



ECOLOGY SERVICES, INC. STATEMENT OF QUALIFICATIONS

INTRODUCTION

Ecology Services, Inc. (ESI) was founded in 1989 to provide high quality radiological support services to companies and institutions in the Northeastern United States that utilize radioactive materials.

Between 1992 and 2005, ESI was contracted to manage all of the radioactive and mixed waste generated at the National Institute of Health (NIH) in Bethesda, Maryland. The NIH is one of the largest research institutions in the world and ESI provided full-time support that included scheduling and performing waste pickups at individual laboratories; sample, analysis, and characterization of wastes; packaging for disposal, operation of the mixed waste treatment system; sanitary disposal of qualifying liquids; emergency response; and the overall operation of the waste management facility.

While ESI is regarded as a provider of quality health physics and radioactive waste management services, our service area was limited to the Northeastern United States. In 2011, ESI launched an aggressive plan to expand its radiological services capabilities to encompass the United States resulting in the January 2012 opening of an office in Knoxville, Tennessee staffed with some of the most experienced waste management professionals in the industry. In March 2012, ESI received a radioactive materials license authorizing waste storage and processing at ESI's warehouse in Baltimore, Maryland.

Recognizing the need for environmentally friendly solutions for non-radioactive refuse, Ecology Services Refuse and Recycling, LLC (ESRR) was formed in 1996 to focus on residential and municipal waste collection and recycling. ESSR is a conscientiously managed organization centered on courteous customer oriented personalized refuse removal needs.

Ecology Services Municipal Operations, LLC (ESMO) was instituted to provide solid waste collection services to Montgomery County, Maryland. Utilizing over fifty trucks, ESMO provides solid waste collection and recycling services to five service areas awarded in 2002 and 2003.

The remainder of this Statement of Qualifications (SOQ) will detail ESI's capabilities and qualifications for supporting the needs of our customers that use radioactive materials.

RADIOLOGICAL SUPPORT SERVICES

ESI's radiological support services are functionally organized into two complimentary divisions each led by its own Vice President. One group focuses on radioactive and mixed waste brokerage services and the other provides health physics services. Each group has the ability to draw on the other's expertise as needed. As an example, the brokerage group can utilize the services of the health physics group if a customer requires extensive characterization of unknown waste streams. Conversely, the health physics group can call upon the brokerage group's waste management expertise during a decommissioning that will generate wastes requiring disposal.

RADIOACTIVE AND MIXED WASTE DISPOSAL SERVICES

ESI's Radioactive Waste Brokerage division is staffed with personnel who have over 200 years of experience with low-level radioactive and mixed waste transportation, processing and disposal. This experience ensures that our customers' wastes will be handled in full compliance with all regulations and in the most cost effective manner available.

Waste Processing & Disposal Options

ESI strives to maintain contractual relationships with all properly licensed viable waste processing/disposal providers in the United States. When we are contacted to assist a customer with disposal, we evaluate each waste stream and determine the options available. We then present the choices, their costs and benefits, and allow the customer to determine which option is best suited to them. Some decisions may be made solely on cost while others may choose an option that they perceive to present a lower long term risk, i.e. thermal treatment.

Disposal and processing options that may be offered by ESI are provided in the table below:

Disposal/Processing Facility	Location	Service Provided
EnergySolutions	Clive, UT	Disposal of Class A LLRW and Mixed Waste
EnergySolutions	Barnwell, SC	Disposal of Class A, B, and C LLRW for the Atlantic Compact
US Ecology	Richland, WA	Disposal of Class A, B, and C LLRW for the Northwest and Rocky Mountain Compacts Disposal of NORM/NARM
WCS	Andrews, TX	Disposal of Class A, B, and C LLRW for TX Compact Disposal of Class B & C LLRW for out of compact generators with import authorization Disposal of NORM, NRC unimportant quantities, and smoke detectors

US Ecology	Grand View, ID	Disposal of NORM/NARM, NRC unimportant quantities, exempt smoke detectors, high volume low activity remediation waste
EnergySolutions	Oak Ridge, TN	Supercompaction; incineration of DAW, aqueous liquids, oil, animal/biological waste, and non-RCRA scintillation vials; and metal processing
Toxco	Oak Ridge, TN	Supercompaction, small sealed source processing, aqueous liquid processing, lead recycling, metal processing, BSFR
Perma-Fix Northwest	Richland, WA	Supercompaction; thermal treatment of DAW, aqueous liquids, oil, animal/biological, and non-RCRA scintillation vials.
Perma-Fix	Gainesville, FL	Scintillation vials, mixed waste
Perma-Fix DSSI	Kingston, TN	Mixed waste
NSSI	Houston, TX	Scintillation vials, mixed waste
Qual-X	Powell, OH	Kr-85 recycling
International Bio-Analytical Industries	Boca Raton, FL	Uranium and thorium compound recycling
Thermo MeasureTech	Round Rock, TX	Sealed source disposal/recycle

Each of the disposal/processing options shown in the table has its own specific acceptance criteria. No one processor can handle every waste type. ESI personnel have worked closely with each of the listed facilities and fully understand what each can and cannot do. We use this knowledge to offer our customers the best possible solutions for their low-level and mixed radioactive wastes.

Rigid Training Standards

All ESI brokerage personnel participate in an extensive training program to ensure they are knowledgeable of all pertinent regulatory requirements as well as waste disposal/processor capabilities and waste acceptance criteria. ESI training exceeds the standards established by the Department of Transportation (DOT) in 49CFR 172 Subpart H. Training is conducted on an annual basis or anytime there is a significant change to the regulations applicable to transportation or disposal.

All ESI brokerage personnel are trained and demonstrate a thorough understanding of the following:

- DOT incident reporting
- The use of the hazardous materials table
- Reportable quantities
- Shipping paper requirements
- Package marking
- Labeling
- Vehicle placarding
- Security plan and shipment security
- Emergency response information
- DOT hazardous material classification
- Radioactive material excepted packages
- Radioactive Type A shipment requirements
- Low specific activity shipments
- Surface contaminated object shipments
- Vehicle and package radiation limits
- Vehicle and package contamination limits
- NRC uniform radioactive waste manifest requirements
- NRC 10 CFR 61 waste classification
- Radioactive material package types

- EPA hazardous waste determination and coding
- EPA manifesting requirements
- EPA hazardous waste transporter requirements
- Waste disposal/processor acceptance criteria

Superior Customer Service

ESI's brokerage division provides superior customer service. When you call our Tennessee office you will be connected to experienced knowledgeable people who will respond to your questions and requests in a timely manner.

Our standard waste pickup services include the preparation of all NRC 540,541, and 542 Uniform Low Level Radioactive Waste Manifest forms. If your shipment contains mixed waste, our staff will complete all required waste profiles and the EPA Uniform Hazardous Waste Manifest and accompanying Landfill Disposal Restriction (LDR) forms. We will schedule the delivery of your waste to the chosen waste processors and complete the shipment pre-notification forms.

When we pick up your waste, one of our trained shippers will be present and will complete a thorough inspection to ensure that the package is in proper condition for shipment. We will apply all required marking and labels. Our shippers will perform radiological surveys to ensure that no DOT radiation or contamination limits are exceeded. The shipment will then be secured in the vehicle to prevent shifting during transport. If placards are required, we will apply them to the vehicle.

ESI utilizes eMWaste™ software to ensure that all shipping documents are accurate. eMWaste™ converts traditional radiological units to SI units as required by DOT and performs all calculations required to verify if the shipment is regulated by DOT as radioactive material, if any container has a DOT Reportable Quantity, and confirms that the activity and radionuclides are correct for the chosen shipping name.

If needed, ESI can perform additional services including on-site waste characterization and waste packaging. These services can be done utilizing ESI's radioactive materials license through reciprocity with the NRC or agreement state where the waste is located.

Assured Compliance

To ensure that all waste pickups are conducted in full compliance with regulatory requirements, ESI has developed standard operating procedures. All waste pickups are made in strict compliance with these procedures. The following table lists each procedure and what it encompasses:

Procedure	Description
ESI-01 Conduct of Brokerage Operations	Details manifesting, package inspection, marking, labeling, placarding, radiological surveys, loading, bracing, and shipment checklists.
ESI-02 Emergency Response	Specifies immediate reporting requirements for incidents, emergency response telephone number requirements, and emergency response information provided with shipping papers.
ESI-03 Security Plan	Complies with 49 CFR 171 Subpart I requirements. Details when the ESI Security Plan must be engaged. Details specific actions taken by ESI to ensure the security of hazardous materials in transport and at ESI facilities.
ESI-04 Training	Complies with 49 CFR 171 Subpart H requirements. Specifies the minimum training ESI brokers will receive, its frequency, and minimum acceptable knowledge levels.
ESI-05 Waste Acceptance Criteria	Establishes acceptance criteria for standard pricing for LLRW.

Customer Friendly Pickup Schedules

To better serve our customers, ESI has established waste pickup schedules within specific geographic regions. At a minimum, our pickups are scheduled to occur at a less than a 90 day frequency to ensure that customers who generate mixed waste can ship the material before they exceed EPA mandated storage limits. Regional scheduling allows ESI to perform multiple customer pickups maximizing transportation efficiency while minimizing costs.

Scheduled regional pickups are conducted in the Northeast, Southeast, Midwest, and West Coast regions of the United States. All customers in these regions are provided an annual calendar with pickup dates for planning purposes. Before a scheduled waste pickup, ESI will e-mail our customers a reminder that we will be in their area so they can begin preparations.

If a customer requires waste removal outside of a scheduled pickup, ESI will work to make the best most cost effective arrangements possible.

Licensed Secure Storage Facility

ESI maintains a licensed secure warehouse facility in Baltimore, Maryland. The facility is strategically situated near I-95 and provides ready access to the eastern United States. Our radioactive materials license authorizes storage of low-level radioactive waste for periods of up to one year and allows waste consolidation, repackaging, sealed source encapsulation, compaction, absorption/solidification of liquids, collection and consolidation of tritium exit signs, and the collection and consolidation of smoke detectors. Storage for decay is authorized for radionuclides with half- lives of 88 days or less with storage for up to

2.5 years. The warehouse is surrounded by a security fence and is equipped with a sprinkler fire suppression system, video surveillance, and monitored intruder and fire alarms.

Proper utilization of the warehouse allows ESI to accumulate waste for brief periods of time so we can assemble efficient cost effective shipments of customer waste materials to designated processing/disposal facilities.

KEY PERSONNEL

Andy Armbrust

The brokerage group is led by Vice President Andy Armbrust who has over 40 years of operations and management experience with LLRW and mixed waste disposal facilities, transportation, radiation protection, training, and waste processing.

Before joining ESI, Andy managed LLRW and hazardous waste disposal facilities for US Ecology; managed brokerage operations for US Ecology, Scientific Ecology Group, and Philotechnics; and performed remediation and decommissioning projects throughout the United States.

Andy is regarded as an expert in the area of hazardous materials transportation and uses this knowledge to ensure that all ESI personnel are trained to the highest standards in the industry.

Michele Patterson

As the Manager of the brokerage group, Michele is responsible for day to day operations and overall customer support. Michele has over 20 years of experience in the LLRW industry.

Before joining ESI, Michele managed brokerage operations for Philotechnics, was the Customer Service Manager for the Philotechnics waste brokerage and supported LLRW processing at Scientific Ecology Group and Molten Metal Technologies.

Kimberly Page

Kimberly is ESI's Mixed Waste Manager and brings 20 plus years of LLRW and mixed waste experience.

Prior to joining ESI, Kimberly supported waste brokerage services for US Ecology and Philotechnics. Kimberly gained a superior knowledge of the mixed waste industry and the unique needs of non-utility waste generators while serving as a customer service manager at NSSI (only one of four companies offering commercial mixed waste processing) where she assisted all of the nation's waste brokers with their mixed waste disposal needs.

David DeLaCruz

As the ESI Logistics Manager, David is responsible for properly manifesting and tracking all LLRW and mixed waste shipped by ESI's brokerage. Additionally, David maintains an inventory of all waste stored in our facility to ensure that no license requirements are exceeded.

David has over 23 years of experience working for Scientific Ecology Group (SEG), Duratek, and Philotechnics where he was responsible for waste tracking, inventory control, and the generation of shipment manifests.

Don Hartje

Don is the ESI National Operations Support Manager. Being located near Boston, Massachusetts allows Don to respond quickly to the needs of our Northeastern customers.

Don has over 32 years of experience including managing brokerages for Philotechnics and Scientific Ecology Group as well as being SEG's Transportation Supervisor where he was responsible for over 30,000 incoming and outgoing radioactive waste shipments.

Don's knowledge of hazardous materials shipping requirements as well as waste processing and disposal facility criteria make him uniquely qualified to provide assistance to our customers.

Greg Keck

Greg is our Waste Operations Manager and is responsible for the compliant operation of ESI's licensed warehouse in Baltimore, Maryland and the pickup of radioactive and mixed waste from customer locations throughout the eastern United States.

Greg has over 23 years of experience in the radioactive and mixed waste industry beginning his career with Radiation Services Organization (RSO), a company that provided radioactive brokerage and health physics services in the Maryland/Washington D.C. area. He then moved to ESI where he supported radioactive and mixed waste operations at the NIH for 13 years including 7 years where he managed a minimum of 5 people who collected and packaged waste from all of the laboratories throughout the campus. Greg was responsible for all NIH shipments to waste processing and disposal facilities as well as on-site treatment and storage for decay programs.

HEALTH PHYSICS SERVICES

ESI provides a wide range of support services to facilities that use radioactive materials including:

- Radiological laboratory
- Survey instrument calibration and repair
- Radioactive materials license program assessments
- Facility decommissioning
 - Decommissioning funding plans
 - Development of decommissioning plans in accordance with NUREG-1757
 - Historical site assessments
 - Facility decontamination
 - MARSSIM final status surveys
 - Preparation of decommissioning final report

Radioactive Materials License

All of the activities listed above are authorized by one or both of ESI's Maryland issued radioactive materials licenses. In the event ESI is requested to perform radiological services at a customer's facility we will determine if their radioactive materials license authorizes the activity and if they will allow the work to be conducted under their supervision and license. If ESI cannot work under the customer's license, we will notify the Agreement State or NRC, as appropriate, and submit an application for reciprocity which will allow ESI to perform the work under our radioactive materials license.

Radiological Laboratory Services

ESI's licensed laboratory is equipped with a liquid scintillation counter, a windowless gas flow proportional counter, and multichannel analyzer and is available to support our customers with:

- Smear counting
- Air sample counting
- Sealed source leak tests
- Bioassay analysis
- Identification of unknown items
- Waste classification

ESI works with each customer to ensure sample turn around and reporting is expeditious and meets the customer's requirements.

Calibration/Repair of Portable Survey Instruments

ESI provides calibration and repair services for portable dose and contamination rate meters. All calibrations/repairs are done in accordance with instrument manufacturer specifications and comply with the NRC's requirements in 10 CFR 35.61 Calibration of Survey Instruments.

Characterization of Unknown Materials

Unfortunately, many radioactive materials users encounter legacy items that may have been at their facilities for years but there are no records or personnel remaining who can provide useful information. ESI can supply trained personnel and equipment to properly identify and, if desired, dispose of the item(s).

If the unknown object is small and does not have a high radiation dose rate, we can properly mark, label, and ship it to our Columbia, Maryland laboratory where our technicians can determine its isotopic content and activity. As needed, ESI can either return the item or arrange for its disposal.

In the case of complex, large quantities, or high dose rates; ESI will utilize a combination of inspection, dose rate measurements, in situ gamma spectroscopy, and sampling to identify the unknown materials.

We can employ a Berkley Nucleonics SAMS 935 portable multi-channel analyzer to identify and quantify unknown gamma emitting radionuclides. Larger more complex projects may require ESI to

deploy its Canberra ISOCS™ in situ gamma spectroscopy system which utilizes software that factors the package configuration as a part of the characterization process.

If historical site use, observations, or field tests indicate that chemical characteristics are suspected that may cause the material to be classified as an EPA regulated hazardous waste, samples may be collected and sent to an off-site laboratory for analysis.

Program Assessments

Many radioactive materials licenses require the licensee to conduct a periodic assessment of their radiation safety program and supporting procedures to ensure they are adequate to achieve overall license compliance. While this assessment may be done by the licensee, it is wise to periodically utilize the services of an independent entity with the knowledge and experience to objectively evaluate program compliance.

ESI will develop an audit checklist that encompasses all the requirements of your radioactive materials license and thoroughly evaluate compliance to those requirements. We will also evaluate whether activities are being conducted using best practices and make recommendations for improvements.

Decommissioning Funding Plans

An application for a new radioactive materials license will generally require a decommissioning funding plan which establishes the amount of money that must be set aside to ensure that the facility can be properly decommissioned by an outside contractor. The determined sum is then placed in a bond or other financial instrument approved by the licensing agency.

Periodically, throughout the operating life of the facility, the licensee will be required to review and update the decommissioning funding plan to take into account any changes to facility operations and current market costs associated with decommissioning.

It is important to get the decommissioning funding plan right. If costs are underestimated, the licensing agency may not approve the plan and delay the issuance of a license. On the other hand, a high estimate will result in unnecessary costs associated with bonding or other approved financial vehicles.

ESI utilizes the guidance provided by the NRC in NUREG-1757 Consolidated Decommissioning Guidance Volume 3 to ensure that a site specific funding plan will be deemed adequate and approved by the licensing agency.

Facility Decommissioning

For most facilities, decommissioning is a non-routine event that their personnel have never experienced. In addition to specific complex regulatory requirements, the facility may also be dealing with shutting down or transferring operations to another location and reducing or eliminating employees.

ESI can eliminate many of the stresses associated with decommissioning. We understand the complex regulatory requirements and are experienced with implementing Volume 2 of NUREG 1757 Consolidated Decommissioning Guidance and the Multi Agency Radiation Survey and Site Investigation Manual (MARSSIM). Our capabilities include:

- Developing work plans
- Preparing cost estimates
- Working with the facility and regulator to establish release criteria
- Preparation of decommissioning plans
- Completion of historical site assessments
- Designing and completing scoping and characterization surveys
- Performing MARSSIM final release surveys
- Preparation of the final decommissioning report for regulatory submittal
- Managing all of the wastes generated during decommissioning

Many decommissioning projects generate large volumes of waste. In some instances over half of decommissioning costs are associated with waste disposal so it is important to use a company with the knowledge to provide the most economical disposal options available. Our ability to integrate decommissioning and waste management expertise assures that your decommissioning will be conducted smoothly and economically.

KEY PERSONNEL

Paul Marshall

The Health Physics Services Group is led by Vice President Paul Marshall. Paul is a Certified Hazardous Materials Manager (CHMM) with over 20 years of experience providing service to industrial, educational, and research institutions that utilize radioactive and hazardous materials.

Timothy Osborne

Tim is a Certified Health Physicist (CHP) with over 35 years' experience as a radiation safety officer and health physicist. He has over 15 years' experience providing radiation safety training and related R&D activities for the Federal Government.

James Dean Jr.

Jim has over 30 years of experience with radioactive materials including managing radiation safety programs, support and management of a variety of facility decommissioning and soil remediation projects, providing radioactive waste management services, and supplying consulting services for a vast array of companies using radioactive materials. Before joining ESI, Jim was a key manager at RSO, Inc. for 28 years. While employed by RSO, Jim served as the General Manager Field Operations, Manager of Radiation Safety Services, D&D Project Manager, and Radiation Safety Officer. Prior to joining RSO, Inc., Jim was employed by Westinghouse Nuclear Support Services where he worked as a health physics and decommissioning technician supporting nuclear power station outages and maintenance throughout the United States and Europe.

Colt Greer

Colt is a recent graduate of Bloomsburg University with a degree in Applied Health Physics. Colt has been with ESI for over a year performing radiation survey, personnel monitoring, and site control services for decommissioning and radioactive materials license compliance.

SUPPLEMENTAL INFORMATION

Corporate Office

9135 Guilford Road
Suite 200
Columbia, MD 21046
301-362-6700 phone
301-490-0172 fax

Tennessee Office

10427 Hickory Path Way
Knoxville, TN 37922
865-766-5873 phone
865-766-5908

Website

<http://www.ecologyservices.com>

Administrative Information

Federal Tax ID 52-1633980
DUNS 608010419
Cage Code 06ZQ6