

## RI - DNMS Licensee Event Report Disposition

Licensee: ECS Mid-Atlantic, LLC  
 Event Description: Damaged Troxler Gauge  
 License No: 45-2534-01 Docket No: 030352405 MLER-RI: 2007-020  
 Event Date: 08/14/07 Report Date: 08/14/07 HQ Ops Event #: 43567

1. REPORTING REQUIREMENT

<input type="checkbox"/>	10 CFR 20.1906 Package Contamination	<input checked="" type="checkbox"/>	10 CFR 30.50 Report
<input type="checkbox"/>	10 CFR 20.2201 Theft or Loss	<input type="checkbox"/>	10 CFR 35.3045 Medical Event
<input type="checkbox"/>	10 CFR 20.2203 30 Day Report	<input type="checkbox"/>	License Condition
<input type="checkbox"/>	Other: _____		

2. REGION I RESPONSE

<input type="checkbox"/>	Immediate Site Inspection	Inspector/Date	<u>Richard Ladon</u> <u>August 21, 2007</u>	
<input checked="" type="checkbox"/>	Special Inspection	Inspector/Date		
<input type="checkbox"/>	Telephone Inquiry	Inspector/Date		
<input type="checkbox"/>	Preliminary Notification/Report	<input type="checkbox"/>		Daily Report
<input checked="" type="checkbox"/>	Information Entered in RI Log	<input type="checkbox"/>		Review at Next Inspection
<input type="checkbox"/>	Report Referred To: _____			

3. REPORT EVALUATION

<input checked="" type="checkbox"/>	Description of Event	<input checked="" type="checkbox"/>	Corrective Actions
<input checked="" type="checkbox"/>	Levels of RAM Involved	<input checked="" type="checkbox"/>	Calculations Adequate
<input checked="" type="checkbox"/>	Cause of Event	<input type="checkbox"/>	Additional Information Requested from Licensee

4. MANAGEMENT DIRECTIVE 8.3 EVALUATION

<input type="checkbox"/>	Release w/Exposure > Limits	<input type="checkbox"/>	Deliberate Misuse w/Exposure > Limits
<input type="checkbox"/>	Repeated Inadequate Control	<input type="checkbox"/>	Pkgng Failure > 10 rads/hr or Contamination > 1000x Limits
<input type="checkbox"/>	Exposure 5x Limits	<input type="checkbox"/>	Large# Indivs w/Exp > Limits or Medical Deterministic Effects
<input type="checkbox"/>	Potential Fatality	<input type="checkbox"/>	Unique Circumstances or Safeguards Concerns
<input type="checkbox"/>	If any of the above are involved:		
<input type="checkbox"/>	Considered Need for IIT	<input type="checkbox"/>	Considered Need for AIT
	Decision/Made By/Date: _____		

5. MANAGEMENT DIRECTIVE 8.10 EVALUATION (additional evaluation for medical events only)

<input type="checkbox"/>	Timeliness - Inspection Meets Requirements (5 days for overdose / 10 days for underdose)
<input type="checkbox"/>	Medical Consultant Used-Name of Consultant/Date of Report: _____
<input type="checkbox"/>	Medical Consultant Determined Event Directly Contributed to Fatality
<input type="checkbox"/>	Device Failure with Possible Adverse Generic Implications
<input type="checkbox"/>	HQ or Contractor Support Required to Evaluate Consequences

6. SPECIAL INSTRUCTIONS OR COMMENTS

Non-Public      Inspector Signature: Ludwig C. Aglodon      Date: 9/26/07  
 Public-SUNSI REVIEW COMPLETE \*      Branch Chief Initials: Morse Miller      Date: 10/21/07

\* ~~Redact personal telephone numbers, AND~~  
~~Remove pictures of gauge internals~~ done MDM

Other Nuclear Material	Event Number: 43567
Rep Org: ENGINEERING CONSULTANT SERVICES Licensee: ENGINEERING CONSULTANT SERVICES Region: 1 City: ROANOKE State: VA County: License #: 45-25534-01 Agreement: N Docket: NRC Notified By: SETH REYNOLDS HQ OPS Officer: JEFF ROTTON	Notification Date: 08/14/2007 Notification Time: 17:17 [ET] Event Date: 08/14/2007 Event Time: 17:10 [EDT] Last Update Date: 08/14/2007
Emergency Class: NON EMERGENCY 10 CFR Section: INFORMATION ONLY	Person (Organization): PAUL KROHN (R1) JOSEPH HOLONICH (FSME)

**Event Text**

<p>TROXLER MOISTURE DENSITY GAUGE DAMAGED ON CONSTRUCTION SITE</p> <p>At 1710 EDT on 08/14/07, a Troxler moisture density gauge, model 3430, serial number 36254, was in use at a construction worksite on VA Route 460. A large piece of construction equipment was backing up and while the gauge technician attempted to get the vehicle driver's attention, the vehicle ran over the Troxler gauge. The 8 millicurie Cs-137 source was extended and after the damage could only be retracted to within 4 inches of the gauge case. The technician kept the extended source in the ground and controlled access to the area. The gauge technician called the NRC Operations Center for assistance.</p> <p>R1DO (Paul Krohn) and FSME EO (Holonich) were notified and briefed by the licensee technician on what assistance was required. During the conference call the RSO was notified and the company was dispatching personnel to the scene to assist.</p> <p>* * * UPDATE PROVIDED BY CURTIS HOWELL TO JEFF ROTTON AT 1953 EDT ON 08/14/07 * * *</p> <p>The licensee was able to retract the source and close the shutter door. No significant personnel exposure was received. The area has been opened for unrestricted access.</p> <p>Notified R1DO (Krohn) and FSME EO (Holonich).</p>
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# ECS MID-ATLANTIC, LLC

Geotechnical • Construction Materials • Environmental • Facilities

September 19, 2007

Mr. Randy Ragland  
Division of Nuclear Materials Safety  
U.S. N.R.C. Region I  
475 Allendale Road  
King of Prussia, Pennsylvania 19406-1415

Reference: Incident Report  
License No. 45-255534-01  
Troxler 3430 S.N. 36254

Dear Mr. Ragland:

The Roanoke Branch of ECS – Mid-Atlantic, LLC (ECS) respectfully submits the following incident report for the above-referenced portable nuclear gauge. This gauge was destroyed on a construction site on August 14, 2007, leading to transfer of the device to Troxler Electronic Laboratories, Inc. for decommissioning on September 11, 2007.

Please contact Brian Wyatt at (540) 362-2000 or [bw Wyatt@ecslimited.com](mailto:bw Wyatt@ecslimited.com) if you require additional information.

Respectfully,  
ECS – MID-ATLANTIC, LLC

Brian S. Wyatt, P.E.  
Field Services Department Manager  
Radiation Safety Officer

Grant E. Walker, P.E.  
Roanoke Branch Manager – V.P.

2007 SEP 25 AM 5: 57

RECEIVED  
REGION 1

**Date of Incident:** August 14, 2007

**Portable Nuclear Gauge:** Troxler 3430 S.N. 36254 (internal Gauge #7)

**Licensee:** ECS Mid-Atlantic, LLC, License # 45-25534-01, 5320 Peters Creek Road, Suite F, Roanoke, Virginia, 24019

**ECS Branch Radiation Safety Officer:** Brian Wyatt, (540) 362-2000, cell – (540) 537-2077

**ECS Authorized User:** Seth Reynolds, cell – (540) 400-4293

**Project Location:** Kroger Store R-391 Project Site, Challenger Avenue & Valley Gateway Boulevard, Roanoke County

**Contractor:** W-L Construction

**Contractor Equipment Operator:** Charles Felty

**Incident Description:**

At approximately 17:15 on August 14, 2007, our Authorized User was conducting density testing for fill placement along a narrow temporary sediment basin berm, at the toe of southeastern slope for the site (Please see the attached sketches). The Authorized User set up and started running a nuclear test within one “lane” of fill along the berm. While test was processing, the Authorized User stepped approximately 10 feet into the adjacent “lane” of fill and drove a pin for a subsequent test. Based on the pattern of previous testing performed with the Contractor at the site, tight conditions along the berm, and location of the compactor, the Authorized User was under the impression that the Equipment Operator was waiting for him to complete testing. However, the Equipment Operator started backing along the edge of berm toward the Authorized User and gauge. The Authorized User indicated he pointed to the gauge and waved arms; however, the Equipment Operator had approached the work area. By the time the Equipment Operator noticed the Authorized User, the equipment had rolled up onto the gauge, at which time the Equipment Operator stopped. The equipment was a CAT 815 sheeps foot compactor. Upon realizing what had occurred, the Equipment Operator rolled forward off of the gauge.

**Response Description:**

The Authorized User requested that no one enter the area and attempted to pull the rod into a shielded position unsuccessfully. The Authorized User observed the gauge and area surrounding the gauge and equipment noting no evidence of debris having moved from the immediate vicinity surrounding the gauge. The Authorized User moved away from the gauge. The

Equipment Operator pulled to the edge of the fill. The Authorized User pulled his truck across the access to the berm, limiting access to the area and verbally told individuals on site to not enter the area.

The RSO was out of town on vacation; therefore, the Authorized User attempted to contact the ECS Field Services Supervisor (Curtis Howe, cell – [REDACTED] and ECS Project Manager for the site (Michael Moon, cell – [REDACTED], leaving voice messages. The Authorized User then successfully contacted the ECS Branch Manager (Grant Walker, office – (540) 362-2000) at the office. The Branch Manager successfully contacted the Project Manager, who contacted the Field Services Supervisor and both began procedures for additional response. While en route to the site, the Project Manager contacted the Authorized User. Based on the apparent lodged nature of the source rod, it was agreed that Troxler and the NRC would be contacted for assistance. The Authorized User contacted the NRC and the Project Manager contacted Troxler. The Project Manager contacted Troxler (Corporate RSO, Steve Browne, ultimately, office – (919) 485-2228) and the Roanoke ECS RSO by telephone. The RSO also suggested that the Project Manager contact the ECS Corporate RSO (Stan Murphy) for additional information based on corporate experience. The Field Services Supervisor obtained the Radiation Survey Meter from the office and began traveling to the site. The Field Services Supervisor also contacted the ECS Roanoke RSO while en route. Multiple communications were made to discuss and update the NRC, Troxler Corporate RSO, ECS Roanoke RSO, and ECS Corporate RSO en route to, on-site, and upon completion of initial response activities.

Upon arrival at the site with the Radiation Survey Meter, ECS staff surveyed the area, with expected elevated levels in the gauge vicinity, as the gauge was generally unshielded. Based on the belief that the source rod could not be returned to the shielded position, conversations continued with all parties as to a means to shield the source appropriately for transport. Various options were discussed with regard to practicality and acceptability; however, no option was readily acceptable. After discussions, ECS staff approached the gauge to again try to pull the source rod into a shielded position. With efforts by the Authorized User, Field Services Supervisor, and Project Manager, the source rod was pulled back into the shielded position. The gauge parts were placed within the Type A Package and surveyed with the Radiation Survey Meter for emission levels. Levels were found to be below 0.4 mrem/hr at 1 meter. The incident area was surveyed with the Radiation Survey Meter, with no detectable levels of radiation beyond background levels for the general site as a hole. Written statements were recorded by the Authorized User and Equipment Operator (See attached handwritten statements). Photographs were taken of the incident area (See attached photographs). Updates were made to the NRC, Troxler Corporate RSO, and the ECS Roanoke RSO and ECS Corporate RSO. The package and contents were returned to the ECS office for leak testing and appropriate storage.

Leak testing was performed and sent to Pacific Nuclear Technology on August 15, 2007. Photographs were sent electronically to Troxler on August 15, 2007. On August 16, 2007, the Troxler Corporate RSO indicated that a Returned Goods Authorization would be provided upon their receipt of leak test results.

**PERSONAL INFORMATION WAS REMOVED  
BY NRC. NO COPY OF THIS INFORMATION  
WAS RETAINED BY THE NRC.**

After the incident, the Authorized User was restricted from use of portable nuclear gauges until further evaluations are completed. (On September 7, 2007, our Authorized User resigned of his own accord). The Authorized User was contacted by the NRC and informed that a representative would visit our office and the site on August 21, 2007. On August 20, 2007, the ECS Roanoke RSO was contacted by Mr. Dick Ladum ((484) 868-0985), tentatively scheduling a visit on the morning of August 21, 2007.

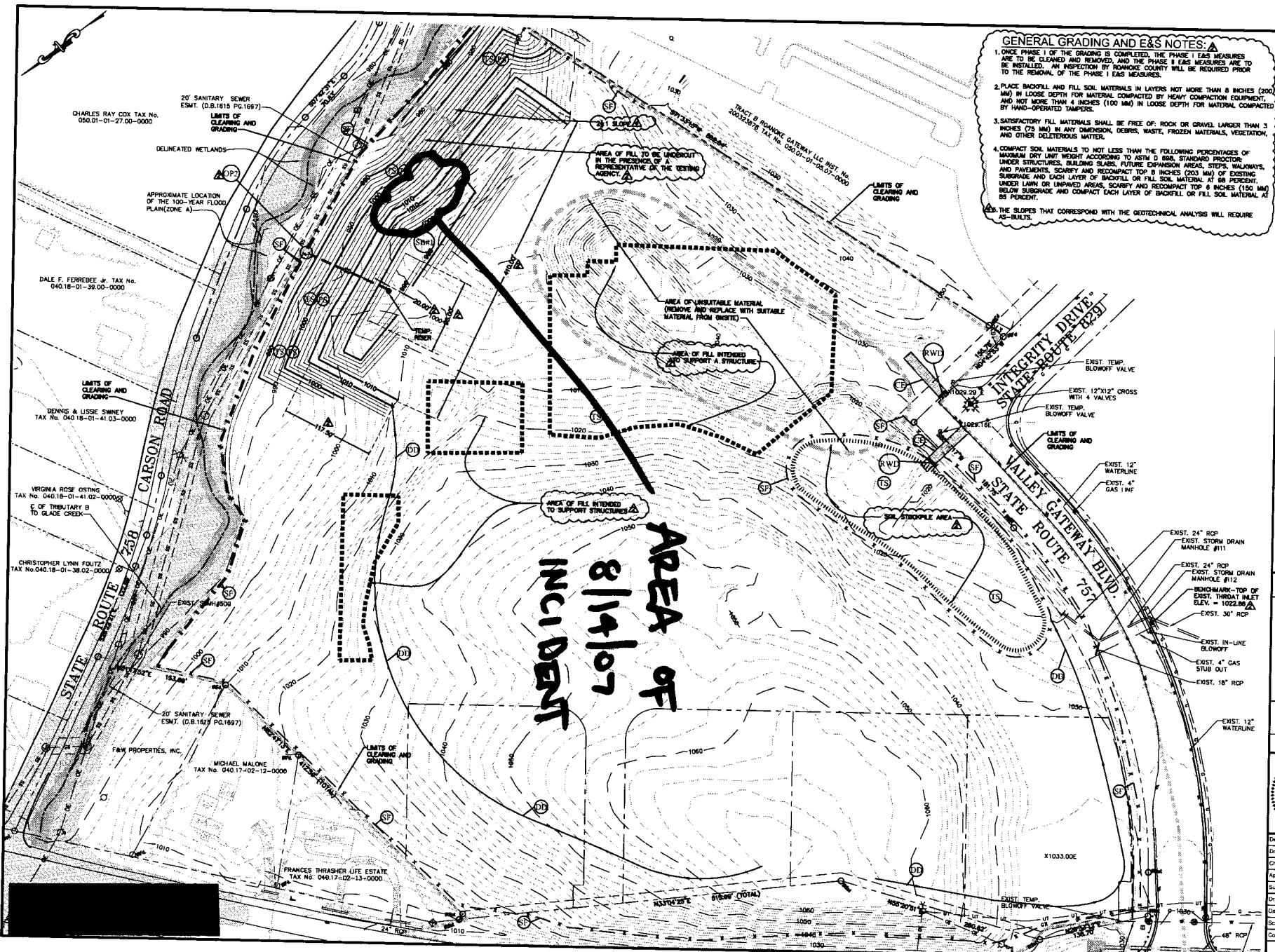
On August 21, 2007, Mr. Ladum visited our office and the subject project site, as well as our Christiansburg storage facility, between approximately 11 a.m. and 3:30 p.m.

On August 29, 2007, we received leak test results from Pacific Nuclear Technology indicating no detectable removable contamination (See attached Report of Leak Test). On August 29, 2007, we requested and received an RGA number from Troxler for return of the gauge. On August 30, 2007, the gauge was shipped to Troxler for transfer and decommissioning. On September 5, 2007, Troxler received and took possession of the gauge for decommissioning. On September 11, 2007, Troxler provided a memo confirming this transfer (See attached Disposal Order memo).

### **Proposed Improvements:**

Based on the subject incident and response activities, as well as discussions with Mr. Ladum, we propose to complete the following improvements to our Radiation Safety Program prior to the end of this year:

- 1.) The Authorized User will not be permitted to use a portable nuclear gauge until successful completion of a second outside radiation safety training seminar. (The Authorized User resigned of his own accord on September 7, 2007).
- 2.) An Assistant Radiation Safety Officer will be formally designated and trained through an outside radiation safety officer seminar.
- 3.) We will explore the potential for formation of a service contract with an outside agency, or specialized internal training, for response to such incidents in the future.
- 4.) An extremity badge will be obtained for use in performing required response to potential future incidents, as well as leak testing for the primary individual performing leak tests.
- 5.) A "lunch box" safety session will be prepared for offering to general contractors and grading contractors. It is noted that ECS cannot mandate this safety meeting be attended by contractors working in the vicinity of our portable nuclear gauges; however, this will be made available for contractors at their request.



- GENERAL GRADING AND E&S NOTES:**
- ONCE PHASE I OF THE GRADING IS COMPLETED, THE PHASE I E&S MEASURES ARE TO BE CLEANED AND REMOVED, AND THE PHASE II E&S MEASURES ARE TO BE INSTALLED. AN INSPECTION BY ROANOKE COUNTY WILL BE REQUIRED PRIOR TO THE REMOVAL OF THE PHASE I E&S MEASURES.
  - PLACE BACKFILL AND FILL SOIL MATERIALS IN LAYERS NOT MORE THAN 8 INCHES (200 MM) IN LOOSE DEPTH FOR MATERIAL COMPACTED BY HEAVY COMPACTION EQUIPMENT, BY HAND-OPERATED TAMPERS.
  - SATISFACTORY FILL MATERIALS SHALL BE FREE OF ROCK OR GRAVEL LARGER THAN 3 INCHES (75 MM) IN ANY DIMENSION, DEBRIS, WASTE, FROZEN MATERIALS, VEGETATION, AND OTHER DELETERIOUS MATTER.
  - COMPACT SOIL MATERIALS TO NOT LESS THAN THE FOLLOWING PERCENTAGES OF MAXIMUM DRY UNIT WEIGHT ACCORDING TO ASTM D 888, STANDARD PROCTOR, UNDER STRUCTURES, BUILDING SLABS, FUTURE EXPANSION AREAS, STEPS, WALKWAYS, AND PAVEMENTS, SCARIFY AND REDCOMPACT TOP 8 INCHES (203 MM) OF EXISTING SUBGRADE AND EACH LAYER OF BACKFILL OR FILL SOIL MATERIAL AT 80 PERCENT, UNDER LAWN OR UNPAVED AREAS, SCARIFY AND REDCOMPACT TOP 8 INCHES (150 MM) BELOW SUBGRADE AND COMPACT EACH LAYER OF BACKFILL OR FILL SOIL MATERIAL AT 95 PERCENT.
  - THE SLOPES THAT CORRESPOND WITH THE GEOTECHNICAL ANALYSIS WILL REQUIRE AS-BUILTS.

**AREA OF  
8/14/07  
INCIDENT**

102 Albemarle Ave.  
Roanoke, Virginia 24013  
www.lmwpc.com  
PH: 540.345.0676  
FAX: 540.342.7456  
lmwpc@lmwpc.com

**L M W P C**  
Engineering  
Surveying  
Landscape Design

**NEW STORE SITE: R-391  
VINTON MAGISTERIAL DISTRICT  
ROANOKE COUNTY, VIRGINIA**

DATE	DESCRIPTION	BY
8/14/07	PER MOY & COUNTY COMMENTS	CHW
8/14/07	PER MOY & COUNTY COMMENTS	CHW

**PHASE I GRADING AND  
EROSION CONTROL PLAN**

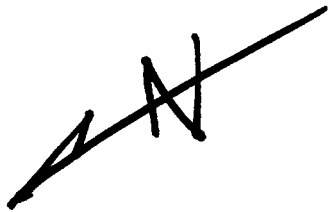
**EROSION CONTROL PLAN**

NO. 020021

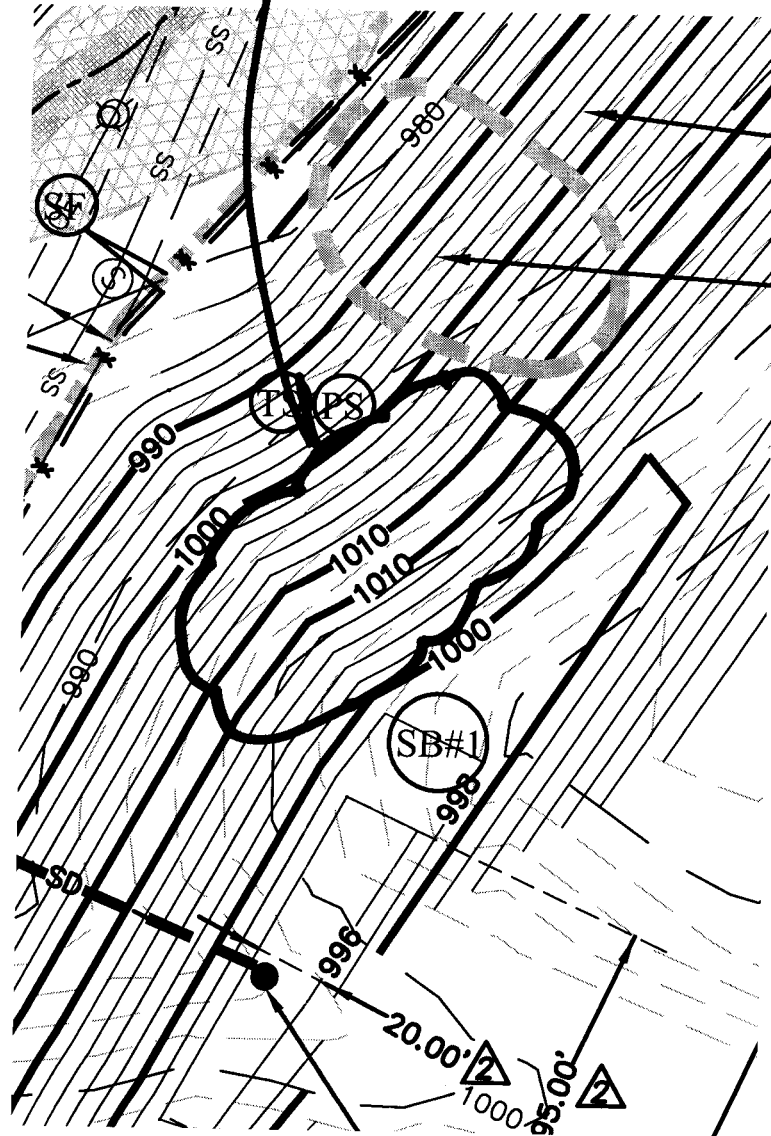
Richard C. White  
Professional Engineer  
No. 020021

Designed By: CHW  
Drawn By: CHW  
Checked By: RCW  
Approved By: RCW  
Submitted By: RCW  
Drawing: 3155A (3/15/07)  
Date: 11/20/06  
Scale: 1"=40'  
Commission No. 3155A

Sheet 5 of 22



# AREA OF 8/14/07 INCIDENT





Technician, [unclear]  
 Used his white compact car, was rolling over  
 approx. 25' to 30' in front of test location. Placed trailer  
 nuclear test gauge, [unclear] and began to run test.  
 Technician walked forward 10' to 12' to begin driving  
 car for next test. As driving his compact car ~~backed~~ <sup>backed</sup> up  
 parallel with technician. Technician pointed to gauge,  
 compact car operator turned and continued backing up.  
 Technician yelled "stop" and yelled "stop". Compact  
 car operator stopped, car rolled onto nuclear gauge. Compact  
 car operator pushed off of gauge. Technician ran over  
 to gauge and pulled up handle, handle would not move.  
 Technician pushed car, persons, so  
 away from gauge. Mike [unclear], and Brian [unclear]  
 were contacted. Area has been [unclear] [unclear] [unclear].  
 Technician [unclear]. Brian Reynolds from EGS, Mid-Atlantic, U

*[Signature]* 8/14/07 11:20 pm

6:40 p.m.  
8-11-07

Operator was compacting fill area.  
He was unaware of compaction test being  
conducted. Operator was backing up when  
he heard the ground man yell out stop.  
The operator stopped but it was too late.  
He had already backed over nuclear gauge.

He also noticed ground man waving his  
ARMS.

The operator of the compactor was Charles Felty

*Charles Felty*



Pacific Nuclear Technology  
2525 West 10<sup>th</sup> Street  
Antioch, CA 94509  
925-706-8300  
925-706-8396 Fax

RGA #05946

PSW

8/29/07

**REPORT OF LEAK TEST**

**ECS - MID-ATLANTIC LLC**  
BRIAN WYATT  
5320 PETERS CREEK RD NW ST STE F  
ROANOKE VA 24019

Model Number: 3430

Serial Number: T343 36254

Isotope: Cs-137 8 mCi  
Am-241 40 mCi  
mCi

Date of Test: 8/15/2007


The sample identified above was submitted for leak test analysis.

Analysis Date: 8/20/2007 Analysis Number: K16077

Results: REMOVABLE  
CONTAMINATION: NIL microcurie

NOTE: The US Nuclear Regulatory Commission and the Agreement States require that the analysis of the wipe from a sealed source must be capable of detecting the presence of 0.005 microcurie (185 Bq) on the sample. The count on the wipe was below a Lower Limit of Detection of 0.0001 microcurie (3.7 Bq). The source is not considered leaking. This report should be retained for viewing by regulatory agencies.

Signed



Office of Radiation Safety  
Calif. RM License No. 5634-07



**Troxler Electronic Laboratories, Inc. • Troxler International, Ltd.**  
3008 Cornwallis Road, P.O. Box 12057, Research Triangle Park, NC 27709 - USA  
Telephone: 919/549-8661 Telefax: 919/549-0761

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09/11/2007

ECS Mid-Atlantic, LLC  
5320 Peters Creek Road  
Suite F  
Roanoke, VA 24019

Attn: Radiation Safety Officer

This is to acknowledge receipt of the below-referenced nuclear gauge(s) under North Carolina Radioactive Materials License #032-0182-1. You should retain this letter in your files to document transfer of the gauge.

Date Received: 09/05/2007

<u>Disposal Order</u>	<u>Model</u>	<u>Serial Number</u>
86489	3430	36254

Regards,

Steve Pennington  
Service Sales Manager  
TroXler Electronic Laboratories, Inc.