picloram groundwater contamination. The adsorption aspect constitutes the first objective of the entire research with an attempt to identify the specific soils vulnerable to picloram groundwater contamination.

PROJECT LEADER

Dr. Lii-chyuan Liu, Plant Physiologist, Agricultural Experiment Station, College of Agricultural Sciences, University of Puerto Rico, Mayaguez Campus.

SITE OF EXPERIMENTATION AND INITIATION DATE:

Agricultural Experiment Station, Rio Piedras Research Center, Rio Piedras, Puerto Rico.

EXPERIMENT PLAN

Soil samples will be collected at a depth of 0-15 cm from representative pasture fields located in the northern humid region of Puerto Rico. The physical and chemical properties of these soils will be determined at the central Analytical Laboratory, AES-UPR. One gram of each air-dried soil will be weighed into a small erlenmeyer flask containing 5 ml of different concentrations (0.5, 1.0, 2.0, 4.0 & 8.0 ppm of ^{14}C -carboxyl labeled picloram (specific activity 4.13 $\mu\text{g Ci./mg}$ with a total specific activity of 82.6 $\mu\text{Ci.}$) to determine the magnitude of picloram adsorption by pasture soils. The standard radioassay procedure will be followed. After shaking the flask on a horizontal shaker for 12 hr, the soil suspension will be centrifuged for 10 minutes at 5,000 rpm. Then 1 ml of the supernatant solution will be added to 10 ml of scintillation solution. The remaining radioactivity in the supernatant will be determined using scintillation counting. The Freundlich equation $X/M = KC^{1/n}$ will be used to characterize the adsorption behavior. Where X/M is the weight (μg) of picloram adsorbed per gram of soil. C is the picloram equilibrium concentration ($\mu\text{g/ml}$) and K and $1/n$ are constants. The adsorption isotherms will be constructed on the basis of the above data. The adsorption constant (K) for different soils will be determined graphically. The K values thus obtained will serve as a guide for predicting the mobility of picloram in different soils and also will be correlated with respective soil properties.

MATERIALS LICENSE

Amendment No. 22

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 1, Parts 30, 31, 32, 33, 34, 35, 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.

Licensee		In accordance with letter dated March 28, 1989,	
1. University of Puerto Rico Agricultural Experiment Station		3. License number 52-01986-01 is amended in entirety to read as follows:	
2. P. O. Box 21360 Rio Piedras, Puerto Rico 00926		4. Expiration date September 30, 1993	
		5. Docket or Reference No. 030-01182	
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. Carbon 14	Any	A. 10 millicuries	
B. Nickel 63	Boil sources (U.S. Radio Corporation, AE70) contained in metal detector cells	B. Not to exceed 14.5 millicuries per foil	
C. Hydrogen 3	Foil sources (contained in Varian 0222681 detector cells or Safety Light Corp. Model 508-2)	C. Not to exceed 1 curie per foil	
D. Cesium 137	★ Sealed source (Campbell D. Pacific Nuclear Model CPN 131)	D. Not to exceed 10 millicuries per source	
E. Americium 241	E. Sealed neutron sources (Campbell Pacific Nuclear Model CPN 131)	E. Not to exceed 50 millicuries per source	
F. Americium 241	F. Sealed neutron sources (Troxler Dwg. No. A-102700)	F. Not to exceed 10 millicuries per source	
9. Authorized use			
A. For storage only.			
B. For use in gas chromatographs for sample analysis.			
C. For foil source preconditioning in accordance with letters dated December 22, 1983 and February 22, 1984 and attachments thereto and use in gas chromatographs.			



MATERIALS LICENSE
SUPPLEMENTARY SHEET

License number

52-01986-01

Docket or Reference number

030-01182

Amendment No. 22

CONDITIONS

(cont'd)

- D. and E. For use in Campbell Pacific Nuclear Models MC Series and 500 Series portable gauging devices for measurement of density and moisture in soil.
- F. For use in Troxler Electronic Laboratories Models 3220 or 3320/3330 Series portable gauging devices for measurement of moisture in soil.

CONDITIONS

10. A. Licensed material listed in Items 6.A., 6.B., and 6.C. shall be used only at the Agricultural Experiment Station, Caguas - Carolina Intersection (Routes 1 and 3), Rio Piedras, Puerto Rico.
- B. Licensed material listed in Items 6.D., 6.E., and 6.F. shall be stored at the Agricultural Experiment Station in Rio Piedras, Puerto Rico and used at temporary jobsites of the licensee anywhere in the United States where the U.S. Nuclear Regulatory Commission maintains jurisdiction for regulating the use of licensed material.
11. A. Licensed material listed in Items 6.A., 6.B., and 6.C. shall be used by or under the supervision of, Rafael Montalvo, Nilsa Acin, James A. Singmaster, III, Ph.D., or Alex G. Alexander, Ph.D.
- B. Licensed material listed in Items 6.D., 6.E., and 6.F. shall be used by, or under the supervision and in the physical presence of Victor Snyder, Ph.D.
12. Sealed sources listed in Items 7.D., 7.E., and 7.F. shall not be opened or removed from the gauges by the licensee.
13. Maintenance on the portable gauging devices shall be performed only with the sealed sources in the safely shielded position.
14. Except as authorized under Item 9.C., detector cells containing licensed material shall not be opened or the foil sources removed from the detector cells by the licensee.
15. In lieu of using the conventional radiation caution colors (magenta or purple on yellow background) as provided in Section 20.203(a)(1), of 10 CFR Part 20, the licensee is hereby authorized to label detector cells and cell baths, containing licensed material and used in gas chromatography devices, with conspicuously etched or stamped radiation caution symbols without a color requirement.
16. Detector cells containing scandium tritide foil shall only be used in conjunction with a properly operating temperature control mechanism which prevents foil temperatures from exceeding 325 degrees Centigrade.
17. The licensee shall conduct a physical inventory every 6 months to account for all sources and/or devices received and possessed under the license. Records of inventories shall be maintained for 2 years from the date of each inventory.
18. The licensee may transport licensed material in accordance with the provisions of 10 CFR Part 71, "Packaging and Transportation of Radioactive Material."

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License number

52-01986-01

Docket or Reference number

030-01182

Amendment No. 22

CONDITIONS

(cont'd)

19. A. The source(s) specified in Items 7.D., 7.E., and 7.F. shall be tested for leakage and/or contamination at intervals not to exceed 6 months and the source(s) specified in Item(s) 7.B. shall be tested for leakage and/or contamination at intervals not to exceed 3 years. Any source received from another person which is not accompanied by a certificate indicating that a test was performed within 6 months before the transfer shall not be put into use until tested.
- B. Any source in storage and not being used need not be tested. When the source is removed from storage for use or transfer to another person, it shall be tested before use or transfer.
- C. The 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, the source shall be removed from service and decontaminated, repaired, or disposed of in accordance with Commission regulations. A report shall be filed within 5 days of the date the leak test result is known with the U. S. Nuclear Regulatory Commission, Region II, Division of Radiation Safety and Safeguards, Nuclear Material Safety Section, 101 Marietta Street, Suite 2900, Atlanta, Georgia 30323. The report shall specify the source involved, the test results, and corrective action taken. Records of leak test results shall be kept in units of microcuries and shall be maintained for inspection by the Commission. Records may be disposed of following Commission inspection.
- D. The licensee is authorized to collect leak test samples for analysis by Tracor, Campbell Pacific Nuclear, Troxler Electronic Laboratories, or tests for leakage and/or contamination shall be performed by persons specifically licensed by the Commission or an Agreement State to perform such services.
20. 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 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. Applications dated:
- o September 6, 1973
 - o February 6, 1978

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License number

52-01986-01

Docket or Reference number

030-01182

Amendment No. 22

CONDITIONS

(cont'd)

B. Letters (with attachments) dated:

- o April 2, 1974
- o October 11, 1978
- o March 8, 1983
- o December 22, 1983
- o February 22, 1984
- o August 17, 1984
- o April 13, 1988
- o March 28, 1989

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

CAROL A. CONNELL



Date

MAY 22 1989

By

Region II, Nuclear Materials
Safety Section
101 Marietta Street, Suite 2900
Atlanta, GA 30323