PRELIMINARY ASSESSMENT/SITE INSPECTION REPORT
AND SWMU ASSESSMENT REPORT

UNIT NUMBER: 494

UNIT NAME: C-410 Ash Removal Systems

DATE: 12/10/01

REGULATORY STATUS: Solid Waste Management Unit (SWMU)

LOCATION: C-410 Complex

APPROXIMATE DIMENSION: Primary ash receivers including housings – 6 ft x 4 ft x 4.5 ft; secondary and filter receivers including housings – 3 ft dia x 3 ft tall; ash drum evacuation booth – 6 ft x 4 ft x 4.5 ft

FUNCTION: Ash receivers were a component of the uranium hexafluoride (UF_6) production process, located in the northwest portion of the C-410 complex. A series of three receivers (primary, secondary, and filter), along with associated cyclones, piping, and filters, comprised the ash removal system. Situated at the bottom of the eight fluorination towers, these systems captured unreacted powders for subsequent processing and reuse.

The primary ash receivers captured the majority of the powders, particularly the more volatile particles. As such, the primary ash receivers "smoked" when initially removed from the towers. The primary ash receiver housings were equipped with evacuation systems, which pulled on the housings to capture the particulate matter being generated. An ash receiver evacuation housing was also available on the west wall of the northeast corner of the west expansion, where ash receivers could be placed to allow the "smoke" to be captured and removed while a new receiver was positioned on the tower. The housings and evacuation booth discharged through a paper filter bank located near the northwest corner of the original tower area.

After a lid was clamped into place, the ash receiver was rolled over to the jib crane in the northwest corner of the west expansion and raised to the upper platform where it was weighed. It was then placed outside in the ash receiver shed (SWMU 495). Once a sufficient number of receivers were available for transport, they were taken to a warehouse area in the northeast portion of the plant site to allow radiation levels to decrease. Ultimately the receivers were taken to C-400 for processing.

BRIEF HISTORY: The C-410 complex was constructed to produce UF_6 from uranium trioxide by a series of reduction, hydrofluorination, and fluorination reactions. The complex began operation in 1953 and, with the exception of a four-year shutdown from 1964 to 1968, operated continuously until 1977. The ash removal systems were part of the fluorination process and involved both normal assay material as well as

reactor tails material. Uranium in the collected ash subsequently was recovered at C-400 for refeeding at C-410. While all housings are in place (8 primary, 16 clamshell), it is believed that most of the ash receivers have been removed from the facility in the past. Due to the position/orientation of the housings, it was not possible at the time of the facility inventory to determine the presence/absence of ash receivers. The facility is intact but there are some problems with the roof leaking as seen in the attached picture.

OPERATIONAL STATUS: Inactive

DATES OPERATED: July 1953 to July 1964 and July 1968 to May 1977

SITE/PROCESS DESCRIPTION: Ash (primarily unreacted uranium tetrafluoride solids) was produced during the fluorination process carried out in the northwest portion of the C-410 complex. Most of this material was separated from the UF_6 gas by diversion of the gas stream through a cyclone. The majority of the ash fell into the primary ash receiver at the bottom of the tower. The gas stream (containing smaller quantities of ash) continued to the primary cyclone where additional (finer) particulate material dropped out into the secondary ash receiver. The carrier gas (containing the product) then went to the secondary cyclone where the last remaining fine particulate dropped out into a third ash receiver (sometimes referred to as the filter ash receiver). Each tower, therefore, had three ash receivers operating in series.

Although the uranium feed materials were exceptionally pure, metallic impurities (natural decay products or fission products) that were present in the feed material were concentrated in the receiver ash. These metallic impurities were less dense that uranium and, as a result, tended to concentrate more in the secondary ash receivers than in the primary units. As they were removed from service, the ash receivers were weighed and staged in the ash receiver shed (SWMU 495). They were subsequently transported to a warehouse area for temporary staging to allow radiation levels to decrease, after which they were taken to C-400 for processing.

WASTE DESCRIPTION: Most of the ash receivers have been removed from the complex and disposed of offsite. Although some dismantlement has occurred, most of the associated ash removal equipment remains in the complex. There are a few ash receivers (number undetermined at this time) in the facility; however, most receivers were removed from the facility in the past. Radiological contamination is anticipated, particularly with respect to uranium compounds, with the potential for trace levels of transuranics, as well, due to the processing of reactor tails material. Some asbestos wastes may be present as well. Ash, if present, in the remaining receivers, statistically has failed the TCLP test for metals.

WASTE QUANTITY: Unknown

SUMMARY OF ENVIRONMENTAL SAMPLING DATA: Several radiological surveys have been completed since shutdown of the complex; the most recent occurred in May 2000. Data indicate that radiological contamination (primarily uranium) is prevalent throughout the complex. Detectable transuranic contamination is present in some locations as well. In addition, asbestos contamination is prevalent throughout the building, including the zones housing the ash removal systems.

DESCRIPTION OF RELEASE AND MEDIA AFFECTED: No releases from this SWMU have been documented.

GROUNDWATER: This SWMU is located within the confines of the C-410 Building. There are no known groundwater impacts from this SWMU.

SURFACE WATER: This SWMU is located within the confines of the C-410 Building. There are no known surface water impacts from this SWMU.

SOIL: This SWMU is located within the confines of the C-410 Building. There is no known impact on surface soils from this SWMU.

ECOLOGY AFFECTED (i.e., threatened/endangered species): No known impacts. No federal or state listed T&E plant or animal species have been identified. The federally endangered Indiana bat (*Myotis sodalis*) potentially occurs in the vicinity, but the C-410 complex does not provide a suitable habitat.

DOCUMENTATION OF NO RELEASE: There is no documentation.

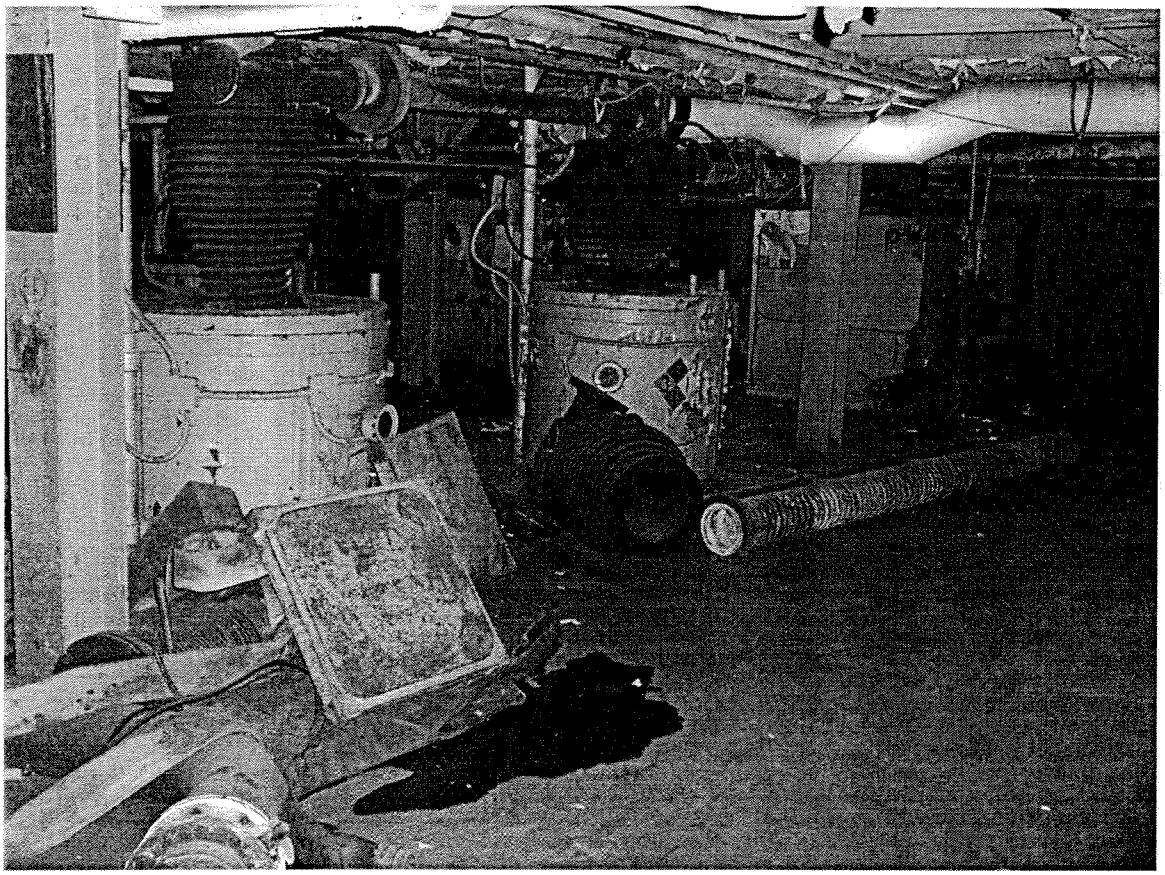
IMPACT ON OR BY OTHER SWMU/AOC: The following SWMUs are in the vicinity of the C-410/420 complex:

SWMU 11	SWMU 19	SWMU 20	SWMU 26
SWMU 40	SWMU 41	SWMU 47	SWMU 78
SWMU 169	SWMU 198	SWMU 203	

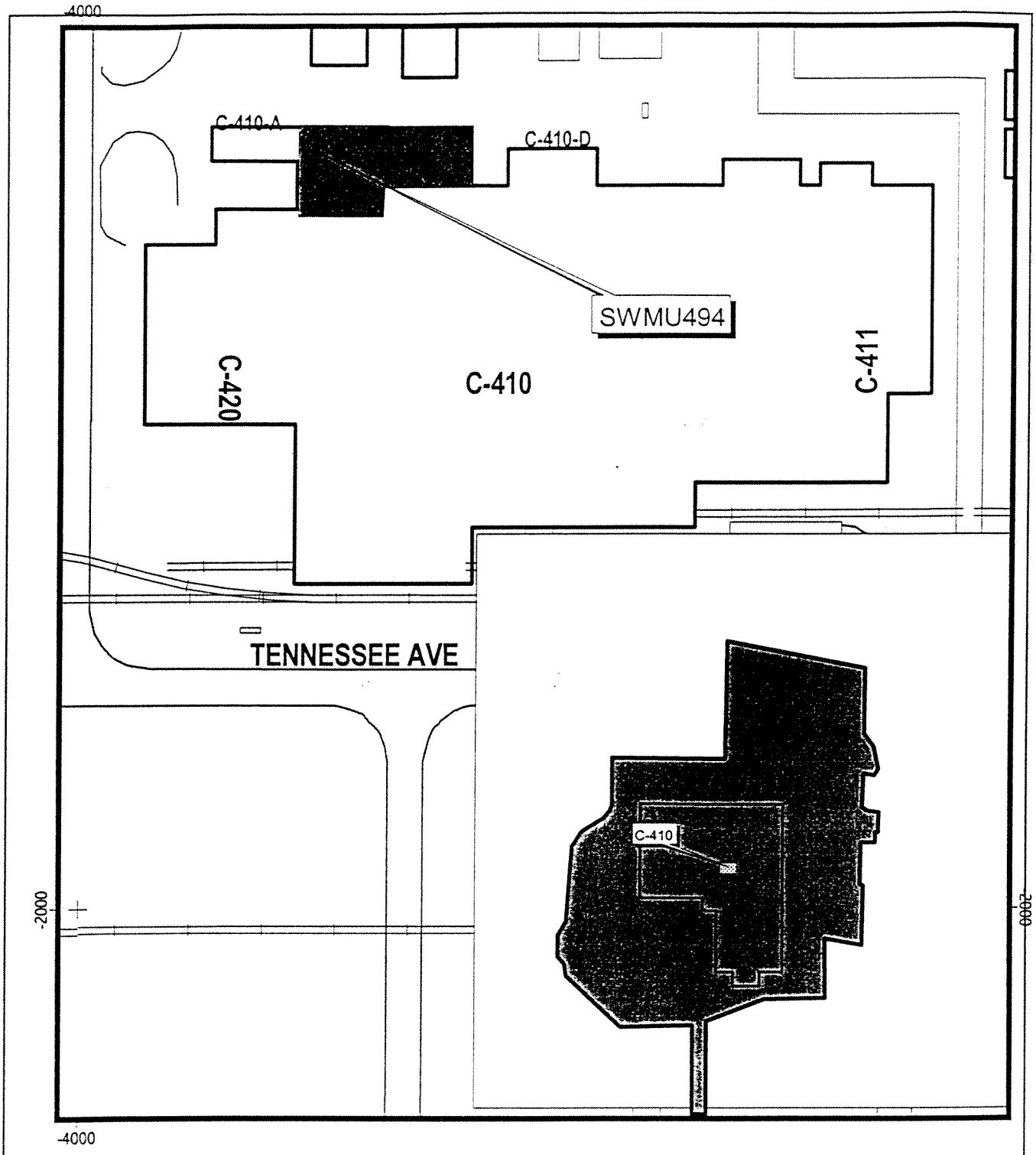
PRG COMPARISON: NA

RFI NECESSARY: This area is associated with an inactive facility that is included in the decontamination and decommissioning (D&D) program. Site evaluation work is underway at this time, along with planning associated with the infrastructure D&D phase. The need for a Remedial Investigation/Feasibility Study will be evaluated as part of the facility structure D&D phase.

NOTE: Elements included in this outline shall be considered and incorporated, as appropriate, when developing the above referenced document.



SWMU 494



90 0 90 180 Feet

TRUE NORTH 20° PLANT NORTH

U.S. DEPARTMENT OF ENERGY
DOE OAK RIDGE OPERATIONS
PADUCAH GASEOUS DIFFUSION PLANT

BECHTEL JACOBS COMPANY LLC
MANAGED FOR THE US DEPARTMENT OF ENERGY UNDER US GOVERNMENT CONTRACT DE-AC-05-98OR22700
Oak Ridge, Tennessee • Paducah, Kentucky • Portsmouth, Ohio

SWMU 494 at C410.

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FIGURE No. c5ac90001sk244.apr
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