

NRC Form 313 I (12-81) 10 CFR 30	U.S. NUCLEAR REGULATORY COMMISSION	1. APPLICATION FOR: <i>(Check and/or complete as appropriate)</i>
APPLICATION FOR BYPRODUCT MATERIAL LICENSE INDUSTRIAL		<input type="checkbox"/> a. NEW LICENSE
<i>See attached instructions for details.</i> Completed applications are filed in duplicate with the Division of Fuel Cycle and Material Safety, Office of Nuclear Material Safety, and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555 or applications may be filed in person at the Commission's office at 1717 H Street, NW, Washington, D. C. or 7915 Eastern Avenue, Silver Spring, Maryland.		<input type="checkbox"/> b. AMENDMENT TO: LICENSE NUMBER
		<input checked="" type="checkbox"/> c. RENEWAL OF: LICENSE NUMBER 12-05672-02

2. APPLICANT'S NAME <i>(Institution, firm, person, etc.)</i> S.T.S. CONSULTANTS LTD. <i>(Formerly Soil Testing Services)</i> TELEPHONE NUMBER: AREA CODE - NUMBER EXTENSION (312) 272-6520	3. NAME AND TITLE OF PERSON TO BE CONTACTED REGARDING THIS APPLICATION Robert J. Hubbard TELEPHONE NUMBER: AREA CODE - NUMBER EXTENSION (312) 272-6520
4. APPLICANT'S MAILING ADDRESS <i>(Include Zip Code)</i> <i>(Address to which NRC correspondence, notices, bulletins, etc., should be sent.)</i> 111 Pfingsten Road, Northbrook, Ill. 60062	5. STREET ADDRESS WHERE LICENSED MATERIAL WILL BE USED <i>(Include Zip Code)</i> (SEE ATTACHED) 111 Pfingsten Rd., Northbrook, Ill., 60062 835 Midway Dr., Willowbrook, Ill., 60521 6918 Forest Hills Rd., Rockford, Ill., 61111

(IF MORE SPACE IS NEEDED FOR ANY ITEM, USE ADDITIONAL PROPERLY KEYED PAGES.)

6. INDIVIDUAL(S) WHO WILL USE OR DIRECTLY SUPERVISE THE USE OF LICENSED MATERIAL <i>(See Items 16 and 17 for required training and experience of each individual named below)</i>	
FULL NAME	TITLE
a. SEE ATTACHED	
b. Robert J. Hubbard, C.E.T.	Field Services Supervisor
c. Michael T. Russell, P.E.	Vice-President, Materials Engineering Div.
7. RADIATION PROTECTION OFFICER Clyde McComb, P.E.	
Attach a resume of person's training and experience as outlined in Items 16 and 17 and describe his responsibilities under Item 15. SEE ATTACHED	

8. LICENSED MATERIAL				
LINE NO.	ELEMENT AND MASS NUMBER	CHEMICAL AND/OR PHYSICAL FORM	NAME OF MANUFACTURER AND MODEL NUMBER <i>(If Sealed Source)</i>	MAXIMUM NUMBER OF MILLICURIES AND/OR SEALED SOURCES AND MAXIMUM ACTIVITY PER SOURCE WHICH WILL BE POSSESSED AT ANY ONE TIME
(1)	Cesium 137	Sealed Source	Troxler Dwg. 102112	No single source to exceed 10 millicuries
(2)	Americium 241	Sealed Source	Troxler Dwg. 102451	No single source to exceed 50 millicuries
(3)	Cesium 137/ Americium 241	Sealed Source	Campbell Pacific Nuclear CPN-131	No single source to exceed 10/50 millicuries
(4)	Cesium 137	Sealed Source	New England Nuclear NER-572	No single source to exceed 5 millicuries
DESCRIBE USE OF LICENSED MATERIAL E				
(1) & 2	For use in Troxler Model 3411-B moisture -density meter to measure soil density.			
3	For use in Campbell Pacific Nuclear Model MC-2 moisture-density meter "			
4	For use in Mt. Sopris Instrument Co. Model GG-375 Density Attachment Model HLP 2375. combination probe for measuring soil density in borings			

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 12-05672-05 PDR

CONTROL NO. 78305

9. STORAGE OF SEALED SOURCES

LINE NO.	CONTAINER AND/OR DEVICE IN WHICH EACH SEALED SOURCE WILL BE STORED OR USED. A.	NAME OF MANUFACTURER B.	MODEL NUMBER C.
(1)	&2 Manufacturers Source Housing	Troxler Electronics	3411-B
(2)	3 " " "	Campbell Pacific Nuclear	MC-2
(3)	4 " " "	New England Nuclear	NER-572
(4)			

10. RADIATION DETECTION INSTRUMENTS

LINE NO.	TYPE OF INSTRUMENT A	MANUFACTURER'S NAME B	MODEL NUMBER C	NUMBER AVAILABLE D	RADIATION DETECTED (alpha, beta, gamma, neutron) E	SENSITIVITY RANGE (milliroentgens/hour or counts/minute) F
(1)	NONE					
(2)						
(3)						
(4)						

11. CALIBRATION OF INSTRUMENTS LISTED IN ITEM 10

<input type="checkbox"/> a. CALIBRATED BY SERVICE COMPANY NAME, ADDRESS, AND FREQUENCY N.A.	<input type="checkbox"/> b. CALIBRATED BY APPLICANT Attach a separate sheet describing method, frequency and standards used for calibrating instruments. N.A.
---	---

12. PERSONNEL MONITORING DEVICES

TYPE (Check and/or complete as appropriate.) A	SUPPLIER (Service Company) B	EXCHANGE FREQUENCY C
<input checked="" type="checkbox"/> (1) FILM BADGE <input type="checkbox"/> (2) THERMOLUMINESCENCE DOSIMETER (TLD) <input type="checkbox"/> (3) OTHER (Specify): _____ _____	R.S. Landauer Jr. & Co. Glenwood Science Park Glenwood, Illinois 60425	<input checked="" type="checkbox"/> MONTHLY <input type="checkbox"/> QUARTERLY <input type="checkbox"/> OTHER (Specify): _____ _____

13. FACILITIES AND EQUIPMENT (Check where appropriate and attach annotated sketch(es) and description(s).)

- ☐ a. LABORATORY FACILITIES, PLANT FACILITIES, FUME HOODS (Include filtration, if any), ETC.
☒ b. STORAGE FACILITIES, CONTAINERS, SPECIAL SHIELDING (fixed and/or temporary), ETC. (SEE ATTACHED)
☐ c. REMOTE HANDLING TOOLS OR EQUIPMENT, ETC.
☐ d. RESPIRATORY PROTECTIVE EQUIPMENT, ETC.

14. WASTE DISPOSAL

- a. NAME OF COMMERCIAL WASTE DISPOSAL SERVICE EMPLOYED
NONE
- b. IF COMMERCIAL WASTE DISPOSAL SERVICE IS NOT EMPLOYED, SUBMIT A DETAILED DESCRIPTION OF METHODS WHICH WILL BE USED FOR DISPOSING OF RADIOACTIVE WASTES AND ESTIMATES OF THE TYPE AND AMOUNT OF ACTIVITY INVOLVED. IF THE APPLICATION IS FOR SEALED SOURCES AND DEVICES AND THEY WILL BE RETURNED TO THE MANUFACTURER, SO STATE
Sealed sources to be returned to manufacturer for disposal when no longer used.

INFORMATION REQUIRED FOR ITEMS 15, 16 AND 17

Describe in detail the information required for Items 15, 16 and 17. Begin each item on a separate page and key to the application as follows:

15. RADIATION PROTECTION PROGRAM. Describe the radiation protection program as appropriate for the material to be used including the duties and responsibilities of the Radiation Protection Officer, control measures, bioassay procedures (if needed), day-to-day general safety instruction to be followed, etc. If the application is for sealed source's also submit leak testing procedures, or if leak testing will be performed using a leak test kit, specify manufacturer and model number of the leak test kit.
(SEE ATTACHMENTS --- TROXLER ELECTRONICS LEAK TEST KIT & SERVICE)
16. FORMAL TRAINING IN RADIATION SAFETY. Attach a resume for each individual named in Items 6 and 7. Describe individual's formal training in the following areas where applicable. Include the name of person or institution providing the training, duration of training, when training was received, etc. (REFER TO EARLIER LICENSE FOR CLYDE MCCOMB TRAINING - RESUME ATTACHED)
 - a. Principles and practices of radiation protection.
 - b. Radioactivity measurement standardization and monitoring techniques and instruments.
 - c. Mathematics and calculations basic to the use and measurement of radioactivity.
 - d. Biological effects of radiation.
17. EXPERIENCE. Attach a resume for each individual named in Items 6 and 7. Describe individual's work experience with radiation, including where experience was obtained. Work experience or on-the-job training should be commensurate with the proposed use. Include list of radioisotopes and maximum activity of each used.

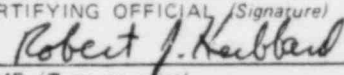
(SEE EARLIER LICENSE-- MATERIAL TO BE USED BY INDIVIDUALS WHO HAVE SATISFACTORILY COMPLETED MANUFACTURER'S SAFETY PROGRAM AND HAVE BEEN DESIGNATED BY LICENSEE'S RADIATION PROTECTION OFFICER. LICENSEE SHALL MAINTAIN RECORDS OF INDIVIDUALS WHO HAVE BEEN DESIGNATED AS AUTHORIZED USERS.)

18. CERTIFICATE

(This item must be completed by applicant)

The applicant and any official executing this certificate on behalf of the applicant named in Item 2, certify that this application is prepared in conformity with Title 10, Code of Federal Regulations, Part 30, and that all information contained herein, including any supplements attached hereto, is true and correct to the best of our 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.

a. LICENSE FEE REQUIRED (See Section 170.31, 10 CFR 170)	b. CERTIFYING OFFICIAL (Signature) 
Renewal License Fee \$110	c. NAME (Type or print) Robert J. Hubbard
(1) LICENSE FEE CATEGORY: Renewal Byproduct Materials	d. TITLE Supervisor
(2) LICENSE FEE ENCLOSED: \$ 110	e. DATE August 17, 1983

CLYDE L. McCOMB
SENIOR PROJECT ENGINEER



Professional Profile

EDUCATION

B.S.C.E., University of Missouri, Columbia, Missouri, 1962

REGISTRATION

Professional Engineer: Illinois

PROFESSIONAL ACTIVITIES

American Society of Civil Engineers, Member
International Society of Soil Mechanics, Member
National Society of Professional Engineers, Member
Illinois Society of Professional Engineers, Member
American Society of Quality Control, Member
Construction Specification Institute, Member
American Concrete Institute, Member

EXPERIENCE

Present	<u>Soil Quality Assurance Manager</u> , STS Consultants, Ltd. Responsible
1973-	for organizing and monitoring soil quality assurance program during
	construction of earth embankments and foundations for special con-
	sultation and soil studies for difficult problem silts. Prepare soil
	engineering reports, specifications and pavement design.
1973	<u>Project Engineer</u> , Soil Testing Services, Inc. Supervision of technicians
1964-	and field engineers on soil quality assurance projects.
1964	<u>Soils Engineer</u> , Soil Testing Services, Inc. Performed soil testing and
1959-	inspection services during construction of embankments for
	buildings, roads, parking lots, railroads, airports, dams; and inspected
	foundations for industrial, commercial, residential and high-rise
	buildings.
1958	<u>Engineering Technician</u> , U.S. Army Corps of Engineers. Performed
1957-	field and laboratory tests of construction materials.

RESUME

RADIOACTIVE MATERIAL EXPERIENCE

CLYDE L. MCCOMB

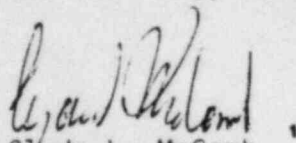
SOIL TESTING SERVICES, INC.
NORTHBROOK, ILLINOIS

Original experience to Nuclear gauges was obtained in 1960 while working on the first major earthwork project at O'Hare Field in Chicago. I used the Nuclear Chicago Corporation instruments extensively to monitor compaction of soils and asphalts during preparation of foundation and pavements.

More experience was obtained during the sixties with further use of the Nuclear Chicago Corporation instruments in the Chicago areas as well as out of state projects. When Seaman Nuclear Corporation introduced their new nuclear moisture and density meters in late sixties, I used their Model #75 on several hundred projects in the Chicago area. Similar experience has been realized with the use of their newer Model #C-100.

The writer has several years experience both with the Soil Test Inc., NIC-5 series and Troxler's Lab Inc. Model 2400 Series. These experiences involve actual field use of these instruments including proper care and maintenance as well as their limitations.

I have attended several 1-day in-house seminars sponsored by Soil Test Inc. and Seaman Nuclear Corporation on radiation protection, radioactivity measurements and biological effects of radiation. These seminars always include care, maintenance, and operation of these various units.



Clyde L. McComb

Radiation Protection Officer

January 23, 1979

TROXLER ELECTRONIC LABORATORIES, INC.

HEREBY CERTIFIES THAT

CLYDE L. MCCOMB

of

SOILS TESTING SERVICES

HAS SUCCESSFULLY COMPLETED THE TROXLER ELECTRONIC LABORATORIES, INC.
TRAINING COURSE FOR THE USE OF NUCLEAR TESTING EQUIPMENT.

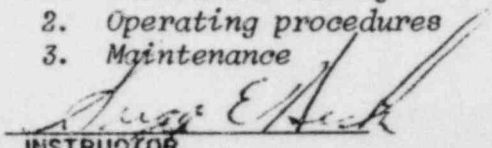
SUBJECTS INCLUDED IN THIS COURSE WERE AS FOLLOWS:

Radiological Safety

- | | |
|--|---|
| 1. Principles and practices of radiation protection. | 5. Radioactivity measurement standardization and monitoring techniques and instruments. |
| 2. Leak testing procedures. | 6. Accident and incident procedures. |
| 3. Mathematics and calculations basic to the use and measurement of radioactivity. | 7. Procedures for nuclear gauge storage and transportation. |
| 4. Biological effects of radiation. | 8. General safety precautions. |

Gauge Operation

- | | |
|-------------------------|----------------------|
| 1. Instrument theory | 4. Field application |
| 2. Operating procedures | 5. Gauge calibration |
| 3. Maintenance | |


INSTRUCTOR

2/5-6/79
DATE

WILLIAM F. TROXLER
PRESIDENT

CONTROL NO. 78305

ROBERT J. HUBBARD
FIELD ENGINEERING SERVICES SUPERVISOR



Professional Profile

EDUCATION

B.S., Biology, St. Lawrence University, Canton, New York, 1974

CERTIFICATION

Certified Engineering Technician, American Society of Certified Engineering Technicians, 1981.

Nuclear Radiation Liaison Officer.

Campbell Pacific Nuclear Density Meter Certification, 1979.

Troxler Nuclear Density Meter Certification, 1979.

EXPERIENCE

Present 1980-	<u>Field Services Supervisor</u> , STS Consultants, Ltd. Responsible for daily scheduling and coordination of field services employees, monitoring and issuing equipment, and writing job progress reports.
1980 1978-	<u>Soil and Materials Technician</u> , Soil Testing Services, Inc. Responsibility for commercial and industrial construction monitoring and testing throughout the Chicago area with related field reporting of recommendations and analysis. Duties included soil testing of both rock and hardpan caissons, footings and monitoring of concrete, asphalt and mortar placement with special testing for corrosion of parking garage structures and caisson instrumentation.
1978 1976-	<u>Research Chemical Technician</u> , Institute of Gas Technology. Duties involved constructing, monitoring and reporting on benchscale research experiments involving inorganic chemical reactions relating to closed loop thermochemical hydrogen production cycles.

CONTROL NO. 7 8 3 0 5

TROXLER ELECTRONIC LABORATORIES, INC.

HEREBY CERTIFIES THAT

ROBERT J. HUBBARD

of

STS CONSULTANTS, LTD.

HAS SUCCESSFULLY COMPLETED THE TROXLER ELECTRONIC LABORATORIES, INC.
TRAINING COURSE FOR THE USE OF NUCLEAR TESTING EQUIPMENT.

SUBJECTS INCLUDED IN THIS COURSE WERE AS FOLLOWS:

Radiological Safety

1. Principles and practices of radiation protection.
2. Leak testing procedures.
3. Mathematics and calculations basic to the use and measurement of radioactivity.
4. Biological effects of radiation.
5. Radioactivity measurement standardization and monitoring techniques and instruments.
6. Accident and incident procedures.
7. Procedures for nuclear gauge storage and transportation.
8. General safety precautions.

Gauge Operation

1. Instrument theory
2. Operating procedures
3. Maintenance
4. Field application
5. Gauge calibration

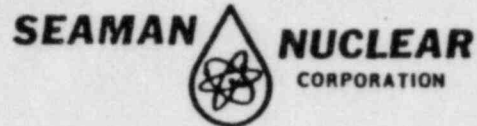
Lawrence James
INSTRUCTOR

6/5/82
DATE

WILLIAM F. TROXLER
PRESIDENT

Nº 00455

CONTROL NO. 78305



HEREBY CERTIFIES THAT ON

FEBRUARY 2, 1979

ROBERT J. HUBBARD

HAS SUCCESSFULLY COMPLETED THE FACTORY PRESCRIBED RADIOLOGICAL SAFETY TRAINING COURSE, THEORY, MAINTENANCE, AND OPERATION OF THE SEAMAN NUCLEAR SERIES OF NUCLEAR METERS.

THIS FURTHER ATTESTS THAT THE ABOVE NAMED HAS MET ALL THE REQUIREMENTS OF ACCURACY IN TESTING SOILS, AGGREGATES, CONCRETES, ASPHALTIC CONCRETES, AND/OR ROOFING MOISTURE.

IN TESTIMONY WHEREOF, THIS CERTIFICATE HAS BEEN ISSUED BY AUTHORITY OF THE CORPORATION.

Robert J. Schenbach

CHIEF RADIOLOGIST

D. J. Seaman

PRESIDENT

CONTROL NO. 7830 -

Certificate Of Completion

This is to certify that BOB HUBBARD has completed the basic training
course on *Radiation Safety and Use of Nuclear Soil Gauges*, held
this 29th day of January 1981, held at Soil Testing Services City of Northbrook
State of Illinois by *Campbell Pacific Nuclear Corporation*.


INSTRUCTOR


RADIATION SAFETY OFFICER



EDUCATION

M.S.C.E., Construction Materials, Purdue University, West Lafayette, Indiana, 1981
B.A., Chemistry, St. Louis University, St. Louis, Missouri, 1972

REGISTRATION

Registered Professional Engineer: Indiana
Non-Destructive Testing Level III Certification for all methods per the American Society for Non-Destructive Testing (SNT-TC-1A)
Certified Welding Inspector by the American Welding Society Specification QCI-77, Section 4 - Certified (10/29/77)

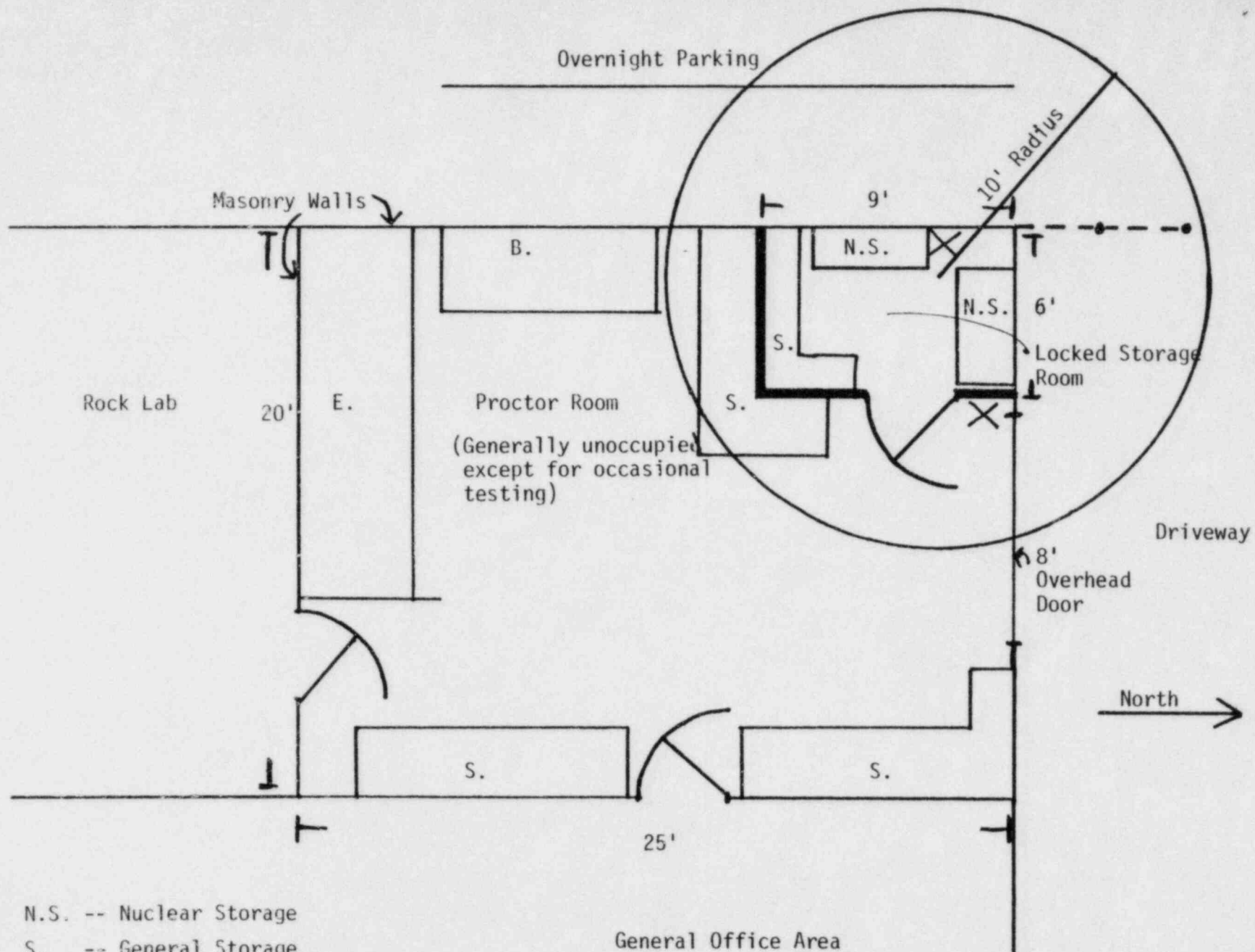
PROFESSIONAL ACTIVITIES

American Concrete Institute, Member
American Welding Society, Member
American Society for Non-Destructive Testing, Member
American Society for Testing and Materials, Member
Construction Specifications Institute, Member

EXPERIENCE

Present 1980-	<u>Vice President, Materials Engineering Division</u> , STS Consultants, Ltd. Responsible for staffing and managing the materials engineering group including business development efforts, and providing consulting expertise for all regional offices.
1979 1977-	<u>Area Manager</u> , Soil Testing Services, Inc. Responsible for managing the Rockford office including the engineering and administrative functions.
1977 1973-	<u>Senior Materials Engineer</u> , Soil Testing Services, Inc. Worked on various aspects of construction quality assurance including the mechanical and non-destructive testing of steel, concrete, soils, asphalt, roofing, welds, wood, and related materials.
1973	<u>Construction Foreman</u> , Russell Brothers, Inc. Worked on various phases of excavation and paving projects.

CONTROL NO. 78302



- N.S. -- Nuclear Storage
- S. -- General Storage
- E. -- Test Equipment
- B. -- Bench
- X -- Radiation Sign

SOIL TESTING SERVICES, INC.

PROJECT _____

STS JOB NO. _____

BY _____

CHK _____

DATE _____

PAGE ____ OF ____



STS Consultants Ltd.
111 Pfingsten Road
Northbrook, Illinois 60062
312-273-5440

PERSONNEL RADIATION SAFETY
NUCLEAR METER STORAGE IN NWC OF STS CONSULTANTS, LTD. BUILDING
111 PFINGSTEN ROAD, NORTHBROOK, ILLINOIS

Given: Sources with No Shielding (Worst Case)
(Dose in mRem/hour of exposure)

- A) Gamma Source $2,500,000/D^2$ (mm)
- B) Neutron Source $62,500/D^2$ (mm)
- C) Combined $2,562,500/D^2$ (mm)

<u>Distance From Gauge</u>		<u>Combined Dose (mRem) from One (1) Unshielded Meter</u>			<u>Worst Case 10 Unshielded Meters (mRem)</u>
<u>Ft.</u>	<u>mm</u>	<u>Hour</u>	<u>8hr. Day</u>	<u>40 hr. Week</u>	<u>40 hour week</u>
5'	1524	1.10	8.8	44.0	441
10'	3048	0.276	2.21	11.04	110.4
10.72'	3267.6	0.24	1.92	9.6	96-Max. NRC Weekly Allowable Whole Body Dose
15'	4572	0.12	0.96	4.8	48
20'	6096	0.07	0.55	2.76	27.6
25'	7620	0.044	0.35	1.76	17.65
30'	9144	0.031	0.24	1.23	12.26

Based upon normal everyday working conditions of 10 feet or more from the meter storage, plus the shielding of sources, plus the normal condition of no one person working 40 hours a week on proctors, plus very seldom having 10 or more nuclear meters in at any one time, the extent of radiation risk appears minimal.

CONTROL NO. 78305



STS Consultants Ltd.
111 Pfingsten Road
Northbrook, Illinois 60062
312-273-5440

RADIOLOGICAL EMERGENCY ASSISTANCE TELEPHONE NUMBERS

If an accident occurs involving radioactive materials or radiation producing machines, the Region III Nuclear Regulatory Commission and the State of Illinois Department of Nuclear Safety are available for direct technical support and assistance through 24-hour telephone numbers.

To report emergencies involving Radioactive Material spills, lost or stolen Radioactive sources, over exposures, radiation problems which exist or could exist, please call the following 24-hour numbers:

Region III Nuclear Regulatory Commission Duty Officer

(312) 932-2500 (24-hour)

State of Illinois Department of Nuclear Safety Duty Officer

(217) 782-7860 (24-hour)

Illinois Emergency Preparedness & Disaster Service

(312) 246-4610 (9AM-5PM)

In addition, notify one or all of the following:

*S.T.S. Consultants 800-942-4836 (office)

*Clyde L. McComb, Radiation Safety Officer (312) 381-6809 (home)

*Michael T. Russell, V.P. Field Services (312) 680-8525 (home)

*Robert J. Hubbard, Supervisor (312) 545-6198 (home)

Always give your name, telephone number where you can be contacted, and other pertinent information.

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RADIATION SAFETY & EMERGENCY PROCEDURES PROGRAM

To ensure compliance with the provisions of 10CFR Part 19, "Notices, Instructions and Reports to Workers, Inspection," and Part 20, "Standards for Protection Against Radiation", Soil Testing Services, Inc., has established the following procedures for usage of the nuclear density and moisture gauges.

Item A

Emergency Procedures in the event of accidents involving either damage or loss of gauge are included on the Radiological Assistance sheet shown in red attached to each unit. This sheet indicates the names and telephone numbers of individuals to be notified immediately in the event of an accident.

Item B

Safety measures to be used in transporting the devices and the user's vehicle shall include transporting the unit in the manufacturer's shipping container. The shipping container should be locked at all times. In addition, the shipping container should be away from the passenger compartment as far as possible.

Item C

To prevent unauthorized access to the unit, the unit or the shipping containers should be locked when not in use or when not under user's direct supervision. When the units are stored on the job site, the job construction trailer should be locked when the unit is not under the user's observation.

Item D

To prevent unauthorized use or removal of the gauges from the storage place in the laboratory, the door is locked at all times and only laboratory supervisors have the key.

Item E

The user is not to tamper with or dismantel or remove any parts of the gauges. Any servicing or internal adjusting or any dismanteling is to be performed by the manufacturer.

Item F

All maintenance and repair of gauges will be performed by the manufacturer.

Item 7 G

Leak tests on each instrument is required every six months.

Item 7 H

Each user is required to keep with each unit the required license, leak test certificate, emergency procedures, and the operator manual. Each user is required to wear a film badge when using the unit. The film badge is not to be stored any place near the unit.

If there are any questions with regard to the aforementioned please contact your supervisor and the radiation protection officer.

Clyde L. McComb
Radiation Protection Officer

CLM/vrb

STS CONSULTANTS, LTD.
SAFETY POLICY STATEMENT

It is the policy of STS that every operation shall be performed in the safest possible manner, so as to prevent injuries to persons and damage to property. To accomplish this, every reasonable effort will be made in the interest of accident prevention, fire prevention, and health protection.

To implement this policy, STS will continue all efforts to maintain a safe and healthful place to work. To the maximum extent possible, we will continue to provide safe working equipment, necessary safety protection devices, and first aid equipment. The minimization of accidents will continue to be considered as an integral part of our operations and the responsibility of every employee.

Since we have a large number of projects at any time which usually have only individual STS employees or small teams of STS employees on the project site, it is absolutely imperative that every STS employee regard his safety and the safety of those in his area as part of his/her responsibilities. It is, however, particularly important that all supervisors, including lead drillers and lead technicians, pay special attention to the safety of those employees working under their supervision.

All work related accidents must be reported to your supervisor. It is the responsibility of the Department Head in charge of the operational area in which the accident happened to investigate the accident and report his findings to the Safety Committee of his office. It is then the responsibility of the Department Head, Supervisor, and employee to make sure the necessary action to prevent similar accidents has been taken.

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Each employee must review the safety requirements for his/her job. There are available manuals and guidelines relating to specific safety problem areas such as handling of hazardous materials. If you have any questions regarding the safe practices for any assigned task, check with your supervisor. Repeated failure to follow accepted safe practices or safety regulations may lead to termination of your employment with STS.

USE OF INTOXICANTS OR DRUGS

No STS employee is permitted to use or transport intoxicants or to be under the influence of any intoxicant or drug while on the job. This includes any time when operating a company vehicle, or when an employee is on STS premises, even if the day's work is completed. Failure to obey this policy may result in immediate termination of your employment with STS.

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SECTION 4

NUCLEAR DENSITY GAUGES

Basic Requirements

Nuclear density gauges (NDG) are used in several applications within our construction monitoring services, such as field density testing of compacted earth fills, field density testing of asphalt paving, and moisture surveys of built-up roofs. Although the radiation sources used in nuclear density gauges are of relatively low intensity and well protected within the gauges, it is imperative that each operator be trained in and be familiar with proper operating and safety procedures so that neither the operator nor the general public is subjected to hazardous levels of radiation.

Because safety requirements vary somewhat depending on the type of source within the NDG and local state regulation, the following safety procedures are necessarily general. An operator will need to obtain additional information from the local STS Radiation Protection Officer. Before operating any NDG, the operator must check with the local Radiation Protection Officer to confirm that he/she has had the proper training.

General Safe Practices

1. Emergency Procedures — Emergency procedures regarding any damage or loss of an NDG are included on the radiological assistance sheet attached to each NDG. This sheet includes the names and telephone numbers of individuals to be notified immediately in the event of an accident. Do not go to the field with an NDG unless the radiological assistance sheet is attached.
2. Transportation — Safety measures to be used in transporting the NDG's in an STS or operator-owned vehicle include transporting the NDG in the manufacturer's shipping container. Shipping containers should be locked at all times. In addition, the shipping container should be away from the passenger compartment of the vehicle as far as possible and secured to prevent shifting during a sudden stop.

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3. Preventing Damage — The operator must always remain alert to the danger of construction equipment running over the NDG. On the job site, always keep an NDG within your reach or safely stowed in a vehicle or construction office trailer. Remember, construction equipment operators often will not be able to see the NDG. Do not, even temporarily, place an NDG on a wall or other elevated structure from which it may fall and be damaged. Also, use only your fingertips on the keyboard pad. Small punctures from using a pencil, pen, or other sharp object to press the keypad can cause electrical short circuits.
4. Access — To prevent unauthorized access to the NDG, the NDG or the shipping container should be locked when not in use, or when not under user's direct supervision. If an NDG is to be stored on the job site, it should be placed inside the job construction trailer and the trailer should be locked when the NDG is not under the operator's observation. A "Caution - Radioactive Materials" sign should be posted on the outside of the trailer's entrance door.
5. Storage Security — To prevent unauthorized use or removal of an NDG from its storage place in an STS office or laboratory, the door to the storage area is to be locked at all times and only field technician supervisors are to have a key.
6. Servicing — The operator is not to tamper with or dismantle and remove any parts of an NDG without supervision. High voltage electrical sources are located within an NDG. All maintenance, repair, servicing, internal adjustments, or dismantling are to be performed by the manufacturer's service department or the Radiation Protection Officer.
7. Leak Tests — A leak test on each NDG is required to be performed every 6 months by the local Radiation Protection Officer.
8. Documentation — Each operator is required to keep with each NDG the required license, leak test certificate, emergency procedures, and the operator manual.

9. Film Badges — Each user is required to wear a film badge or dosimeter when using the unit. The film badge or dosimeter is not to be stored in the vicinity of the NDG, television sets, microwave ovens, or other sources of radiation.

SPECIAL FORM AND PACKAGING - TESTS AND CERTIFICATIONS

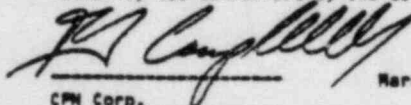
* SPECIAL FORM *

173.398(a)(Note 1) Each shipper of special form radioactive material shall maintain on file for at least one year after the last shipment, and be prepared to provide the DOT, a complete certification and safety analysis that the special form material meets the requirements.

173.398(a) SPECIAL TESTS, Special Form Material

- (1) FREE DROP -- Ten free falls of dummy capsule. No damage. Capsule experienced random tumble during fall striking at various angles upon contact. (capsule is further mounted within device and will not experience exposure to outside in event of similar free fall of actual finished device).
- (2) PERCUSSION -- Dummy capsule placed on 1/4" lead sheet on concrete. Steel rod allowed to slide down aluminum angle guide (top 1" off center) distance of 40". Five falls with weldment upright and five falls with weldment downwards. No damage.
- (3) HEATING -- Dummy capsule heated to red hot glow (1675 deg F) with torch. Maintained for 10 minutes. Discoloration but no damage to capsule integrity.
- (4) IMMERSION -- Dummy capsule placed in water breaker for 64 hours. No damage.

This is to certify that the encapsulated radioactive material in CPN's gauge has been tested for and is in compliance with the requirements for special form material. It has been issued IAEA Certificate of Competent Authority No. USA/0115/S by the US DOT.



March 11, 1982

CPN Corp.
Patrick J. Campbell
Radiation Safety Officer

* PACKAGING *

173.394(a)(1) Each shipper of a Specification 7A package must maintain on file for at least one year after the latest shipment, and be prepared to provide the DOT, a complete certification and supporting safety analysis demonstrating that the construction methods, packaging design, and material of construction are in compliance with the specifications.

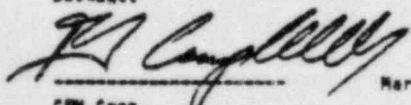


CPN's gauges contain Radioactive Material in Special Form and as such must be packaged according to Specification 7A, Type A. The gauges are shipped in combination shipping and carrying cases made of high density polyethylene, fiberglass or aluminum.

173.398(b) SPECIAL TESTS for a Type A package

- (i) WATER SPRAY -- Exempt. Package is of plastic or metal.
- (ii) FREE DROP -- Exempt. Package is of plastic or metal.
- (iii) CORNER DROP -- Exempt. Package is of plastic or metal.
- (iv) PENETRATION -- A steel rod 1.25 inches in diameter with hemispherical ends was dropped from a distance of 40 inches on to the center of the top of the case. No cracking or other significant deformation occurred.
- (v) COMPRESSION -- Five loaded cases were stacked on top of a sixth case for a period of 24 hours. No visible deformation was observed.

This is to certify that the shipping case for CPN's gauge has been tested for and is in compliance with the requirements for a Type 7A, Type A package.



March 11, 1982

CPN Corp.
Patrick J. Campbell
Radiation Safety Officer

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TROXLER ELECTRONIC LABORATORIES, INC.
P.O. BOX 12057, CORNWALLIS ROAD
RESEARCH TRIANGLE PARK, NORTH CAROLINA 27709, U.S.A.
Telephone 919/549-8661, Cable Troxelec, Telex 579474

TYPE A PACKAGE CERTIFICATION

Troxler Electronic Laboratories, Inc. certifies that their models 1255, 1257, 1351, 1352, 2226, 2376, 2401, 2402, 2451, 2452, 3401A, 3401B, 3411A, 3411B, 3205, 3215, 3221, 3222, 3223, and 3565 contain Type A quantities of special from radioactive materials and are packed for shipment in Specification 7A Type A (general packaging) containers (US Title 49 CFR 178.350).

These containers meet the requirements of CFR 173.24 and are designed and constructed to meet the standards as specified in CFR 173.389(j) and 173.398(b).

They are marked USA DOT 7A Type A, RADIOACTIVE MATERIALS in conformance with CFR 173.24.

These regulations are in conformance with the requirements (Marginal C-6) of the "International Atomic Agency's Regulations for the Safe Transport of Radioactive Materials", Safety Series No. 6, 1973, revision edition. These regulations do not require competent authority for international shipment as covered in Section VIII, paragraph 801.

For re-shipment, the shipper must maintain a copy of this Certification on file for a period of one year in accordance with CFR 173.394 (a) (1). Note that 173.393(b) requires that each package must incorporate a feature such as a seal, which is not readily breakable and which, while intact, will be evidence that the package has not been illicitly opened.

TROXLER ELECTRONIC LABORATORIES, INC.

R.L. Berry, Vice President
Research and Development
Dec. 22, 1980

RLB/cll

SHIPPER'S CERTIFICATION FOR RADIOACTIVE MATERIALS

Two completed and signed copies of this certification shall be handed to the carrier.
(Use block letters)

WARNING: Failure to comply in all respects with the applicable regulations of the Department of Transportation, 49-CFR, CAB 82 and, for international shipments, the IATA Restricted Articles Regulations may be a breach of the applicable law, subject to legal penalties. This certification shall in no circumstance be signed by an IATA Cargo Agent or a consolidator for international shipments.

This shipment is within the limitations prescribed for: (mark one)

☐ passenger aircraft And contains radioactive material intended for use in, or incident to, research, or medical diagnosis or treatment.

☒ cargo-only aircraft

NATURE AND QUANTITY OF CONTENT

PACKAGE

PROPER SHIPPING NAME	RADIOISOTOPE	GROUP	FORM	ACTIVITY		CATEGORY	TRANSPORT INDEX	TYPE
FOR U.S. SHIPMENTS, SEE SECTION 2, CAB 82, TARIFF 6-0	NAME OR SYMBOL OF PRINCIPAL RADIOACTIVE CONTENT	GROUP NUMBER OF GROUPS I TO VII	CHEMICAL FORM AND PHYSICAL STATE (GAS/LIQUID/SOLID), or SPECIAL FORM, or SPECIAL ENCAPSULATION	NUMBER OF CURIES, or MILLI-CURIES	Number of Packages	I—WHITE or II—YELLOW or III—YELLOW LABEL	FOR YELLOW LABEL CATEGORIES ONLY	INDUSTRIAL or TYPE A, or TYPE B
Radioactive Materials Special Form (N.O.S.) IATA Article #2129	Cesium 137	III	Special Form Type "A"	.010 Curies	1	II Yellow	0.1	Type "A"
Material in -- (Campbell Pacific or Troxler Nuclear Moisture/ Density Meters)	Americium 241: Beryllium	I	Special Form Type "A"	.050 Curies		II Yellow	0.1	Type "A"

ADDITIONAL INFORMATION REQUIRED FOR FISSILE MATERIALS ONLY

EXEMPTED FROM THE ADDITIONAL REQUIREMENTS FOR FISSILE MATERIALS SPECIFIED IN 7.1. OF PART 2 OF THE IATA RESTRICTED ARTICLES REGULATIONS ☐
NAMES, PLUS QUANTITY IN GRAMS, OR CONCENTRATION OR ENRICHMENT IN U235:

NOT EXEMPTED: FISSILE CLASS I ☐ FISSILE CLASS II ☐ FISSILE CLASS III ☐

Additional certificates obtained by the Shipper when necessary:

Special Form Encapsulation Certificate(s) ☐
Type "B" Packaging Certificate(s) ☐
Certificate(s) for Fissile Material ☐

Certificate(s) for Large Radioactive Source ☐
Government Approvals/Permits ☐

Special Handling Information
Not Applicable

I hereby certify that the contents of this consignment are fully and accurately described above by Proper Shipping Name and are classified, packed, marked, labelled and in proper condition for carriage by air according to applicable national governmental regulations, and for International Shipments, the current IATA Restricted Articles Regulations.

Name and full address of Shipper

Soil Testing Services, Inc.

111 Pfingsten Road

Northbrook, Illinois 60062

Name and title of person signing Certification

Michael T. Russell

Vice President

N.R.C. License No. 12-05672-02

Signature of the Shipper (see WARNING above)

Michael T. Russell

Date

March 9, 1982

Air Waybill No. *

Airport of Departure *

Airport of Destination *

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15756