**FACILITY NAME:** Hooker Electrochemical
Niagara Falls, New York

**ALSO KNOWN AS:** Hooker Chemical Co.
Occidental Chemical Corp.
Occidental Chemical Corp., Specialty Chemical

**TIME PERIOD:** 1943-1948

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*In January 1943, Hooker began work for the Manhattan Engineer District to manufacture fluoridated and chlorinated organic chemicals. The by-product of this work was hydrochloric acid that was subsequently used in the chemical processing of a uranium-bearing slag as a precursor of uranium recovery. This work was continued until shortly after World War II. Activities related to this contract ended June 1948. Hooker Electrochemical's relationship with the AEC resumes between 1953 and 1958 as the Management and Operating Contractor for the Lake Ontario Ordnance Works, listed separately in this database.*

**DISCUSSION:**
There is no documentation identifying the radiological conditions at the cessation of operations or information that can be used to determine if the facility was adequately decontaminated after DOE work was discontinued.

There is documentation of radiological surveys during the period of October 11- 15, 1976. This survey concludes that residual radioactivity levels were within current Federal and State guidelines for unrestricted use.

**INFORMATIONAL SOURCES:**
The sources of information used in performing this evaluation included the DOE Worker Advocacy Website and other correspondence provided by the DOE ES&H Group. Reference: 1) Report, Formerly Utilized MED/AEC Sites Remedial Action Program Radiological Survey of the Hooker Chemical Company Niagara Falls, New York, January 1977; 2) Report, FUSRAP Elimination Report for Occidental Chemical Corporation (Former Hooker Electrochemical Company) Niagara Falls, New York September 30, 1985

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1949 -1976

**FACILITY NAME:** Horizons, Inc.
Cleveland, Ohio

**ALSO KNOWN AS:** Lamotite, Inc.

**TIME PERIOD:** 1944-1956
Residual Radiation 1957 - 1977

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*During the 1940s and 1950s the metal handling facility was used for the production of granular thorium metal for the AEC and conducted some thorium research work for Savannah River. From July 1949 to November 1949, Horizons, Inc. was also under AEC contract to conduct research and perform development work on a process for the preparation of ductile, high-purity zirconium by fused salt electrolysis.*

**DISCUSSION:**
Documentation reviewed indicates residual contamination from AWE work still exists at this facility. DOE identified contamination in a 1977 survey but determined that they had no authority to remediate this facility under FUSRAP.

Documentation also demonstrates that USDOE informed USEPA of the conditions. Facility status and/or remediation activities conducted at this point are unknown.

**INFORMATIONAL SOURCES:**
The sources of information used in performing this evaluation included the DOE ES&H Website and other correspondence provided by the DOE ES&H Group. Other sources of information included: (1) Final Report (DOE/EV-0005/10); Formerly Utilized MED/AEC Sites Remedial Action Program Radiological Survey of the Former Horizons, Inc., Metal Handling Facility, Cleveland, Ohio; February, 1979 OH.05-3, (2) DOE Letter; DeLaney to Snyder; No Authority under the AEC; December 19, 1985 OH.05-1.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION:**
1957 - present

**FACILITY NAME:** Hunter Douglas Aluminum Corp.
Riverside, California

**ALSO KNOWN AS:** Bridgeport Brass Co.

**TIME PERIOD:** 1959-1963

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*In 1959, Hunter Douglas Aluminum extruded approximately 1600 pounds of solid uranium stock for National Lead Company of Ohio (Fernald). In a subsequent subcontract, the company fabricated uranium-zirconium billets for the GE Evendale Plant.*

**DISCUSSION:**
The facility did not have the potential for significant exposure during operations due to the small amount of uranium (1,600 lbs) used. Also, it is noted in the NLO (Fernald) contract that Hunter Douglas was responsible for the decontamination and cleanup of facilities and equipment.

**INFORMATIONAL SOURCES:**
The sources of information used in performing this evaluation included the DOE ES&H Website and other correspondence provided by the DOE ES&H Group.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** International Minerals and Chemical Corp.
Mulberry, Florida

**ALSO KNOWN AS:** Pilot Facility
Uranium Recovery Unit at the Bonnie Plant
Phosphate Chemicals Division, Bonnie Uranium Plant
C.F. Industries, Inc.

**TIME PERIOD:** 1951-1961

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*International Minerals and Chemical Corp. produced uranium as a byproduct of the recovery of phosphate chemicals and fertilizers. In 1951, AEC contracted with International Minerals and Chemical Corp. for the recovery of uranium, which was ultimately used for the production of weapons. The original production plant was shut down in 1959. During the years of operation, 100 tons of $U_3O_8$ were produced, with a peak production of 2-3 tons per month. Starting in 1954, the uranium recovery unit was located at the Bonnie Plant. In 1955, it switched to the phosphoric acid process. International Minerals and Chemical Corp. became Central Farmers (now C.F.) Industries. In 1969, C.F. Industries became C.F. Chemicals, Bartow Phosphate Works. The phosphoric process was shut down in 1961.*

**DISCUSSION:**
A 1977 survey by ORNL identified radium in the soil up to 28 pCi/gram. This was not considered unusual at a phosphate plant, as these levels are apparently within expected ranges at commercial phosphate recovery facilities. While the origination of the existing soil contamination cannot be determined, it does not appear to be significant. At the time of this survey the facility where operations were conducted had already been demolished and the radiological conditions prior to demolition could not be assessed.
Documentation reviewed indicates the presence of residual contamination outside of the period in which weapons-related production occurred inside the facility.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group. Other information included in the evaluation included: Preliminary Survey of International Minerals and Chemical Corporation Mulberry, Florida; March 1980 FL.02-1.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1962 - 1977

**FACILITY NAME:** International Nickel Co., Bayonne Laboratories
Bayonne, New Jersey

**TIME PERIOD:** 1951-1952

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*International Nickel plated uranium slugs with nickel for use in the nuclear weapons production system during the early 1950s.*

**DISCUSSION:**
The records were not completely clear, but it appears this was test work that was conducted, and not production levels. There was no specific information regarding exactly how many uranium slugs were processed. Available documentation indicates that there is little likelihood of residual contamination outside the stated dates and that there is no additional documentation available for review.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred

**FACILITY NAME:** International Rare Metals Refinery, Inc.
Mount Kisco, New York

**ALSO KNOWN AS:** Canadian Radium and Uranium Corp.
Pregals Mt. Kisco Refinery
Pregal

**TIME PERIOD:** 1942-1949

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*The International Rare Metals Company processed pitchblende ores for the African Metals Corporation to extract radium. The same ores were processed for the Manhattan Engineer District to recover uranium. Other than the coordination of the shipments of ores and sludge, there was no MED involvement at this site. The company did apparently ship a 1 milligram and a 5 milligram source of radium to Chicago.*

**DISCUSSION:**
Radiological surveys were reportedly conducted by the AEC at this facility during 1952 and 1956, identifying significant radiation levels, removable contamination and airborne radioactive material concentrations. These surveys were conducted in an effort to assist the state of New York evaluate the site conditions. The building was demolished in 1966, and contaminated debris and dirt were transported to another facility. Elevated radiation levels were identified in 1979 by a local reporter. These areas were localized and contained within a locked chain-link fence. The site was reportedly remediated sometime prior to 1996 with state of New York involvement. There was no survey data available regarding close-out or the present status of the facility.

Documentation available for review does not clearly substantiate that this facility was involved with AWE related activities other than being a private enterprise from which the MED purchased radium sources. A 1987 Department of Energy Memo states that the MED purchased a significant number of radium sources from the company in the early 1940s. However it does not appear they had any connection with the operation of the facility.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1950 - 1966

**FACILITY NAME:** International Register
Chicago, Illinois

**ALSO KNOWN AS:** Intermatic, Inc.

**TIME PERIOD:** 1943

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*International Register was involved in the development of uranium machining techniques for the Metallurgical Lab and the Manhattan Project. Records indicate that a test of centerless grinding equipment took place at International Register in February 1943. Uranium rods (1" in diameter and 6" long) were ground with the accuracy of about .001" for the Met Lab.*

**DISCUSSION:**
There was a FUSRAP elimination recommendation made in 1987, indicating little likelihood of contamination, and no further action being necessary.

There were no radiological surveys performed during or after the test that were available in the provided documentation. However, given this was a one-time test, the likelihood of significant facility contamination is remote.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Ithaca Gun Company
Ithaca, New York

**TIME PERIOD:** 1961-1962

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*During 1961-1962, Ithaca Gun conducted tests involving the forging of hollow uranium billets into tubes for the metallurgical group at National Lead Company of Ohio (Fernald).*

**DISCUSSION:**
Documentation exists which shows that the facility was effectively decontaminated (immediately) after the DOE work was completed. The document titled, "Authority Review for Ithaca Gun Co." reveals that the testing site was vacuumed down to background levels after the completion of the test. All equipment was decontaminated using rags and solvents. All material was returned to NLO (Fernald).

**INFORMATIONAL SOURCES:**
The sources of information used in performing this evaluation included the DOE ES&H Website and other correspondence provided by the DOE ES&H Group.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** J.T. Baker Chemical Co.
Phillipsburg, New Jersey

**ALSO KNOWN AS:** Subsidiary of Vick Chemical Company

**TIME PERIOD:** 1948; 1957 - 1958

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*J. T. Baker Chemical Co. was licensed by AEC to process and distribute refined source material (uranium). The company had previously sought to purchase uranium compounds during World War II, but these were diverted for wartime use.*

**DISCUSSION:**
Available documentation does not provide any evidence of a contractual or similar relationship with the AEC, information about AEC operations involving radioactive material or radiological survey data from the facility. The available documentation does not provide any indication that J. T. Baker was anything other than a licensed commercial facility.

Based on the available documentation there is no known or described activity that would have resulted in residual contamination.

**INFORMATIONAL SOURCES:**
The sources of information used in performing this evaluation included the DOE Worker Advocacy Website, FUSRAP files, and other correspondence provided by the DOE ES&H Group.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Jessop Steel Co.
Washington, Pennsylvania

**TIME PERIOD:** 1950-1954

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*In the early and mid 1950s, the Jessop Steel Company was under contract to the AEC for metal fabrication with some work through DuPont. In the early 1950s, records indicate that uranium metal in nickel scrap was sent to Jessop to make stainless steel piping for Fernald. In 1954, tentative plans were made for Jessop to roll uranium for Fernald billet production.*

**DISCUSSION:**
Documentation reviewed indicates that AWE activities were limited, and subsequent radiological surveys which included a private residence where dismantled facility timber had been re-used, indicated nothing above natural background levels.

**INFORMATIONAL SOURCES:**
The sources of information used in performing this evaluation included the DOE ES&H Website and other correspondence provided by the DOE ES&H Group. Other sources of information utilized in this evaluation included: Oak Ridge National Laboratory Report (ORNL/RASA-89/20); "Results of the Radiological Survey at the Jessop Steel Company site, 500 Green Street, Washington, Pennsylvania (JSP001)", April 1991.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Joslyn Manufacturing and Supply Co.
Ft. Wayne, Indiana

**ALSO KNOWN AS:** Joslyn Stainless Steel Co.

**TIME PERIOD:** 1944-1952

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*Joslyn rolled uranium rods from billets for use by the MED and the AEC in weapons production.*

**DISCUSSION:**
The billets were received by rail. Work was conducted under MED/AEC constant supervision, and scraps and ash generated were retained by MED/AEC personnel for uranium accountability. Small furnaces were used to heat the material. Three mills and straightening, cutting, threading, and grinding equipment were used in the operation. An outdoor area was used to burn waste.

Documentation reviewed indicates that there was a comprehensive radiological survey performed at the end of AEC activities (1949), for the purpose of identifying contamination levels for a facility cleanup. While no post decontamination surveys are available for review, description of the removal of equipment and handling of accountable materials at the end of the operations, in conjunction with the conditions identified in subsequent DOE preliminary FUSRAP surveys (1976) indicates that residual contamination did not exist beyond the listed period.

**INFORMATIONAL SOURCES:**
The sources of information used in performing this evaluation included the DOE ES&H Website and other correspondence provided by the DOE ES&H Group. Other sources of information used in this evaluation included: 1) DOE Report (ORNL); Preliminary Survey of Joslyn Stainless Steel Company, Fort Wayne, Indiana; March 1980, 2) ERDA Memorandum; Thornton to Kennedy; Subject: ERDA Resurvey Program: Joslyn Stainless Steel Company, Fort Wayne, Indiana; March 10, 1977.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Kaiser Aluminum Corp.
Dalton, Illinois

**TIME PERIOD:** 1959

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*In March 1959, Kaiser performed the extrusion of three CP-5 type fuel elements containing normal uranium oxide for Argonne National Laboratory. Documentation indicates that Kaiser was under consideration to participate in a program to develop alternate sources of uranium, but it is unclear whether that work ever took place.*

**DISCUSSION:**
Documentation exists which shows that the facility was effectively decontaminated (immediately) after the DOE work was completed.

**INFORMATIONAL SOURCES**
The sources of information used in performing this evaluation included the DOE ES&H Website and other correspondence provided by the DOE ES&H Group.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Kellex/Pierport
Jersey City, New Jersey

**ALSO KNOWN AS:** Vitro Corp. of America
Kellex Corp.

**TIME PERIOD:** 1943-1953
DOE 1979-1980 (remediation)

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*In 1943, the M.W. Kellogg Company established the Kellex Corporation to design and construct the first gaseous diffusion uranium enrichment facility, the K-25 Plant, in Oak Ridge TN. This work was conducted under contract to the Manhattan Engineer District and later to the Atomic Energy Commission. In the 1940s and early 1950s, Kellex conducted research and development on fuel reprocessing and component testing using uranium hexafluoride, and uranium processing and recovery techniques. In 1951, the Vitro Corporation of America assumed all the rights and obligations of the Kellex Corporation. In 1953, Kellex discontinued all AEC contract work at the Kellex/Pierpont site.*

**DISCUSSION:**
Remediation activities under the Formerly Utilized Site Remediation Action Program (FUSRAP) occurred in 1979 and 1980 by Tobar Construction and Envirosphere Co. The cleanup was certified in 1983.
A 1953 survey performed by Vitro indicated that the site had been decontaminated to standards that were applicable at that time. ORNL radiological surveys from the late 1970s identified conditions at background with the exception of a few well-defined hot spots near the location where the Lab Building used to be (it had been demolished). A report that is excerpted in the OWA files says the Kellex Lab Building, Building 11, where all the radioactive material work reportedly occurred, was demolished in 1953.

About 1,000 barrels of contaminated soil were removed from isolated areas found in the ORNL survey of March, 1979. FUSRAP remedial action was completed in 1980-1981. No documentation reviewed shows any DOE contract activity or remedial action after 1981.

**INFORMATIONAL SOURCES:**
The sources of information used in performing this evaluation included the DOE Worker Advocacy Website and other correspondence provided by the DOE ES&H Group. Reference: 1) DOE Report (DOE/EV-0005/29 and ORNL-5734); Radiological Survey of the Former Kellex Research Facility, Jersey City, New Jersey; February 1982; 2) DOE-ORNL Letter; Kaye to ORO (Attention: Keller); Subject: FUSRAP - Post Decontamination Radiological Survey of a portion of the Former Kellex Laboratory Site, Jersey City, New Jersey.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1954 -1978; 1981

**FACILITY NAME:** Kerr-McGee
Guthrie, Oklahoma

**TIME PERIOD:** 1963-1973

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*Kerr-McGee processed uranium for the AEC as part of the nuclear weapons production process. The Recycled Uranium reports show material being shipped from Kerr-McGee to both Fernald and Savannah River*.

**DISCUSSION:**
Available documentation describes this facility as having handled recycled uranium as part of the nuclear weapons production process. Current NRC decommissioning documentation indicates the facility has completed the majority of decontamination activities necessary for unrestricted release and license termination with the exception of groundwater remediation which indicates uranium and technetium-99 contamination.

Estimated completion for these activities is identified as May 2007.

**INFORMATIONAL SOURCES:**
The sources of information used in performing this evaluation included the DOE Worker Advocacy Website and other correspondence provided by the DOE ES&H Group. Reference: NRC Sites Undergoing Decommissioning - Complex Materials - License No. SNM-928, Docket No. 70-0925.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1974 - present

**FACILITY NAME** Koppers Co., Inc.
Verona, Pennsylvania

**TIME PERIOD:** 1956-1957

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*In conjunction with the Kennecott Copper Co., Koppers conducted pilot plant tests for the production of uranium hexafluoride. In 1956, Koppers was licensed receive 2000 pounds of refined source material for use in studies toward the preparation of uranium dioxide for reactor fuel elements and 6,150 pounds of refined source material for use in research and pilot plant investigations on feed material processing. In October 1957, they were authorized to receive 110 pounds of normal uranium hexafluoride. Most of the research work appears to have taken place at the Koppers Research Department in Verona, PA.*

**DISCUSSION:**
Documents reviewed suggest that the work which the Koppers Co., Inc. was doing was licensed and could have been strictly a commercial venture. This work may not have been AWE related. There are indications this may have been an attempt to develop a commercial $UF_6$ production process. On that basis, they were not considered under FUSRAP.

Based on the described activities, amounts of material involved, and the absence of radiological survey data from the period when operations were ceased, there is a potential for significant residual contamination outside the covered period.

In 1996, the NRC performed a facility safety inspection and found that general area dose rates were within natural background levels and that uranium concentrations from excavations within the building were within environmental concentrations.

**INFORMATIONAL SOURCES:**
The sources of information used in performing this evaluation included the DOE ES&H Website and other correspondence provided by the DOE ES&H Group. Reference: NRC Inspection Report No. 040-90001/96-001.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1958 - 1996

**FACILITY NAME:** La Pointe Machine and Tool Co.
Hudson, Massachusetts

**TIME PERIOD:** 1956

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*National Lead of Ohio (Fernald) conducted a single test involving the use of uranium metal on a broaching machine and an arbor press at the La Pointe Machine Tool Company facility.*

**DISCUSSION:**
Documentation exists which shows that the facility was effectively decontaminated immediately after DOE work was completed.

**INFORMATIONAL SOURCES:**
The sources of information used in performing this evaluation included the DOE ES&H Website and other correspondence provided by the DOE ES&H Group.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Landis Machine Tool Co.
Waynesboro, Pennsylvania

**ALSO KNOWN AS:** Teledyne Landis Machine

**TIME PERIOD:** 1952

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*In 1952, National Lead of Ohio (Fernald) personnel performed tests involving the machining of uranium slugs at Landis Machine Tool Company. The tests were performed over a two day period.*

**DISCUSSION:**
Documents available for review illustrate that air sampling was performed over the two day operation of September 18 and 19, 1952. Due to the limited operations and the evidence that radiological conditions were being monitored during operations, the potential for residual contamination outside the period of weapons-related production is remote.

**INFORMATIONAL SOURCES:**
The sources of information used in performing this evaluation included the DOE ES&H Website and other correspondence provided by the DOE ES&H Group.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Latty Avenue Properties
Hazelwood, Missouri

**ALSO KNOWN AS:** Contemporary Metals Corporation
Continental Mining and Milling
Commercial Discount Corporation
Futura Coatings, Inc.
Jarboe Realty and Investment Company
Hazelwood Interim Storage Site
HISS
Futura Coatings Site

**TIME PERIOD:** 1967-1974;
Residual Radiation 1975-1983;
DOE 1984-1986 (remediation)

**FACILITY DESCRIPTION:**

**DOE ES&H Website:**

*The Mallinckrodt Chemical Company conducted uranium milling and refining operations under contracts with the Manhattan Engineer District and the Atomic Energy Commission at the St. Louis Downtown Site in Missouri. Mallinckrodt transported process residues to the St. Louis Airport Site (also in Missouri) for storage until the Commercial Discount Corporation of Chicago purchased them in 1967; Commercial Discount transported the residues to the Latty Avenue Properties for storage and processing. This material was sold to the Cotter Corporation in 1969 and was dried and shipped to their facilities in Canon City, Colorado. By 1974, most of the material had been sold and removed from the Latty Avenue Properties, leaving only residual contamination.*

*The 1984-1986 work was performed under the Bechtel National Inc. (BNI) environmental remediation umbrella contract for the DOE.*

**DISCUSSION:**

The 1984 Energy and Water Appropriations Act directed DOE to conduct a decontamination research and development project at four sites throughout the nation, including 9200 Latty Avenue and properties in the vicinity. Although contamination in Hazelwood did not result directly from atomic energy programs, Hazelwood properties were added to the DOE's FUSRAP by Congress to expedite decontamination. A review of the FUSRAP web page suggested that Latty Avenue Properties remedial action is ongoing at the present time.

**INFORMATIONAL SOURCES:**

The sources of information used in performing this evaluation included the DOE ES&H Website and other correspondence provided by the DOE ES&H Group.

1. DOE (ORNL) Report, "Radiological Evaluation of Decontamination Debris at Futura Chemical Company Facility, 9200 Latty Avenue, Hazelwood, Missouri," dated September 9, 1981.
2. "Background Information, Hazelwood Site and Vicinity Properties, Formerly Utilized

Sites Remedial Action Program," prepared for U.S. EPA by DOE, December 1986.
3. DOE (ORNL) Interim Report, "Radiological Survey of the Property at 9200 Latty Avenue, Hazelwood, Missouri," September 1977.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**

1975 – 1983; 1987 - present

**FACILITY NAME:** Linde Air Products
Buffalo, New York

**ALSO KNOWN AS:** Linde Air Products Div. Of Union Carbide
Linde
Linde Center
Chandler Plant
Chandler Street Plant
Linde Chandler Plant

**TIME PERIOD:** 1945-1947

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*The Linde Air Products facility, also known as the Chandler Plant, was involved in the development and production of barrier for the Oak Ridge Diffusion Plant. During World War II, Linde was part of the Carbide and Carbon Chemical Corporation, later known as Union Carbide.*

**DISCUSSION:**
An AEC Realty & Lease holding report shows that the Linde Air facility in Buffalo, New York was acquired in September 1944 and terminated in November, 1947. The contracting period does not precisely correlate with the dates specified as the period in which weapons-related production occurred however documentation indicates that this facility did not handle radioactive materials and should not be mistaken for the Linde Ceramics Plant in Tonawanda, New York.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group consisting of written communications by or for the DOE and FUSRAP documentation.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Linde Ceramics Plant
Tonawanda, New York

**ALSO KNOWN AS:** Tonawanda Laboratory
Linde Air
Paxair

**TIME PERIOD:** 1942-1953;
Residual Radiation 1954-1995
DOE 1988 – 1992; 1996 (remediation)

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*The Linde Air Company performed uranium and nickel processing for the Manhattan Engineer District (MED) and the Atomic Energy Commission (AEC) at the Ceramics Plant in Tonawanda. African and Canadian ores were milled to black oxides at the plant. Documents indicate that the facility was placed on standby as of March 1, 1950. Linde's contractual agreements with the AEC continued through 1953 for various activities relating to closing out work at the Tonawanda location. Linde was a part of Carbide and Carbon Chemical Corporation (C&CCC), which then became Union Carbide.*
*In 1980, Linde Ceramics was designated as part of the Formerly Utilized Site Remediation Action Program (FUSRAP) and work under this program was performed during 1988-1992 and then again in 1996. The 1996 work was performed under the Bechtel National Inc. umbrella contract for DOE environmental site remediation.*

**DISCUSSION:**
Radiological surveys performed in the 1980s, identified conditions which subsequently led to FUSRAP actions. It is not clear from the available documentation how significant the potential radiological hazards were to workers occupying these areas after 1950. However, the presence of this residual contamination and the need for FUSRAP activities indicates the need for further investigation to determine the potential for residual contamination after 1950. Documentation indicates that FUSRAP activities were initiated in 1990.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website, documentation provided by the DOE ES&H Group consisting of written communications by or for the DOE and FUSRAP documentation and the US Army Corps of Engineers Linde Site Missions Sheet.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1954 – 1987; 1993-1995; 1997-present

**FACILITY NAME:** Lindsay Light and Chemical Co.
W. Chicago, Illinois

**ALSO KNOWN AS:** Kerr-McGee
Reed-Keppler Park

**TIME PERIOD:** 1942-1953

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*Lindsay Light and Chemical Co. was a commercial processor of monazite sands, which yield several commercially valuable products, including the radioactive metal thorium. The MED and then the AEC purchased thorium from Lindsay. AEC contractors purchased a variety of products from this firm as well. Documents indicate that the firm supplied thorium to the MED and AEC through at least 1953. The facility received a source material license from the AEC in 1956, and it continued to process radioactive materials for commercial purposes until 1973.*

**DISCUSSION:**
Documentation reviewed confirms the presence of significant residual contamination outside of the period in which AWE operations occurred, this residual contamination is indistinguishable from non-AWE related wastes. Multiple areas/locations are undergoing remedial actions conducted under the USEPA Superfund cleanup process.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group consisting of written communications by or for the DOE and FUSRAP documentation. Other sources of information used in the evaluation included: 1) Argonne NL Report to the NRC; Written by Frigerio, Larson and Stowe; Subject: Thorium Residuals in West Chicago, Illinois; September 1978; 2) USEPA site ID#'s ILD980823991 / ILD980824007 / ILD980824015 / and ILD980824031.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1954 - present

**FACILITY NAME:** Magnus Brass Co.
Cincinnati, Ohio

**ALSO KNOWN AS:** Magnus Metals
Moanes Brass

**TIME PERIOD:** 1954-1957

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*The site machined various forms of uranium metal under subcontract to the NLO (Fernald). The work was performed at two locations: Reading Road (from December 1954 through November 1955) and West 7th Street (from December 1955 through December 1957). Total production machining was approximately two or three hundred billets.*

**DISCUSSION:**
Documentation demonstrates that the machining work first performed at the 533 Reading Road facility resulted in equipment and surrounding area which were "heavily contaminated". Operations were then moved to the West 7th Street location. Prior to this move a decontamination effort was reportedly performed but no radiological survey data is available documenting post-decontamination radioactivity levels. The Reading Road facility was reportedly occupied by a new owner and has since been demolished (date unknown).

Documentation reviewed describes multiple trips that were taken from the Fernald Site to Magnus Brass for the purpose of monitoring and decontaminating the equipment used. Decontamination was declared complete in a March 19, 1958 memo to J.A. Quigley from J. F. Wing.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group and documents provided by the DOE representative at the Fernald Site. Pertinent document: DOE Memorandum; Wing to Quigley; Subject: Decontamination of Equipment and Facilities at Magnus Metals Division Cincinnati Ohio in connection with Subcontract S-129, March 19, 1958.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1958

**FACILITY NAME:** Massachusetts Institute of Technology
Cambridge, Massachusetts

**ALSO KNOWN AS:** MIT, Hood Building

**TIME PERIOD:** 1942-1963

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*The Massachusetts Institute of Technology (MIT) was one of the institutions that contributed to early nuclear physics research in the United States. In addition to their research efforts, they also sent scientists to work at Los Alamos. For example, in 1942, MIT experimented on the process of melting and casting uranium metal, extracted uranium from low grade ores, studied the element beryllium, and experimented with nuclear propulsion systems. MIT also explored the coordination and the quality control of these processes. The building, in which the research was done, was demolished in 1963.*

**DISCUSSION:**
Documentation indicates uranium extraction research was performed by MIT in Cambridge, Massachusetts from 1942 through 1946. In 1946, MIT reportedly transferred the operations to the Watertown Arsenal (Bldg 421). American Cyanamid took over those activities in 1950. Activities in Bldg 421 reportedly continued through 1953 when the operations were transferred to a newly constructed laboratory in Winchester, Massachusetts. Documentation is not clear as to what activities were conducted at the MIT Cambridge site from 1946 through 1954. However, from 1954 through 1958, Nuclear Metals Inc. used the MIT Cambridge site for MED/AEC research. In 1958, Nuclear Metals Inc. moved operations to Concord, Massachusetts and the MIT Cambridge site was locked down and subsequently demolished in 1963.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group consisting of written communications by or for the DOE and FUSRAP documentation.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Mathieson Chemical Co.
Pasadena, Texas

**ALSO KNOWN AS:** Pasadena Chemical Corp.
Olin Mathieson Chemical Co.
Mobil Mining and Minerals Co.

**TIME PERIOD:** 1951-1953

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*Mathieson Chemical extracted uranium oxides out of phosphoric acid compounds in a pilot study for the Atomic Energy Commission.*

**DISCUSSION:**
Documentation describes the activities as bench-top type experiments for extracting uranium oxides from phosphoric acid compounds, which would most likely have been conducted under laboratory controls. There is no description of the quantities of uranium extracted or radiological conditions immediately after cessation of activities. But, it is reasonable to believe that laboratory work would not have resulted in widespread distribution or residual contamination post-operations. A radiological survey was performed for the DOE in 1977, with the only finding of residual contamination on inside surfaces of one sink and possibly the drain line, which poses no significant exposure to personnel based on the low activity levels discovered.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group consisting of written communications by or for the DOE and FUSRAP documentation.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Maywood Chemical Works
Maywood, New Jersey

**ALSO KNOWN AS:** Maywood Site
Maywood Interim Storage Site
MISS
Stepan Co.
MCW

**TIME PERIOD:** 1947-1950

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*From 1916 to 1959, Maywood Chemical Works extracted radioactive thorium and rare earth elements from monazite sands for use in commercial products. From 1947 to 1950 the AEC purchased thorium compounds from the Maywood Chemical Company.*
*Although this site was designated as part of the Formerly Utilized Site Remediation Action Program (FUSRAP) in 1983, no work was ever performed under this program prior to its transfer to the Army Corp.*

**DISCUSSION:**
Documentation exists demonstrating the MED/AEC acquired thorium products from Maywood, starting in 1947, due to the "fertile" nature of the material. Documentation is unclear as to the exact quantity of material acquired. Documentation demonstrates that the radioactive material residues associated from these MED/AEC acquisitions constitutes only a portion of the overall residual contamination and potential radiological hazards. However, the inability to disregard these residues and/or distinguish them from non-MED/AEC residues necessitates the determination that a portion of the residual contamination requiring FUSRAP activities beginning in 1984, are attributable to former AWE activities.

Documentation reviewed indicates that significant residual contamination from AEC/DOE activities, exists outside the covered period. The facility and/or affected areas are presently undergoing remediation under agreements established between the USACOE and USEPA.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group consisting of written communications by or for the DOE and FUSRAP documentation. Other sources of information utilized for this evaluation included: 1) USEPA and USDOE Federal Facility Agreement for the Maywood Interim Storage Site; Agreed to by DOE on 7/23/1990 and EPA on 9/17/1990, and 2) USACOE Fact Sheet - Maywood, New Jersey, January 2004.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1951 - present

**FACILITY NAME:** McKinney Tool and Manufacturing Co.
Cleveland, Ohio

**ALSO KNOWN AS:** Parker Rust Proof
Meister-matic Inc.
KC&F

**TIME PERIOD:** 1944

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*Between May and August of 1944, McKinney Tool and Manufacturing Co. of Cleveland, Ohio, turned and ground unbonded slugs to provide fuel for the first nuclear reactors, including the three Chicago piles; the Oak Ridge X-10 reactor; and the Hanford B, D, and F production reactors and 305 test pile.*

**DISCUSSION:**
Radiological survey data gathered for the DOE in 1981 and 1991 demonstrates that no residual contamination existed at that time however, there is no documentation identifying the radiological conditions at the end of the operations in 1944.
A review of documented radiological conditions observed at C.H. Schnorr in Springdale, Pennsylvania and Baker Brothers in Toledo, Ohio, where similar activities were conducted, indicates that there is potential for significant residual contamination outside of the period in which weapons-related production occurred.

Based on the nature of the work, the absence of additional documentation, coupled with no radiological survey data until 1981, the presence of residual contamination cannot be ruled out up until the time of the survey.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group consisting of written communications by or for the DOE and FUSRAP documentation. Pertinent documents included: (1) DOE/Oak Ridge Laboratory Survey; R. Foley and M. Uziel; Subject Results of the Rad. Survey at the Former McKinney Tool and Mfg. Co., 1688 Arabella Road, Cleveland, OH (MTC001 and MTC002); ID#: ORNL/RASA-91/7; November 1991. (2) DOE report; Subject; Elimination Report for Former McKinney Tool Mfg. Co.; January 1994.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1945 -1981

**FACILITY NAME:** Medart Co.
St. Louis, Missouri

**TIME PERIOD:** 1951-1952

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*The Medart Company manufactured steel mill machining equipment which was useful in uranium processing. In 1952, Medart conducted broaching machine and arbor tests turning uranium for the National Lead Company of Ohio (Fernald). According to a former Medart employee, the bar turning machine was eventually shipped to Fernald for use at the Feed Materials Production Center.*

**DISCUSSION:**
Radiological monitoring was performed during operations and the data identifies significant airborne radioactive material concentrations as having been generated. This data indicates a strong potential for the dispersion of contamination throughout the immediate area of the facility where operations were performed. No documentation has been found to demonstrate that decontamination efforts were initiated, or to describe post-operational radiological conditions.

Documentation reviewed indicates that there is potential for significant residual contamination outside of the period in which weapons-related production occurred. No additional information has been located, and there does not appear to have been any radiological survey of the facility located at 3535 Dekalb Street where the operations were reportedly conducted.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group consisting of written communications by or for the DOE and FUSRAP documentation.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1953 - present

**Facility Name:** Metallurgical Laboratory
Chicago, IL

**Also Known As**: Eckhardt Hall (+ West Stands, New Chem. Lab and Annex, Ryerson Physical Lab, Kent Chem. Lab) , Met Lab

**TIME PERIOD:** 1942-1952;
Residual Radiation 1953-1983;
DOE:1982-1983;1987 (remediation)

## FACILITY DESCRIPTION:

**DOE ES&H Website:**

*The University of Chicago Metallurgical Laboratory was involved in early uranium metallurgical work in 1942-1943. The first self-sustaining nuclear chain reaction was achieved at the university in a "pile" called the Chicago Pile 1, built by Enrico Fermi and his Met Lab colleagues. The Met Lab is the direct predecessor of Argonne National Laboratory The University of Chicago continued to perform research and metallurgical work for Atomic Energy Commission until the early 1950s. The University of Chicago site includes seven buildings that were associated with Manhattan Engineer District/Atomic Energy Commission nuclear research and development between 1942 and 1952. These include the new Chemistry Laboratory and Annex, West Stands, Ryerson Physical Laboratory, Eckhart Hall, Kent Chemical Laboratory, Jones Chemical Laboratory, and Ricketts Laboratory. Under the direction of DOE, decontamination activities at the University of Chicago were conducted by Argonne National Laboratory in 1982 and 1983 and by Bechtel National, Inc. (BNI) in 1987. Cleanup of the sites where this work was performed was certified complete in 1989.*

## INFORMATIONAL SOURCES:

The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group. Pertinent documents included, Radiological Surveys performed by Argonne National Laboratories during 1977 (DOE/EV - 0005/23 0005/24 and 0005/26), along with a Draft Certification Docket for the Remedial Action Performed at the University of Chicago , Chicago, Illinois, From December 1982 to October 1987.

## EVALUATION FINDINGS:

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

## PERIOD OF POTENTIAL RESIDUAL CONTAMINATION

1953-1981, 1984-1986

**FACILITY NAME:** Metals and Controls Corp.
Attleboro, Massachusetts

**ALSO KNOWN AS:** M&C Nuclear
Metals and Controls Nuclear Corp.
M & C
Texas Instruments

**TIME PERIOD:** 1952-1967

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*Records indicate that the Metals and Controls Corp. fabricated fuel elements for production reactors, but it is unclear whether its work was related to the nuclear weapons complex. For example, Metals and Controls Corp. fabricated uranium foils for reactor experiments and fuel components, fabricated complete reactor cores for the Naval Reactors program, and fabricated uranium fuel elements for experimental and research reactors. Records indicate shipments of depleted uranium between Rocky Flats and M&C during the period from 1955-1958.*

**DISCUSSION:**
Documentation reviewed indicates that there is potential for significant residual contamination outside of the period in which weapons-related production occurred.
It appears that an onsite area was remediated due to residual contamination where burn-off activities were performed. There was no radiological data available for review from inside the facility, where the activities were conducted.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group consisting of written communications by or for the DOE and FUSRAP documentation.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1968 - present

**FACILITY NAME:** Middlesex Municipal Landfill
Middlesex, New Jersey

**ALSO KNOWN AS:** MML

**TIME PERIOD:** 1948-1960;
Residual Radiation 1961-1986;
DOE 1984; 1986

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*From 1948 to 1960, the Middlesex Sampling Plant conducted thorium and uranium activities and disposed of the wastes at the Middlesex Municipal Landfill.*
*Although this site was designated as part of the Formerly Utilized Site Remediation Action Program (FUSRAP) in 1980, the only years in which remediation work took place were 1984 and 1986. This work was performed under the Bechtel National Inc. umbrella site remediation contract and by local subcontractors.*

**DISCUSSION:**
Documentation is available and adequate to determine that the site was used for disposal of contaminated soils in 1948. In 1960, discovery of the contamination was made through observance of abnormal background radiation readings during a civil defense drill. Documentation establishes that subsequent to interactions between local and federal authorities, 650 cubic yards of surface material was removed on May 18, 1961. Residual subsurface contamination still existed after this action, but awareness of this condition and the documented radiation levels is considered to pose no significant exposure scenario. The *Certification Docket for Remedial Action Performed at the Middlesex Municipal Landfill in Middlesex, New Jersey in 1984 and 1986* confirmed that the actions taken in 1986 were successful.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website, documentation provided by the DOE ES&H Group consisting of written communications by or for the DOE and information found on the FUSRAP considered sites database especially the *Certification Docket for Remedial Action Performed at the Middlesex Municipal Landfill in Middlesex, New Jersey in 1984 and 1986.*

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1961 – 1983; 1985

**FACILITY NAME:** Midwest Manufacturing Co.
Galesburg, Illinois

**ALSO KNOWN AS:** Maytag Co.

**TIME PERIOD:** 1944

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*A November 7 1944 document indicates that Midwest Manufacturing Co. worked on the "self lubricating draw die" which was related to metal fabrication for the Manhattan Project.*

**DISCUSSION:**
It is not clear if radioactive material was involved, nor is it clear what activities were involved in the process development operations.

Review of the available documentation related to this facility, indicates that there is little potential for residual contamination outside of the covered period.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group consisting of written communications by or for the DOE and FUSRAP documentation. Pertinent documents included: (1) DOE Letter; Wagoner to Kimble; Subject; Midwest Manufacturing Co. Information; February 10, 1995. (2) Memorandum/Checklist; Wallo to the File; Subject; Midwest Manufacturing Co.; November 3, 1987. (3) MED Memorandum; Methods and Materials Section to Stearns; Subject; Metallurgical Fabrication and Physical Studies; November 7, 1944.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Mitchell Steel Co.
Cincinnati, Ohio

**TIME PERIOD:** 1954

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*In 1954, Mitchell Steel Company may have participated in the machining of a sample lot of four hollow extrusion uranium billets from ingots for National Lead of Ohio (Fernald). It is unclear whether Mitchell conducted the test or performed any addition work for NLO or the AEC.*

**DISCUSSION:**
This facility reportedly performed a machining test on limited quantities of uranium (4 billets), and there is no documentation to demonstrate further work was performed. The 1954 National Lead Company of Ohio document "Request for a Subcontract to Produce Hollow Extrusion Billets on a Lump Sum Basis" which identifies Mitchell Steel Company and four other companies suggests that the Magnus Brass Manufacturing Company of Cincinnati was the contractor selected to continue this work.

Due to the limited amount of work performed at this facility, machining of four billets, the potential for significant residual radioactivity outside of the period of weapons related work is considered low.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group consisting of written communications by or for the DOE and FUSRAP documentation.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Mitts & Merrel Co.
Saginaw, Michigan

**ALSO KNOWN AS:** Genesse Packing Co.

**TIME PERIOD:** 1956

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*In a test for National Lead of Ohio (Fernald), Mitts and Merrel reduced a thorium metal chunk to small particle size pieces in its Hog Grinder.*

**DISCUSSION:**
The available documentation refers to thorium metal (+10 pounds) without specification of the isotope, having been ground up to fine particles producing heavy visible dusting outside of the equipment. Without further documentation of follow-up decontamination actions taken at that time, and consideration of the assumption that no additional post-operations radiological survey documentation exists, it is determined that there is a significant potential for residual contamination after completion of this operation.

The facility where this work was reportedly performed was referred to as the "north" or "river side" facility. Based on an interview with a knowledgeable former employee, this facility was demolished in 1959-1960 and replaced with a parking lot.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group consisting of written communications by or for the DOE and FUSRAP documentation.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1957 - 1960

**FACILITY NAME:** Monsanto Chemical Co.
Dayton, Ohio

**ALSO KNOWN AS:** Runnymeade Playhouse
Scioto Laboratory
Dayton Project
Old Schoolhouse
Units I, III and IV

**TIME PERIOD:** 1943-1949

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*In 1943, the Manhattan Engineer District began the Dayton Project to investigate the chemistry and metallurgy of polonium. Monsanto was chosen for the project because of its earlier work at its Scioto Research Laboratory (also in Dayton). Work for the MED was initially performed at Monsanto's facility on Nicholas Road in 1943 (Unit I). As the project expanded, it moved into a location on West First Street (Unit III) with all operations being transferred to Unit III by October 1944. By 1944 it was clear that even this space was inadequate, and so the former Runnymeade Playhouse was converted to a laboratory and referred to as Unit IV, to be operated in conjunction with Unit III. When space became too tight in the combined areas of Units III and IV, preparations were made to move the operations to the present day Mound facility in Miamisburg. Processing began at Mound in February 1949 and shortly thereafter Units III and IV were dismantled and decontaminated.*

**DISCUSSION:**
Documentation reviewed demonstrates that the sites referred to as Dayton I, Dayton III, Dayton IV and the Dayton Warehouse were decontaminated and/or demolished at the end of AWE related activities in 1950.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group consisting of written communications by or for the DOE and FUSRAP, specifically the Preliminary Assessment/Site Inspection Reports for Unit I, III, IV and the Dayton Warehouse.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1950

**FACILITY NAME:** Museum of Science and Industry
Chicago, Illinois

**TIME PERIOD:** 1946-1953

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*Portions of the East Pavilion of the Museum of Science and Industry were used by employees of the Metallurgical Laboratory and the ANL. Although the facility was primarily used as office space, it is believed that radioactive materials were handled at this facility and that a spill of radioactive material may have taken place near the service elevator on the ground floor.*

**DISCUSSION:**
While a description of specific activities performed and/or material handled is not available, it is clear that work was performed for the AEC by ANL at this facility from 1946 through 1953. Documentation demonstrates that decontamination activities and radiological surveys were performed by ANL in the East Pavilion of the facility in 1949. It should be noted that while no such documentation was available for review relative to the West Court, which ANL occupied through 1953, a radiological survey was performed for the DOE in 1977 resulting in no identifiable residual contamination above normal background readings.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group consisting of written communications by or for the DOE and FUSRAP documentation.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** National Guard Armory
Chicago, Illinois

**ALSO KNOWN AS:** Washington Park Armory

**TIME PERIOD:** 1942-1951;
Residual Radiation 1952-1987;
DOE 1987 (Remediation)

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*In the 1940s, the Manhattan Project leased the National Guard Armory from the State of Illinois for uranium processing and radioactive material storage. In 1951, the site was returned to the State of Illinois.*

*Although this site was designated as part of the Formerly Utilized Site Remediation Action Program (FUSRAP) in 1985, the only year in which remediation work took place was 1987.*

**DISCUSSION:**
A radiological survey was performed for the DOE from September 1977 through October 1978, identifying widespread contamination in several areas of the facility and localized concentrations in others. After reviewing the radiological survey data, it is determined that the potential for residual radioactivity existed between 1951 and the beginning of DOE activities in the 1980s. This determination is principally based on the identification of removable surface contamination in overhead areas up to 1,700 dpm/100cm$^2$ alpha and 2,500 dpm/100cm$^2$ beta-gamma.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group consisting of written communications by or for the DOE and FUSRAP documentation.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1952 - 1986

**FACILITY NAME:** National Research Corp.
Cambridge, Massachusetts

**ALSO KNOWN AS:** NRC

**TIME PERIOD:** 1944-1952

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*National Research Corp. had Manhattan Engineer District experience in working with vacuum centrifugal castings, in developing jets and baffles for diffusion pumps, and in developing cold trap systems. National Research's work with vacuum centrifugal castings (contract W-7405-eng-293) involved casting tube alloy (uranium metal) using the "lost wax" technique. In 1948, National Research did work for Mallinckrodt involving the vacuum melting of approximately 500 pounds of uranium.*
*A December 1946 letter indicates that National Research Corp. requested a "leak detector for use in connection with some special development work on beryllium." It is not clear whether this work was ever actually done.*

**DISCUSSION:**
Documentation reviewed indicates a potential for significant residual contamination outside of the period in which weapons-related production occurred. The location and/or facility and associated equipment used for these activities is described as a “shack” adjacent to the 70 Memorial Drive laboratory. Records indicate that the shack was demolished and replaced with an apartment building sometime prior to 1987.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group consisting of written communications by or for the DOE and FUSRAP documentation. Other sources of information included: 1) The Aerospace Corporation memo, title: Elimination Recommendation Former National Research Corporation Site 70 Memorial Drive, Cambridge, Mass.; from Charles D. Young to Andrew Wallo III, dated 5 October 1987. 2) USDOE Memo to W. Cottrell from Andrew Wallo III, titled Survey of the Former National Research Corporation Site at 70 Memorial Drive, Cambridge, Massachusetts.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1953 - 1987

**FACILITY NAME:** Naval Research Laboratory
Washington, District of Columbia

**TIME PERIOD:** 1943-1945;
DOE 1959

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*During World War II, the Naval Research Laboratory produced quantities of enriched uranium through a thermal diffusion process. The Navy built a small pilot plant at the Anacostia facility for this purpose.*
*In the 1950s, the Laboratory handled radioactive materials for different research applications, and it is listed in the AEC annual report for 1959 as having just over $2 million in AEC-owned equipment on-site.*

**DISCUSSION:**
Available documentation does not include surveys demonstrating the radiological conditions during or after these operations. This facility has been managed by the DOD under AEC/NRC license since inception.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group consisting of written communications by or for the DOE and FUSRAP documentation.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1946-1958, 1960-present

**FACILITY NAME:** New England Lime Co.
Canaan, Connecticut

**ALSO KNOWN AS:** NELCO

**TIME PERIOD:** 1963

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*In 1963, the New England Lime Co. (NELCO) conducted tests on "prill," a magnesium-uranium waste product, to determine the feasibility of recovering these materials for re-use in the nuclear weapons production system. The prill came from the AEC's NLO (Fernald) facility. Six drums of prill were sent from NLO (Fernald) to NELCO for the test.*
*The New England Lime Co. also provided magnesium and calcium to the MED and AEC from 1944-1956. This work did not involve radioactive materials.*

**DISCUSSION:**
Documentation available for review describes the material handled as waste, bearing low uranium concentrations. This material description suggests a low potential for dispersion at significant activity levels. Documentation also indicates that the workforce involved received fundamental training with respect to radioactive material handling, controls and monitoring, which provides support for the determination that there is little potential for residual contamination after operations.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group consisting of written communications by or for the DOE and FUSRAP documentation.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** New York University
New York, New York

**TIME PERIOD:** 1946-1952

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*New York University (NYU) worked on the development of counting equipment for the MED/AEC. NYU handled a small quantity of uranium for research purposes.*

**DISCUSSION:**
Available documentation does not clearly establish that research and development work performed for the AEC involved the handling of radioactive materials. There is documentation describing a request for a small quantity of $UO_3$ made in 1952, but there is no evidence of receipt or disposition of this material.

Based on the information contained in available documentation, recognizing that laboratory controls would have likely been implemented to prevent cross-contamination of the detector instruments being developed and tested, and the limited amount of radioactive materials handled, there is little potential for residual contamination outside the covered period.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group consisting of written communications by or for the DOE and FUSRAP documentation.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Norton Co.
Worcester, Massachusetts

**TIME PERIOD:** 1945 -1957

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*Norton manufactured refractory products from boron, beryllium, uranium, thorium, and magnesium oxide for the MED and the AEC.*
*As early as 1943, Norton was providing boron to the SAM laboratory. Documents show that Norton began working with beryllium for the MED in approximately September 1944 and that work with beryllium continued through 1956. Work with thorium and uranium continued through 1957 at Norton's Worcester location.*
*Norton continued to manufacture refractory products until at least 1965 for the AEC weapons complex, including Rocky Flats, Hanford and Y-12. However, after 1957 these contracts specified that the refractory products were to be made out of magnesium oxide. Since magnesium oxide is not radioactive, Norton's work with it does not qualify it as an Atomic Weapons Employer for these years.*

**DISCUSSION:**
Norton also provided thorium and uranium products to the MED/AEC. The company produced uranium crucibles for Argonne and fused thoria slugs that were irradiated in Hanford reactors. Contracts indicate Norton continued to produce refractory materials for the AEC until 1961.
Documentation reviewed indicates work with radioactive materials, performed for the AEC may have ended sometime in the late 1950s. Norton received an AEC license in the mid 1950s. Residual contamination from prior MED/AEC AWE activities in the 1940s through the 1950s would be indistinguishable from non-AWE work.

Documentation reviewed indicates that there is potential for significant residual contamination outside of the period in which weapons-related production occurred. Air monitoring results performed at various times during operational activities indicates a high potential for dispersal of radioactive materials. No post-operational radiological survey data has been located. This facility still exists at the same location, however the status of the equipment used during the AWE activities is unknown.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group consisting of written communications by or for the DOE and FUSRAP documentation.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1958 - present

**FACILITY NAME:** Nuclear Materials and Equipment Corp. (NUMEC)
Apollo, Pennsylvania

**ALSO KNOWN AS:** Babcock & Wilcox
Atlantic Richfield Corp. (ARCO)

**TIME PERIOD:** 1957 -1983

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*The Nuclear Materials and Equipment Corp. (NUMEC) began operations at the Apollo and Parks Township facilities in the late 1950s. The Atlantic Richfield Corp.(ARCO) purchased the stock of NUMEC in 1967. In 1971, Babcock & Wilcox (B&W) purchased NUMEC and is the current owner of the Apollo and Parks Township facilities.*
*NUMEC processed unirradiated uranium scrap for the AEC in the 1960s. This facility also provided enriched uranium to the naval reactors program and included a plutonium plant, plutonium plant storage area, high-enriched uranium fuel facility, metals and hafnium complex and a uranium hexafluoride storage area. The facility also fabricated plutonium-beryllium neutron sources.*
*The B&W Apollo facility ceased manufacturing nuclear fuel in 1983.*

**DISCUSSION:**
Documentation reviewed indicates residual contamination existed outside of the period in which weapons-related production occurred. Facility remediation was completed in 1995, under NRC license termination with partial funding through the DOE.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group consisting of written communications by or for the DOE and FUSRAP documentation including NRC-SECY-97-015, *Removal of the Babcock & Wilcox Apollo Site from the Site Decommissioning Management Plan*.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1984 -1995

**FACILITY NAME:** Nuclear Materials and Equipment Corp. (NUMEC)
Parks Township, Pennsylvania

**ALSO KNOWN AS:** Babcock & Wilcox
Atlantic Richfield Corp. (ARCO)

**TIME PERIOD:** 1957-1980

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
The Nuclear Materials and Equipment Corp. (NUMEC) began operations at the Apollo and *Parks Township facilities in 1957. The Atlantic Richfield Corp.(ARCO) purchased the stock of NUMEC in 1967. In 1971, Babcock & Wilcox (B&W) purchased NUMEC and is the current owner of the Apollo and Parks Township facilities.*
*The primary function of the NUMEC Parks Township facility was the fabrication of plutonium fuel, the preparation of high-enriched uranium fuel, and the production of zirconium/hafnium bars. The Parks Township facility ceased fuel fabrication activities in 1980.*

**DISCUSSION:**
Documentation reviewed indicates that significant residual contamination existed outside of the covered period in which weapons-related production occurred, which is indistinguishable from non-related contamination. An August 2004 U.S. NRC document indicates that SNM-414 was terminated and the Parks Township facility was released for unrestricted use on August 24, 2004.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group consisting of written communications by or for the DOE, FUSRAP documentation, and U.S. NRC document, SECY-04-0163*, Weekly Information Report - Week Ending August 27, 2004.*

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1981 - 2004

**FACILITY NAME:** Nuclear Metals, Inc.
West Concord, Massachusetts

**ALSO KNOWN AS:** NMI
Starmet, Inc.
MIT Met Lab
Whittaker Corp., Nuclear Metals Division

**TIME PERIOD:** 1954-1990

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*Nuclear Metals, Inc. was incorporated in 1954. It's work evolved out of the MIT Metallurgical Laboratory. In 1958, the company moved from Cambridge (where the MIT lab had been) to Concord. The company's current name is Starmet.*
*In 1958, Nuclear Metals began operating as a facility that produced depleted uranium products, primarily as penetrators for armor-piercing ammunition. It also supplied copper-plated uranium billets that were used to fuel Savannah River's production reactors. Other work at this facility included the manufacture of metal powders for medical applications, photocopiers and other applications. Thorium and thorium oxide were also handled at the site under license to the NRC.*

**DISCUSSION:**
During the period from 1962-1986, Nuclear Metals was the sole source supplier for beryllium alloy end closure fuel element rings used in the "N" Reactor in Richland. Records also indicate beryllium work for the AEC at various times during the 1940s and 1950s. Documentation reviewed indicates that significant residual contamination exists outside of the period in which work was performed with weapons-related material. This facility is on the USEPA National Priority Listing (NPL) and is undergoing cleanup.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group consisting of written communications by or for the DOE and FUSRAP documentation.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1991 - present

**FACILITY NAME:** Oliver Corp.
Battle Creek, Michigan

**TIME PERIOD:** 1956-1957; 1961-1962

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*The Oliver Corporation participated in green salt briquetting testing for the National Lead Company of Ohio (Fernald). Records indicate that testing took place in November 1956, July 1957, May 1961 and May 1962. It is unclear from the documentation whether the company ever performed this work at a production level. The Oliver Corporation AEC license history indicates that it was licensed to receive 350 pounds of normal uranium (40-6977 - 03/08/63) and 20,000 pounds of uranium enriched U-235 (70-646 – 03/26/62) (but comments that records indicate that it is not related to its work for NLO).*

**DISCUSSION:**
Trip reports from this period report that post-work surveys found no detectably contamination above background. These reports detail steps taken to minimize contamination before operations; monitoring that was performed during the activity; and decontamination efforts performed after the activities. This determined to be sufficient evidence to support the dates provided, 1956-57 and 1961-62.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group. Pertinent documents includes;

1. Memo, D.E. Carr to J.A. Quigley, M.D., "Trip Report to Oliver Corporation, Battle Crrek, Michigan, from October 31 to November 5, 1956," dated Dec 17, 1956.
2. Memo, E.M. Chenault to J.A. Quigley, M.D., "Trip Report to Oliver Corporation, Battle Creek Michigan, on July 22-26, 1957," dated Aug 7, 1957.
3. Memo, R. L. Bipes to J.A. Quigley, M.D., "Trip Report to the Oliver Corporation, Battle Creek, Michigan, on April 23-27 and May 3-5, 1962," dated May 21, 1962.
4. Memo, R.H. Starkey and E.M. Chenault to H. A. Kraus, "Additional precautionary health and safety steps necessary at Oliver Corp.," dated Aug 14, 1961.
5. Memo, R.H. Starkey and E.M. Chenault to J.A. Quigley, M.D., "Trip Report to the Oliver Corporation, Battle Crrek, Michigan, on April 10-14, 1961," dated May 1, 1961.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Painesville Site (Diamond Magnesium Co.)
Painesville, Ohio

**ALSO KNOWN AS**: Uniroyal
Lonza Chemical

**TIME PERIOD:** 1951-1953

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*The Painesville Site was formerly a magnesium production facility, owned by the Diamond Magnesium Company. In 1951, 1952 and 1953, Diamond Magnesium received approximately 1650 tons of radioactively contaminated scrap steel from the Lake Ontario Ordnance Works, to be used to control chlorine emissions during the magnesium production process. Although this site was designated as part of the Formerly Utilized Site Remediation Action Program (FUSRAP) in 1992, no work under this program occurred prior to its transfer to the Army Corps.*

**DISCUSSION:**
Although the magnesium plant was constructed in the early 1940s, the information available indicates that the radioactive contamination was introduced with contaminated steel in 1952 and 1953. Information reviewed in the Army Corps of Engineers website indicate that remediation at the site is on-going.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website, internal AEC/DOE correspondence provided by the DOE ES&H Group, and the US Army Corps of Engineers Painesville Site Mission Sheet.

Pertinent documents reviewed:
1. Memo, R. P. Whitfield to Manager, Oak Ridge Operations, "Authorization for Remedial Action at the Former Diamond Magnesium Facility, Painesville, Ohio," dated Oct 8, 1992.
2. Memo, James W. Wagoner, II to L. Price, "Authorization for Remedial Action at Diamond Magnesium Site in Painesville, Ohio," dated Sept 25, 1992.
3. Foley, R.D. and R.F. Carrier, "Radiological Characterization Survey of the Former Diamond Magnesium Company Site, 720 Fairport-Nursery Road, Painesville, Ohio (DMP001, DMP002)," ORNL/TM-11817, December 1991.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1954 – present

**FACILITY NAME:** Penn Salt Co.
Philadelphia/Wyndmoor, Pennsylvania

**TIME PERIOD:** 1953-1956

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*Penn Salt Co. experimented with samples of fluoride-containing by-products from AEC operations to determine if they could be used for hydrogen fluoride production or to extract uranium from the material. Penn Salt Co. was licensed to receive scrap from AEC operations.*

**DISCUSSION:**
Penn Salt Co. was licensed at one time to receive 2,000 pounds of magnesium fluoride scrap for testing. There is no information regarding any more than 350 pounds that were actually received and tested. Other information reviewed suggests that the material had a maximum of 5 percent U content. The site was removed from FUSRAP in 1987 because of low probability for contamination.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Philadelphia Naval Yard
Philadelphia, Pennsylvania

**ALSO KNOWN AS:** Abelson's Pilot Plant
Koppers Co.
Naval Boiler& Turbine Laboratory

**TIME PERIOD:** 1944-1945

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*In 1944, the Navy built a thermal diffusion pilot plant using concentric hot and cold pipes at the Philadelphia Naval Yard. The S-50 plant at Oak Ridge was a large-scale version of this plant. A large quantity of uranium hexafluoride was processed at this site.*

**DISCUSSION:**
The site was not included in the FUSRAP system, as it is controlled by the Department of Defense. Neither the exact dates of operations, nor the condition of the site when operations were concluded can be determined from the available documentation.

This facility was identified by the DOE as potentially contaminated in 1987 and notification was provided to the DOD. No documentation was available describing any radiological surveys and/or remediation.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group. Reference: DOE Letter; Fiore to Schafer; Referral of DOD or Former DOD Sites for Consideration Under Appropriate DOD Programs; May 29, 1987. Enclosure 2; Department of the Defense Installations/Facilities; Number 8.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1946-present

**FACILITY NAME:** Podbeliniac Corp.
Chicago, Illinois

**ALSO KNOWN AS:** Capitol Associates

**TIME PERIOD:** 1957

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*In 1957, National Lead Company of Ohio (Fernald) used equipment at the Podbeliniac Corp. to conduct an extraction experiment using uranium in solution. NLO later traveled to the site to oversee the decontamination of equipment used in the experiment.*

**DISCUSSION:**
Available documentation includes a National Lead of Ohio, trip summary describing the decontamination efforts and residual contamination levels after completion of a limited scale operation. Based on the available documentation and the premise that no further activities with radioactive materials were performed, there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Precision Extrusion Co.
Bensenville, Illinois

**TIME PERIOD:** 1949-1950; 1956-1959

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*Precision Extrusion Co. was involved in several projects for the AEC and ANL. From 1949 to 1950, it extruded experimental fuel channel tubes from aluminum and aluminum-lithium alloys. During 1956 through 1959, Precision Extrusion performed several uranium extrusion projects on a small-scale basis.*

**DISCUSSION:**
It was not clear in the documentation whether the site handled any radioactive material in1949-1950. All the work at that time appeared to be with aluminum and various alloys.

The work in 1956-1959 seemed to be experimental in basis and was not performed on a production scale. All testing operations were accompanied by ANL personnel, and decontamination and surveying of the machinery was conducted after each test.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group. Pertinent documents included;

1. Memo, H. Wm. Gaut to John R. Novak, "Extrusion of Uranium Oxide Aluminum Billets in Bensenville, Illinois," dated April 17, 1956.
2. Memo, G. T. Lonergan and C. S. McKee to John R. Novak, "Extrusion of Billets, Precision Extrusion Company, May 24, 1958," dated Aug 12, 1958.
3. Memo, C. S. McKee to J. R. Novak, "Survey at Precision Extrusion Company Following Extrusion of Billets," dated March 30, 1959.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Purdue University
Lafayette, Indiana

**ALSO KNOWN AS:** Chemistry Building, Locomotive Lab

**TIME PERIOD:** 1942-1946

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*Purdue University was involved in Nuclear Physics research during the Manhattan Project.*

**DISCUSSION:**
Documentation indicates Purdue University performed work related to "Hydrochlorination of T salts followed by a vapor phase chlorinization of the resulting residue to give satisfactory $TCl_4$ product with no appreciable loss of T material."

Other work included unspecified testing of metal sawdust, and process development in the manufacture of fluorocarbons.

Materials used appear to be small research quantities. A FUSRAP determination made in 1987 indicates little likelihood for radioactive contamination.

Documentation reviewed suggests that limited research quantities of material were used. While there is no documentation identifying radiological surveys or decontamination that was provided, little potential exists for radioactive contamination resulting from AEC/DOE research beyond the period in which weapons-related production occurred.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group consisting of US Army Corps of Engineers correspondence, and internal DOE facility evaluation documentation.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Quality Hardware and Machine Co.
Chicago, Illinois
**ALSO KNOWN AS:** Ravenswood Venture, Marden Manufacturing

**TIME PERIOD:** 1944-1945

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*Quality Hardware and Machine Co. had a contract to support the University of Chicago. The company canned experimental unbonded uranium slugs for Hanford, and may have canned all of the slugs used in the Hanford production reactors during World War II.*

**DISCUSSION:**
As many as 48,000 slugs may have been canned by Quality Hardware and Machine Co. in the time frame of 1944-1945. The slug canning process that was probably used was developed by DuPont, and involved a "triple dip" including: 1) cleaning the slug in a nitric acid bath; 2) bathing in a molten bronze, tin, aluminum-silicon mixture; and, 3) water quenching. There is nothing to indicate that machining or turning of the uranium slugs occurred at these facilities. However, there would be removable contamination from the oxidization of the uranium slug prior to nitric acid cleaning. Once the slug was coated in aluminum, the potential for contamination is essentially eliminated.

Records indicate that the work may have been conducted at two facilities in the Chicago area. A 1978 internal DOE memo indicates that site 1, located on North Ravenswood in Chicago, was occupied by a furniture manufacturing company, Marden Manufacturing. There was no information regarding how long Marden Manufacturing has occupied the property. However, records indicate that the property had been transferred in 1968.

The facility at site 2, 1046 West Fullerton in Chicago, was apparently demolished and replaced by a grocery store as late as 1976. The Atlantic and Pacific Tea Company (a.k.a. A&P Grocery Store) was the property owner as of 1976, and DOE memoranda indicate that the building appeared new. There is no information regarding the use of the property prior to that.

Site 1 was recommended for a designation survey by ORNL in 1987, and FUSRAP records indicate that a survey was completed in 1989. The conclusion of this survey was that no contamination in excess of current levels was identified.

Documentation exists supporting that there was a significant quantity of material processed between 1944 and 1945. After 1945 however, there is no evidence that further coating of uranium was performed. The results of the 1989 survey indicate that no contamination in excess of current levels was identified. , little potential exists for radioactive contamination resulting from AEC/DOE research beyond the period in which weapons-related production occurred, as the process used to can the slugs should not have resulted in a significant spread of radioactive contamination.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website, DOE report DOE/EM-0319 "Linking Legacies", along with documentation provided by the DOE ES&H Group consisting of internal DOE facility evaluation documentation.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** R. Krasburg and Sons Manufacturing Co.
Chicago, Illinois

**TIME PERIOD:** 1944

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*In 1944, R. Krasberg entered into a subcontract with the University of Chicago for services and supplies for the Metallurgical Laboratory. The subcontract required Krasberg to provide necessary personnel, facilities and equipment to produce special machining of parts for special equipment, tools, jigs, fixtures, etc., from materials furnished by the University. It is unclear from the documentation whether Krasberg handled any radioactive materials as part of its work.*

**DISCUSSION:**
A radiological survey of the facility conducted by Oak Ridge Associated Universities (ORAU) did not identify any radioactive contamination at the facility above the levels specified in 10 CFR 835. Exposure rates in the facility were well within the range typically considered background levels. The facility was removed from FUSRAP status in late 1989.

Documentation provided does not identify that radioactive material was used at the facility. Radiological surveys conducted support the facility is not contaminated above accepted guidelines.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group consisting of US Army Corps of Engineers correspondence, and internal DOE facility evaluation documentation.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** R. W. Leblond Machine Tool Co.
Cincinnati Ohio

**TIME PERIOD:** 1961

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*National Lead Company of Ohio (Fernald) contracted with Leblond Machine for the purchase of a rapid boring machine. In 1961, acceptances tests, using 17 tons of natural uranium, were conducted at Leblond Machine.*

**DISCUSSION:**
It is not clear on the exact quantity of uranium that was used during the first test; however, there are references to fourteen 7-inch x 21-inch billets being successfully drilled. For the second test, documentation exists to support 60,000 pounds of uranium metal being shipped to the R.W. Leblond Machine Tool Co. for the test.

At the conclusion of each test, there is documentation describing decontamination of equipment, and a return of all metal, machining chips, fines, turnings and decontamination equipment to the FMPC. The cutting oil used in the process was released to Leblond after analysis showed that the uranium contamination was 2.4 mg/liter.

There is little likelihood of significant residual contamination remaining at the facility at the conclusion of the September testing period.

Documentation indicates that there were only two tests conducted at the facility. Given the nature of the described decontamination effort, and controls that were put in place during the testing, there is little potential for significant contamination at the facility after the second test was complete.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group consisting of US Army Corps of Engineers correspondence, and internal DOE facility evaluation documentation.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Radium Chemical Company, Inc
New York, New York
**ALSO KNOWN AS:** J. Kelly

**TIME PERIOD:** 1943 - 1950

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*Beginning in 1943, the Radium Chemical Co. supplied most of the radium required for the Manhattan Engineer District. Combinations of material supplied and/or mixed by the Radium Chemical Company included radium bromide and radium bromide mixed with powdered beryllium. Brass was also used.*

**DISCUSSION:**
The facility was in operation as late as the 1980s. In 1987, the New York State Attorney General issued a Stipulation and Order intended to result in the ultimate decontamination of the facility. Decontamination was initiated in 1988, by the State of New York.

Documentation reviewed indicates there is a potential for residual contamination outside of the covered period, which in part resulted from contracted work with the MED/AEC, and would be indistinguishable from non-AWE work residues. This facility was eliminated from FUSRAP, but added to the National Priority Listing under the USEPA.

In the late 1980s approximately 100 curies of radium needles were removed which were most likely not AWE related. The EPA then selected the final site remedy. This consisted of partial decontamination of the building, followed by its complete dismantling and disposal in appropriate facilities. Cleanup actions began in November 1990 and all work was completed in July 1994.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group consisting of US Army Corps of Engineers correspondence, and internal DOE facility evaluation documentation.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1951 - 1994

**FACILITY NAME:** Rare Earths/W.R. Grace
Wayne, New Jersey

**TIME PERIOD:** 1950-1960; Residual Radiation 1961-1984
DOE 1985-1987

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*Rare Earths extracted thorium from monazite sands from 1950-1960 under various contracts with the AEC. The AEC needed the thorium for its weapons program. Although the processing of monazite sands continued at Rare Earths through 1971, it was no longer performed under contract for the AEC, but rather was for commercial purposes.*
*Remediation activities were conducted from 1985-1987 by Thermo Analytical/Eberline and Bechtel National Inc. (BNI) under the BNI umbrella contract as part of the Formerly Utilized Site Remediation Action Program (FUSRAP).*

**DISCUSSION:**
Radiological surveys were conducted at the property in 1981 and 1982, and the site entered the FUSRAP process. The site was added to the National Priorities List in 1985.

Based on the inability to distinguish AEC related contamination from that of commercial operations, results in a determination that AEC related residual contamination existed outside the period in which weapons-related production occurred. A January 2006 Fact Sheet on the US Army Corps of Engineers website indicates that removal of all contaminated materials was completed in December of 2001.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website, internal DOE/AEC correspondence provided by the DOE ES&H Group, and the US Army Corps of Engineers document FUSRAP Wayne Interim Storage Site, January 2006.

Pertinent documents:
1. Contract No AT(29-6)-993 [might actually be contract AT(49-6)-993], dated July 9, 1957.
2. "An Aerial Radiological Survey of the W.R. Grace Property, Wayne Township, New Jersey," EG&G Survey Report, NRC-8113, November 1981.
3. "Radiological Survey of the W.R. Grace Property, Wayne Township, New Jersey," Final Report, January 1983 (performed by ORAU).
4. Contract No. AT(30-1)-1037, dated Nov 2, 1950.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1961–1984; 1988-2001

**FACILITY NAME:** Reed Rolled Thread Co.
Worcester, Massachusetts

**ALSO KNOWN AS:** Reed Rolled Thread and Die

**TIME PERIOD:** 1955

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*In 1955, Reed Rolled Thread and Die was scheduled to thread roll a test lot of 1500 Savannah River plant slugs for National Lead Company of Ohio (Fernald).*

**DISCUSSION:**
A memo from National Lead of Ohio to C.L. Karl states that 1500 slugs will be thread rolled on September 14 and 15, 1955. Another NLO memo states that 1711 slugs were successfully thread rolled on September 27 and 28 of 1955.

A FUSRAP determination in 1990, listed the site as "TBD". There is no new documentation indicating whether or not radiological surveys were conducted as part of this test or afterwards.

With the absence of any known radiological survey data from this or any other period, based on the assumption that the work did occur, there is a potential for the existence of significant residual contamination after completion of the operations.

This company/facility appears to still exist at an address in Holden, Massachusetts. It is unknown if this is the same facility where the AWE work was performed.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group consisting of internal DOE facility evaluation documentation. Reference: 1) National Lead Company of Ohio Letter (extract); To C.L. Karl; Subject: Resume Activities July 1955; August 3, 1955; 2) OTS/Weston Note; Stout to Williams; Subject: Additional Considered Sites; December 18, 1990; 3) DOE Memorandum; Murphie to Osheim; Subject: Documents Pertaining to Sites Being Evaluated in the Formerly Utilized Sites Remedial Action Program; January 24, 1995.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1956 - present

**FACILITY NAME:** Revere Copper and Brass
Detroit, Michigan

**TIME PERIOD:** 1943-1950s
Residual Radiation 1960-1984

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*Between 1943 and 1946, Revere Copper and Brass extruded uranium rods in its Detroit plant. During the late 1940s and early 1950s Revere rolled or extruded uranium rods.*

**DISCUSSION:**
Documentation also suggests that thorium metal (presumably Th-232) was formed, rolled extruded, and /or machined by Revere Copper and Brass sometime during the period above. There is no indication of the quantity of material that was processed.

Argonne National Laboratory personnel performed a preliminary survey of the facility in 1981, finding no significant residual contamination in readily accessible areas or equipment. It was recommended in that report that a more detailed and thorough survey be performed to assess overhead and other surface areas for accumulated airborne uranium aerosols/dust based on the nature of the prior work performed and the absence of ventilation systems for control. Information indicates that some of the equipment that was used during the AEC contract was still in use at the facility as late as 1981, but subsequently stolen when the facility was closed and demolished in 1984, prior to a detailed survey having been performed. DOE eliminated the facility from FUSRAP actions in 1990, based on the preliminary survey results (1981) and the absence of the facility due to demolition (1984).

Based on the nature of uranium extrusion work and associated activities with thorium, coupled with the lack of a detailed radiological survey, it is determined that this facility poses a potential for significant residual contamination outside the period in which weapons-related production occurred up to the time that the facility was demolished.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group consisting of US Army Corps of Engineers correspondence, and internal DOE facility evaluation documentation. Pertinent documentation included;

1. ANL Preliminary Survey Report; Subject: Notes and Comments Revere Copper and Brass, Detroit, MI, circa 4/22/81;
2. DOE Report, FUSRAP Elimination Report for the Former Revere Copper and Brass Corporation, 5851 West Jefferson Street, Detroit Michigan, March 30, 1990.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1960 – 1984

**FACILITY NAME:** Roger Iron Co.
Joplin, Missouri

**ALSO KNOWN AS:** Roger Iron Works Company

**TIME PERIOD:** 1956

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*The Roger Iron Company conducted a test operation involving crushing of a dolomite c-liner for the AEC. The liner had trace amounts of uranium and magnesium fluoride. The test involved four individuals, including two employees of National Lead of Ohio (Fernald). NLO also monitored the air during the time of the test.*

**DISCUSSION:**
This was a single point test conducted at the vendor's facility. Air monitoring was performed during the crushing operation, both Breathing Zone and General Area samples were collected.

There is little information regarding the disposition of the material following the test. Given the results of the air monitoring, and the fact that this test was conducted over a short period of time, with material containing trace quantities of radioactive material, it is doubtful that there was a significant spread of radioactive contamination.

A FUSRAP determination made in 1990, excluded the site from further consideration.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group consisting of internal DOE facility evaluation documentation.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Sciaky Brothers, Inc.
Chicago, Illinois

**TIME PERIOD:** 1953

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*In 1953, Argonne National Laboratory suggested that Sciaky Brothers be used to perform a stitch welding operation for a uranium cord, zirconium clad specimen EBR irradiation. The documentation does not indicate whether this work actually took place. The company may also have done electron beam melting or welding of uranium metal on an experimental basis.*

**DISCUSSION:**
This appears to be a single operation involving only one specimen. Given that the uranium was clad when provided to Sciaky Brothers, and the operation apparently only occurred once, there is little potential for radioactive contamination at this facility. The facility was removed from FUSRAP in 1987, and no further actions were recommended or taken.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group consisting of US Army Corps of Engineers correspondence, and internal DOE facility evaluation documentation.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Seaway Industrial Park
Tonawanda, New York

**ALSO KNOWN AS:** Charles St. Plant

**TIME PERIOD:** 1974

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*In 1974, the Ashland Oil Company constructed bermed areas on the Ashland #1 property to hold two petroleum tanks. Some of the soil removed during construction was disposed of in three areas of the Seaway Industrial Park landfill. Subsequent investigations determined that the soil from the Ashland site contained radioactive contaminants exceeding Department of Energy (DOE) guidelines. This soil came from an area used for disposal of radioactive residues from the nearby Linde Air Products site. This company processed uranium for the Atomic Energy Commission and the Manhattan Engineer District, predecessor agencies of the Department of the Energy (DOE).*
*Although the Seaway Industrial Park was designated as part of the Formerly Utilized Site Remediation Action Program (FUSRAP) in 1984, no work under this program was performed prior to its transfer to the Army Corps of Engineers.*

**DISCUSSION:**
A radiological survey of the property was conducted in 1978 as part of the FUSRAP process. The survey indicated that the site was contaminated in an approximately 13-acre area of the landfill. External exposures ranged from 8-80 microrem per hour, and averaged 36 microrem per hour. DOE cleanup activities were apparently begun, under the FUSRAP program in 1984. There is no documentation identifying when or if that activity was completed.

Documentation reviewed indicates the presence of residual contamination outside of the period in which weapons-related production occurred. Remediation is ongoing under FUSRAP and is scheduled for completion in 2007.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group consisting of US Army Corps of Engineers correspondence, and internal DOE facility evaluation documentation. Other sources of information used for the evaluation included: 1) DOE Report (DOE/EV-0005/6); FUSRAP Radiological Survey of the Seaway Industrial Park Tonawanda New York; May 1978 (Final Report) 2) USACE Seaway Site Missions Sheet.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1975 - present

**FACILITY NAME:** Seymour Specialty Wire
Seymour, Connecticut

**ALSO KNOWN AS:** Reactive Metals, Inc.
National Distillers and Chemical Co.
Bridgeport Brass Co.

**TIME PERIOD:** 1962-1964; Residual Radiation 1965-1984;
DOE 1992-1993(remediation)

**FACILITY DESCRIPTION:**

**DOE ES&H Website:**

*From 1962 to 1964, the Bridgeport Brass Company performed contract work at the Seymour site for the Atomic Energy Commission (AEC). This work involved developing an extrusion process for natural uranium metal. After 1964, the work was consolidated at the Reactive Metals site in Ohio. Operation of the Seymour site was later taken over by employees and the facility eventually became the Seymour Specialty Wire Company.*

*Although this site was designated as part of the Formerly Utilized Site Remediation Action Program (FUSRAP) in 1985, remediation only took place during 1992 and 1993. This work was performed under the Bechtel National Inc. umbrella contract or DOE site environmental remediation.*

**DISCUSSION:**

A radiological survey was conducted at the facility in 1964. According to the records, removable contamination ranged from 20-90 dpm/100 $cm^2$ and fixed contamination ranged from <800 dpm-3200 dpm/60 $cm^2$. The facility was substantially renovated sometime prior to 1977, to house corporate printing operations and a warehouse. While residual contamination in 1964 met existing standards and a survey in 1977 didn't find a need for decontamination, subsequent surveys in 1985 and 1993 found areas that exceeded then-applicable standards. A December 1985 memo determining that this site should be remediated, also states that the remaining contamination is inaccessible, and therefore if not disturbed poses no threat to anyone.

In 1985, the site was designated under FUSRAP for remedial action because of contamination detected in floor drains, soil contamination and minor surface contamination. Cleanup of the site was completed in 1993 with the removal of approximately 38 cubic yards of waste.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group.
Pertinent documents:

1. DOE memo Hazard Assessment dated 8/10/93;
2. ORNL survey report from 1985;
3. ORNL survey report from 1993;
4. ORNL final verification survey report from 1995.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1965 - 1991

**FACILITY NAME:** Shattuck Chemical
Denver, Colorado

**ALSO KNOWN AS:** Dawn Mining Corp
Denn Mining Corp

**TIME PERIOD:** 1950s, 1963

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*Shattuck Chemical prepared uranium compounds and uranium oxide in the late 1950s. (This was probably done under a Source Materials License issued by the Atomic Energy Commission.) Shattuck also processed refined uranium and produced natural uranium oxides on a commercial basis for the private market, and in 1963, supplied a small quantity of uranium to the Rocky Flats plant.*

**DISCUSSION:**
In 1987, a FUSRAP elimination recommendation was made with the basis being "no records found which indicate there were any contracts between MED/AEC and Shattuck."

Available documentation indicates that residual contamination from AWE related work is indistinguishable from non-AWE related contamination. This facility was undergoing soil removal and site remediation under USEPA Superfund projects program. Final Status Surveys were reportedly completed in July 2004.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group consisting of US Army Corps of Engineers correspondence, and internal DOE facility evaluation documentation. Reference: USEPA Shattuck Superfund Site Summer 2004 Update.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1950s - 1962, 1964 - 2004

**FACILITY NAME:** Shpack Landfill
Norton, Massachusetts

**ALSO KNOWN AS:** Metal and Controls Nuclear Corp.
Texas Instruments
M&C Nuclear

**TIME PERIOD:** 1960-1965;
Residual Radiation 1966-1998

**FACILITY DESCRIPTION:**

**DOE ES&H Website:**

*The Shpack Landfill began operating as a private landfill in the early 1960s and received both industrial and domestic wastes. The landfill was closed in 1965 under court order. In 1978, a concerned citizen who had detected elevated radiation levels at the site contacted the Nuclear Regulatory Commission. The Commission investigated the site and confirmed the presence of radioactivity in excess of natural background levels for the area. Exactly when these contaminants were deposited at the site is not known. However, the Nuclear Regulatory Commission determined that the Texas Instruments plant (see Metals and Controls Corp.) of Attleboro had used the landfill to dispose of trash and other materials. The Nuclear Regulatory Commission concluded that the contaminants probably resulted from this waste stream.*

**DISCUSSION:**

Residues and waste containing uranium (enriched to > 90%), thorium, and radium have been detected in the soil and groundwater of the site. Radiological surveys taken in the late 1970s revealed extensive contamination at the landfill.

The site was turned over to the Army Corps of Engineers in 1997. FUSRAP update reports include remediation plans as recently as 2004. There is no evidence that the remediation has been completed.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE ES&H Website, and internal AEC/DOE correspondence provided by the DOE ES&H Group.
Pertinent documents:

1. Memo, Sheldon Meyers to R.J. Hart, "Shpack Landfill, Norton, Massachusetts," dated Jan 27, 1981.
2. "Radioactive Material in Uncontrolled Location, Norton, Massachusetts," Report No. 078-154-A Part 1 of 2, U.S. NRC Office of Inspection and Enforcement, Mar 13, 1979.
3. "Radioactive Material in Uncontrolled Location, Norton, Massachusetts," Report No. 078-154-A Part 2 of 2, U.S. NRC Office of Inspection and Enforcement, June 7, 1979.
4. "Radiological Survey of the Shpack Landfill, Norton, Massachusetts," DOE/EV-0005/31, ORNL-5799, Dec 1981

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1966-present

**FACILITY NAME:** Simonds Saw and Steel Company
Lockport, New York

**ALSO KNOWN AS:** Allegheny-Ludlum Steel Corp.
Simonds Saw and Steel Division
Guteri Special Steel Corp.

**TIME PERIOD:** 1948-1956
Residual Radiation 1957 - 2003

**FACILITY DESCRIPTION:**

**DOE ES&H Website:**

*Simonds Saw and Steel rolled uranium billets into rods for the AEC as part of the multi-site process overseen by the New York Operations Office for the production of uranium metal for fabrication into slugs for fueling Hanford production reactors. Simonds also rolled thorium metal whose most likely use was irradiation in Hanford reactors for the weapons program. Simonds rolled between 25 million and 35 million pounds of uranium and between 30,000 to 40,000 pounds of thorium.*

**DISCUSSION:**

Records indicate that between 25 million and 35 million pounds of uranium, and 30,000 to 40,000 pounds of thorium may have been processed at this facility. Contract activities with AEC ended sometime in the 1957-58 period. As part of contract termination, a large-scale facility decontamination was required to have been performed, but it is unclear whether it was ever performed. A 1958 NLO (Fernald) Trip Report, indicated that facility surveys and decontamination were conducted, but neither the extent of the surveys, nor the effectiveness of the decontamination was described. A 1976 ORNL survey of the facility identified alpha contamination was within "acceptable "limits, but beta-gamma radiation "...in some areas exceeded the maximum allowable for unrestricted use specified in NRC guidelines."

Documentation reviewed indicates significant residual contamination outside of the period in which weapons-related production occurred. This facility is in the remediation process, managed by the Buffalo District of the USACOE FUSRAP program.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group. Other sources of information included: 1) ORNL Letter; Cottrell to Turi; Radiological Survey of the Guterl Steel Facility, Lockport, New York; July 20, 1984, 2) ORISE Report (99-1699); Radiological Survey of the Guterl Specialty Steel Corporation, Lockport, New York, Final Report; December 1999, 3) DOE Letter; Fiore to Van Winkle, concerning the eligibility of the site for cleanup under FUSRAP; May 19, 2000.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1957 - present

**FACILITY NAME:** Southern Research Institute
Birmingham, Alabama

**TIME PERIOD:** 1955-1958; 1962; 1976

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*The Southern Research Institute was involved in several AEC projects. During the period from November 10, 1955 through June 1, 1958, it was licensed (License #C-3417) to receive source material from National Lead Company of Ohio (Fernald) for research on the properties of uranium-liquid metal fuel elements. The Institute performed hot tensile tests on uranium metal and was authorized to receive 300 pounds of normal uranium from NLO. Records also indicate that it handled test quantities of radioactive metals for NLO in 1976. The file also contains a proposal to NLO to test uranium workability at elevated temperature, but does not indicate if the work was done*.

**DISCUSSION:**
There is no mention of the work performed in 1976, other than a FUSRAP document identifying test quantities of uranium. However, there is no mention of this work actually being performed.

From available documentation it appears that the work conducted by SRI was limited in scope and involved small amounts of radioactive material (uranium). No radiological survey data available from during or after the performance of this work is known to exist. It does appear that SRI was aware of, and implemented, appropriate laboratory controls during the work, which would limit the potential for residual contamination. However, in the absence of any radiological survey data, residual contamination cannot be ruled out.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1959 - 1961, 1963 – 1975, 1977 - present

**FACILITY NAME:** Spencer Chemical Co., Jayhawks Works
Pittsburg, Kansas

**TIME PERIOD:** 1958-1963

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*The Spencer Chemical Company, Jayhawks Works, processed unirradiated uranium scrap for the AEC, recovering enriched uranium from it for use in the weapons complex. In 1963, Kerr-McGee took over Spencer Chemicals' nuclear operations.*

**DISCUSSION:**
Other information in the provided documentation indicates there was some work with uranium hexafluoride, uranium oxide, and thorium. Uranium enrichments apparently ranged from depleted to 93%.

There were two Special Nuclear Material licenses issued to Spencer Chemical at this facility, #154 and #329. SNM-329 allowed the facility to possess up to 1,000 kilograms of 5% enriched uranium at any one time. SNM-154 was not available for this review, but in the absence of any identified license amendments to SNM-329, higher enriched work and thorium work may have been conducted under SNM-154. Spencer Chemical also had a Source Material License (C-4352) issued, however the specifications of that were unavailable. Spencer Chemical was cited for non-compliance with license conditions as a result of a May 2-5, 1961 inspection by the AEC.

The total quantities of material handled under these licenses were not identified in the documents reviewed, and in 1962, SNM-154 and SNM-329 were cancelled. As a condition of the license cancellations, Spencer Chemical was required to provide documentation to the AEC that all material had been removed from the facility, and that remaining contamination levels should not exceed specified contamination levels which are consistent with current standards.

Documentation reviewed indicates that AEC licenses were terminated no later than 1963, at which time an AEC performed a final closeout inspection of the decommissioned facility.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group, consisting of US Army Corps of Engineers correspondence, and internal DOE facility evaluation documentation including written communications between Spencer Chemical Company Representatives and the U.S. Atomic Energy Commission.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Sperry Products, Inc.
Danbury, Connecticut
**ALSO KNOWN AS:** PCC Technical Industries

**TIME PERIOD:** 1952-1953

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*In 1952 and 1953, Sperry developed processes for testing and examining uranium plates for the Sylvania Corp., a major AEC contractor*.

**DISCUSSION:**
Based on documentation provided, the testing involved ultrasound of uranium plates. As much as 70 kg of uranium may have been processed through the facility between 1952 and 1953.
Given the nature of the work and the limited quantity of material used at the facility, there is little likelihood for residual radioactive contamination and subsequent employee exposure.

Documentation exists supporting that there was only a small quantity of material processed. While there is no documentation containing the results of radiological surveys, little potential exists for radioactive contamination resulting from AEC/DOE testing beyond the period in which weapons-related production occurred.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group, consisting of internal DOE facility evaluation documentation.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** St. Louis Airport Storage Site (SLAPS)
St. Louis, Missouri

**ALSO KNOWN AS:** Robertson Airport
Robertson Storage Area

**TIME PERIOD:** 1946-1966; Residual Radiation 1967-1998

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*The St. Louis Airport Site Vicinity Properties are associated with both the St. Louis Airport Site and the Latty Avenue Properties. The Manhattan Engineer District acquired the St. Louis Airport Site in 1946 and used it to store uranium-bearing residues from the St. Louis Downtown Site from 1946 to 1966, when Continental Mining and Milling Company of Chicago purchased the waste, removed it from the storage site near the airport, and placed it in storage at Latty Avenue under Atomic Energy Commission license.*
*Although the SLAPS site was designated as part of the Formerly Utilized Site Remediation Action Program (FUSRAP) in 1984, no work under this program was performed prior to its transfer to the Army Corps of Engineers.*

**DISCUSSION:**
The information indicates that as much as 121,000 tons of refining residue were stored at the site, containing as much as 236 pounds of uranium.

A draft environmental assessment conducted in 1981 indicates that "in 1973. . .the Airport Authority removed more residue from the site, razed and buried all onsite structures except the fence, and spread clean fill over the entire site to reduce radiation levels and control runoff and erosion."

Radiological survey data from 1979 identified residual contamination. The site was turned over to the US Army Corps of Engineering for remediation under FUSRAP in 1997.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group. Environmental reports from 1981 and 1986. Pertinent document: DOE Report (DOE/EV - 0005/16); Radiological Survey of the St. Louis Airport Storage Site, St. Louis, Missouri; Sept. 1979.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1967 - 1998

**FACILITY NAME:** Standard Oil Development Co. of NJ
Linden, New Jersey

**ALSO KNOW AS:** Bayway Exxon

**TIME PERIOD:** 1942-1945

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*Standard Oil performed a variety of tasks during World War II. It was under contract to coordinate materials for work to be done by the Metallurgical Laboratories of the Manhattan Engineer District. It also conducted studies to develop uranium metal through chemical reduction process, and to develop and construct centrifuges for uranium separation.*
*The company continued to provide consulting and analytical services for the Atomic Energy Commission, but it is not clear if any radioactive materials were handled there after World War II.*

**DISCUSSION:**
Documentation reviewed indicates that there is potential for significant residual contamination outside of the period in which weapons-related production occurred. Work may have been done through 1953. Early facilities may have been dismantled and disposed of sometime around 1949-1950, however there is no data or documentation describing the radiological conditions or disposition of contaminated materials.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group. Pertinent documents included: (1) Oak Ridge Associated Universities Letter; Berger to Wagoner; Subject: Visit to Potential Sites in Newark and Linden New Jersey; February 12, 1990. (2) Exxon Research and Engineering Company Letter; Buckman to Willis (Weston/OTS); providing a plot plan of the Linden Technology Center (old Standard Oil Development Company site); July 18, 1988. (3) Weston OTS Note; Stout to Williams (DOE); Revised Site Summary for the Exxon Company in Linden, New Jersey; March 22, 1991.

**EVALUATION FINDINGS**:
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1946 - present

**FACILITY NAME:** Star Cutter Corp.
Farmington, Michigan

**TIME PERIOD:** 1956

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*The Star Cutter Corporation manufactured machine tools. Records indicate that National Lead of Ohio (Fernald) conducted a one-time test of a Star Cutter drill to hollow uranium slugs.*

**DISCUSSION:**
The test involved approximately 100 pounds of uranium. There is no evidence of any subsequent operations involving uranium. The site was removed from FUSRAP action in 1991.

Little potential exists for radioactive contamination resulting from processing this material beyond the period in which weapons-related production occurred.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group, consisting of internal DOE facility evaluation documentation.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Staten Island Warehouse
New York, New York

**ALSO KNOWN AS:** Archer Daniels Midland Company

**TIME PERIOD:** 1942

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*This warehouse was used for uranium ore storage from the Belgian Congo. From this warehouse, the ore was transported to various Manhattan Engineer District (MED) sites for long-term storage and/or processing. The ore was the property of the African Metals Corporation and the MED contractor purchased only the $U_3O_8$ content of the ore while African Metals retained ownership of the radium and precious metals in the ore.*

**DISCUSSION:**
Documentation identifies that ores stored at this location from 1939 through 1942 were a result of an independent speculative business enterprise. The MED learned of this material in 1942 and subsequently purchased and removed the ores at that time. The building where these ores were stored appears to have been demolished after MED acquisition of the materials sometime between 1942 and 1946. A radiological survey of the area of the demolished storage facility in 1980 identified a localized area of potential contamination.

This material was not government controlled or owned, unlike the materials stored at the Baker and Williams Warehouses, until 1942 whereupon it was removed.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Stauffer Metals, Inc.
Richmond, California

**ALSO KNOWN AS:** Stauffer-Tenescal Co.
Tenescal Co.

**TIME PERIOD:** 1961

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*Stauffer performed electron beam melting tests on uranium metal for National Lead of Ohio (Fernald). The company had performed similar tests for Hanford.*

**DISCUSSION:**
There is no information regarding this facility in the FUSRAP records. Because this was a one-time test, the likelihood for significant long-term contamination at the facility is remote. There is little likelihood of long-term significant contamination resulting from this one-time operation.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Superior Steel Co.
Carnegie, Pennsylvania

**ALSO KNOWN AS:** Copper Weld, Inc.
Lot and Block 102J210

**TIME PERIOD:** 1952-1957
Residual Radiation 1958-2001

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*Superior Steel produced uranium strip and rolled uranium slabs for use by the Savannah River Laboratory. In 1955, for example, they hot rolled twenty-five tons of uranium into strip.*

**DISCUSSION:**
There is little information in the FUSRAP files regarding Superior Steel Co. The company apparently rolled production quantities of uranium metal for NLO (Fernald) in the time frame identified above.

A 1981 ORNL survey indicated that the site was contaminated in the area where the uranium operations took place, on and under floors, in sumps and on some of the machinery that was used during production.

Documentation reviewed indicates residual contamination from AWE work still exists at this facility. DOE identified the contamination in a 1981 survey but eliminated the facility from FUSRAP.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group. Other sources of information included the following: (1) Aerospace Corporation Letter with Enclosures; C. Young to A. Whitman; Authority Review - The Former Superior Steel Corporation Site - AEC Contract No. AT(30-1)- 1412; September 30, 1985 PA.03-1, (2) DOE Letter; A. Whitman to A. Wallo; comments and authority decisions on various sites; October 28, 1985 PA.03-2, (3) DOE Letter; J. Wagoner to Mayor Willard; Information on the former Superior Steel Company site; January 27, 1995 PA.03-3, (4) ORNL/DOE Preliminary Survey; T.E. Myrick and C. Clark; Preliminary Site Survey Report for the Former Superior Steel Mill at Carnegie, Pennsylvania; April 1981 PA.03-4.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1958 - present

**FACILITY NAME:** Sutton, Steele and Steele Co.
Dallas, Texas

**TIME PERIOD:** 1951; 1959

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*In 1951, AEC and AEC contractor personnel conducted tests at Sutton, Steele, and Steele, Inc. which were aimed at devising means of recovering uranium from low grade wastes and residues. The tests were to determine the feasibility of separating fused dolomite from magnesium floride slag and uranium. In 1959, National Lead of Ohio (Fernald) personnel evaluated Sutton, Steele, and Steele's dry tabling equipment for the separation of normal uranium shot.*

**DISCUSSION:**
During the first test, 2 tons of C-liner and C-special were processed to determine whether the uranium could be separated from the dolomite and magnesium fluoride. As this was liner material, the uranium concentrations were relatively low, and only about 50 pounds of uranium were processed through the equipment. At the conclusion of the test, the equipment was decontaminated and residues were returned to the AEC.

In 1959, NLO (Fernald) personnel evaluated Sutton, Steele and Steele's dry tabling equipment for the separation of uranium shot. Fifty pounds of normal uranium were processed in a single test to evaluate particle size separation. As in the first test, the equipment was decontaminated and monitored after the operation.

Sutton, Steele and Steele was eliminated from FUSRAP action in 1993 based on the low potential for residual contamination at the facility.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group consisting of internal DOE facility evaluation documentation.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Swenson Evaporator Company
Harvey, Illinois

**TIME PERIOD:** 1951

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*Swenson Evaporator was scheduled to perform a raffinate spray drying test for National Lead Company of Ohio (NLO) on March 20, 1951. This test would have involved some radioactive residue. The drums containing the raffinate were shipped to Swenson by Mallinckrodt, but it is believed that they were not opened and the test not performed.*

**DISCUSSION:**
Documentation indicates that because of public relations issues, and health department intervention, the test was never performed. There were approximately 40 drums of raffinate liquor that were delivered to Swenson for the test. Evidence indicates that the drums were never opened and subsequently returned to NLO (Fernald). The exact dates of the shipments are not clear.

A FUSRAP determination made in 1987 recommended the removal of this facility from the FUSRAP process because of low potential for residual contamination.

Documentation indicates that a limited evaluation was scheduled, however, never performed. There is little to no potential for residual contamination remaining at the site as a result of AEC/DOE activities.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Sylvania Corning Nuclear Corp.-Bayside Laboratories
Bayside, New York

**ALSO KNOWN AS:** Sylvania Electric Products, Inc.
Metallurgical Laboratory
Sylvania Electric Corporation, Atomic Energy Division
Sylvania Bayside Laboratories
Sylcor

**TIME PERIOD:** 1947-1962

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*The Metallurgical Laboratory of the Sylvania Electric Company investigated uranium and thorium powder metallurgy. It also produced powdered metal slugs, developed bonding techniques, and plated uranium slugs with nickel. The work with slugs included the conversion of uranium metal to uranium hydride using hydrogen. A February 1948 AEC Monthly Summary of Activities indicates that the Lab's "initial program will involve determining the physical properties and the health hazards of beryllium and uranium powders and the applications of powder metallurgy to these metals and their alloys." In 1948, the work required 315 pounds of raw beryllium metal. Beryllium was handled first in the regular metallurgical building and then, after the objections of the AEC medical division, in a special AEC metallurgical development laboratory.*

**DISCUSSION:**
Other work at the facility included $UO_2$ wafer production, flat plate production, pipe cutting using abrasive wheel cutters, canning slugs, thorium slug canning, and thorium metal production.

In 1973, a FUSRAP site status report indicated that New York had terminated the facility's license after verifying there was no contamination at the site. The facility was demolished sometime before 1977. An ORNL survey of the property in 1977 identified no contamination at the site distinguishable from background. The site was removed from FUSRAP in 1993. Based on a description of the survey performed prior to turn-over to GTE Labs in 1962, coupled with results from follow-up surveys in 1973 and 1977, there is no indication that residual contamination existed beyond the period in which weapons-related production occurred.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group. Pertinent documentation included, Aerospace Corporation memorandum from Vierzba to Mott, Sylvania-Corning Nuclear Corporation, Inc. Bayside, New York Disposition of Radioactive Materials.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Sylvania Corning Nuclear Corp.- Hicksville Plant
Hicksville, New York

**ALSO KNOWN AS:** General Telephone and Telegraph Laboratories
Sylcor

**TIME PERIOD:** 1952-1966

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*Under Atomic Energy Commission (AEC) contracts, the facility was used for research and development with radioactive materials, principally uranium and thorium. It was also licensed by the AEC to fabricate reactor fuel elements for the AEC, for Sylvania use, for sale, and for research purposes.*

**DISCUSSION:**
There is little information in the file regarding the operations performed or quantities of material that were used at the Hicksville facility.

A final release survey of the facility was conducted in 1965 by the Savannah River Company. A subsequent survey by ORNL (no date given) identified some residual activity (no quantity given).

Documentation reviewed indicates that significant AWE related contamination existed up until the specified end date of 1966. Available documentation included a report of the decontamination/dismantlement activities and an associated radiological survey from 1965-1966.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group. Reference: (1) AEC (SROO) Letter; Stetson to Pittman; Subject: Decontamination and Decommissioning of AEC Facilities (Your TWX, 10/29/73); November 13, 1973.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Tech-Art, Inc.
Milford, Ohio

**TIME PERIOD:** 1952

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*In 1952, National Lead Company of Ohio (Fernald) used Tech-Art to grind inserts as part of a study of Firth Sterling HF carbide profile inserts in conjunction with the machining development program. Additional documentation shows that Tech-Art possessed a subcontract with NLO for "[m]achine shop operations on Government owned materials at prescribed hourly rates of pay."*

**DISCUSSION:**
Based on the available documentation, there is little likelihood that this facility handled any radioactive material. There is a reference to "machine shop operations on government-owned materials at prescribed hourly rates of pay," but exactly what was performed is not clear. It appears that the inserts were ground by Tech Art for use in machining operations. The inserts were not radioactive. There is reference to a 1990 memorandum to the file, indicating that this site was to be evaluated by FUSRAP, but there is no documentation indicating that this was ever completed. The site remains classified as FUSRAP-TBD.

With the absence of any information confirming that radioactive material was used at this facility, the presence of residual radioactivity is unlikely.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group consisting of internal DOE facility evaluation documentation.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Tennessee Valley Authority
Muscle Shoals, Alabama

**TIME PERIOD:** 1951-1955

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*At its National Fertilizer Development Center, the TVA performed research and development on uranium recovery under formal agreement with the AEC. The work involved the extraction of uranium during the production of fertilizer from leached zone phosphate ore. A laboratory and pilot plant were operated at the fertilizer plant, but little uranium (about 2.5 kilograms of uranium concentrate) was produced.*

**DISCUSSION:**
Very little uranium was produced at this facility. A preliminary survey of the facility, conducted in 1980 by ORNL showed that the radiation and contamination levels at the facility did not vary significantly from background.

A FUSRAP determination made in the 1980s recommended elimination from the process based on the limited material processed and low potential for radioactive contamination remaining at the facility after the operation was ceased.

There was limited radioactive material produced at the facility. Little potential exists for radioactive contamination beyond the period in which weapons-related production occurred.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group consisting of internal DOE facility evaluation documentation.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Texas City Chemicals, Inc.
Texas City, Texas

**ALSO KNOWN AS:** American Oil Company
Morden, Incorporated
Smith Douglass
Amoco Chemical Company

**TIME PERIOD:** 1952-1956

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*Texas City Chemicals, Inc. produced uranium by recovery of $U_3O_8$ from a phosphate fertilizer production plant. The AEC contracted with Texas City Chemicals for the recovery of uranium which was ultimately used in weapons production.*

**DISCUSSION:**
Contract specifications identify that as much as 12 tons of $U_3O_8$ per year may have been produced at the plant during the contract years of 1952-1956.

Texas City Chemicals subsequently declared bankruptcy in 1956, and the facility in which the uranium was produced was demolished at an unknown time after that.

A preliminary survey conducted by ORNL in 1977 (issued in 1980), did not identify radiation/contamination levels above what would normally be expected at a phosphate fertilizer plant in that region of the country. The facilities associated with AWE work had been demolished at some time prior to this survey.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group including DOE Report (ORNL); Preliminary Survey of Texas City Chemicals, Inc. (Borden Chemical Division of Borden, Inc.) Texas City Texas; March 1980.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Titanium Alloys Manufacturing
Niagara Falls, New York

**ALSO KNOWN AS:** Humphreys Gold Co.
Titanium Alloys Manufacturing Co, Division of NLO
Titanium Alloys Metals
Titanium Pigment Co.

**TIME PERIOD:** 1950-1956

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*In the early 1950s, Titanium Alloys Manufacturing was under contract to the AEC to provide zirconium tetrachloride. In 1955, TAM was issued an AEC source material license to do work related to the conversion of thorium scrap to anhydrous tetrachloride. Correspondence from Oak Ridge indicates that it was not interested the company's thorium work. In 1956, this division reduced ores and other uranium compounds by arc melting in an induction furnace.*

**DISCUSSION:**
Documentation reviewed includes radiological air and area monitoring data from furnace operations conducted in 1956. These surveys indicate that both airborne radioactivity concentrations and area contamination levels were very low during furnace operations. Therefore the potential for residual contamination after operation ceased are low.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group. Other sources of information utilized in this research included: 1) Analytical Data Sheets; No. 9806 and 9805; Analytical Dept. - Health and Safety Division; Received by Analytical Chemistry Section July 13, 1956; 2) Analytical Data Sheets; No. 9804 and 9803; Analytical Dept. - Health and Safety Division; Received by Analytical Chemistry Section July 12, 1956.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Titus Metals
Waterloo, Iowa
**ALSO KNOWN AS:** Titus, Incorporated

**TIME PERIOD:** 1956

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*Titus Metals performed extrusion of uranium oxide billets into fuel plates for the Argonaut reactor at Argonne National Laboratory on June 29, 1956.*

**DISCUSSION:**
Records also indicate that, at the completion of the operation, the facility and equipment were decontaminated to non-detectable levels.
A FUSRAP determination made in 1987 recommended elimination from the process based on the decontamination of the facility, the limited material processed, and low potential for radioactive contamination remaining at the facility after the operation was ceased.
There was limited radioactive material use, and the operations only lasted a few days. Documentation indicates that the facility was decontaminated at the conclusion of the operations at Titus Metals.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group consisting of internal DOE facility evaluation documentation.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Tocco Induction Heating Div.
Cleveland, Ohio

**ALSO KNOWN AS:** Ohio Crankshaft Company
Tocco Heat Testing
Park Ohio Industries

**TIME PERIOD:** 1968-1969

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*Tocco had a contract with National Lead of Ohio (Fernald) to develop induction heating coil equipment for heating uranium fuel cores. Tocco performed operational tests of these units at its Ohio facility, which took place during 1968-1969. The company received 2000 pounds of natural uranium machined fuel cores and 5600 pounds of depleted uranium machined fuel cores from NLO for testing.*

**DISCUSSION:**
The license was amended in 1967 to authorize up to 16,000 pounds of uranium. A 1968 inspection of the facility by AEC identified several areas of low-level contamination on the working area floor (300-1500 dpm/100cm$^2$) and on the machinery (3,000-4,500 dpm/100 cm$^2$).

In 1968, the facility sent a letter to AEC stating that all materials had been returned to NLO (Fernald), and questioning whether the license should be cancelled or allowed to expire. In January 1969, the AEC terminated the license. There was apparently no follow-up inspection of the facility.

In 1993, the NRC conducted a survey of the facility and found that the radiation levels and contamination levels in the facility did not vary significantly from background. Removable contamination surveys were also performed at the facility and there was no evidence of removable contamination detected.

Documentation reviewed indicates that the facility was licensed to perform work under contract with NLO (Fernald) from 1966 to1969. There is however, no reason to expect that significant radioactive contamination existed at the facility after the 1969 date when the AEC license was terminated.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Torrington Co.
Torrington, Connecticut

**TIME PERIOD:** 1951-1953

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*The Torrington Company performed small-scale swaging experiments on uranium rods in the early 1950s. Torrington conducted this work for two companies: the Bridgeport Brass Company and American Machine and Foundry.*

**DISCUSSION:**
Given the short duration of the testing, and the limited use of uranium, it is not likely that significant contamination existed at the facility beyond the dates identified on the DOE ES&H Website.

A FUSRAP determination made in 1987 recommended elimination from the process, based on the limited quantity of material and low potential for radioactive contamination.

There was limited radioactive material use, and the resultant tests only lasted a few days. While there is no documentation containing the results of radiological surveys, little potential exists for radioactive contamination resulting from the limited use of radioactive material used at the site beyond the period in which weapons-related production occurred.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group consisting of internal DOE facility evaluation documentation.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Tube Reducing Co.
Wallington, New Jersey

**TIME PERIOD:** 1952; 1955; 1957

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*Tube Reducing Co. conducted tests for National Lead of Ohio (Fernald) on shaping and sizing uranium rods. In January 1952, two uranium rods were processed. More tubes were extruded in a reduction experiment in January 1955. Another test was conducted in 1957. The firm is also mentioned in World War II-era reports as a possible location for uranium machining, but there are no indications that any such work was done at the facility during that time period.*

**DISCUSSION:**
Given the short duration of the testing, and the limited use of uranium, it is not likely that significant contamination existed at the facility beyond the dates identified on the DOE ES&H Website.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group consisting of internal DOE facility evaluation documentation.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Tyson Valley Powder Farm
St Louis, Missouri

**TIME PERIOD:** 1942-1949

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*The Tyson Valley Powder Farm was a storage site for radioactive materials in the late 1940s. Records show, for example, that at the end of 1946, 206,110 pounds of uranium metal were stored at this location for the Manhattan Engineer District.*

**DISCUSSION:**
Given the quantity of material at the facility and the variety of storage methods used, it is reasonable to assume that radioactive contamination was present in the facility during the time the storage took place.
The materials were removed from the site in 1948, and records suggest that the site was sold to a local municipality, and subsequently developed into a park.

**INFORMATIONAL SOURCES:**
Sources of information reviewed during this evaluation included the DOE ES&H Website along with documentation provided by the DOE ES&H Group consisting of internal DOE facility evaluation documentation.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** U.S. Steel Co., National Tube Division
McKeesport, Pennsylvania

**TIME PERIOD:** 1959-1960

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*Tests at the Christy Park Works, National Tube Division of the U. S. Steel Corporation, conducted in 1959 and 1960, demonstrated that rotary piercing of uranium was possible. The tests were conducted for National Lead of Ohio (Fernald).*

**DISCUSSION:**
There is a 1967 report indicating that the testing phase occurred during the 1959-1960 time-frame. Rotary piercing of uranium was never adopted by NLO (Fernald).

The documentation reviewed includes descriptions the radiological controls that were in place during the operation and the decontamination efforts effort after operations. Post operational surveys indicate that decontamination efforts were successful.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group.
Halcomb, R. N., to Quigley, "Trip Report to National Tube Division, Christy Parks Works, McKeesport, Pennsylvania on February 15 to March 2, 1960"

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** United Lead Co.
Middlesex, New Jersey

**ALSO KNOWN AS:** Perry Warehouse; Middlesex Sampling Plant

**TIME PERIOD:** 1950-1967;
Residual Radiation 1968-1984

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*From 1950 to 1955, United Lead Co., a subsidiary of National Lead Company, was the AEC's operating contractor for the Middlesex Sampling Plant. The Middlesex Sampling Plant sampled, assayed, stored, and shipped uranium, thorium, and beryllium ores. The plant discontinued uranium and beryllium assaying and sampling activities in 1955. Until 1967, the site was used as a thorium storage and sampling site.*

**DISCUSSION:**
Documentation indicates that operations began at this facility in 1943 and ended in 1955, at which time the facility was used for storage of radioactive materials through 1967. Work included receiving, storing, crushing, grinding, and sampling of ores received from African Metals and other sources.

In 1969, the property was transferred to the Department of the Navy and used as a Marine Corps training facility. In 1978, the property was transferred back to the DOE for remedial activities.

Documentation states that prior to the GSA transfer, the site was decontaminated. A subsequent survey performed by ORNL in 1976 identified significant residual contamination that led to decontamination and restoration activities at the facility and surrounding properties. A survey performed in 1985 indicated that radioactive contamination exceeded unrestricted release criteria. In 1997 the responsibility for site remediation was turned over to the U.S. Army Corps of Engineers under FUSRAP.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group. Specific documents include DOE/OR/20722-20, *Radiological Survey Report for the Former Middlesex Sampling Plant, Middlesex New Jersey, March 1985.*

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1968 - present

**FACILITY NAME:** United Nuclear Corp.
Hematite, Missouri

**ALSO KNOWN AS:** Mallinckrodt Chemical Works, Chemical Div.

**TIME PERIOD:** 1958-1969

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*The United Nuclear Corporation in Hematite, Missouri, processed unirradiated uranium scrap for the AEC, recovering enriched uranium from it for use in the nuclear weapons complex. Mallinckrodt Chemical Works owned the Hematite plant until 1961.*

**DISCUSSION:**
The exact quantities and forms of radioactive material processed at the facility could not be readily determined from available documentation. There are statements in the records that "thousands of pounds of uranium" were processed. Enrichments of the uranium varied from low-enriched to > 90%.

In 1970, United Nuclear Corp. received a contract from the AEC to fabricate fuel plate elements which was apparently terminated in 1972.

There is no documentation supporting the radiological status of the site at the end of the contract. However, United Nuclear Corp. was contracted to supply uranium fuel for the commercial nuclear industry as well as the AEC.

Documentation reviewed indicates that residual contamination related to AWE work exists outside of the period in which weapons-related production occurred, which is indistinguishable from non-weapons' related contamination.

This facility is currently owned by Westinghouse/BNFL which is investigating conditions and options with respect to clean-up. Remediation is being conducted under Nuclear Regulatory Commission (NRC) oversight.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1970 - present

**FACILITY NAME:** University of California
Berkeley, California

**ALSO KNOWN AS:** California Resources and Development

**TIME PERIOD:** 1942 – 1949; Residual Radiation 1950-1980;
DOE 1981-1983 (remediation)

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*Gilman Hall, located on the University of California-Berkeley campus, was the site of nuclear research involving plutonium and uranium. These activities were conducted on behalf of the Manhattan Engineer District and the Atomic Energy Commission.*
*From December 1981 through February 1983, under agreement between DOE and the Univeristy, Lawrence Berkeley Laboratory personnel performed remedial action decontamination and shielding of the contaminated areas. Remedial action was certified complete in 1985.*

**DISCUSSION:**
No radiological survey data was available from the period ending MED/AEC activities in the 1940s however, the 1976 survey performed by Lawrence Livermore National Laboratories which identified low-level residual contamination and subsequently led to decontamination of the facility, indicates the potential for significant residual contamination post MED/AEC operations.

DOE completed the cleanup of all FUSRAP-related radioactive contamination in FY 1982. DOE-FUSRAP has no continuing presence at the site.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group. Pertinent documents included DOE documents related to the Conditional Certification of Gilman Hall, University of California, May 1985.

**EVALUATION FINDINGS**:
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1950 - 1980

**FACILITY NAME:** University of Denver Research Institute
Denver, Colorado

**TIME PERIOD:** 1963-1965

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*The University of Denver Research Institute is listed as a processor of radioactive materials for National Lead of Ohio (Fernald). It appears that the University of Denver handled test quantities of radioactive metal in February 1965.*

**DISCUSSION:**
From available documentation, the work conducted by the University of Denver was limited in scope and involved test quantities of radioactive material. The University was/is licensed, was aware of, and implemented, appropriate laboratory controls during the work which would limit the potential for residual contamination.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group. References: (1) DOE Memorandum J. Wagoner to Mayor E. Webb; Subject - Information related to the U. of Denver Research Institute; January 23, 1995, (2) DOE Memorandum E. DeLaney to R. Lynch with NLO Memo enclosure; Subject - Commercial Facilities Used By NLO in Support of Feed Materials Production Center Operations, July 28,1986

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** University of Florida
Gainesville, Florida

**ALSO KNOWN AS:** J. Hillis Miller Health Center
College of Medicine, Department of Radiology

**TIME PERIOD:** 1963-1969

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*Documents indicate that the University of Florida handled test quantities of radioactive material under a National Lead of Ohio (Fernald) sub-contract between 1963-1969. Upon completion of the project, the material was sent to the Savannah River Site.*
*The University also obtained licenses to handle radioactive material from the Nuclear Regulatory Commission. Work done under these NRC licenses was not related to nuclear weapons production and is not covered under EEOICPA.*

**DISCUSSION:**
Available documentation indicates that work conducted by the University of Florida was limited in scope and involved test quantities of radioactive material. The University of Florida was/is licensed, was aware of, and implemented, appropriate laboratory controls during the work which would limit the potential for residual contamination.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group.
Reference: DOE Letter; Fiore to Sjoblom; Subject: NRC Licensed Sites; June 20, 1990.
Attachment: Enclosure 1 - Formerly Utilized Sites Eliminated from FUSRAP; Circa 1990.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** University of Michigan
Ann Arbor, Michigan

**TIME PERIOD:** 1944

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*The University of Michigan developed radar fuses and conducted ordnance research to assist Los Alamos in atomic bomb research and production.*
*Records indicate that small quantities of uranium metal were handled at the University of Michigan under AEC contract. The contract expired April 10, 1944. It is unknown whether or not similar work was performed before or after this date.*

**DISCUSSION:**
The testing involved developing a coating mechanism to can uranium slugs to prevent them from corrosion. The University of Michigan subsequently was involved in the development of a non-destructive evaluation method to verify the integrity of the canning of the slugs.

All contract work was apparently terminated in April, 1944. It is apparent that only small quantities of material were used during these tests.

In 1987, the University of Michigan was removed from FUSRAP consideration under a general elimination recommendation.

There is little potential for significant facility contamination at the University of Michigan resulting from MED/AEC activities.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** University of Virginia
Charlottesville, Virginia

**TIME PERIOD:** 1942–1949; 1960s

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*The University of Virginia played an integral role in developing the process to use uranium in the development in nuclear weapons. The Naval Research Laboratory asked Dr. Jesse Beams, of UVA, about the possibility to using isotope separation by centrifuge for the enrichment process of uranium. He was able to successfully enrich uranium by the use of his high-speed centrifuge.*
*Later, the University of Virginia's Nuclear Reactor Facility, operated by the Department of Mechanical, Aerospace and Nuclear Engineering, housed the UVAR, a light-water-cooled and moderated research pool-type reactor which began operation in 1960 and ceased operations in 1998.*

**DISCUSSION:**
There were indications that work under AEC contract may not have ceased until 1985 when research into the centrifuge process was terminated by DOE.

Available documentation indicates that small quantities of uranium were enriched through development and testing of an operational centrifuge. The operation was reportedly shut down in June of 1985 and the uranium and equipment, including the centrifuge, were shipped to DOE Oak Ridge, Tennessee.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1970 – 1985

**FACILITY NAME:** Utica St. Warehouse
Buffalo, New York

**ALSO KNOWN AS:** Linde Air Products

**TIME PERIOD:** 1945

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*Residues from Linde Air operations were stored and rebarreled at this location.*

**DISCUSSION:**
As of 1945, as much as 355,000 pounds of residues were stored at the facility in steel and wooden barrels. There is no information regarding how long the material was in storage, but it is indicated that several of the drums required repackaging because of deterioration.

The material was apparently moved out of the warehouse in late 1945. The facility was subsequently demolished sometime prior to 1981 and replaced with a parking lot. Surveys by ORNL conducted in 1982 did not indicate any radioactivity above what would be considered background and the site was removed from FUSRAP determination.

There is no information concerning the radiological status of the facility after the material was moved in 1945.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Ventron Corporation
Beverly, Massachusetts

**ALSO KNOW AS:** Metal Hydrides Corp., Ventron Division
Morton Thiokol, Inc.

**TIME PERIOD:** 1942-1948;
Residual Radiation 1949-1995;
DOE 1986; 1996-1997 (remediation)

**FACILITY DESCRIPTION:**

**DOE ES&H Website:**

*From 1942 to 1948, Metal Hydrides Corp. was under contract to the Manhattan Engineer District and the Atomic Energy Commission to convert uranium oxide to uranium metal powder. This work, as well as later operations to recover uranium from scrap and turnings from a fuel fabrication plant at Hanford, was conducted at a foundry at the site. During this period, Metal Hydrides was the AEC's primary uranium scrap recovery contractor.*
*Cleanup activities at this location included the removal of an underground storage tank in 1986. Further remediation was performed between May 1996 and August 1997 by Bechtel National Inc. and a number of local subcontractors as part of the Formerly Utilized Site Remediation Action Program (FUSRAP).*
*The plant is currently owned by the Ventron Division of Morton International.*

**DISCUSSION:**

The Ventron Site consisted of several buildings that were once used to support AEC contracts. The buildings that were used as the foundry for scrap recovery operations were demolished shortly after the contract with AEC expired in 1948.

The site was surveyed as part of the FUSRAP process in 1982 and found to be significantly contaminated. Remedial cleanup was conducted in 1996-1998, and nearly 10,000 cubic yards of contaminated material were removed to a licensed facility. On August 8, 1997 DOE determined that the site was clean, and released it for unrestricted use.

It was clear from available documentation that the site was significantly radiologically-contaminated for the entire period in which weapons-related production occurred.

Documentation reviewed indicates that the potential for significant residual contamination existed outside of the period in which weapons-related production occurred, specifically between 1948 and 1986.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1949-1985; 1987-1995

**FACILITY NAME:** Virginia-Carolina Chemical Corp.
Nichols, Florida

**ALSO KNOWN AS:** Conser Department of Phillips Brothers Div.
Englehard Minerals and Chemical Corp.
Socony Mobile Oil Co.
Virginia-Carolina Chemical Corp.

**TIME PERIOD:** 1952-1957

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*The Virginia-Carolina Chemical Corp. produced uranium as a byproduct of the recovery of phosphate chemicals and fertilizers. The AEC contracted with the Virginia-Chemical Corp. for the recovery of the uranium, which was ultimately used in weapons production.*

**DISCUSSION:**
The Virginia-Carolina Chemical Corp. was under contract to produce 12 tons of $U_3O_8$ per year during the years 1952-1959. The facility that was used to extract the uranium was disassembled in 1960.

The plant underwent a complete shutdown and abandonment between the years 1969-1973, and as of 1979, was completely remodeled and modified from its original configuration.

Documentation reviewed indicates that there is potential for significant residual contamination outside of the period in which weapons-related production occurred. The facility used for these operations was removed in 1960, a subsequent survey in 1977 identified some residual soil contamination around the remaining pad which was removed and does not appear to be significant.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group including DOE - FUSRAP Ineligibility Report; Former Virginia-Carolina Chemical Company Nichols, Florida; March 8, 1984.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1958 - 1960

**FACILITY NAME:** Vitro Corp of America (New Jersey)
West Orange, New Jersey

**ALSO KNOWN AS:** Heavy Metals Co.
Vitro Chemical Co.

**TIME PERIOD:** 1951-early 1960s; Residual Radiation 1960s-1977

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*In December 1951, Vitro was asked to submit a proposal for research on thorium fluoride production, scrap recovery and waste recovery to involve 14 chemists and analysts. Though it is not certain whether this work was undertaken, by the late 1950s and early 1960s, Vitro conducted work under AEC contract converting low-enrichment uranium dioxide to uranium carbide spheres. The uranium dioxide was shipped from Rockwell International (then known as the Atomics International Division of North American Aviation, Inc.) to Vitro for conversion into uranium carbide and was then shipped back to Rockwell. Around 1958, Vitro also conducted work under contract to the AEC Oak Ridge Operations Office for the separation of fission products.*

**DISCUSSION:**
Available documentation indicates that scrap uranium recovery work was conducted and also indicates that production of $ThF_4$ from thorium nitrate work was being planned. There is an indication that Rockwell International received shipments of enriched uranium from Vitro (assumed to be New Jersey) as late as 1965. The processing facility used for these operations was demolished sometime prior to 1977 when radiological surveys were conducted identifying no radioactivity above what would be considered background. At the time of the survey the property was owned and occupied by the West Orange Tennis club. With the absence of any radiological survey data from the operational period or the facility after operations were completed, it is concluded that there is a reasonable potential that residual contamination existed at the facility up until the time the building was demolished.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group. Pertinent documentation included a DOE Report; FUSRAP Elimination Report for the former Vitro Laboratories Vitro Corporation; West Orange, New Jersey; September 30, 1985.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
early 1960s - 1977

**FACILITY NAME:** Vitro Corp. of America (Tennessee)
Chattanooga, Tennessee

**ALSO KNOWN AS:** Chattanooga Site owned by W.R.Grace
Vitro Chemical, a subsidiary of Vitro Corporation
Heavy Minerals Company.

**TIME PERIOD:** 1957- 1968

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*Records indicate that "Vitro Corporation" of Chattanooga, TN performed some beryllium work for Y-12 during the period 1959-1965. A 1962 document also mentions that the AEC met with members of the beryllium industry, including representatives from "Vitro Chemical" (no address), but does not mention whether any contracts were involved in these discussions. The original owner of this site was Heavy Metals Inc. and possessed an AEC license to process uranium and thorium products beginning as early as 1957. Documentation indicates that the company provided price quotes to the AEC for thorium products as early as 1954, but there is no indication that it received a contract for that work. Vitro Chemical of Chattanooga, TN, a subsidiary of Vitro Corporation, took over the site at the end of 1959 and was under contract to the AEC to produce thorium metal, thorium fluoride and thorium oxide. The current owner, W.R. Grace, purchased the site in 1965 and continued operations until 1983, but records do not reveal any weapons-based link after 1968. The State of Tennessee took over licensing of this site in 1968.*

**DISCUSSION:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which AWE related activities occurred which is indistinguishable from non-related contamination. There is no radiological data available from the time these activities ceased, and the facility has been under an AEC/NRC or State license since the early 1960s.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group. References: (1) Memorandum/Checklist; D. Mackenzie to the File; Subject: Elimination Recommendation of Vitro Chemical Co. from the FUSRAP Program; June 28, 1990, (2) DOE Letter; J. Wagoner to Mayor Roberts; Information on the Vitro Chemical Company site; January 13, 1995, (3) DOE Letter to Michael H. Mobley, Director of Tennessee Division of Radiological Health, from James Fiore acting Director for Division of Eastern Area Programs of the Office of Environmental Restoration, dated May 8 1991, concerning FUSRAP elimination of Vitro Chemical Site in Chattanooga.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1969 - present

**FACILITY NAME:** Vitro Manufacturing (Canonsburg)
Canonsburg, Pennsylvania

**ALSO KNOWN AS:** Vitro Rare Metals Company

**TIME PERIOD:** 1942-1957

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*Starting in 1948, Vitro was under contract to recover uranium from scrap. In the period from 1954-1956, Vitro had a contract to process production quantities of radioactive material (UF4) for National Lead of Ohio (Fernald). Vitro also received uranium scrap from the Tyson Valley Powder Farm sometime in 1949. After 1957 the site was used only for storage. Canonsburg was a major uranium milling facility and although the EEOICPA definition of an Atomic Weapons Employer excludes mining and milling, this site is covered because of its scrap processing activities performed under contract to the Atomic Energy Commission. A 1948 document indicates that General Electric shipped scrap containing beryllium to the Canonsburg site. The Canonsburg site is one of 24 former uranium mill sites designated for Department of Energy remediation by the Uranium Mill Tailings Radiation Control Act (UMTRA).*

**DISCUSSION:**
In 1976, an ERDA survey identified "excessive radium contamination" at the facility. The Canonsburg site was designated for DOE remediation by the Uranium Mill Tailings Radiation Control Act

Documentation reviewed indicates that there is significant residual contamination outside of the period in which AWE production occurred. Documentation from DOE UMTRA and NRC agencies indicates that surface contamination remediation was completed in 1996.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1958 -1996

**FACILITY NAME:** Vulcan Tool Co.
Dayton, Ohio

**TIME PERIOD:** 1959

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*At the request of National Lead Company of Ohio (Fernald), Vulcan Tool Company conducted experiments involving the cutting of normal uranium slugs and tubes on a Brehm cutter in October 1959.*

**DISCUSSION:**
There was a single test performed at the facility. The likelihood of significant contamination is remote at this facility.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** W.E. Pratt Manufacturing Co.
Joliet, Illinois

**ALSO KNOWN AS:** William E. Pratt Manufacturing Co.
Klassing Handbrake
Altrachem, Inc.

**TIME PERIOD:** 1943-1946

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*The W.E. Pratt Manufacturing Company performed metal fabrication tasks (machining and grinding) for the University of Chicago Metallurgical Laboratory beginning in the spring of 1943. The purpose of the machining done by Pratt was to speed up delivery of pieces for the experimental pile and to learn all that could be learned about handing uranium metal in turret lathes and automatic screw machines. In 1944, Pratt was subcontracted by the University of Chicago to finish "short metal rods" by centerless grinding. This work continued until June 30, 1946. The Manhattan Engineer District History indicates that DuPont placed an order with Pratt to turn and grind unbonded Hanford slugs.*

**DISCUSSION:**
The contract with the University of Chicago was terminated in 1946 when operations were consolidated at the Hanford site.

Documentation available for review does not provide enough information to definitively rule out residual contamination at the end of operations in 1946. Radiological survey data from 1989 confirms the radiological status of the facility as being below guideline values.

Based on the nature of the work and absence of radiological survey data until 1989, it is determined that there is a potential for significant residual contamination after the operational period.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group. Other sources of information included: 1) Survey Report, Radiological Survey at 18 Henderson Street, Joliet, Illinois, M.R. Landis, October 1989 IL.12-3; 2) DOE Report, FUSRAP Elimination Report For Former William Pratt Manufacturing Company, 18 Henderson Street, Joliet, Illinois, July 1990 IL.12-4.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1947 – 1989

**FACILITY NAME:** W.R. Grace (Tennessee)
Erwin, Tennessee

**ALSO KNOWN AS:** Nuclear Fuel Services
Davison Chemical

**TIME PERIOD:** 1958-1970

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*The Davison Chemical Division of W.R. Grace Co. (later Nuclear Fuel Services) processed unirradiated uranium scrap for the AEC, recovering enriched uranium from it for use in the nuclear weapons complex. Correspondence from 1963 also indicates that the company also worked with thorium.*

**DISCUSSION:**
The company received an AEC license to engage in the conversion of $UF_6$ to forms needed for the fabrication of fuel elements for research and development. It is unclear what the elements were used for, as they may have been part of fuel manufacture for the Department of the Navy.

While it is unclear whether weapons development work was concluded in 1969, there is a potential for significant residual contamination outside of the period in which weapons-related production occurred that is indistinguishable from non AEC/DOE activities. Documentation indicates this facility is still in the DOE determination phase with respect to FUSRAP eligibility.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1971 - present

**FACILITY NAME:** W.R. Grace and Company (Maryland)
Curtis Bay, Maryland

**ALSO KNOWN AS:** Davison Chemical Corp.
Agri-Chemicals Division

**TIME PERIOD:** 1955-1958; Residual Radiation 1959-1975

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*Processing of radioactive materials at W.R. Grace began in July 1955 when Rare Earths, Inc. (W.R. Grace's predecessor) entered into a contract with the Atomic Energy Commission to extract thorium and rare earths from naturally-occurring monazite sands. In 1956, the Atomic Energy Commission contract and Rare Earths' license to possess, transfer, and use radioactive thorium were transferred to W.R. Grace & Company. The facility where thorium processing took place (Building 23) operated until late spring of 1957, when W.R. Grace and the Atomic Energy Commission agreed to terminate the contract, effective January 31, 1958.*

**DISCUSSION:**
The wastes were buried in a landfill-type area covering about 4 acres. The site currently supports commercial activity. In 1978, the landfill area was fenced off, and patrolled by the facility security guards to preclude access. Also in 1978, a radiological survey was conducted indicating that the landfill area was contaminated at depths up to 15 feet. The building where processing took place (Building 23) was also identified as contaminated, indicating "excessive alpha contamination on all five floors" and "radiation levels as high as 3 mr/hr around the vats and hoppers."

Confirmation of residual contamination, 30 years after termination of AEC activities led to subsequent FUSRAP action authorization. This facility is currently undergoing FUSRAP activities.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group. Pertinent document; ORNL Report (ORNL/TM-10439); Results of the Indoor Radiological Survey at the W.R. Grace Co. Curtis Bay Site Baltimore Maryland; Issued – July 1989.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1959 - present

**FACILITY NAME:** W.R. Grace Co., Agricultural Chemical Div. (Florida)
Ridgewood, Florida

**TIME PERIOD:** 1954

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*For one month in 1954, W.R. Grace performed the pilot plant work on solvent extraction for Armour Fertilizer, which used the solvent process to extract uranium from phosphates.*

**DISCUSSION:**
Documentation available for review indicates that a short term (1 month) operational pilot plant was operated and the test facility was subsequently demolished. Based on this information and the results of radiological surveys performed for the DOE, it does not appear that significant AWE related residual contamination existed outside the listed period.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group including DOE Report (ORNL); Preliminary Survey of W.R. Grace Company, Ridgewood, Florida; March 1980.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Wah Chang
Albany, Oregon

**ALSO KNOWN AS:** Teledyne Wah Chang

**TIME PERIOD:** 1956-1959; 1971-1972

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*Wah Chang operations began in 1956 when, under contract with the U.S. Atomic Energy Commission, Wah Chang Corporation reopened the U.S. Bureau of Mines Zirconium Metal Sponge Plant. Construction of new facilities, at the location of the existing plant, began in 1957. These facilities were established primarily for the production of zirconium and hafnium sponge; however, tantalum and niobium pilot facilities were also included. Melting and fabrication operations were added in 1959. Wah Chang may also have been involved in thorium work. In 1971-1972 a subcontract existed with Union Carbide Corporation (Y-12 plant) for melting uranium-bearing material.*

**DISCUSSION:**
Available documentation indicates that process wastes, including naturally occurring radioactive isotopes, generated during AWE related activities still exist at this facility, and are indistinguishable from non-AWE related wastes. This facility is currently undergoing cleanup action through the USEPA Superfund project.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group.
Reference: USEPA CERCLIS ID File ORD050955848

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1960-1970, 1973 - present

**FACILITY NAME:** West Valley Demonstration Project
West Valley, New York

**ALSO KNOWN AS:** Nuclear Fuel Services, West Valley
Western New York Fuel Services Center

**TIME PERIOD:** 1966-1973
Residual Radiation 1974-1979
DOE 1980-present

**FACILITY DESCRIPTION:**

**DOE ES&H Website:**

*From 1966 to 1972, Nuclear Fuel Services, Inc., under contract to the State of New York, operated a commercial nuclear fuel reprocessing plant at the Western New York Nuclear Services Center. The plant reprocessed uranium and plutonium from spent nuclear fuel; sixty percent of this fuel was generated at defense facilities. Spent nuclear fuel reprocessing generated approximately 600,000 gallons of liquid high-level radioactive waste; this waste was stored onsite in underground tanks.*

*In 1980, the United States Congress passed the West Valley Demonstration Project Act (Public Law 96-368), which authorized the Department of Energy (DOE) to conduct a technology demonstration project to solidify the liquid high-level waste at the Western New York Nuclear Services Center. Under this act, DOE is also responsible for developing containers suitable for the permanent disposal of the solidified high-level waste at an appropriate Federal repository; transporting the containers to this repository; disposing of low level waste and transuranic waste generated by high level waste solidification; and decontaminating and decommissioning facilities used for the solidification. DOE is also responsible for dispositioning the spent nuclear fuel stored at the site.*

*In 1982, DOE selected vitrification as the treatment process for high level waste. This process solidifies and stabilizes nuclear waste by mixing it with molten glass. Pretreatment of the high-level waste began in 1988 and was successfully completed in 1995. DOE expects to complete the West Valley Demonstration Project by 2005.*

**DISCUSSION:**

Documentation supports the presence of significant residual contamination outside of the period in which weapons-related production occurred. This facility is presently undergoing remedial action under the DOE.

**INFORMATIONAL SOURCES:**

The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group.

**EVALUATION FINDINGS:**

Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1974 - 1979

**FACILITY NAME:** Westinghouse Nuclear Fuels Division
Plutonium Fuel Laboratories and the Advanced Fuel Lab
Cheswick, Pennsylvania

**ALSO KNOWN AS:** Westinghouse Commercial Manufacturing

**TIME PERIOD:** 1971 - 1972

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*The Westinghouse Nuclear Fuels Division received shipments of nuclear materials from the AEC nuclear weapons complex in 1971 and 1972. The Cheswick site received a shipment of enriched uranium from the AEC's Fernald plant in 1971. It also received a shipment of plutonium in 1972 from the West Valley facility. This plutonium originated out of Hanford. Because this material came from the nuclear weapons complex, the site qualifies as an Atomic Weapons Employer for these years.*
*Although the Westinghouse facility in Cheswick, PA, conducted substantial work with radioactive materials in other years, this work is not covered under EEOICPA because it was not related to nuclear weapons production. This includes the fabrication of nuclear fuels and reactor subsystems for naval, space, and civilian applications. Among the projects to which the Cheswick facility contributed were the Naval Nuclear Propulsion Program, the Nuclear Engine for Rocket Vehicle Application (NERVA) program, and the Liquid Metal Fast Breeder Reactor (LMFBR) program.*

**DISCUSSION:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred that could not be differentiated from contamination originating from non-weapons related work.

Buildings 7 and 8, which were associated with these operations, were decontaminated and decommissioned in 1979, under NRC.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1973 - 1979

**FACILITY NAME:** Westinghouse Atomic Power Development Plant
East Pittsburgh, Pennsylvania

**ALSO KNOWN AS:** East Pittsburgh Plant

**TIME PERIOD:** 1942-1944

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*Westinghouse prepared uranium metal for Enrico Fermi's Stagg Field experiment and conducted development and pilot-scale production of uranium oxide fuel elements.*

**DISCUSSION:**
Records indicate that at the conclusion of MED activities, all equipment and all of the facilities were decontaminated or shipped to other sites.

A 1976 survey by ORNL did not identify any radioactive contamination above which could normally be considered background at the East Pittsburgh facility. The site was eliminated from FUSRAP consideration in 1985.

Documentation reviewed indicates that this facility was decontaminated at the end of AWE contracted work and that all contamination and/or contaminated items were removed.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group including DOE Report; Certification Docket: Westinghouse Atomic Power Development Plant, East Pittsburgh Plant, Forest Hills Pittsburgh, Pennsylvania; Circa 1985.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Westinghouse Electric Corp. (New Jersey)
Bloomfield, New Jersey

**ALSO KNOWN AS:** North American Phillips Lighting

**TIME PERIOD:** 1942-1943; Residual Radiation 1944-1993

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*Westinghouse Electric Corp., located in Bloomfield, NJ, was one of the large commercial contributors to Manhattan Project research with specific tasks related to uranium metal production and enrichment. Because developing the technology to produce pure uranium metal became a priority for the Manhattan Project, universities and private companies with experience in related chemical processes participated in the task. From 1942-1943, Westinghouse used a photochemical process for metallic uranium and supplied metallic uranium for the first self-sustaining chain reaction in Chicago. In addition to contributing to uranium metal production, Westinghouse Electric participated in activities related to uranium enrichment.*
*Westinghouse also worked with thorium, but it is unclear if that work took place in Bloomfield, or at another Westinghouse location.*

**DISCUSSION:**
Records indicate thorium work may have occurred as late as 1949 at a Westinghouse facility. Three MED contracts were identified covering the dates August 1942-August 1944. There were two additional MED contracts that were issued in which the dates could not be verified.

A confirmatory survey was requested and performed by ORISE, of Building 7 in 1993 which identified areas of localized residual uranium surface contamination throughout several elevations of the facility, and widespread distribution of residual uranium surface contamination within the basement elevation. These survey results confirm that in 1993, the removable contamination levels were below the regulatory criteria and two areas exhibited direct radiation levels in excess of the regulatory criteria for unrestricted use. There was no documentation available confirming the radiological status of this facility after 1993.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group.
Pertinent document: ORISE 93/H-110 Confirmatory Survey of Buildings 7,8,9, and 10A Bloomfield Lamp Plant Westinghouse Electric Corporation Bloomfield, New Jersey dated August 1993.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1944 – present

**FACILITY NAME:** Woburn Landfill
Woburn, Massachusetts

**ALSO KNOWN AS:** Winchester Engineering Vicinity Property

**TIME PERIOD:** 1955-1960

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*Fifty 55-gallon drums of low grade uranium ore were buried at the Woburn site. The material came from the AEC Raw Materials Development Laboratory (see the Winchester Engineering and Analytical Center) operated by the National Lead Company under contract from 1955-1960.*

**DISCUSSION:**
Documentation indicates that the material in question had an activity level similar to granite, and was dumped from the drums into a truck for disposition, and subsequently co-mingled with other refuse and waste. The original landfill was excavated in 1974 and was replaced with clean backfill to support construction of a light industrial complex.

Radiological surveys of the old landfill site and the new landfill (where the excavated material was taken to) do not indicate radioactivity greater than expected background levels at either facility.

It appears that the dumping of the contents from fifty drums occurred in 1960, whereupon the drums were reused. Based on the described low-level radiological characteristics of the material and subsequent radiological surveys from the affected areas there is no indication or reason to suspect residual contamination of any consequence existed beyond the date of 1960.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Wolff-Alport Chemical Corp.
Brooklyn, New York

**TIME PERIOD:** 1949-1950

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*Wolff-Alport Chemical Corp. was under contract with the AEC (#AT-30-1-Gen-287) for the procurement of thorium containing sludge for stockpiling by the AEC. A March, 1949 document mentions the "current contract expires June 30, 1949 and will probably be extended for another year. Cost is approximately $50,000 annually." This same document shows that almost 30,000 pounds of thorium oxalate sludge was provided to the AEC that year.*

**DISCUSSION:**
Records further indicate that activities were conducted as early as 1948 and continued on through 1954 when 238 drums of thorium oxalate sludge were sold to the AEC.

Inventory records indicate that each year from 1948 to 1951 a minimum of 3,400 kilograms of thorium oxalate sludge were transferred to AEC.

Documentation reviewed indicates that residual contamination at this facility, if it exists, is not attributable to AWE related work, rather it was a result of commercial operations. Records do however indicate that purchase of sludges began in 1948 and continued through 1954, whereupon the material handling was AWE related.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group. Pertinent documentation included DOE Letter; Fiore to Solon; Subject; Notification of no DOE authority for Remedial Action at Wolff-Alport Chemical Corp.; 9/29/87. Attachment: FUSRAP Summary Report and Designation/Elimination Analysis for Wolff-Alport Chemical Corp. Brooklyn, N.Y. 1987.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1951-present

**FACILITY NAME:** Wolverine Tube Division
Detroit, Michigan

**ALSO KNOWN AS:** Hermes Automotive
Mamif Corporation
Division of Calumet Consolidated Copper Company

**TIME PERIOD:** 1943-1946

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*In 1943, the University of Chicago subcontracted to Wolverine Tube of Detroit, Michigan, for help in extrusion of metals that were needed as part of the Manhattan Project. Wolverine Tube performed research on the fabrication of aluminum slugs and the process of aluminum canning and also experimented with thorium and beryllium. This contract ended in 1946. Wolverine Tube received other AEC contracts because of its extrusion expertise.*

**DISCUSSION:**
Available documentation does not include information on specific quantities of radioactive materials handled or radiological surveys from the time of, or immediately after, AWE related activities. There are indications that AWE related work may have been performed outside the listed period. Documentation states that "Work probably continued through 1955 under sub-contract with Dupont (Savannah River Operations)."

ORAU performed a radiological survey in October of 1989, verifying the absence of significant residual contamination.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group. Reference: (1) DOE Report; FUSRAP Elimination Report for Former Wolverine Tube Division 1411 Central Avenue, Detroit, Michigan; June,1990, (2) DOE (ORAU 90/A-16) Report; Radiological Survey at 1411 Central Avenue, Detroit, Michigan; February 1990

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is a potential for significant residual contamination outside of the period in which weapons-related production occurred.

**PERIOD OF POTENTIAL RESIDUAL CONTAMINATION**
1947 - 1989

**FACILITY NAME:** Wyckoff Drawn Steel Co.
Chicago, Illinois

**ALSO KNOWN AS:** Wyckoff Steel Co.
Ferranti Steel and Aluminum Company

**TIME PERIOD:** 1943

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*In 1943, the Metallurgical Laboratory conducted experiments of center-less grinding equipment on uranium. Wyckoff Drawn Steel Co. surfaced two tubes and one rod; however, its process was deemed to be too expensive and too slow to be used in production.*

**DISCUSSION:**
Given that only one test was conducted using a limited amount of material, the facility is not likely to be contaminated beyond the date indicated on the DOE website.

In 1987, DOE FUSRAP completed an elimination report, removing this facility from FUSRAP activities.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.

**FACILITY NAME:** Wykoff Steel Co.
Newark, New Jersey

**TIME PERIOD:** 1950

**FACILITY DESCRIPTION:**
**DOE ES&H Website:**
*Wykoff Steel conducted tests of methods to straighten and finish uranium rods on September 6, 1950.*

**DISCUSSION:**
There were no radiological surveys performed during or after the test that were available in the available documentation. However, given this was a one-time test, the likelihood of significant facility contamination is remote.

**INFORMATIONAL SOURCES:**
The sources of information used in this evaluation include information on the DOE ES&H Website and internal AEC/DOE correspondence provided by the DOE ES&H Group.

**EVALUATION FINDINGS:**
Documentation reviewed indicates that there is little potential for significant residual contamination outside of the period in which weapons-related production occurred.