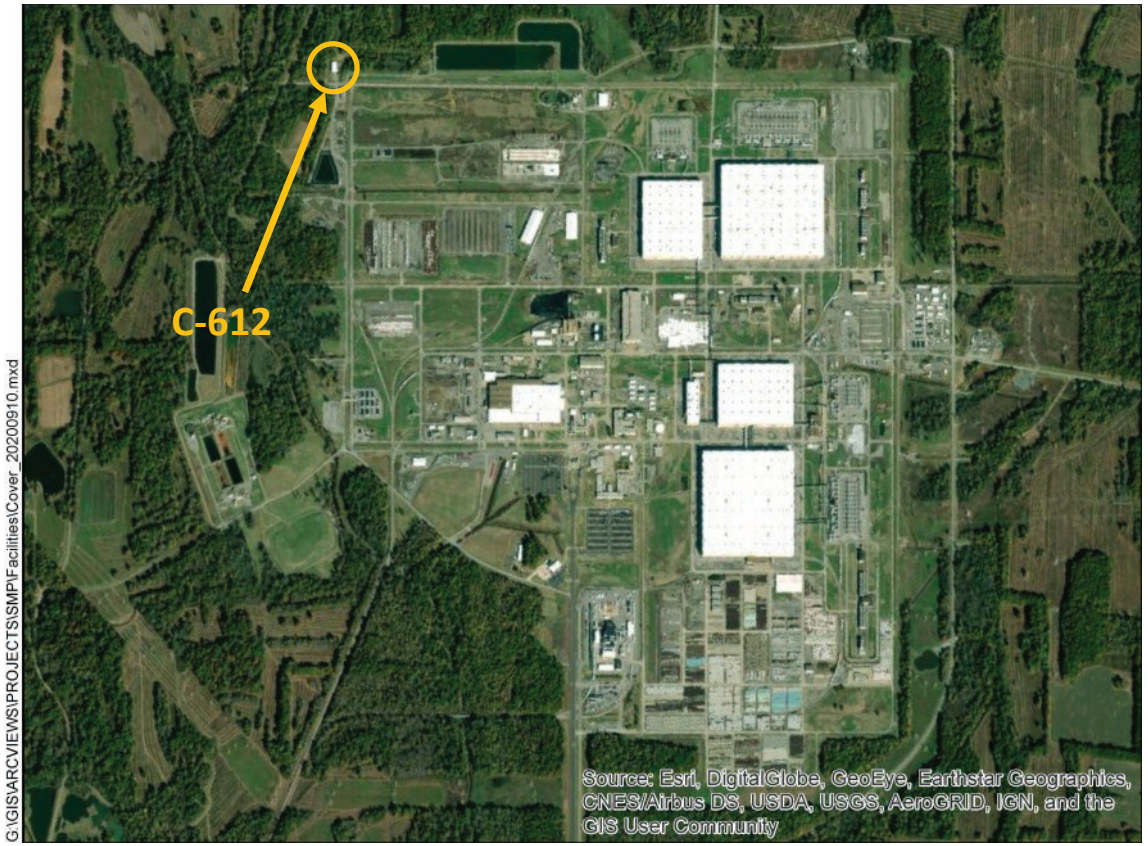
C-612 Northwest Plume Groundwater Treatment Facility



Facility Overview Briefing

November 9, 2021

Reflects consultation with EPA and Kentucky in accordance with the Site Management Plan that occurred on October 25, 2021.

Purpose

- The C-612 Northwest Plume Groundwater Treatment Facility is a candidate for future demolition and disposal, contingent upon funding priorities, once it has been determined through the CERCLA five-year review process and the FFA parties have reached agreement that the facility is no longer required to treat contaminated groundwater.

- Listed in Appendix 6 of the Site Management Plan (SMP); requires consultation with EPA and Kentucky for CERCLA screening prior to demolition.

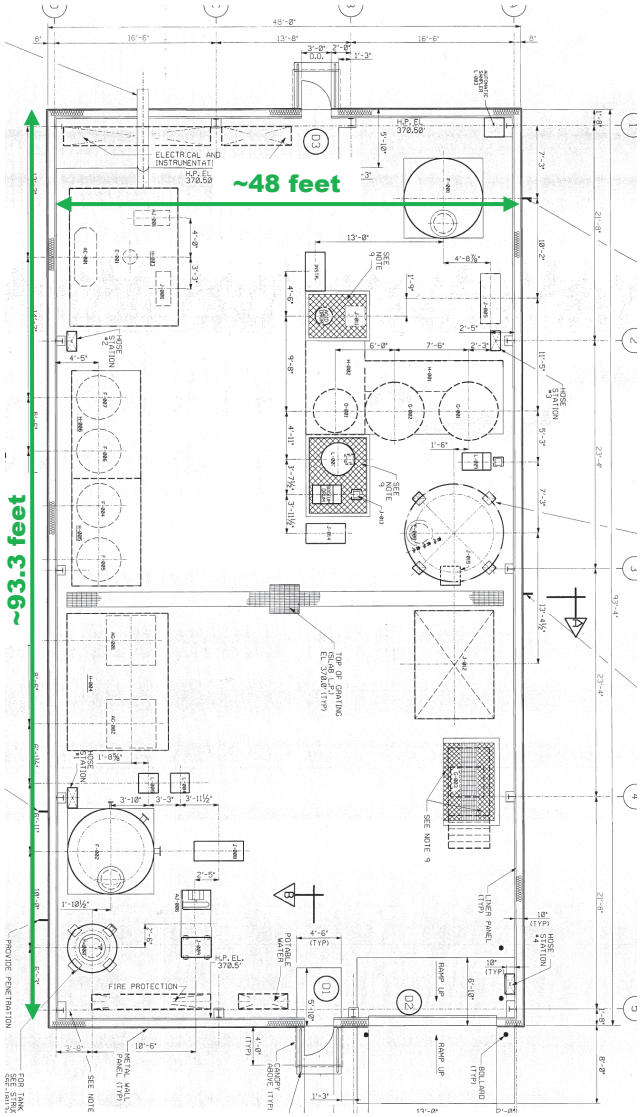
- This presentation is intended to serve as consultation, providing the basis for demolition and disposal of the aboveground structure in accordance with the existing CERCLA Record of Decision (ROD) and is contingent upon the FFA parties reaching agreement that the facility is no longer required to treat contaminated groundwater.

- The remaining slab/soils will be subject to future CERCLA evaluation under Geographical Area (GA) 1.

C-612 Northwest Plume Groundwater Treatment Facility Photo: 5/2021

Construction History

- C-612 is located outside the Paducah Site security fence, northwest of the industrialized area of the Paducah Site.
- Construction was completed in 1995 in accordance with CERCLA documents (e.g., ROD, Remedial Design) approved by EPA and Kentucky.
- Construction consists of a prefabricated metal building on a poured-concrete slab with footers.
- The facility is approximately 4,478 ft^2.
  - Measuring ~ 48 ft x ~ 93.3 ft.



Floor Plan View: Excerpt from Engineering Drawing A5E-18113-A00, Rev. 1

Operational History

- In 1993, a CERCLA ROD was signed for an interim remedial action to mitigate the spread of high concentrations of off-site trichloroethene (TCE) and technetium-99 contamination associated with the Northwest Plume, resulting in the construction of the C-612 Northwest Plume Groundwater Treatment Facility.
- C-612 has operated as a groundwater treatment facility in accordance with the CERCLA Operations and Maintenance Plan approved by EPA and Kentucky from construction in 1995 to present.
- C-612 treats contaminated groundwater and other related wastewater (e.g., decontamination water) with air stripping, carbon treatment, and ion exchange for the removal of TCE, a common degreaser, and technetium-99, a radionuclide.

North Side of Building

East and North Side of Building (Ion Exchange trailer on east side of C-612)

C-612 Northwest Plume Groundwater Treatment Facility Photos: 5/2021

Operational History

- An Explanation of Significant Differences (ESD) was signed in 2010 to install new extraction wells as part of an optimization project to increase the capture of high concentrations of TCE within the Northwest Plume.
- The treatment system was down from mid-November 2015 through mid-February 2016 to allow for reconfiguration of the ion exchange system. The function of the ion exchange system was transferred to a treatment trailer located adjacent to the C-612 building.
- Some chemicals, related to groundwater treatment and testing (e.g., vials of TCE standards), are stored in the C-612 facility.

Air Stripper and Controls

Formerly used Ion Exchange Tanks/Columns (Posted as a Radioactive Material Area)

C-612 Northwest Plume Groundwater Treatment Facility Photos: 5/2021

Current Status

- C-612 is currently being used as a groundwater treatment facility related to a CERCLA interim remedial action.

- Walkdown inspection conducted in May 2021 and employee interviews confirmed no unusual conditions.
  - ❑ A floor trench with a sump pump is present.
    - Water collected in the sump is pumped into a settling tank prior to going to the Equalization Tank.
  - ❑ A Generator Staging Area (GSA) is present.
  - ❑ No known chemical spills.
  - ❑ Filter press, ion-exchange columns/tanks, spent resin, and HEPA vacuums are posted as Radioactive Material Areas (RMAs).
  - ❑ No visible evidence of environmental issues (e.g., no visible floor staining inside or immediately surrounding the facility outside with exception of staining related to condensation on/around treatment equipment).

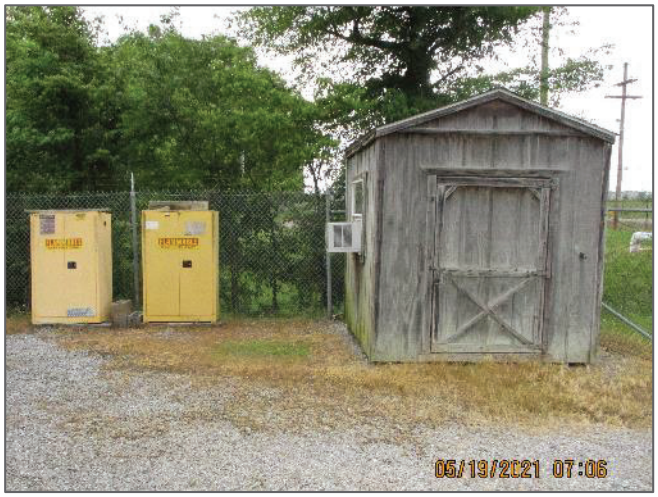
Generator Staging Area

Filter Press (Posted as RMA)

Current Status (cont.)

Floor Drain with Sump

Equalization Tank

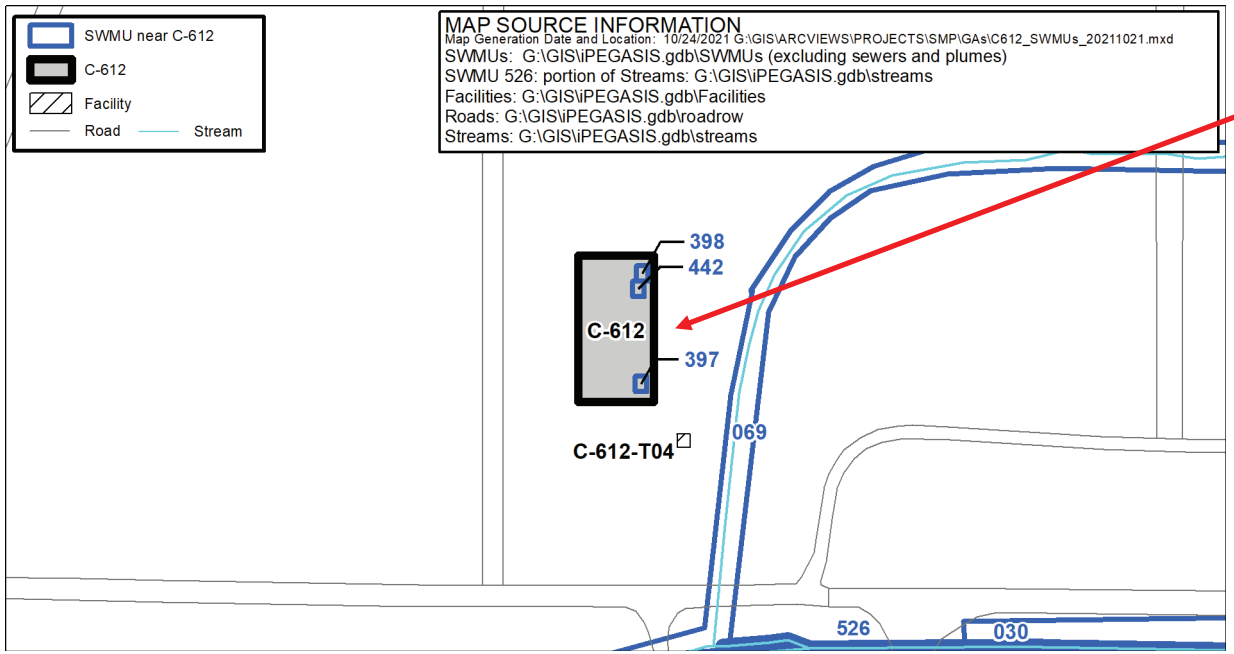


Storage Shed and Flammable Materials Storage

View Along West Wall (Spent Resin in RMA)

C-612 Northwest Plume Groundwater Treatment Facility Photos: 5/2021 and 9/2021

Environmental Impacts
(Solid Waste Management Units)



- The C-612 Northwest Plume Groundwater Treatment Facility is not designated as a SWMU/AOC.

SWMU No.	Facility Name	Current Status	NFA Approval By
30	C-747-A Burn Area	Burial Grounds OU	
69	C-375-W9 Effluent Ditch (KPDES 001)	SWOU	
397	G-612-01	NFA	KDWM 3/8/2007
398	G-612-02	NFA	KDWM 3/8/2007
442	S-612-01	NFA	KDWM 2/14/2006
526*	Internal Plant Drainage Ditches (includes KPDES 016)	SWOU	

* Location is approximate.

Environmental Impacts

- No information to indicate a release or threatened release of a hazardous substance that would require an evaluation for a potential response action to protect future public health or welfare or the environment.

  - C-612 has operated as a groundwater treatment facility related to a CERCLA interim remedial action from 1995 to present.

  - Constructed in 1995, building materials used for construction are not expected to contain lead-based paints and asbestos-containing materials, both of which can be effectively verified during a predemolition inspection and properly managed using standard demolition and waste management practices.

  - No history or records of chemical use or spills that would pose an environmental release threat.

  - C-612 has operated in accordance with approved CERCLA documents and the CERCLA five-year review process has not documented any environmental impacts and states that the treatment system is functioning as designed.

Conclusion and Recommendations

- Walkdown inspection of the facility, employee interviews, and other reviewed historical information did not identify any unusual conditions that would pose a potential threat of environmental release during future demolition of the aboveground structure.
  - Deactivation will include removal of any accessible loose items being stored (to the extent practicable) prior to demolition.
  - Any floor drains will be delineated, documented, and isolated prior to demolition.

- Based on the most recent CERCLA five-year review (DOE 2019 - DOE/LX/07-2426&D2), the treatment system is functioning as designed and has operated in accordance with the approved CERCLA documents. The treatment system is expected to continue to operate until it has been determined through the CERCLA five-year review process that the interim treatment goals have been met and/or a follow-on CERCLA remedial decision is implemented (e.g., Groundwater Operable Unit – Dissolved-Phase Plumes Remedial Action) and the system is no longer required to treat contaminated groundwater.

- Pending ceasing of operation (e.g., the FFA parties have reached agreement that the facility is no longer required to treat contaminated groundwater), deactivation, and availability of funding, proceeding with demolition and disposal of the C-612 facility (aboveground structure) in accordance with the existing CERCLA ROD, contingent upon the fact that no additional changes have occurred that would affect the CERCLA determination of the facility prior to demolition, is recommended.

- All applicable laws, regulations, and DOE procedures/protocols will be followed to ensure the demolition and disposal of the aboveground structure occurs in a safe, compliant manner, including conducting any additional radiological characterization through confirmation radiological surveys (as necessary) to support demolition and waste disposition.

Conclusion and Recommendations

- As part of the demolition of the aboveground structure, the appropriate best management practices (BMPs) will be evaluated and implemented (as needed) to prevent/minimize the pooling and/or migration of storm water that may come into contact with any contamination that may exist on the pad/subsurface structure(s). For example, the following BMPs will be implemented as necessary:
  - Radiological surveying will occur following demolition.
  - Decontamination and/or application of fixatives and/or barriers to contaminated surfaces above regulatory posting limits.
  - Isolation measures and other types of barriers to minimize and/or control runoff/pooling of contaminated storm water [e.g., seal inlets to drains/sumps/subsurface structure(s)].

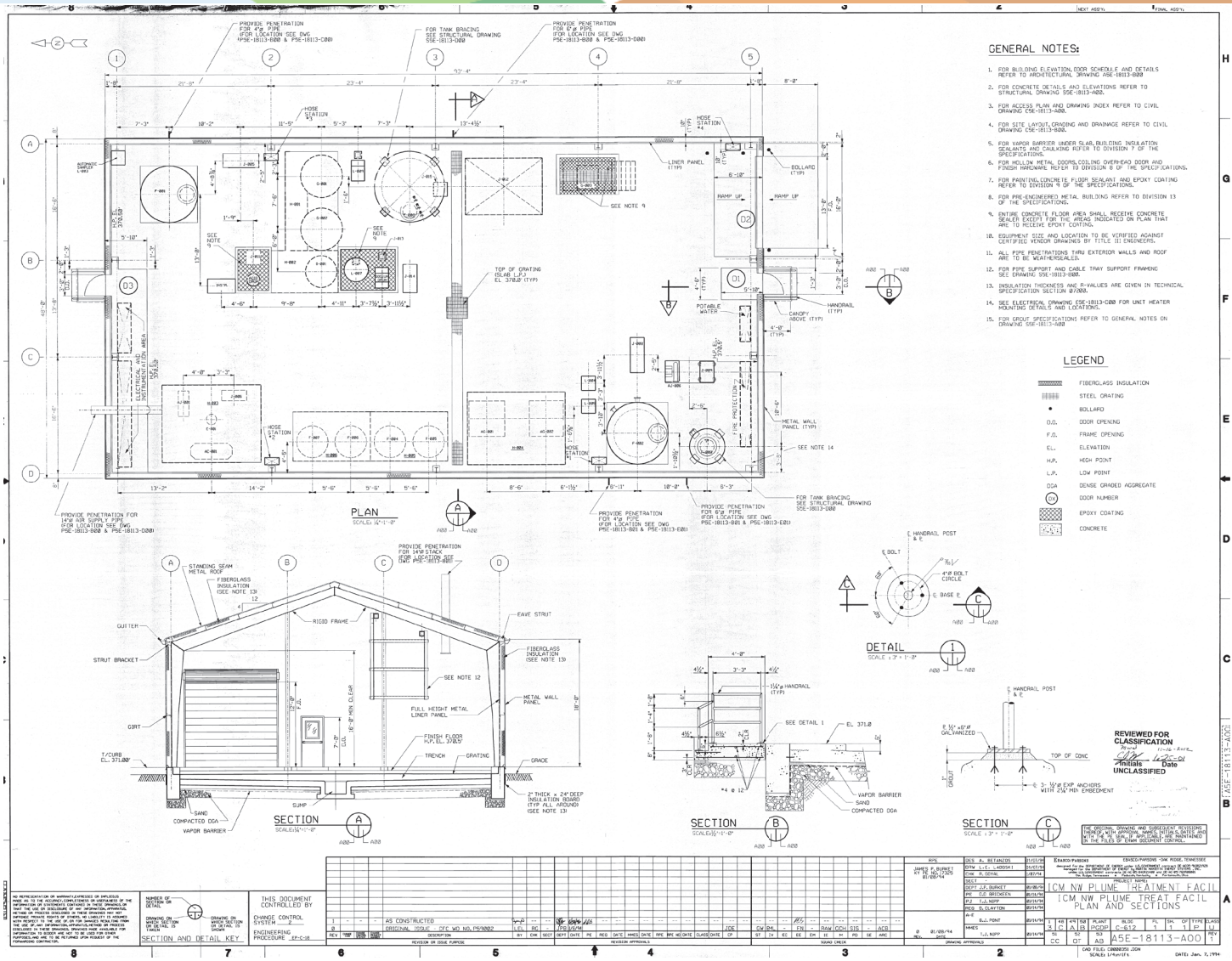
- Removal of the C-612 facility will be documented in the appropriate annual SMP revision.

- The future evaluation conducted for GA 1 will further evaluate the potential threat of release associated with the slab/soils from the C-612 facility.

C-612 Northwest Plume Groundwater Treatment Facility

BACKUP INFORMATION

C-612 Engineering Drawing



A5E-18113-A00, Rev 1

C-612 Sources

- Engineering Drawings:
  - Provided in presentation
- Databases:
  - Issues Management System
  - Regulatory Compliance Archive Spill Log (pre-2018)
  - Active GSAs and SAAs Master List
- Employee Interviews:
  - Facility Manager (21 years plant expertise)
  - Compliance Subject Matter Expert (45 years plant expertise)
- Documents:
  - Paducah Gaseous Diffusion Plant Sitewide Strategy Facility Background Information. FPDP-RPT-0021, May 2016
  - Fluor Federal Services, Inc., Paducah Deactivation Project Comprehensive Environmental Compliance Due Diligence Review, CP5-ES-0101
  - CY 2018 Five-Year Review for Remedial Actions at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LX/07-2426&D2, May 2019
  - Record of Decision for Interim Remedial Action of the Northwest Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/OR/06-1143&D4, July 1993
  - Operation and Maintenance Plan for the Northwest Plume Groundwater System Interim Remedial Action at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/OR/07-1253&D2/R7, November 2020
  - Explanation of Significant Differences to the Record of Decision for Interim Remedial Action of the Northwest Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky, DOE/LEX/07-0343&D2, December 2010
  - Remedial Design Report for the Interim Remedial Action of the Northwest Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky. DOE/OR/08-1220&D1, December 1993.