

**PRELIMINARY ASSESSMENT/SITE INSPECTION REPORT
AND SWMU ASSESSMENT REPORT**

UNIT NUMBER: 496

UNIT NAME: C-410 Fluorine/Hydrogen Filters

DATE: 12/11/01

REGULATORY STATUS: Solid Waste Management Unit (SWMU)

LOCATION: C-410 Complex

APPROXIMATE DIMENSION: 1.5 ft dia x 8 ft tall (hydrogen), 3 ft dia x 8 ft tall (fluorine)

FUNCTION: Filters were employed to remove entrained electrolyte from the fluorine and hydrogen gas streams generated in the cell rooms, prior to their respective surge tanks and ultimate venting (hydrogen) or use in the fluorination towers (fluorine).

BRIEF HISTORY: The C-410 complex was constructed to produce uranium hexafluoride (UF₆) 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 fluorine filters were a component of the fluorine plant, trapping any carryover electrolyte from the fluorine cells and removing it from the gas stream. Similarly, the hydrogen filters removed electrolyte carryover from this stream.

OPERATIONAL STATUS: Inactive

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

SITE/PROCESS DESCRIPTION: When the C-410 complex was operational, a very large fluorine plant was an integral part of the overall UF₆ production process. Over 100 electrolytic fluorine cells were maintained to produce the fluorine needed for uranium tetrafluoride to UF₆ conversion.

The electrolyte was formulated from potassium bifluoride, lithium fluoride, and hydrofluoric acid (HF). Anhydrous HF was fed to the cells via ½" piping, producing separate fluorine and hydrogen gas streams. The gas streams were routed to surge tanks, with the fluorine subsequently fed to the fluorination towers to produce UF₆ and the hydrogen vented through a flare system. To remove trace electrolyte powder from these gases, they were passed through a bank of sintered metal filters prior to their respective surge tanks.

The surge tanks and hydrogen filters were located on the C-410 mezzanine; the fluorine filters were located on the first floor, north blower rooms. When the pressure drop across a given filter increased to a trigger level, the filter was removed from service and transported to C-400 for cleaning. Occasionally the filters were temporarily staged at the Ash Receiver Shed (SWMU 495) prior to being taken to C-400. The headers were vacuumed of powders at that time as well, as powder (particularly lithium fluoride) tended to drop out of the flow stream at lower velocity areas, such as near the filters themselves and at elbows. With the filters removed, it was an opportune time to clean out the accessible portions of the incoming piping, minimizing the quantity of materials that could accumulate.

WASTE DESCRIPTION: Filters and residual electrolyte powders.

WASTE QUANTITY: It is believed that the filters were cleaned following shutdown; however, no documentation has been found to provide verification. While the waste quantity is unknown, the quantity of any residual material is believed to be small due to the nature of operations. Both the fluorine and hydrogen filter banks were comprised of six filters each. Three were operated on stream, with the other three serving as a back-up bank. In addition, two spare hydrogen filters are listed in the facility inventory.

SUMMARY OF ENVIRONMENTAL SAMPLING DATA: Due to the nature of the process, internal radiological contamination is not anticipated. The potential for external contamination exists. No analytical data pertaining to the fluorine filters are available.

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 is no data pertaining to groundwater contamination from this SWMU.

SURFACE WATER: This SWMU is located within the confines of the C-410 Building. There is no data pertaining to surface water contamination from this SWMU.

SOIL: This SWMU is located within the confines of the C-410 Building. There is no data pertaining to soil contamination from this SWMU.

ECOLOGY AFFECTED [i.e., threatened/endangered (T&E) 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	

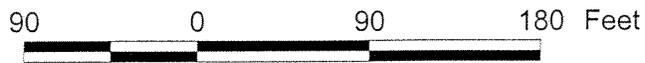
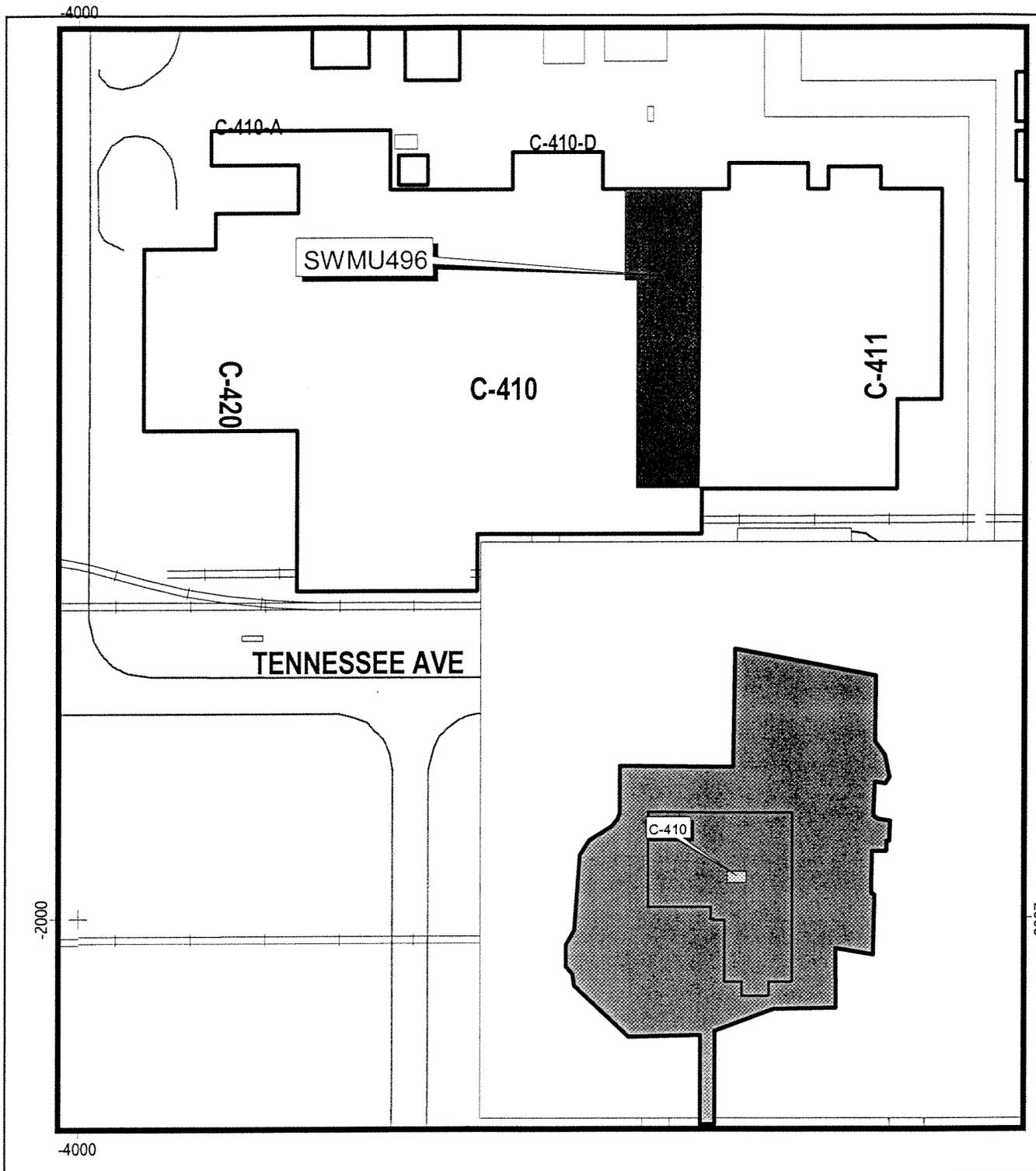
PRG COMPARISON: NA

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 496



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



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



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SWMU 496 at C410.