

Leading the Way in Uranium Recovery

Westinghouse Electric Company, in collaboration with the National Nuclear Laboratory's (NNL's) Preston Laboratory, continues to lead the way in the treatment of uranium-bearing residues. Integration of unique facilities and expertise within Westinghouse's production plants and NNL's Laboratory on the Springfields site enables recovery of uranium from process material generated during UF_6 , UO_2 , fuel development and production activities.

Westinghouse has several large-scale processing facilities with a diverse range of capabilities to enable hundreds of different uranium-bearing residues to be processed at the Springfields site. Westinghouse works closely with NNL experts to develop innovative technologies for the treatment and processing of uranium-bearing residues. As a fuel manufacturer, Westinghouse has the essential ability to recycle uranium and return it to the fuel cycle.



floor cleanings



uranic powder



uranic metal



contaminated filters/paper/clothing



contaminated metal



oil bearing residues

Experience at Springfields

In recent years, Westinghouse has characterised and processed around 50,000 residue drums comprising over 1,000 different residue types generated in over 60 years of nuclear fuel research and manufacture. Westinghouse has a dedicated residues team working with customers and regulators to assess material, conduct trials and develop processing options.

Providing Solutions for your Uranic Materials

With extensive experience in processing their own legacy residues and legacy residues in their care, Westinghouse understands issues regarding legacy uranic material and can offer practical solutions. The financial and regulatory impact of storing uranic residues can be significant. While interim storage of residues may seem like a low cost option in the short term, it means ongoing costs for facilities, manpower and equipment without a permanent solution. Also, sending uranic materials to disposal facilities can be problematic and the development of regulations often means that finding solutions may become more difficult. Westinghouse is able to assess your specific situation with the ultimate goal of recycling the uranium contained in the residues for use in the fuel cycle.

Along with technical support from NNL, Westinghouse has developed bespoke processing systems with exceptional capabilities focussed purely on transforming uranium-bearing residual material into a useable product. Westinghouse is also able to convert uranic residues into a safe and stable form for storage and can provide size reduction where recovery into fuel is impractical.

Westinghouse will deliver on its promise of providing a tailor-made service for your company. You will be assigned a Project Manager who will establish your requirements and provide a cost-effective solution. The Project Manager will have technical experts on hand to ensure that your issues are dealt with successfully. Westinghouse is experienced with uranic residues, and can provide you with unique, effective solutions.

Uranium Recovery Solutions at Springfields



Westinghouse Facilities at Springfields

Westinghouse has several unique facilities at the Springfields site with skilled and experienced operators to process residues. Westinghouse can handle varying volumes of material – from a few kilograms to many tonnes – and can offer pre-processing services, such as sampling, material sorting, size reduction, de-canning and re-drumming as part of their customized service to you. The Springfields site also contains storage facilities to support treatment options.

Enriched Uranium Residue Recovery Plant (EURRP)

The EURRP is a safe geometry plant at Springfields which can process uranium-bearing liquids or powders up to 5% enrichment. Clean materials are processed to U_3O_8 or UO_2 through furnace treatment, and contaminated materials can undergo recovery by nitric acid dissolution, solvent extraction and precipitation to output a clean UO_2 product. The recovered uranium is then returned to the fuel cycle.

Natural and Depleted Uranium Recovery Plant

At Springfields, this recovery plant can process high volumes of natural and depleted uranium residues for immediate return to the fuel cycle or conversion to UO_3 for storage. Several thousand drums per year can be processed depending on the residue form. This plant is capable of processing uranic liquids, powders, metal, slurry, sludge or bulk feed material. The plant normally processes up to 1% enriched material, and enrichments up to 1.4% can be considered on a case-by-case basis.

Nitric Acid Wash Facility (NAWF)

The NAWF provides a unique, innovative process which removes uranium from contaminated, soft residues (e.g., cloth, paper, plastics, rubber) and filters from operating plants as well as legacy materials. The process involves preparing the residue by shredding, bagging and washing it with nitric acid, followed by rinsing and drying. The uranium is recovered to the fuel cycle and the resultant bagged waste is disposed of to a waste facility.

UF_6 Cylinder Wash

The Cylinder Wash Facility at Springfields can process both 30B and 48Y cylinders to remove UF_6 heels. The cylinder is placed on a specific rig for quenching and chemical washing, and is rinsed with water before drying. These rigs can be used for hydraulic pressure testing of repaired cylinders. Westinghouse also offers cylinder maintenance and re-validation services.

Obsolete Cylinder Wash (OCW)

The OCW is a stand-alone facility designed and built by Westinghouse to clean non-standard cylinders holding a 'heel' of UF_6 . The cylinders can then be cut up, decontaminated and disposed of to a waste facility. This facility can wash cylinders up to a maximum size of 30B type and can take enriched material up to 5%.

Enriched Decontamination Facility

The Enriched Decontamination Facility can process material with uranium enrichments up to 5%. Springfields can sort and size-reduce the material as well as dismantle and cut up larger items. This facility uses an acid washing/pickling technique and is suitable for materials such as metal, wood, rubble, etc. The goal is to clean the material to disposal levels or even free release levels.

Natural Decontamination Facility

The Natural Decontamination Facility can sort and size-reduce material as well as dismantle and cut larger items containing natural uranium. This facility uses an acid washing/pickling technique and is suitable for materials such as metal, wood, rubble, etc. The goal is to clean the material to disposal levels or even free release levels.

National Nuclear Laboratory (NNL)

Preston Laboratory

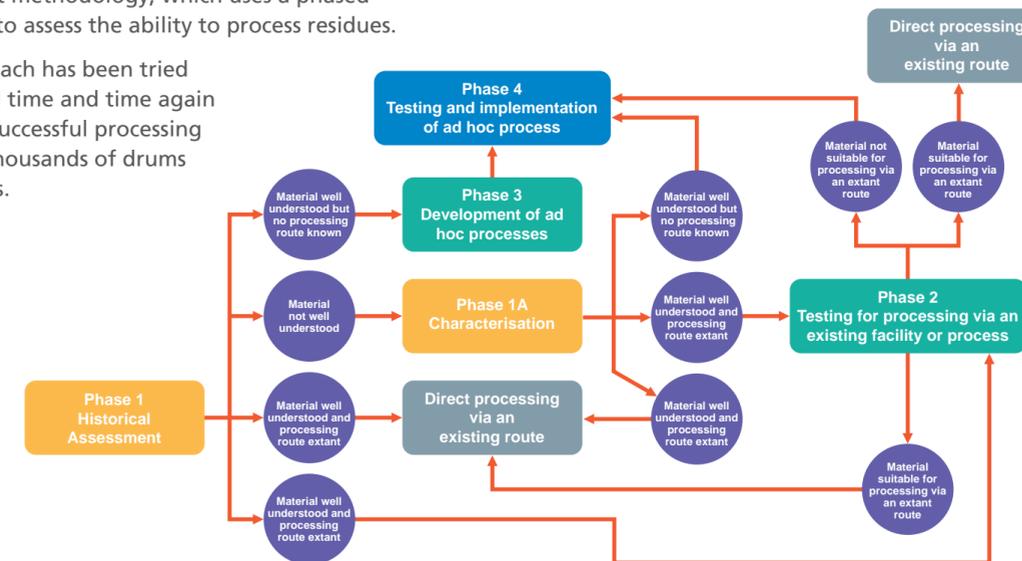
The NNL treats a wide variety of materials produced as by-products of the nuclear fuel cycle, mostly from uranium purification and fuel manufacture but also including materials from uranium enrichment and the decommissioning of obsolete plants.

NNL's Preston Laboratory is home to some of the world's leading experts in uranium residue treatment and recovery. Working in collaboration with Westinghouse, NNL can provide technical assessments leading to cost-effective routes for treating complex residues.

Technical Assessment Process

Springfields and NNL have an established residues assessment methodology, which uses a phased approach to assess the ability to process residues.

This approach has been tried and tested time and time again enabling successful processing of many thousands of drums of residues.



NNL Residues Treatment Plant Capabilities

The Residues Treatment Plant can process approximately 400 drums of material each year, and has facilities for complex residues such as gadolinium or oil-contaminated uranic residues. Many thousands of drums of highly intractable wastes/residues have been processed by this plant, together with hundreds of cubic metres of oil and solvent cleaned to free release levels. A wide range of residues have been treated including:

- Process sludge (filter cakes, alkaline precipitates)
- Contaminated acids, oils, solvents, oily residues, resins and graphite
- Decommissioning residues (concrete, bricks, timber, metals, plastics)
- Uranium metal, alloys and ceramics

NNL's Preston facility houses a laboratory and residues treatment plant which can accept all enrichments, including highly enriched uranium (HEU). This facility can segregate, sort and size-reduce as well as provide processing routes for small-scale problematic residues. The residues treatment plant has a modular design to increase flexibility and is chemically resistant to enable a vast array of material to be processed and a diverse range of processing techniques to be used.

For more information on how we can help you, please contact:



enriched uranium residue recovery plant



nitric acid wash facility



natural and depleted uranium recovery plant



UF_6 cylinder wash



obsolete cylinder wash



enriched decontamination facility



natural decontamination facility



residues treatment



residues treatment plant