



**Research Sites
Restoration Ltd**

**Harwell's Liquid Effluent Treatment
Plant (LETP):
past, present and future challenges
in radiation protection**

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Overview

- General principles of radiation protection
- Examples of past, present and future work



Harwell

- United Kingdom Atomic Energy Authority (UKAEA) carried out Research & Development at Harwell from the late 1940s onwards.
- Old UKAEA facilities subject to decommissioning which is managed by RSRL on behalf of Nuclear Decommissioning Authority.



LETP

- A complex of buildings and large tankage facilities for receipt, treatment and sentencing of radioactive liquid wastes.



Overview

- RSRL provides a core Health Physics management team eg Radiation Protection Advisers.
- Nuvia is the main Health Physics support contractor eg providing surveying staff and an Approved Dosimetry Service.



Overview

- Use of risk assessment to address hazards / risks.
- All dose uptake kept ALARP.
- Where contamination may pose a risk, areas are only accessed and exited via carefully controlled barriers.



Overview

- Provision of suitable dosimetry:
 - external: whole body TLDs, extremity TLDs and electronic personal dosimeters;
 - internal: personal air samplers, WBM and bioassay (eg routine urine and faecal).
- Workplace monitoring:
 - radiation;
 - surface contamination;
 - airborne contamination.



Radiochemical Laboratories / Fingerprints

- A wide range of radionuclides can be found at Harwell eg ^{137}Cs , ^{60}Co , ^{239}Pu , ^{90}Sr and ^{241}Pu .
- Laboratories carry out fingerprinting eg gamma spectrometry.
- Waste sentencing.
- Assists in assessing hazards and producing a prior risk assessment for any work
 - hand held instruments may not detect presence of alphas / soft betas under “wet” conditions.

Treatment plants



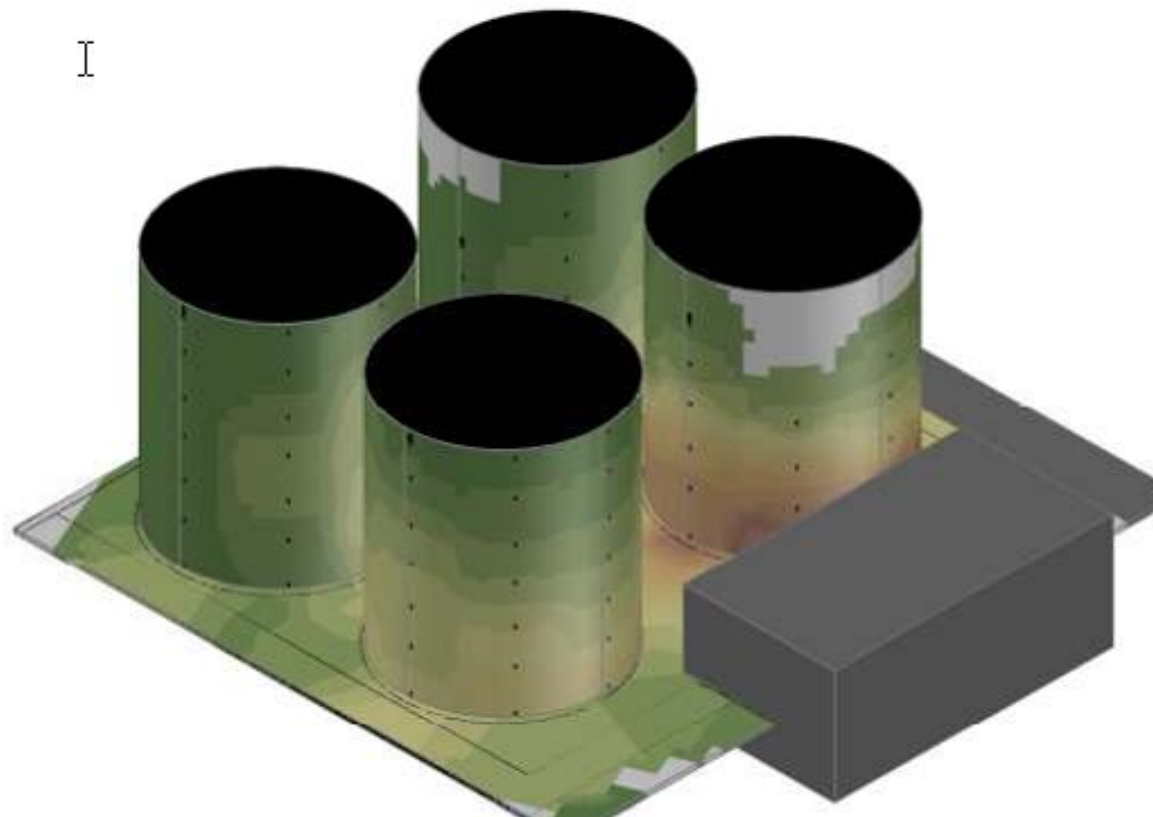
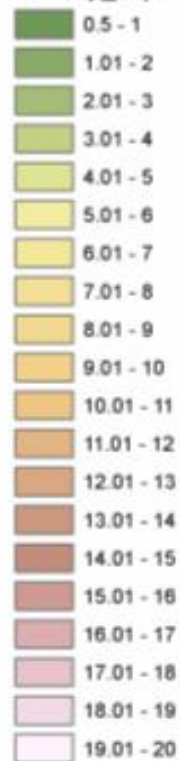
Whessoe Tanks



Whessoe Tanks

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survey_rep



High Level Activity (HLA)

- HLA storage tanks contain 'higher' level aqueous effluents and sludges.
- Concrete planks were constructed over the tanks.

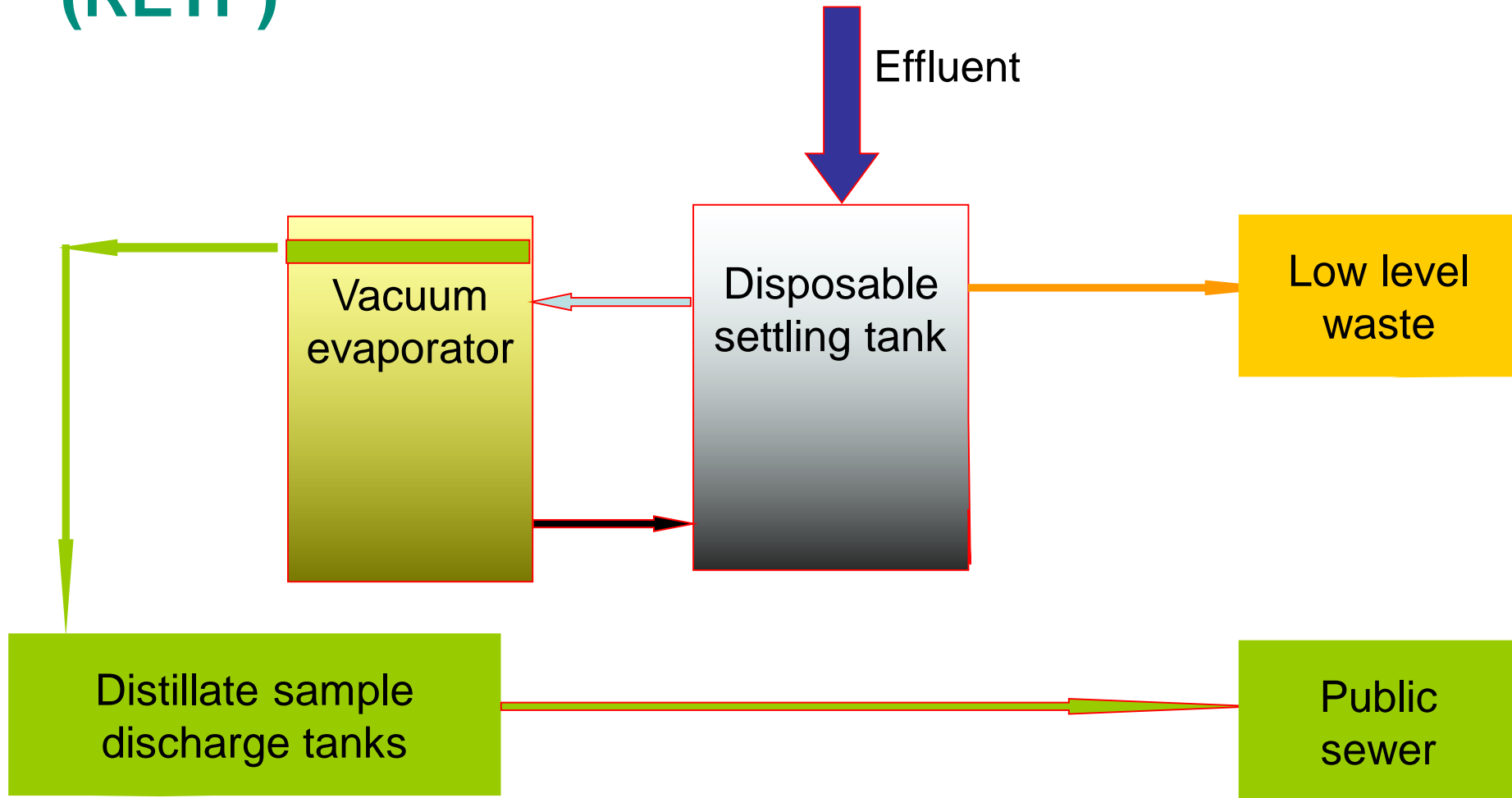


High Level Activity

- Mixers used to produce a homogeneous mix.
- Sampling.
- Waste was pumped to dedicated Encapsulation Plant:
 - poured into drums;
 - cement added / mixed to immobilise;
 - drums monitored & dispatched to solid waste plant.
- Final phases:
 - Post Operational Clean Out (POCO);
 - Plant decommissioning.



Replacement Effluent Treatment Plant (RETP)



RETP Commissioning

- The RETP will be constructed inside a “delay system” located inside the solid waste facility.
- A major POCO operation was carried out.



Questions?



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