



# Radioactive Liquid Organic Waste (RLOW) – Which Wastes Are These?

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- Work package five (WP5) of the PREDIS project
  - Treatment and conditioning of radioactive liquid organic wastes (RLOW)
  - For example, oils contaminated with alpha-emitters – a challenge for conventional incineration
- Options for direct conditioning of RLOW using innovative geopolymers and related alkali activated materials
  - Focused on improving waste loadings and waste-form properties
- WP5 inventory information has been gathered from questionnaires completed by WP5 partners and end user group (EUG) members





## Questionnaire to identify the main RLOW management challenges

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- Target: End Users and Partners who own, manage or produce radioactive wastes
- Online questionnaire, but can be provided as PDF if easier:
  - <https://link.webpolsurveys.com/Participation/Public/39a14620-e5d8-4b4f-a9f5-919b534b57a9?displayId=Fin2161395>
- Still open for responses
- If you prefer to speak directly, please engage with us and we can help with completing the questionnaire
- Note that WP2 State of the Art gap analysis survey for RLOW is also open for responses



## Questionnaire Contents

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- **Name and source:** waste type, material type, sources.
- **Heterogeneity / homogeneity:** composition and activity distribution (bulk or surface).
- **Current state:** location, storage facility, and if it is raw, containerised or packaged.
- **Quantitative data:** masses and volumes.

## Questionnaire Contents

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- **Properties:** physical state and chemical composition.
- **Radioactivity levels:** radionuclide-specific total and specific activity if possible, indicate whether activated or contaminated.
- **Treatment:** current treatment plans and any properties impacting PREDIS treatment and conditioning options.
- **Confidence:** level of confidence in information provided and an indication of any uncertainties.

## Responses and Data Received so far

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- Liquid organic waste data has been received from the following countries:
  - UK (Sellafield)
  - Ukraine (KIPT)
  - Italy (SOGIN)
  - Finland (Fortum Power and Heat)
  - Czech Republic (CV Řež, ÚJV Řež, a. s.)
  - Switzerland (Nagra)
  - France (CEA)
  
- More responses are expected from end users

## RLOW – Quantities and Waste Types

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- About 4500 m<sup>3</sup> of liquid wastes identified so far (current and future)
- Main wastes types
  - Oils (contaminated with alpha- and/or beta/gamma-emitters)
  - Solvents (e.g. dibutyl phosphate (DBP) and its breakdown products, tributyl phosphate (TBP), tritiated solvents)
  - Scintillation cocktails (Meridian GOLD, Ultima Gold, Permafluor, Rotiszint, xylene, toluene)
  - Cleaning / decontamination liquids (e.g., citric acid, tetrachloroethylene, ethylene diamine, EDTA)
  - Lubricants
  - Organic effluents (including concentrates and sludges)

## Main waste streams to investigate in PREDIS WP5

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- The partners decided to focus PREDIS experimental work on the highest priority and largest volume RLOW streams in each country
  - These are oils and solvents
  - Also a growing interest in scintillation cocktails
  - Present in most countries
  - Work directly applicable to national context
- Four reference surrogates will be used by all partners to allow experimental results to be compared
  - Oil (Nevastane EP100 and Shellspirax)
  - Solvent (TBP)
  - Dodecane (paraffinic oil – used as a solvent or TBP diluent)
  - Scintillation cocktails (Ultima Gold AB and INSTA GEL)