

September 29, 2010

Mr. Steven A. Reynolds, Director
Division of Nuclear Materials Safety
U.S. Nuclear Regulatory Commission, Region III
2443 Warrenville Road, Suite 210
Lisle, IL 60532-4352



7770 West New York Street
Indianapolis, IN 46214-2988
317-273-1690 (FAX) 317-273-2250

4310-C Technology Drive
South Bend, IN 46628
574-233-6820 (FAX) 574-233-8242

Re: Response to Confirmatory Order IA-09-044
Quarterly Radiation Safety Activities -Report No. 4
Third Quarter - 2010

Dear Mr. Reynolds:

As per a Confirmatory Order by the Nuclear Regulatory Commission (NRC), which was a result of an agreement reached during an Alternative Dispute Resolution mediation conducted at your facility August 25, 2009, I am submitting the fourth report of our documentation of radiation safety activities (RSA) performed by Earth Exploration, Inc. as required by the confirmatory order referenced above. Activity this past quarter included:

Dosimetry

Submittal to Landauer of dosimetry for our gauge operators by both office locations was made late June and mid July, 2010, for the wear period from April 1 to June 30, 2010. Upon receipt of the dosimetry reports from Landauer, we noted no unusual results of radiation exposure to our employees. However, we did notice an unusual quarterly dose for our area badge posted at our South Bend office location. Landauer reported a dose equivalent of almost 400 (mrem) for this badge.

Our first reporting of this condition to the RSO at our Indianapolis office was made by our RSO trained employee responsible for the dosimetry at this office location via a telephone call to the RSO, followed with submittal of the Landauer report. When questioned regarding the condition, our employee stated that physical inventory practices were performed on the table in June, 2010, directly adjacent to the area badge (dosimetry) location and that when inspecting the sole plate area of the gauges, they had been turned away from the employee, yet in the direction of the area dosimetry. Otherwise, our employee could not provide a reason for the unusually high dosage to the dosimetry. I directed the employee to perform an immediate inspection of the area with our TroxAlert survey meter. No readings in excess were obtained by this survey. I also directed the employee to inspect each of the gauges in the adjacent gauge storage room, to make sure that none of the tungsten source shield sliding blocks had become wedged in an open position. None were found to be in an open position.

We wish to note this table location is a rarely used work station outside the south wall of our gauge storage room. The area badge was placed at this location in order for us to have a more clear understanding of the radiation activity at this location. We also wish to note that performing the physical inventory of the gauges at this location was not a good idea. The employee was reprimanded for this action and physical inventories will not be performed at this location in the future. We do not have a long history of this area badge. The first test result for

the first quarter of this year, 2010, indicated a dose equivalent of approximately 30 (mrem). We will closely watch future test results of the area dosimetry to validate or understand the reason for the relatively high test result.

In closing of discussions related to dosimetry, new dosimetry has been provided to the gauge operators for the fourth quarter of 2010. Results of the third quarter dosimetry testing will be discussed in our fourth quarter report.

Leak Testing of Portable Gauges

As required, leak testing of our Gauge Nos. 2 and 10, which are Troxler Model No. 3411 gauges, was performed at our Indianapolis offices on July 21, 2010. Leak test reports received from Troxler Electronic Laboratories on August 2, 2010, indicated that the leak test result were less than 185 Bq (0.005 uCi). Copies of the leak test certificates are included with this correspondence.

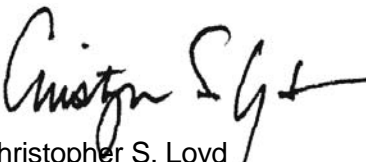
Protection of Yellow Radioactive Type II (DOT Transport Index) Labels

Distress of these labels is a common occurrence at EEI as the portable gauge transportation boxes often rub against other equipment or other transport boxes in storage. We were cited for illegible labels during your inspection in July, 2008. Subsequently we have been diligent in inspecting these labels on a constant basis in order to make sure the labels have not been distressed and that they are legible. In addition, in being proactive regarding this condition we have provided clear adhesive laminated coverings for the labels in order to better protect the labels from damage due to our day to day operations. Although a relatively small act, we hope it is recognized that we are constantly looking at ways to improve our radiation safety program.

We trust this information provides adequate documentation of our previous quarter RSA. Should you have any questions or if you are in need of any additional information, please contact me at your convenience.

Sincerely,

EARTH EXPLORATION, INC.



Christopher S. Loyd
Radiation Safety Officer

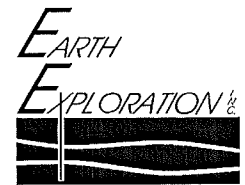
Attachments: Quarterly Radiation Safety Activity Checklist – Report No. 4
Quarterly Radiation Safety Activity Guideline
Dosimetry Reports for Indianapolis Office – 2nd Qtr. 2010
Dosimetry Reports for South Bend Office – 2nd Qtr. 2010
Leak Test Certificates for Indianapolis Gauges 2 and 10 – July 2010
Photograph of Protected Shipping Label

QUARTERLY RADIATION SAFETY ACTIVITIES
REPORT NO. 4 – THIRD QUARTER – 2010
DATE: 9-29-10

Quarterly Radiation Safety Activities
Report No.: 4 (3rd Qtr. 2010)
Date: 9-29-10



Activity	Yes	No	Footnote
RSO Responsibilities			
All terms and conditions of the materials license are being adhered to.	x		
All gauges have been leak tested in accordance with the required time frames and documentation of such testing is made, recorded and filed in an orderly manner (bi-quarterly or annually).	x		
All gauge operators have been provided with, and have worn their personnel monitoring equipment (dosimeters) while operating or servicing the portable gauges and the dosimeters have been submitted to Landauer® on a quarterly basis for required testing.	x		1
Records of the gauge operators radiation exposure based on the test results provided by Landauer® have been posted and any exposure perceived as being in excess of typical exposure has been discussed and documented with the gauge operators .	x		
All gauges are properly secured and protected at all times, when not in use by the individual gauge operators.	x		
The RSO has reviewed the gauge operator's usage of equipment and has assured that any unsafe practices are stopped immediately and has developed, implemented or documented corrective actions when violations of the program have been identified.	x		
Gauge Operator Responsibilities			
The portable gauges have been inspected and adequately logged in and out of the designated storage area of our facilities each day they are used.	x		
The transportation documents are in order and the equipment is secured in the transporting vehicle as required by our radiation safety program and DOT requirements.	x		
The gauges have been maintained in their control at all times.	x		



Activity	Yes	No	Footnote
Respective personnel monitoring devices have been worn at all times.	x		
The following have been in the possession of the gauge operators at all times when they are using the gauges in the field:			
Copy of the License	x		
Authorization card from RSO	x		
Copy of the Radiation Safety Plan	x		
Copy of the equipment operations manual	x		
Copy of current Leak Test Certificate	x		
Copy of Emergency Procedures	x		
Footnote No. 1 - Exposure level for Techs for 2nd Quarter typical.			

**OUTLINE OF QUARTERLY
RADIATION SAFETY ACTIVITIES
THIRD QUARTER – 2010**



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**Earth Exploration, Inc.
Quarterly Radiation Safety Activities
For 2010 and 2011**

A. The following shall serve as a guideline and checklist for radiation safety activities to be performed by the Radiation Safety Officer (RSO) and individual gauge operators on a quarterly basis throughout the time period noted above:

1. The RSO shall assure that all terms and conditions of the materials license are being adhered to.
2. The RSO shall verify that the gauges have been leak tested in accordance with the required time frames and that documentation of such testing is made and recorded and filed in an orderly manner (bi-quarterly or annually).
3. The RSO shall assure that gauge operators are provided with and wear their personnel monitoring equipment (dosimeters) while operating or servicing the portable gauges and that the dosimeters are submitted to Landauer® on a quarterly basis for required testing.
4. The RSO shall post records of the gauge operators radiation exposure based on the test results provided by Landauer®, discuss and document with the gauge operators any exposure perceived as being in excess of typical exposure.
5. The RSO shall assure that the gauges are properly secured and protected at all times when not in use by the individual gauge operators.
6. The RSO will review the gauge operator's usage of equipment and assure that any unsafe practices are stopped immediately and develop, implement and document corrective actions when violations of the program are identified.

B. The gauge operators during each quarter shall be responsible for:

1. Ensuring the portable gauges have been inspected and adequately logged in and out of the designated storage area of our facilities each day they are used.
2. Ensuring the transportation documents are in order and that the equipment is secured in the transporting vehicle as required by our radiation safety program and DOT requirements.
3. Maintain control over the gauge at all times.
4. Wear their respective personnel monitoring device.
5. Have the following in their possession during gauge use:
 - a. Copy of the License
 - b. Authorization card from RSO
 - c. Copy of the Radiation Safety Plan
 - d. Copy of the equipment operations manual
 - e. Copy of current Leak Test Certificate
 - f. Copy of Emergency Procedures

**INDIANAPOLIS OFFICE
DOSIMETRY REPORTS
SECOND QUARTER – 2010
DATE: 9-29-10**

EARTH EXPLORATION INC
CHRISTOPHER LOYD
7770 WEST NEW YORK ST
INDIANAPOLIS IN 46214

LANDAUER®

Landauer, Inc. 2 Science Road Glenwood, Illinois 60425-1586
Telephone: (708) 755-7000 Facsimile: (708) 755-7016
Customer Service: (800) 323-8830 Customer Service Technical: (800) 438-3241
www.landauerinc.com



RADIATION DOSIMETRY REPORT

ACCOUNT NO.	SERIES CODE	ANALYTICAL WORK ORDER	REPORT DATE	DOSIMETER RECEIVED	REPORT TIME IN WORK DAYS	PAGE NO.
179781	IND	1020060334	07/26/10	07/19/10	5	1

PARTICIPANT NUMBER	NAME			DOSIMETER	USE	RADIATION QUALITY	DOSE EQUIVALENT (MREM) FOR PERIODS SHOWN BELOW			YEAR TO DATE DOSE EQUIVALENT (MREM)			LIFETIME DOSE EQUIVALENT (MREM)			RECORDS FOR YEAR	INCEPTION DATE (MM/YY)
	ID NUMBER	BIRTH DATE	SEX				DEEP DDE	EYE LDE	SHALLOW SDE	DEEP DDE	EYE LDE	SHALLOW SDE	DEEP DDE	EYE LDE	SHALLOW SDE		
FOR MONITORING PERIOD:							04/01/10 - 06/30/10				2010						
00IND	CONTROL			Pa	CNTRL		M	M	M							2	09/03
00005	LOYD C S			Pa	WHBODY		M	M	M	M	M	M	82	82	159	2	04/93
	██████████ 12/23/1952			M													
00009	SCHUSTER G M			Pa	WHBODY	P	4	7	10	7	10	13	535	549	572	2	06/93
	██████████ 07/21/1968			M													
00013	EGOLD KIRK			Pa	WHBODY		M	M	M	1	1	M	25	28	31	2	05/94
	██████████			M													
00032	TROUTMAN DAN			Pa	WHBODY	P	M	1	3	2	5	10	217	226	243	2	05/00
	██████████ 06/20/1969			M													
00040	TINCHER T M			Pa	WHBODY	P	7	8	9	7	8	9	317	322	323	2	05/01
	██████████ 09/24/1969			M													
00054	LOYD ROSS			Pa	WHBODY	P	M	M	1	1	1	1	94	96	102	2	09/02
	██████████ 06/04/1984			M													
00084	KING LEWIS			Pa	WHBODY	P	2	2	3	3	4	5	122	125	131	2	01/06
	██████████ 01/09/1966																
00090	SMITH MATT			Pa	WHBODY	P	6	6	5	10	10	7	173	173	159	2	07/06
	██████████ 10/11/1980			M													
00091	SIMISON RON			Pa	WHBODY	P	7	7	7	10	10	9	114	120	138	2	07/06
	██████████ 12/30/1974			M													
00094	ROOSA SCOTT			Pa	WHBODY		M	M	M	M	M	M	1	1	2	2	07/07
	██████████ 07/27/1981			M													

M: MINIMAL REPORTING SERVICE OF 1 MREM

QUALITY CONTROL RELEASE: JAS

1 - PR 9556 - RPT1318- N1

- 20034

*Reviewed by Chris S. H. RSO
7-29-10*



NVLAP®

NVLAP LAB CODE 100518-0**

EARTH EXPLORATION INC
CHRISTOPHER LOYD
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RADIATION DOSIMETRY REPORT

ACCOUNT NO.	SERIES CODE	ANALYTICAL WORK ORDER	REPORT DATE	DOSIMETER RECEIVED	REPORT TIME IN WORK DAYS	PAGE NO.
179781	IND	1020060334	07/26/10	07/19/10	5	2

** LAST PAGE **

** LAST PAGE **

PARTICIPANT NUMBER	NAME			DOSIMETER	USE	RADIATION QUALITY	DOSE EQUIVALENT (MREM) FOR PERIODS SHOWN BELOW			YEAR TO DATE DOSE EQUIVALENT (MREM)			LIFETIME DOSE EQUIVALENT (MREM)			RECORDS FOR YEAR	INCEPTION DATE (MM/YY)
	ID NUMBER	BIRTH DATE	SEX				DEEP DDE	EYE LDE	SHALLOW SDE	DEEP DDE	EYE LDE	SHALLOW SDE	DEEP DDE	EYE LDE	SHALLOW SDE		
FOR MONITORING PERIOD:							04/01/10 - 06/30/10				2010						
00099	SAWYER TOM			Pa	WHBODY	P	14	15	17	16	18	20	76	79	84	2	07/07
00103	SOIL LAB			Pa	AREA	P	23	24	25	41	42	42	123	124	120	2	01/09
																</	

M: MINIMAL REPORTING SERVICE OF 1 MREM

QUALITY CONTROL RELEASE: JAS

1 - PR 9556 - RPT1318- N1

- 20034



NVLAP LAB CODE 100518-0**

**SOUTH BEND OFFICE
DOSIMETRY REPORTS
SECOND QUARTER – 2010
DATE: 9-29-10**

EARTH EXPLORATION INC
KENNETH P MILLER
4310 C TECHNOLOGY DR
SOUTH BEND IN 46628

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EXE!

RADIATION DOSIMETRY REPORT

ACCOUNT NO	SERIES CODE	ANALYTICAL WORK ORDER	REPORT DATE	DOSIMETER RECEIVED	REPORT DATE BY WORK DAYS	PAGE NO
179781	SB	1016820210	06/22/10	06/17/10	3	1 OF 1

PARTICIPANT NUMBER	NAME			DOSIMETER	USE	RADIATION QUALITY	DOSE EQUIVALENT (MREM) FOR PERIODS SHOWN BELOW			YEAR TO DATE DOSE EQUIVALENT (MREM)			LIFETIME DOSE EQUIVALENT (MREM)			RECORDS FOR YEAR	RECEPTION DATE (MM/YY)
	ID NUMBER	BIRTH DATE	SEX				DEEP DDE	EYE LDE	SHALLOW SDE	DEEP DDE	EYE LDE	SHALLOW SDE	DEEP DDE	EYE LDE	SHALLOW SDE		
FOR MONITORING PERIOD:							04/01/10 - 05/30/10			2010							
00058	CONTROL			Pa	CNTRL		M	M	M							2	09/03
00012	MCALISTER JIM	03/23/1952	M	Pa	WHBODY		M	M	M	M		1	822	922	981	2	10/83
00092	MILLER MARK	05/23/1958	M	Pa	WHBODY	9	2	2	1	9	10	11	168	168	176	2	04/07
00104	STINE CHRISTOPHER	02/11/1977	M	Pa	WHBODY		M	M	M	17	17	17	17	17	17	2	01/10
00105	CYLINDER LOG-IN			Pa	AREA	PH	357	365	355	368	396	397	368	396	397	2	01/10

NO: MINIMAL REPORTING SERVICE OF 1 MREM

QUALITY CONTROL RELEASE: RCH

1 - PR 9533 - RPT1318- R1

- 15210

Reviewed by Cheryl S. H., RSO
6-25-10

NVLAQ

NVLAQ LAB CODE 100510-01

**LEAK TEST REPORTS
PORTABLE GAUGES NOS. 2 AND 10
TROXLER MODEL 3411 GAUGES**

**Troxler Electronic Laboratories, Inc.**

3008 Cornwallis Rd., P.O. Box 12057

Research Triangle Park, NC 27709

Tel: (877) 876-9537 Fax: (866) 391-2759

License: NC 032-0182-1

Christopher S. Loyd
EARTH EXPLORATION
7770 WEST NEW YORK ST.
INDIANAPOLIS, IN 46214

Cust ID: 6675

AUG - 2 2010

LEAK TEST CERTIFICATE

DEVICE:

Model: 3411

Serial No: 17587

SEALED SOURCES:

Serial No.	Measure Date	Nuclide	GBq	mCi
47-13016	05/10/1989	AM-241:BE	1.48	40
50-7078	07/24/1989	CS-137	0.296	8

LEAK TEST ANALYSIS:

Sample collected on: 07/21/2010

Sample analyzed on: 07/27/2010 12:54:15 P Position: 47

Analyzed by: D. Rose

	ALPHA	BETA-GAMMA
Conversion factor (cpm/Bq)	1.20E+01	2.00E+01
Background measurement (cpm)	1	25
Sample measurement (cpm)	0	31
Activity (Bq)	< MDA	< MDA
Min. Detectable Activity (Bq)	5.5E-01	1.3E+00

This certifies that the leak test results are:☒ Less than 185 Bq (0.005 uCi)☐ Greater than 185 Bq (0.005 uCi)

Rev. 9/2006

Reviewed by Chris Syc. RSO, 8-2-10

**Troxler Electronic Laboratories, Inc.**

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Christopher S. Loyd
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7770 WEST NEW YORK ST.
INDIANAPOLIS, IN 46214

Cust ID: 6675

LEAK TEST CERTIFICATE

DEVICE:**Model:** 3411**Serial No:** 13427**SEALED SOURCES:**

Serial No.	Measure Date	Nuclide	GBq	mCi
47-8618	10/22/1985	AM-241:BE	1.48	40
50-1254	05/23/1985	CS-137	0.296	8

LEAK TEST ANALYSIS:**Sample collected on:** 07/21/2010**Sample analyzed on:** 07/27/2010 12:56:40 P **Position:** 49**Analyzed by:** D. Rose

	ALPHA	BETA-GAMMA
Conversion factor (cpm/Bq)	1.20E+01	2.00E+01
Background measurement (cpm)	1	25
Sample measurement (cpm)	1	16
Activity (Bq)	< MDA	< MDA
Min. Detectable Activity (Bq)	5.5E-01	1.3E+00

This certifies that the leak test results are:☒ **Less than 185 Bq (0.005 uCi)**☐ **Greater than 185 Bq (0.005 uCi)**

Rev. 9/2006

Reviewed by Craig S. H., RSO, 8-2-10



09/29/2010