

**STATEMENT OF QUALIFICATIONS: INDUSTRIAL**  
*For*  
**ENVIRONMENTAL ALTERNATIVES, Inc.**



Environmental Alternatives, Inc.

Environmental Alternatives, Inc.  
149 Emerald St  
Keene, New Hampshire 03431

Phone: (603) 352-3888  
Fax: (603) 352-3899  
Point of Contact: Randy Martin  
Email: [rmartin@eai-inc.com](mailto:rmartin@eai-inc.com)

## **INTRODUCTION**

Environmental Alternatives, Inc. (EAI) was founded in 1989 to provide advanced cleaning technologies to the nuclear, industrial, and aerospace industries. EAI is dedicated to bringing safe, environmentally acceptable cleaning and waste minimization services to its clients and offers them a complete line of premier technologies such as CO<sub>2</sub> blast cleaning, Chemical Extraction technologies, Concrete Shaving and AIM (absorbent impregnated media). EAI also offers most forms of conventional processes to include multi-media dry abrasives, liquid abrasives, high pressure water blasting, scabbling, and scarification for a broad range of cleaning and decontamination applications.

Headquartered in New England, EAI has provided remediation services throughout the world. The turnkey cleaning systems are mobilized to each site along with a staff of trained and qualified personnel. Multiple rigs and crews are at work throughout the United States performing a wide range of services for nuclear shutdowns, steam generator replacements, environmental cleanup actions and fossil power plant annual outages.

This Statement of Qualifications demonstrates our capabilities to provide industrial cleaning services, environmental remediation for hazards such as PCB's and lead, as well as, radionuclide decontamination projects.

EAI's project experience includes the following (partial list):

## **INDUSTRIAL CLEANING**

In general, industries such as manufacturing and food processing use Freon and trichloroethane as cleaning and degreasing agents in a wide variety of applications, including final cleaning of produced products and cleaning of production-line machinery. One of the technologies that EAI offers, CO<sub>2</sub> blast cleaning, can be substituted with superior results. EAI's Industrial Cleaning Team specializes in supporting shutdown and outage projects for a range of applications. Cleaning has been completed on several different types of boilers, oven (food and blast) interiors, conveyor belts, and components. In all cases, CO<sub>2</sub> blast cleaning proved to be a viable alternative to water blasting, sand blasting, PMB (bead blasting), and solvent cleanings for the removal of general surface grime, plastics, urethanes, weld splatter, flux, carbon deposits, and other materials. The following project serves as an example of our experience providing these services.

### **Fossil Power Plant Services**

### **Various Clients Worldwide**

EAI continues to support the power generation industry year round to keep plants operating at peak efficiency. As a result of the burning of various fossil fuels, plant systems and components can become fouled, thus affecting the heat rate and power output of the plant. EAI furnishes turnkey industrial services to clean boilers, economizers, heat recovery steam generators (HRSG's), selective catalytic reduction (SCR) walls, ammonium injection systems and turbines. Our field services and industrial operations personnel are available to support planned outages, as well as, unscheduled emergency shutdowns. EAI's cleaning systems and technologies are mobile trailer based units that can be dispatched anywhere in the world to support onsite cleaning requirements of large fixed facility plant equipment. Our services have been provided to combined cycle gas turbine generating facilities throughout the United States and worldwide.

### **Blast Cleaning Testing and Process Development**

### **Xerox**

As part of an ongoing effort to eliminate harmful solvents in the workplace, EAI was contracted to perform testing and process development for specific Xerox remanufacturing applications. After process and nozzle development, the testing proved that CO<sub>2</sub> blast cleaning can serve as a replacement for solvent cleaning, achieving higher levels of cleanliness than solvent methods and reducing cleaning time by up to 50 percent. The materials cleaned ranged from molded aluminum parts and steel castings to optics and wire harnesses. The design and installation of a facility-wide blast cleaning system is underway.

### **Condenser/Heat Exchanger Cleaning**

### **Lewcott Corporation**

The client was in the process of adding new resin and polymer manufacturing capabilities to their production facility. During the plant upgrade and retrofit several older condensers and heat exchangers (that had been out of service for several years) were installed to support the new production plant. Upon inspection, it was determined that the tube-side of the components were plugged with old residues and required cleaning prior to start-up. EAI was contracted to provide both mechanical services and cleaning services to refurbish the equipment. EAI personnel removed the heads, cleaned the tube sheets and the internals of the tube bundles using specialized tooling to cut out the built up residue, brush clean and polish the tube I.D., install

new gaskets and reassemble the heads onto the condensers and ready them for service.

## **General Industrial Applications**

EAI provides high pressure water blasting, all types of abrasive blast cleaning processes using walnut shell, corn cob, sodium bicarbonate, plastic bead, glass bead, black beauty, aluminum oxide, magnesium oxide, AIM, steel shot, furnace slag, and liquid abrasives, as well as scabbling, shot blasting and chemical extraction. Projects include surface preparation for recoating or for non-destructive examination, process line and facility cleaning, fire restoration, and other industrial cleaning needs. EAI constantly supports the power generation, automotive, petrochemical, food service, and mass transit industries with our mobile fleet of equipment.

### **Tank Cleaning**

### **GAF Materials Corporation**

Manufacturing complexes that utilize large tanks to hold process materials prior to induction into the manufacturing of finished products require industrial cleaning contractors who can provide a variety of technologies or methods to support process changeovers and annual maintenance shutdowns. GAF contracts EAI to provide our high-pressure water blasting process to remove up to 21” of process residues from three large tanks, followed by grit blasting to allow annual inspections and NDE testing to be performed. EAI provides project supervision, labor, confined space monitoring and permitting, as well as safety oversight to complete the work turnkey.

## **ENVIRONMENTAL REMEDIATION**

PCB decontamination of facilities was previously accomplished using solvent-based cleaners to remove surface contaminants. A typical PCB-contaminated site cleanup normally requires two solvent wipe downs to free release the facility. EAI recently expanded operations to include PCB cleanup actions. The following project summaries describe EAI’s experience in this area.

### **PCB Decontamination Services**

### **Confidential Client**

EAI provided PCB decontamination services to a demolition contractor responsible for the cleanup of a contaminated 1600 square-foot facility. The facility was located on a jet-fuel chemical manufacturing site in New Jersey. EAI provided a PCB decontamination plan, equipment and services, and operator/worker training.

### **PCB/Furan Decontamination and site remediation**

### **Harding Lawson Associates Winslow, ME**

In conjunction with the closure of a former mill and sale transfer of the property, EAI was contracted to utilize our technologies to remediate certain areas of the plant where PCBs and Furan contamination existed from a past transformer fire. The State of Maine DEP and the EPA mandated cleanliness criteria that had to be met in order for the sale transfer to go through and to

allow reindustrialization and future use of the structure. EAI successfully decontaminated the building surfaces to below the mandated clean-up protocol. In addition to the surface cleaning activities, EAI was also contracted to perform selective demolition, which included complete removal of the concrete floor in the load center where the fire occurred. The project was completed on schedule and within budget. Prior to commencing work, EAI was tasked with writing a work plan and procedures to assist the clients in gaining approval from the regulatory agencies. EAI also provided our own health and safety oversight during the evolutions involving site work and managed the packaging of contaminated waste.

### **PCB/Lead Paint Removal**

### **Confidential Client**

Faced with extremely high disposal costs and very conservative environmental regulations, EAI was contacted to develop a solution for a large-scale decommissioning project. EAI spent several months developing a proprietary process to successfully remove PCB and lead containing paints from porous concrete, formed concrete, and a variety of metallic substrates. Onsite testing and a technology demonstration was conducted for the client in the actual field D&D setting on PCB and lead contaminated materials. Following the test, samples were obtained to verify the effectiveness of EAI's process. The test was termed a "complete technical success" by the client. Additional work scopes and site strategies are being developed on how EAI's approach can benefit upcoming evolutions on the project.

### **Historical Restoration**

### **Town of Exeter, NH**

EAI was contracted to assist in the restoration and renovation of the Exeter Town Hall building, which is a very significant historical monument in New England. EAI's scope of work was to contain the structure and remove all of the paint from the ornate wooden portions of the cupola and front portico of the structure. Multiple layers of paint were removed down to the bare wood to allow reconstruction and new paint to be applied to complete the restoration.

### **Lead Paint Removal/Environmental Action Program**

### **Confidential Client**

As a part of a site wide environmental action program at a large electrical utility company, EAI has been contracted to provide environmental cleaning services to eliminate lead paint hazards from components at their various sites. Environmental audit deficiencies have prompted the need to enact a utility wide program to remove old lead containing paint from components and structures at the utility's substations. EAI was awarded the work based on our experience and knowledge in handling and remediation of the lead hazards as well as our ability to manage the industrial hygiene and safety aspects of the project. EAI's technology was selected due to the fact that no secondary wastes are generated and no damage is caused to the equipment being abated. To date, EAI has allowed the utility to correct audit findings and reduce health risks to their employees working at the substations.

## AEROSPACE APPLICATIONS

Freon and trichloroethane are used widely to remove grease, oil, and other contaminants from surfaces that require absolute cleanliness (e.g., satellites and Titan IV rocket payload fairings), as well as in the manufacturing and remanufacturing processes. The sale of most chlorofluorocarbons (CFC's) has been banned for use on U.S. Air Force contracts (effective July 15, 1992). Chemical agents, acid and alkali solutions, and blasting media all leave measurable amounts of residues and have high disposal costs.

As an example of EAI's CO<sub>2</sub> blast cleaning capabilities, at Martin Marietta, Titan IV rocket payload fairings were formerly cleaned by technicians using cotton swabs and Freon - the total task requiring 18,000 to 24,000 labor hours. EAI accomplished the same task using a robotic CO<sub>2</sub> blast cleaning system in only 46 labor hours, a time reduction of 99.74 percent. The acceptable surface contaminant level was 1.0 mg/ft<sup>2</sup> for non-volatile residue (NVR). The previous method, Freon cleaning, achieved results at and slightly below this level. After CO<sub>2</sub> blast cleaning was demonstrated, the results were consistently 0.2 to 0.3 mg/ft<sup>2</sup> NVR, a three to four-time reduction in levels.

Past EAI projects in the aerospace field include the following (selected samples):

### **Phase III Technical Support Contract      Martin Marietta Corporation**

EAI provided technical support for the Phase III CO<sub>2</sub> implementation at Cape Canaveral and Vandenberg Air Force Base. EAI provided technical support in the areas of CO<sub>2</sub> equipment selection, installation, and integration. This is the most advanced CO<sub>2</sub> blast cleaning system in the world, and will be completely operated by a single control room that incorporates readouts of all component operation status, pressures, quality, and other operating conditions. A total of three CO<sub>2</sub> blast-cleaning systems are planned. The systems will vary in configuration and location and will be used in the following applications:

- |          |   |
|----------|---|
| System 1 | Gantry robot system and contamination acquisition for the permanent fixed cleaning of payload fairing (PFL) isogrid panels at Cape Canaveral. |
| System 2 | Manual, trailer-mounted CO <sub>2</sub> blast cleaning system at Cape Canaveral for the cleaning of PLF exterior surfaces.                    |
| System 3 | Identical to System 1, installed at Vandenberg Air Force Base in Santa Barbara, California, for cleaning of Titan IV PLF panel sections.      |

### **IMIP Phase III PLF Automated Processing Program Installation and Integration of Fixed CCAFS CO<sub>2</sub> Subsystem**

### **Martin Marietta Corporation**

EAI provided, installed, integrated, and tested a complete CO<sub>2</sub> blast cleaning system as part of the

Phase III PLF Automated Processing Program at Cape Canaveral Air Force Station (CCAFS). The system is used for the robotic cleaning of Titan IV PLF's.

Contract tasks included the following:

- Fabricate, install, and test CO<sub>2</sub> blast cleaning system components.
- Provide vendor specifications/data sheets and certification of all components associated with this activity.
- Perform system checkout of the CO<sub>2</sub> blast cleaning system.
- Assist in the generation of an acceptance test plan.
- Provide operations and maintenance manuals for the CO<sub>2</sub> blast cleaning system.
- Provide on-site training for engineers and technicians.

### **IMIP Phase II Testing Support     NASA/Martin Marietta Corporation**

Working as a subcontractor to Martin Marietta and in cooperation with the U.S. Air Force and NASA, EAI provided CO<sub>2</sub> blast cleaning equipment and operational expertise for the testing of the CO<sub>2</sub> blast cleaning process as part of the Titan IV Rocket Industrial Modernization and Incentives Program (IMIP) on PLF sections at Marshall Space Flight Center in Huntsville, Alabama, from December 1990 to September 1991. The success of the program has led to the Phase III implementation program described previously.

## **NUCLEAR DECONTAMINATION**

### **Decontamination Project**

**General Atomics/DOE**

EAI performed a three-month decontamination project on 100,000 pounds of lead as part of a facility decontamination and decommissioning (D&D) program. Over the course of the project, 99 percent of all materials were free released.

### **Decontamination Services**

**Cintichem/DOE**

As part of a facility D&D program, EAI was subcontracted to provide decontamination services. During the course of the project, 80,000 pounds of lead (including lead sheets, bricks, blankets, pigs, and scrap) were decontaminated to free release criteria.

### **Hot Cell Decontamination Services**

**Confidential Client**

As part of a facility D&D project, EAI was subcontracted to provide decontamination services with the goal of achieving free release of six 30-year-old hot cells while minimizing secondary waste and generating zero mixed waste. All six hot cells were decontaminated to free release levels over a six-week period.

**Decontamination Services**

**EG&GRockyFlats/DOE**

As part of the on-site decontamination services in support of the Rocky Flats Waste Minimization Program, EAI designed and built a temporary decontamination chamber to perform on site radioactive decontamination services. During the project, EAI successfully decontaminated a variety of components and equipment, proving the effectiveness of our technologies for nuclear decontamination at DOE facilities.

**Blast Cleaning System Design and Installation  
(Fixed Facility)**

**Vermont Yankee Nuclear Power Corporation**

EAI became the first company to design and install a CO<sub>2</sub> blast cleaning system at a commercial nuclear power facility. EAI was selected to install the system at Vermont Yankee Nuclear Generating Station. The CO<sub>2</sub> blast cleaning system combines a low-pressure CO<sub>2</sub> system interconnected with a liquid abrasive booth for tool and equipment decontamination.

**Installation**

**Florida Power and Light  
Turkey Point Nuclear Plant**

EAI designed and installed a trailer-based CO<sub>2</sub> blast cleaning system at the Turkey Point Nuclear Power Station. The system allows for decontamination activities to be performed within a decontamination enclosure booth in the radioactive waste handling building and at locations throughout the site. The EAI-designed system includes all CO<sub>2</sub> equipment, the decontamination chamber, and all air handling/filtration and monitoring equipment.

**Decontamination Facility Design and Installation**

**Virginia Power Corporation  
North Anna Nuclear Station**

EAI has completed the construction of a 40-foot x 50-foot decontamination building for the Virginia Power Corporation, North Anna Nuclear Generating Station, Unit 1. Part of North Anna’s steam generator replacement outage, the project involved the design and erection of a structural steel building; the design, fabrication, and installation of NARED HEPA ventilation system; and the modification of a Kleiber & Schultz liquid abrasive booth to utilize CO<sub>2</sub> blast cleaning.

**Decontamination Services**

**Consumers Power Company  
Palisades Nuclear Power Station**

EAI provided project management, health physics support, and decontamination technicians in support of the Palisades steam generator change out. Once mobilized, EAI supported on-site decontamination services using our state-of-the-art cleaning technologies. As part of the plant’s as low as reasonably achievable (ALARA) program, EAI performed decontamination services to reduce the dose rate from valve internals prior to scheduled maintenance. CO<sub>2</sub> blast cleaning achieved a 50 percent dose rate reduction for a significant man-rem savings.

**Decontamination Operation (1993-1998)**

**Vermont Yankee Nuclear Power Corporation**

EAI supplied project management and decontamination technicians to operate the EAI-installed CO<sub>2</sub> blast cleaning system. The cleaning system uses a CO<sub>2</sub> unit in conjunction with a liquid abrasive booth for the decontamination of plant tools and equipment.

As a supplement to our decontamination service contract, EAI furnished qualified and experienced water blast technicians. EAI ran and operated customer furnished high-pressure water pumps to hydrolaze and flexlance materials and equipment in support of Vermont Yankee's outage shutdowns. Water blasting activities included drain lines, reactor cavity, heat exchangers and other maintenance functions as required.

**Decontamination Services**

**Virginia Power Corporation  
North Anna Nuclear Generating  
Station**

EAI provided CO<sub>2</sub> blast cleaning equipment, CO<sub>2</sub> decontamination project management, EAI shift supervisors, and training of Virginia Power decontamination personnel. EAI's CO<sub>2</sub> blast cleaning set a new world record for the minimum amount of radioactive waste buried from a steam generator change out. The CO<sub>2</sub> system and EAI personnel provided superior decontamination support to the steam generator replacement outage.

**Decontamination Services**

**Georgia Power Plant  
Hatch Nuclear Power Station**

EAI provided on-site decontamination for contaminated equipment, tools, chain falls, scaffolding, and other miscellaneous components stored in the radioactive waste handling building. EAI successfully decontaminated post-outage tools and equipment inside an existing structure. EAI performed engineering modifications and installed air-handling systems to support the decontamination work. In support of the decontamination effort, EAI also provided project management, health physics support, and decontamination technicians.

**Decontamination Services**

**Public Service Electric and Gas  
Salem Nuclear Power Station**

EAI provided decontamination services in support of the maintenance group for a refueling shutdown. EAI was responsible for designing and erecting the decontamination enclosure and ventilation system. EAI successfully decontaminated a wide assortment of valves, equipment, tools, scaffolding, and other plant-related components. EAI also decontaminated residual heat removal orifice plates, achieving dose reduction from 600 mrad/hr Beta Gamma to one mrad/hr Beta Gamma. EAI also was able to decontaminate valve motor operators to free release, avoiding the need for respirators to be worn by plant workers performing valve maintenance. EAI supplied project management, health physics support, and decontamination technicians.

**Multimedia Decontamination Service**

**GPU Nuclear Corporation**



**Mobile Decontamination Facility Lease**

**Oyster Creek Station**

EAI provided our new, completely self-contained, trailer-based Mobile Decontamination Facility, fully equipped with a CO<sub>2</sub> blast cleaning system and a multi-media, dry abrasive cleaning unit to support the Oyster Creek refueling outage. In addition, a full complement of nuclear qualified system specialists were provided to operate and run the facility.

**Decontamination Service  
Mobile Decontamination Facility Lease**

**Rochester Gas and Electric  
Company – Ginna Station**

EAI provided the Mobile Decontamination Facility (MDF) to RG&E to support decontamination and waste minimization activities during a refueling and maintenance outage. The MDF was equipped with CO<sub>2</sub> and multi-media decontamination systems to achieve cleanliness criteria for free release of equipment from the site. The MDF also supported normal plant decontamination requirements for tools and equipment.

**Multimedia Decontamination Service  
Mobile Decontamination Facility Lease**

**Duke Power Company  
McGuire & Catawba Nuclear Stations**

EAI has recently completed decontamination support of three steam generator replacement projects at the Catawba, McGuire I, and McGuire II plants. EAI provided a trailer based mobile decontamination facility equipped with CO<sub>2</sub> and multimedia abrasive blast systems. In addition, EAI furnished a modular decon booth, portable HEPA ventilation system and portable AIM and CO<sub>2</sub> blast units to support decontamination of large bore pipes, structural steel and other large materials that would not fit into the trailer based decon system. The addition of the modular booth allowed large materials to be decontaminated without extensive handling and size reduction, which saved both labor and exposure. All three projects were performed successfully and drastically reduced the volume of buried waste generated during the project. Not only did the waste volume reduction help save millions of dollars in alternate processing or disposal costs, but also allowed Duke Power to achieve a **world record** for lowest volume of buried waste during an SGRP.

**Decontamination Service  
Temporary Decontamination Facility**

**Central Nuclear Vandellos  
Spain**

EAI provided a mobile support system trailer-based unit, along with a temporary decontamination building, CO<sub>2</sub> blast booth, and HEPA ventilation system to support outage decon activities. An absorbent impregnated media (AIM) system was furnished to supplement the system for removal of stubborn fixed contamination. EAI also provided project management and technical support.

**Multimedia Decontamination Service  
Mobile Decontamination Facility Lease**

**Central Nuclear ASCO  
Spain**

EAI provided our trailer-based Mobile Decontamination Facility to support decontamination

activities associated with the SGRP at the ASCO plant in July, 1995.

**Decontamination Support  
for Demolition Project**

**Oak Ridge National Laboratory  
K-25 Site**

EAI has completed a subcontract for the K-1419 Sludge Fixation Facility Demolition/RCRA Closure project at Oak Ridge National Laboratory K-25 site. EAI was contracted to perform the decontamination of various metallic materials, equipment, and concrete surfaces in support of the disassembly and demolition of the K-1419 Sludge Fixation Facility. EAI provided a mobile cleaning system and HEPA ventilation to remove adhering residues that contained both radioactive and RCRA contaminants. Structural steel, beams, grating, stairways, process piping, and large process equipment, were cleaned and decontaminated for free release. EAI also supplied project management, qualified equipment operators, experienced blast technicians, site safety and health personnel, waste compliance engineers, and general labor craft personnel to perform the work for the client

**Abrasive Blast Support RCRA  
Demolition/Closure**

**Paducah Gaseous Diffusion Plant  
Bldg C-400/C-409**

EAI provided a mobile decontamination system along with qualified operators to complete the RCRA decontamination of process equipment and buildings at the C-400 and C-409 areas of the Paducah site. The work included decontamination of tanks, rooms, large process machinery, ductwork, floors, and walls to support the dismantlement and demolition activities.

**Decontamination of Buildings  
FUSRAP Project**

**Tonawanda, NY**

EAI was contracted to provide decontamination for removal of loose smearable contamination from overhead areas of a former weapons processing facility and to demonstrate our ability to remove coatings and fixed contamination from steel beams, supports, and concrete walls. All identified areas for the work scope were cleaned to release levels. EAI provided all equipment, materials, labor, and project management.

**Decontamination Service**

**GPU Nuclear Corporation  
Oyster Creek Nuclear Plant**

Based on EAI's previous experience and successful completion of decon support to GPU during the 15R fuel outage, EAI was once again contracted to support the 16R outage. EAI's contract included providing a mobile trailer based decontamination system along with project supervision, and qualified blast technicians.

**Hot Cell Decontamination and Recovery**

**AECL  
Chalk River Laboratory**

After several attempts by the client to decontaminate the Hot Cell using their own resources, EAI

was placed under contract to decontaminate a spent fuel testing hot cell. The cell required decontamination and dose rate reduction to allow manned entries to perform refurbishment and repairs. Dose rates were reduced from 500mR/hr general area (with hot spots up to 10R/hr) down to less than 30mR/hr general area. Contamination levels were reduced from 41rad/hr to less than 20,000dpm/100cm<sup>2</sup>. The hot cell was repaired, refurbished, and placed back into operation.

**Multimedia Decontamination Support Service**

**Commonwealth Edison**

EAI has been awarded a three year contract to provide our mobile trailer based decontamination facility and qualified decon personnel in support of planned outages within the Commonwealth Edison (ComEd) system. The contract kicked off in November 1997 to provide support at the Byron Nuclear Station SGRP. In August 1998, EAI provided support for the Braidwood Station SGRP. EAI has also provided scabbling and decon of contaminated concrete slabs for various buildings, recovery and release projects as well as specialized critical path decon of valves and other equipment. EAI will continue to provide decon services to all ComEd facilities on an as-needed basis. The contract has been renewed in 2000 and will remain in effect for the next five years, including all of the plants that will be incorporated under the formation of Excelon Corp.

**Decontamination Support Services**

**Southern Nuclear Operating Company  
Farley Nuclear Station**

EAI was awarded the contract for decontamination support services for both SRGPs at the Farley I and Farley II nuclear stations. The first SGRP was completed during February through May 2000. During the outage, EAI was also tasked with the decontamination and surface cleaning of the reactor stud bolts. All work was accomplished utilizing our mobile decontamination trailer based facility, which was set up adjacent to the plant's waste processing building. EAI returned to the Farley Plant in January 2001 to support the second SGRP.

**Decontamination Support Testing  
Removal of subsurface Contamination**

**BNFL, Inc.  
Oakridge, TN**

Under the reindustrialization program at the DOE's former weapons production complex at the K-25 site in Oakridge, TN, EAI was selected to perform testing to demonstrate our ability to decontaminate porous materials that were contaminated with radioactive isotopes such as technetium, plutonium, and uranium. The concrete surfaces of the buildings not only had loose surface contamination but also contained high levels of deeply embedded subsurface contamination. To eliminate extensive labor to scabble and jackhammer the concrete and to reduce the amount of buried waste that would be created during clean up of the buildings, EAI was contracted to perform a technology demonstration using a chemical extraction technology to decontaminate both concrete and metallic surfaces. The chemistry is applied topically to the surface of the material in a three-step sequence. The formulas utilize a complex matrix of both high and low pH solutions to open the pores and migration pathways of the substrate, seek out and encapsulate the target contaminants breaking the electrostatic and chemical bonds and then extract the contaminant using floatation chemistry.

EAI demonstrated the removal of contamination at levels up to 2,000,000 dpm/100cm<sup>2</sup> to less than background in one application of the process.

**Decontamination, De-Sludge and  
Lockdown of Tank Farm**

**DEMCO, Inc.  
Connecticut Yankee D&D Project**

Under subcontract with DEMCO, Inc. EAI was tasked to de-sludge, decontaminate and apply lockdown fixatives on all eight of the plant process tanks including the ADHUT, RWST, RTT's, BWST's and WTT's. The project utilized a combination of remote tooling, robotics and innovations to reduce worker exposures during the clean up. This work was performed to prepare the tank farm and mitigate the spread of contamination during demolition activities.

**Decontamination of Gloveboxes**

**Kaiser Hill Co., LLC  
Rocky Flats Environmental  
Technology Site**

Under contract with Kaiser Hill Company, who is the managing contractor for the US Department of Energy at Rocky Flats, EAI provided decontamination services and technical support to decontaminate plutonium contaminated glove boxes and process equipment to reduce them from TRU waste to SCO I and II levels for disposal. EAI provided site wide support for all buildings involved in this phase of the D&D project. Significant savings have been achieved through reductions in disposal costs, as well as, acceleration of the project schedule.

**Reactor Head Support Work**

**Bechtel Power Corporation  
Connecticut Yankee D&D Project**

EAI was contracted to remotely apply a lock down fixative to all surfaces of the reactor head in order to prepare it for final shipment to the burial site as part of the site decommissioning activities. Prior to EAI applying the lock down, Bechtel cut the thermal sleeves and nozzles away from the underside of the reactor head and allowed them to fall to the floor inside the reactor head stand. Following the lock down work and the removal of the reactor head from containment, EAI was contracted to utilize a specially designed robot with manipulator grip arm to retrieve the thermal sleeves and nozzles and remotely place them onto an engineered pin rack for placement into an 8120 shipping cask for disposal. The thermal sleeves had extremely high radiation dose rates and were highly contaminated with alpha contamination as well as beta gamma contamination. The use of the robot to retrieve the thermal sleeves significantly reduced radiation exposures for the project.

**Decontamination for Final Survey**

**Maine Yankee Atomic Power Co.  
Maine Yankee D&D Project**

EAI has been awarded the contract for the Maine Yankee D&D project to remove paint and concrete from all of the interior surfaces of the PAB and Spray buildings at the Maine Yankee site. The work was performed in preparation for final site survey for the decommissioning of the former nuclear power plant. EAI is utilizing a new technology know as concrete shaving to accomplish the removal. EAI mobilized to the site in December 2001 and completed the majority of the work by September 2002. The concrete shaving technology achieved all of the clients established goals for the project related to engineering controls for dust free removal of the concrete, smooth surface finish for final survey accuracy and minimization of waste. In addition, EAI has been providing demolition support for the removal of trenches, concrete pump pads, sump liners, embedded metals and hot spots in the concrete in order to meet the site

Derived Concentration Guideline Levels (DCGLs) for the license termination plan. Recently EAI completed the decontamination of the containment trenches and sumps along with the containment safeguard cross over piping systems.

**Decontamination Support for Decommissioning**

**Shaw Environmental and  
Infrastructure, Inc.  
Gulf Nuclear D&D Project**

EAI supported Shaw Environmental under their Rapid Response Contract with the US Army Corps of Engineers for the decontamination of components and building surfaces of a former radioactive source manufacturing facility. The buildings contain gloveboxes and air handling systems that are contaminated with high levels of Class C radioactive material for which there are limited commercial disposal options. The goal of the project is to decontaminate the components to Class A waste so that they can be disposed of as low level and to assist with the clean up of the buildings for demolition. EAI deployed a team of decon specialists that used our chemical extraction technology to complete the decontamination and waste reduction activities. In addition, EAI performed the removal of the components from the building and packaged the waste for final disposal. As part of our service, EAI also furnished support equipment, portable HEPA ventilation systems and a mobile decontamination trailer based unit to handle the clean up of the site. Once the facility was abandoned by the former company that ran the source manufacturing business the project had been prioritized under the Homeland Security Act to mitigate the risk of radioactive materials falling into the wrong hands and being used to produce "Dirty Bombs".

**Shaw Environmental & Infrastructure, Inc.**

**Los Alamos National Laboratory**

EAI recently completed testing of our Chemical Extraction technology at Los Alamos in Building TA-55 under a Large Scale Demonstration and Deployment project for the DOE. The TA-55 Building is being converted to a new mission and requires extensive decontamination of gloveboxes and components that were used to support past years of work for the nuclear weapons program. The original plan called for the removal, size reduction and disposal of these components as TRU waste and complete replacement of the equipment for the new mission. EAI's technology has shown that these components can be effectively decontaminated to levels low enough to be converted to reuse rather than being replaced. This represents a significant cost savings to the DOE and the lab. Baseline estimates show that the use of EAI's process will save hundreds of thousands of dollars per glovebox. As part of the test, Los Alamos tested other processes against EAI's chemical extraction technology and EAI's process was the clear winner. Additional work using this new strategy is expected to start in 2003.

**Fluor Hanford Company**

**Hanford DOE Site**

EAI was awarded the contract to provide our chemical extraction technology and on site technical support for the decontamination of plutonium contaminated glove boxes at both the Plutonium Finishing Plant (PFP) and the 232-Z Incinerator Facility. The objective of the project was to decontaminate all glove boxes and components from high level TRU waste down to low-level waste under the SCO criteria for on site disposal. The project is expected to be complete in approximately 27 months.