

October 6, 2011

Materials Licensing Branch
Nuclear Regulatory Commission, Region III
2443 Warrenville Road, Suite 210
Lisle, Illinois 60532-4352

PHONE: 630-829-9829; FAX: 630-515-1078

Subject: Amendment to License Number 24-11585-04 (Docket Number 030-18583)

To whom it may concern:

Missouri State University (MSU) hereby submits this request for an amendment to License Number 24-11585-04. MSU requests that an Enriched Uranium calibration standard be added to the license under authorized user, Robert Pavlowsky, PhD. The custom calibration standard is has a total activity of 0.750 +20%/-0% microCi, which means that the standard activity will be no more than 0.9 microCi. The standard will be comprised of the U-235, U-234, and U-238, as seen in the table below. The calibration standard will be in a sand matrix in a sealed Marinelli beaker. The standard will be used as a calibration source for a gamma spectrometer (CG4020 GE Co-Axial Detector with DSA Digital Spectrum Analyzer) for the analysis of sediment samples. The calibration standard will be used at the main campus of Missouri State University, 901 S. National Ave., Springfield, MO (Condition 10.A.), specifically in Temple Hall, Room 125. The research conducted with this calibration source will adhere to the Missouri State University Radiation Safety Program described and approved in previous license applications.

Enriched Uranium - 500 mL Sand in 500 mL					
Marinelli Beaker Calibration Standard					
Total Activity: 0.750 +20%/-0%					
U-235	~0.015 microCi				
U-234	~0.734 microCi				
U-238	~16.2 picoCi				

The manufacturer of the requested standard is Eckert & Ziegler Analytics, Inc. The source requested is a custom-made standard and therefore does not have a sealed source model number and is not listed in the Sealed Source and Device Registry. I have included a copy of Eckert & Ziegler Analytics, Inc.'s radioactive materials license which indicates their approval to make such custom standards, as well as the quotation given by Eckert & Ziegler to MSU for the calibration standard.

Please contact me at (417) 836-4132 or erinparrish@missouristate.edu if you have any additional questions regarding this amendment request.

Sincerely.

Erin Parrish. MS

Director of Research Compliance/RSO

4220 International Parkway, Suite 100, Atlanta, Georgia 30354
Chris Clark, Commissioner
Environmental Protection Division
Carol A. Couch, Director
404-362-2675

RADIOACTIVE MATERIALS PROGRAM GEORGIA RADIOACTIVE MATERIALS LICENSE

Pursuant to the Georgia Radiation Control Act O.C.G.A. 31-13 (H.B. 947) 1990 and the Georgia Department of Natural Resources Rules and Regulations, designated Chapter 391-3-17, and in reliance on statements and representations heretofore made by the licensee designated below, a license is hereby issued authorizing such licensee to transfer, receive, possess, and use the radioactive material(s) designated below; and to use such radioactive materials for the purpose(s) and at the place(s) designated below. This license is subject to all applicable rules and regulations of the Georgia Department of Natural Resources and orders issued by the Department, now or hereafter in effect, and to any condition specified below.

3.

License

(1. Name and 2. Address)

Page 1 of 5 Pages License Number GA 742-1 Amendment Number .25

In accordance with letter dated April 14, 2009, License Number GA 742-1 is

Eckert & Ziegler Analytics, Inc. amended in its entirety to read as follows: 1380 Seaboard Industrial Boulevard Atlanta, Georgia 30318 4. Expiration Date: November 30, 2011 5. Telephone Number: 404-352-8677 6. RADIOACTIVE MATERIAL 7. CHEMICAL AND/OR 8. MAXIMUM QUANTITY (ELEMENT AND MASS PHYSICAL FORM LICENSEE MAY POSSESS AT NUMBER) ANY ONE TIME A. Any radioactive material A. 2000 millicuries, not to exceed A. Anv with atomic number 3 50 millicuries per isotope with through 83, inclusive atomic number 3 through 83. inclusive B. Any radioactive material B. Anv B. 50 millicuries, not to exceed 5 with atomic number 84 millicuries per isotope with through 96, inclusive, atomic number 84 through 96. except special nuclear inclusive material C. Hydrogen 3 C. 50 millicuries C. Any D. Krypton 85 D. Any D. 5000 millicuries E. Polonium 210 E. Any E. 10 millicuries F. Thorium 232 F. Any F. 2.2 millicuries (20 kilograms) G. Uranium 234 G. As an impurity in G. 60 millicuries Uranium enriched in the isotope Uranium 235 H. Uranium 238 H. Any H. 2.9 millicuries (5000 grams) Xenon 127 I. Any 1000 millicuries J. Xenon 133 J. 5000 millicuries J. Any

Radioactive Materials License Supplementary Sheet

> Page 2 of 5 Pages License Number GA 742-1 Amendment Number .25

- 6. RADIOACTIVE MATERIAL 7. CHEMICAL AND/OR (ELEMENT AND MASS NUMBER)
 - PHYSICAL FORM
- 8. MAXIMUM QUANTITY LICENSEE MAY POSSESS AT ANY ONE TIME

K. lodine 125

- K. lotrex liquid
- K. 600 millicuries

- L. Special Nuclear Material (Uranium-233, Uranium-235, Plutonium)
- H. Any

H. A total quantity insufficient to form 95% of a critical mass. See item 9.L. below

9. **AUTHORIZED USE**

A. through J.

To receive, possess, use, transfer, and distribute radioactive materials for the purpose of preparation of custom instrument calibration standards, instrument calibration cross checks, spectral measurements, and analysis.

K.

To receive, possess, use, transfer, and distribute commercial calibration standards.

L.

To receive, possess, use, transfer, and distribute radioactive materials for the purpose of preparation of custom instrument calibration standards, instrument calibration cross checks, spectral measurements, and analysis. The licensee shall restrict the possession of special nuclear material such that the following sum of ratios equation is met:

$$\frac{\text{grams U-235}}{350} + \frac{\text{grams U-233}}{200} + \frac{\text{grams Pu}}{200} < 0.95$$

CONDITIONS

- 10. Radioactive material shall be used only at the licensee's address stated in Item 2 above.
- 11. The licensee shall comply with the provisions of Georgia Department of Natural Resources Rule 391-3-17-.03, "Standards for Protection Against Radiation, Amended.", Rule 391-3-17-.06, "Transportation of Radioactive Material, Amended.", and Rule 391-3-17-.07, "Notices, Instructions and Reports to Workers: Inspections, Amended."

Radioactive Materials License Supplementary Sheet

Page 3 of 5 Pages License Number GA 742-1 Amendment Number .25

Conditions (continued)

12. In accordance with DNR Board Policy adopted May 28, 2003, the fees associated with this license, fee category C.1, are:

Application fee \$1300 Annual fee \$2293 Amendment fee \$550 Non-routine Inspection fee \$2000

Checks for the fees should be made payable to the <u>Department of Natural Resources</u>, <u>Radioactive Materials Program</u>, and mailed to the following address:

Radioactive Materials Fees P.O. Box 101161 Atlanta, GA 30392

Mail license applications and amendment requests to the following address:

Radioactive Materials Program
4220 International Parkway, Suite 100
Atlanta, GA 30354

All license applications, amendments and fee payments should be mailed the same day. Annual fees are billed by the Department at the beginning of each fiscal year.

- 13. The Radiation Safety Officer in this program shall be Walter Levich.
- 14. Radioactive material shall be used by or under the supervision of Daniel Montgomery, Evgeny Taskaev, Walter Levich, Margarita Taskaeva, **Natalie Kasate, or Wenlin Mao**.
- 15. The licensee shall conduct a physical inventory every 6 months to account for all licensed material received and possessed under this license. The records of inventories shall be maintained for inspection by the Department and shall include the quantities and kinds of radioactive material, the manufacturer, model and serial number, location of sealed sources, and the date and name of the individual performing the inventory.
- 16. Each sealed source fabricated by the licensee shall be inspected and tested for construction defects, leakage, and contamination prior to use or transfer as a sealed source. If the inspection or test reveals any construction defects or 0.005 microcurie or greater of contamination, the source shall not be used or transferred as a sealed source until it has been repaired, decontaminated and retested.
- 17. The licensee is authorized to receive custom sources containing radioactive material for rework, recycle, and/or disposal. This authorization is limited to sources distributed under this license.

Radioactive Materials License Supplementary Sheet

> Page 4 of 5 Pages License Number GA 742-1 Amendment Number .25

Conditions (continued)

- 18. This license does not authorize commercial distribution of licensed material to persons exempt from licensing pursuant to (3)(b) of Rule 391-3-17-.02. The distribution of byproduct material, source material, and special nuclear material (as defined in Rule 391-3-17-.01) to persons exempt from licensing pursuant to (3) of Rule 391-3-17-.02 requires a license issued by the U.S. Nuclear Regulatory Commission.
- 19. The licensee is authorized to hold radioactive material with a physical half-life of less than 120 days for decay-in-storage before disposal in ordinary trash provided:
 - A. Before disposal in ordinary trash, radioactive material shall be surveyed at the container surface with the appropriate survey meter set on its most sensitive scale and with no interposed shielding to determine that its radioactivity cannot be distinguished from background. All radiation labels shall be removed or obliterated.
 - B. A record of each disposal permitted under this License Condition shall be retained for three years. The record must include the date of disposal, the date on which the radioactive material was placed in storage, the radionuclides disposed, the survey instrument used, the background dose rate, the dose rate measured at the surface of each waste container, and the name of the individual who performed the disposal.
- 20. The licensee shall not transfer possession and/or control of materials or products containing radioactive material as a contaminant except:
 - A. By transfer of waste to an authorized recipient;
 - B. By transfer to a specifically licensed recipient; or
 - C. As provided otherwise by a specific condition of this license pursuant to the requirements of (13) of Rule 391-3-17-.03.
- 21. Except as provided in Rule 391-3-17-.06(16), no plutonium regardless of form shall be delivered to a carrier for shipment by air transport or transported in an aircraft by the licensee except in packages the design of which the U. S. Nuclear Regulatory Commission has specifically approved for transport of plutonium by air.
- 22. In accordance with Chapter 391-3-17-.02(8)(g), the licensee has filed a financial assurance mechanism as described in letter, with attachments, dated March 9, 2001, and as revised in renewal application dated October 27, 2006, as determined necessary by the Department to provide for the protection of the public health and safety. Expiration of a specific license shall not relieve the license of responsibility for decommissioning its facility and terminating the specific license.

Radioactive Materials License Supplementary Sheet

> Page 5 of 5 Pages License Number GA 742-1 Amendment Number .25

Conditions (continued)

- 23. Except as specifically provided otherwise in this license, the licensee shall conduct its program in accordance with statements, representations, and procedures contained in the documents, including any enclosures listed below:
 - A. Application for renewal with attachments dated October 27, 2006, signed by Walter A Levich, Plant Manager and RSO.
 - B. Analytics Quality Assurance Manual, as described in the renewal application, as amended or revised.
 - C. Decommissioning Funding Plan, submitted under cover letter dated March 9, 2001, signed by Robert C. McFarland, Radiation Safety Officer, revised in renewal application dated October 27, 2006, as amended or revised.
 - D. Electronic correspondence from Walter Levich to Eric Jameson dated December 28, 2006, 15:24:29.
 - E. Letter with attachments dated April 14, 2009, signed by Walter A. Levich, Plant Manager and RSO.
 - F. Electronic correspondence from Walter Levich to Eric Jameson dated June 23, 2009, 12:35.

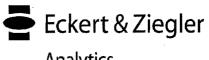
The Georgia Department of Natural Resources' regulations shall govern unless the statements, representations and procedures in the licensee's application and correspondence are more restrictive than the Regulations.

FOR THE DEPARTMENT OF NATURAL RESOURCES

Date:	July 23, 2009	BY	In ameson

 Λ

✓ Eric T. Jameson



Analytics

Missouri State University Erwin Mantei 901 S. National Rd. Springfield, MO 65897

Tel: 417-836-5446

Email: emantei@missouristate.edu

Page 1 of 3

Eckert & Ziegler

Analytics Inc. (Tax ID 58-1406082) 1380 Seaboard Industrial Blvd Atlanta, GA 30318, USA

Phone: +1-404-352-8677
Fax: +1-404-352-2837
Email: analytics@ezag.com

8 am - 5pm. Mon-Fri, Eastern Time

Quotation No. 5852 - 19 September 2011

We thank you for your inquiry and send this quote in accordance with our General Terms and Conditions attached

Reference:

Your email inquiry dated 30 Aug 2011

Delivery time:

Approx 4-6 weeks after acceptance of order and Containers in Duplicate

Shipping:

FOB Eckert & Ziegler Analytics, Atlanta, Georgia, USA

Payment:

Federal Express airfreight – Collect or prepaid/add to invoice Net 30 days (upon credit approval) or Credit Card – Visa/MasterCard

For new customers – Credit check done in advance for terms

Validity:

3 months from date of quotation

Remark:

When placing your order please refer to our quotation number

Our quotation is subject to change without notice

Item#	Product Code	Qty	Description	Unit Price	Total
1 URE-SAN		1	Enriched Uranium – 500 mL Sand in 500 mL, Marinelli Beaker Calibration Standard, Total Activity: 0.750 +20% / -0% U-235 ~ 0.015 microCi U-234 ~ 0.734 microCi U-238 ~ 16.2 picoCi (Calibrated in Bq)	2,140.00	2,140.00
				TOTAL USD	\$2,140.00

Doreen McBride

Customer Service Manager

Your contact for this quote:

Email: andre.depass@ezag.com

Technical Approval

Terms and Conditions

1380 Seaboard Industrial Boulevard Atlanta, Georgia 30318 USA Phone (404) 352-8677 • Fax (404) 352-2837



Email: analytics@ezag.com

- 1. **DEFINITIONS**. A. The word "goods" as used herein means products offered or acknowledged in this catalog, ordered by Buyer and furnished by Seller. B. The word "services" means testing and other services offered or acknowledged in this catalog, ordered by Buyer and provided by Seller.
- 2. GENERAL. The terms and conditions set forth herein shall exclusively govern the sale of goods by Seller to Buyer and the furnishing of services by Seller to Buyer. Acceptance of this offer or of the goods or services furnished under quotations or acknowledgements is expressly limited to the terms and conditions contained herein. Any terms and conditions stated by Buyer in any purchase order or other document accepting or ordering such goods or services containing statements, clauses, terms or conditions modifying, adding to, repugnant to, or inconsistent with the terms and conditions of Seller herein contained, may only be deemed accepted by Seller if so stated in writing by a duly authorized signatory of Seller. Buyer further expressly agrees that such terms accepted by Seller are accepted only upon the condition and with the express understanding that, notwithstanding any statements, clauses, terms or conditions contained on any forms of Buyer, the liabilities of Seller shall be determined solely by the terms and conditions stated herein. Acceptance by Buyer of any goods offered for sale or services performed by Seller is expressly limited to the terms and conditions contained herein, and acceptance of said terms shall be deemed to be acceptance of the Buyer's performance inconsistent with any term or condition herein shall constitute a waiver as to said term or condition only.
- 3. PRICES. All prices quoted are in U.S. dollars, Quoted prices do not include charges for shipping, handling, insurance and hazardous materials documentation. State, use, consumption, compensating and excise taxes and retailers occupations taxes payable or collectable by Seller in connection with its sales shall be in addition to invoice prices and are not listed on the invoice unless specifically noted. Buyer will reimburse Seller for same at the time of payment of the invoice, whether or not such taxes are separately stated on the invoice. If Buyer claims exemption from any of these taxes, Buyer shall promptly furnish satisfactory proof of such exemption and shall indemnify Seller for any loss or damage, including attorneys' fees, Seller may incur in the event any taxing authority finds that Seller should have collected tax.
- 4. DELIVERY. All delivery dates are estimated as accurately as possible; however, Seller shall not be liable for any loss, damage or delay caused or occasioned by acts of God, fire, strikes, insurrection, riot, accident, embargo, delay of carrier, act of civil or military authority, failure of a supplier to make timely delivery, the requirements of any statute, order or directive of any governmental authority, or, without limiting the generality of the foregoing, by any other cause which is unavoidable or beyond Seller's reasonable control. If delays from any such cause occur, the delivery time is correspondingly extended.
- 5. TITLE AND RISK OF LOSS. Title to and risk of loss of goods shall pass to the Buyer upon delivery to carrier even if transportation costs are prepaid by the Seller.
- 6. PAYMENT TERMS. Payment shall be due 30 days from date of invoice. If Buyer requests Seller to hold goods for delivery later than scheduled, the invoice shall bear the scheduled delivery date and payment shall be due 30 days from the scheduled delivery date. Buyer bears all risk of loss or damage while such goods are in Seller's possession and shall pay all reasonable charges for goods held for more than two months and shall reimburse Seller for all use or personal property taxes levied on held goods at any time while in Seller's possession. Seller shall have the right to modify, change or withdraw credit at any time and without notice. If in Seller's judgment the financial responsibility of Buyer becomes impaired or unsatisfactory or if Buyer defaults under any contract with Seller, Seller may demand and Buyer shall give advance cash payment or satisfactory security and Seller may withhold shipments until such payment or security is received. Buyer expressly waives any right of set-off and shall make no deductions from payments due hereunder or for any damages of any type claimed by Buyer against Seller.
- 7. LIMITED WARRANTY. ANALYTICS warrants that at the time of shipment the products sold by it are free from defects in material and workmanship and conform to specifications, which accompany the product. ANALYTICS makes no other warranty, expressed or implied, with respect to the products, including any warranty of merchantability or fitness for any particular purpose. Complaints of breach of warranty on radioactive products must be received in writing by ANALYTICS within two half-lives of the radioactive material or 30 days, whichever first occurs. The maximum liability for any breach of warranty shall be replacement of the product or refund of the invoice price of the product. ANALYTICS shall in no case be liable for special, incidental or consequential damages of any kind.
- 8. LIMITATION OF LIABILITY AND INDEMNIFICATION. SELLER ASSUMES NO LIABILITY FOR SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND. Buyer by acceptance of the goods or services assumes all liability for, and shall indemnify and hold Seller harmless against, the consequence of use or misuse by Buyer, its employees or others. Further, Buyer agrees to defend any and all suits, claims and demands brought against Seller and agrees to and will indemnify Seller and save it harmless from and against any and all suits, claims and demands whatsoever for injuries to or death of any person, or damage to or loss of property alleged out of, in connection with or to be incidental to Seller's furnishing of goods or services contemplated herein, whether or not such injury, death, loss or damage shall be caused or contributed to by the joint or concurring negligence of Seller. Buyer further agrees to and will pay, liquidate, discharge and satisfy any and all judgments, awards or expenses which may be rendered against or incurred by Seller on account of injuries to or death of any person or loss or damage to any property whatsoever, caused by, arising out of, in connection with or incidental to Seller's furnishing of the goods or services contemplated herein, including but not limited to all costs of suit, attorneys' fees and expenses in connection therewith, whether or not such judgment, award or expense is rendered against or incurred by Seller, in whole or in part, because of the joint or concurring negligence of the Seller. As used in this paragraph, the word "Seller" shall include Seller, its officers, directors, employees and agents. Buyer's care, custody and control at any time of the goods contemplated herein shall give rise to a conclusive presumption between the parties that

Terms and Conditions

1380 Seaboard Industrial Boulevard Atlanta, Georgia 30318 USA

Phone (404) 352-8677 • Fax (404) 352-2837

Email: analytics@ezag.com



any negligence was joint or concurring. This paragraph, in its entirety, also applies to suits, claims and demands based on the rules of strict liability and product liability.

- 9. CHANGES AND GOODS MADE TO BUYER'S SPECIFICATIONS. Seller reserves the right where possible to make any change in material or in its design which is an improvement but bears no obligation to do so. If goods are made to specifications of Buyer, it is upon the express condition that Buyer shall assume all responsibility and shall indemnify and hold the Seller harmless if the goods infringe or contribute to the infringement of, or are alleged to infringe or contribute to the infringement of any letters, patent, copyright or trademark where such infringement arose out of the designs, drawings or specifications supplied by Buyer alone or in combination with elements supplied by Seller.
- 10. SELLER INSPECTION AND TESTING. The goods are inspected and, where practicable, submitted to Seller's standard tests at Seller's plant before delivery. Buyer agrees to pay Seller reasonable additional charges for any additional tests which Buyer requires Seller to perform.
- 11. BUYER INSPECTION AND ACCEPTANCE. Within 30 days after tender of delivery to or receipt by Buyer of any shipment, Buyer shall inform Seller in writing if the goods are found defective or short in any respect. Failure to so inform Seller or any use by Buyer of the goods shall constitute conclusive evidence that Seller satisfactorily performed and Buyer waives any right to reject such goods thereafter.
- 12. COMPLIANCE WITH LAWS. Buyer agrees that in the performance hereof it will comply with all applicable laws, statutes, rules, regulations or orders of the National government or political subdivision thereof and same shall be deemed incorporated by reference herein. A. In the United States: Federal and State regulations require a copy of a Buyer's NRC license, Agreement State License, or Licensing State License together with all amendments, to be on file with Seller before any shipment of radioactive materials can be made. Buyer and Seller each warrant that it is an equal opportunity employer and that if this order is placed as a contract or subcontract under United States Government prime contract, those clauses required by federal law to be included are herein incorporated by reference. B. In Canada: A copy of the Buyer's AECB license, together with all amendments must be on file with Seller prior to any shipment of radioactive materials.
- 13. LIMITATION PERIOD. Causes of action for breach of contract relative to any order for goods or services shall not be asserted after one year from the date that said cause of action occurs, provided that this limitation shall not apply to actions by Seller to recover purchase price of the goods.
- 14. CANCELLATION. The contract arising out of Buyer's order cannot be canceled, transferred to others, or changed after receipt by Seller, except as may mutually be agreed in writing between the parties:
- 15. APPLICABLE LAW. Seller reserves any and all rights and remedies provided by law. The contract arising out of Buyer's order shall be interpreted and construed in accordance with the laws of the State of California.
- 16. WAIVERS. No waiver by Seller of any breach of any provision hereof shall constitute a waiver of any other breach of such provision. Seller's failure to object to provisions contained in any communications from Buyer shall not be deemed an acceptance of such provisions or as a waiver of the provisions hereof.
- 17. NO OTHER REPRESENTATIONS. There are no understandings, agreements, representations or warranties, either written or oral, relative to the goods or services that are not fully expressed in this document. No statement, recommendation or assistance made or offered through its representatives or by any sales literature in connection with the use of any goods, shall be or constitute a waiver by Seller or any of the provisions hereof. The provisions of this document supersede and cancel any previous understanding or agreement between the parties with respect to the subject matter hereof and this document expresses the final and complete understanding of the parties.
- 18. ARBITRATION. All disputes arising out of this contract shall be determined by binding arbitration in accordance with the rules of the American Arbitration Association. In such arbitration, the prevailing party shall be awarded attorneys' fees and costs (including costs of experts) and the provisions of California Code of Civil Procedure Section 1283.05 shall apply.

OFFICE OF RESEARCH COMPLIANCE

901 South National Avenue Springfield, Missouri 65897



7007 0710 0001 1271 2589



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\$05.790

10/07/2011

Mailed From 65804
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RETURN RECEIPT REQUESTED

materials Licensing Branch
nfc, Region III
2443 Warrenville FA, Suite 210
Lisle, 12 60532-4352

