Sewage Sludge in Agriculture – An Irish Perspective

Ireland's experience regarding managing biosolids safely, planning for the future and challenges ahead.

Aoife Kyne

Wastewater & Sludge Asset Planning Specialist

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UISCE ÉIREANN : IRISH WATER

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Current Laws and Regulations

Legislation & Regulations

- The Sewage Sludge Directive was transposed into Irish law by Waste Management (Use of Sewage Sludge in Agriculture) Regulations 1998, as amended by S.I. 267 of 2001.

- Code of Good Practice for Use of Biosolids in Agriculture.

- IW Sustainability Strategy – targets GHG emissions
- EU Fertiliser Regulations
- Nitrates Action Plan review
- River Basin Management Plan review
- New Renewable Energy Legislation
- EU Soil Strategy
- EU Methane Strategy
- Potential review of Code of Good Practice for Use of Biosolids in Agriculture - tbc

Code of Good Practice for Use of Biosolids in Agriculture

Traceability of the Biosolids is essential.

- Certificate of analysis of the Biosolids product is required.

- Date on which the sample was taken

- Origin of the sludge from which the biosolids was produced

- Treatment process used to achieve the Biosolids product

- Analysis of the parameters specified in the Code.

- Soil samples are taken from the spreadlands for analysis.
- Biosolids producer provides a full Nutrient Management Plan – revision annually – taking into account most recent COA, soil testing results, crop type and any other changes.
- Storage required between October and February

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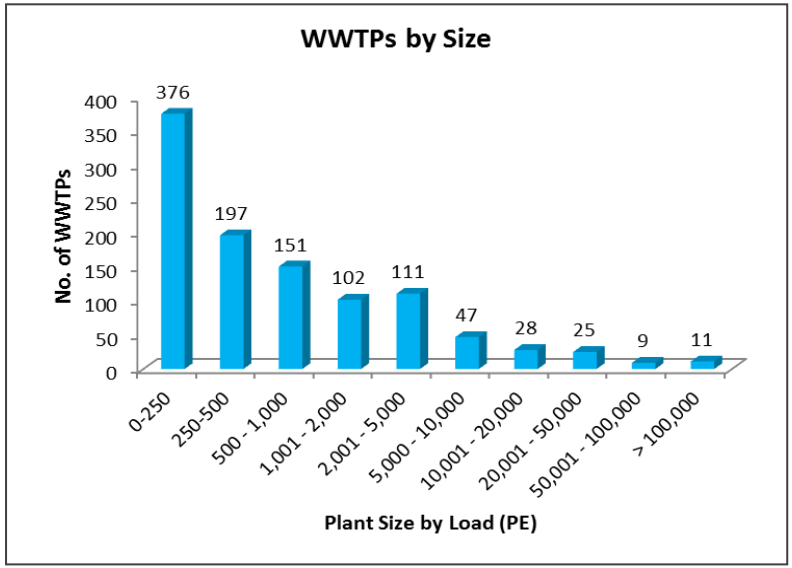
Overview of Ireland's Wastewater Asset Base

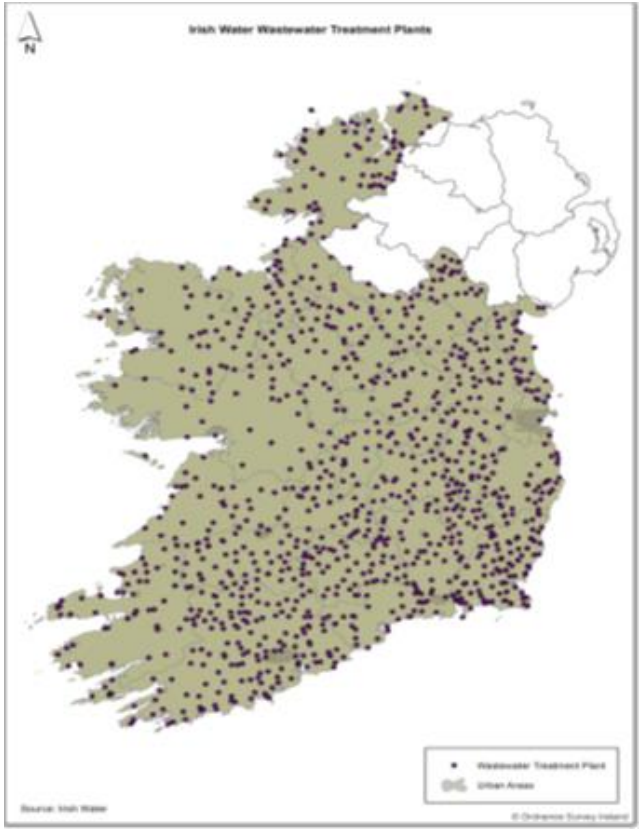
National Infrastructure

Large number of small WWTP's (over 60% < 500 p.e.)

Centralised treatment required for efficient resource recovery

~50% of WW sludge generated at 11 WWTPs > 50,000 PE





Sludge Quantities

Year	Sludge Quantity (tds/a)	Comment
2019	Approx. 58,000	• Reported sludge quantities
2025 (predicted)	87,000	Additional sludge due to: • Full compliance with regulations / licences including new WWTP's • Additional 5-6 % due to population growth • Additional desludging of WWTP's • Includes 10,000 tds/a DWWT sludge

Notes:

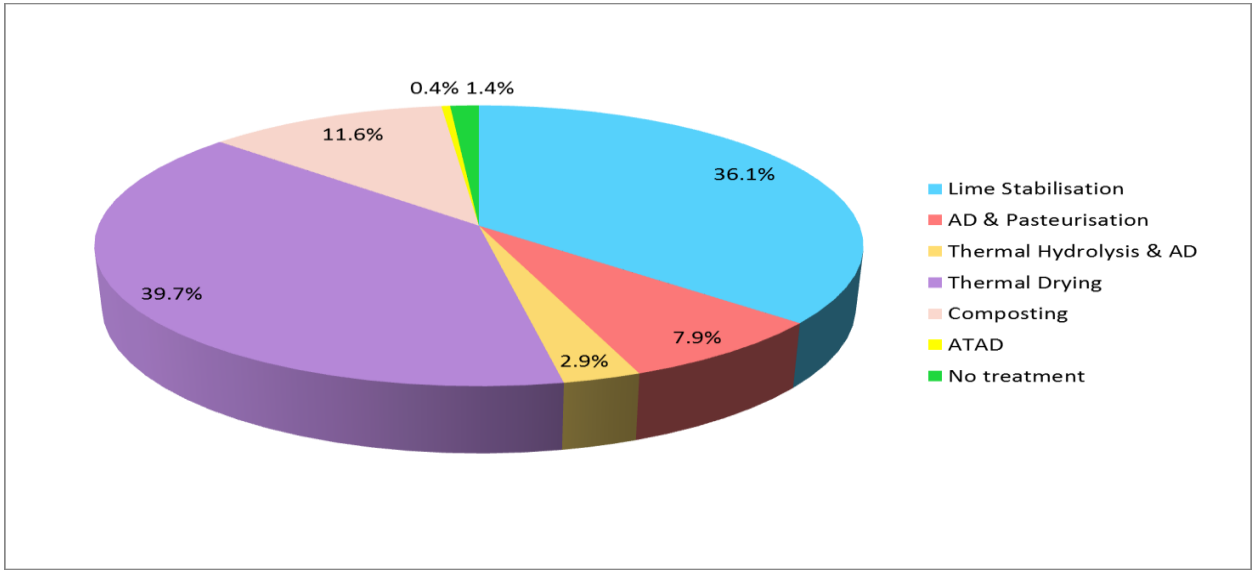
- Actual sludge quantities in 2025 likely to be less than predicted

Code of Good Practice for the Use of Biosolids in Agriculture

In Ireland, the following primary methods are deployed to treat wastewater sludge

- **Anaerobic Digestion (mesophilic) + Pasteurisation**
- **Lime [alkaline] Stabilisation (to maintain pH and temperature in specified ranges);**
- **Thermal Drying delivering biosolids with < 10% moisture;**
- **Composting (to increase the temperature to 55°C for specified periods); and**
- **Thermophilic Aerobic Digestion (retention to adjust temperature and volatile solids into ranges).**

Type of sludge treatment

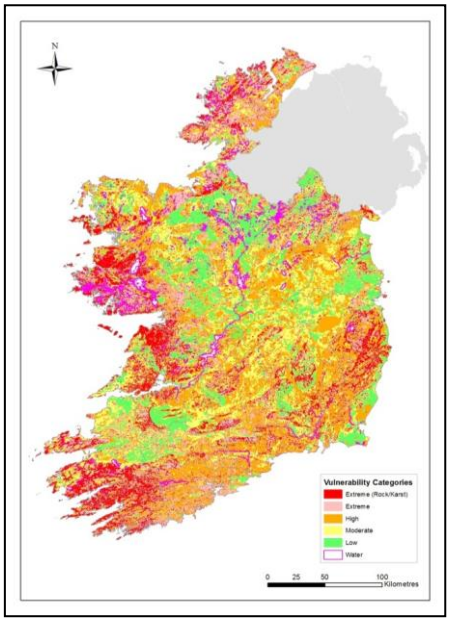


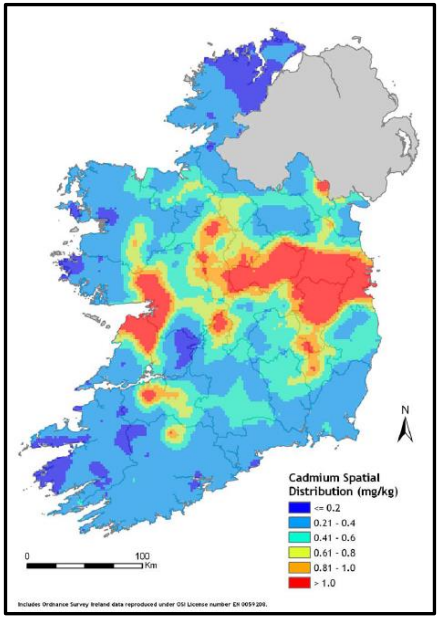
Irish Water WWTPs → Sludge Contractor (NMP) → FARMERS → Department of Environment, Climate and Communications

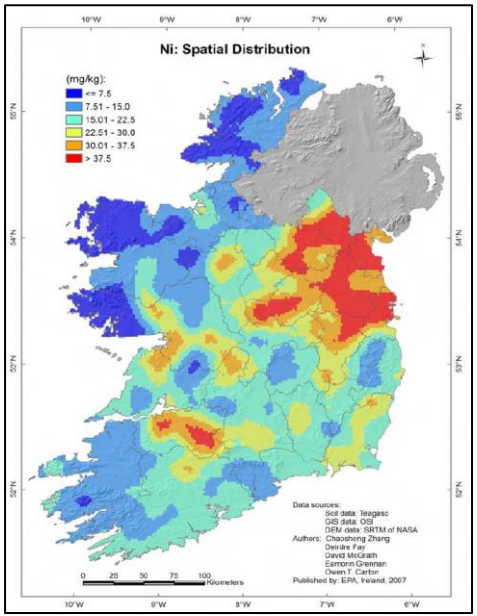
Sludge Management

- Approximately 98% of wastewater sludge produced by Irish Water current disposal rout route is to land.
- Small quantities of sludge going to forestry and landfill
- Pressure on sludge agricultural outlets due to food industry quality assurance schemes
- Irish Water to scope potential to develop quality assurance system for re-use of biosolids
- Alternative sludge outlets currently being assessed
- Phosphorus recovery being considered for larger wastewater treatment plants
- Upgrades to sludge treatment to increase anaerobic digestion to increase energy recovery and reduce sludge quantities

Restrictions in Land-spreading







- Groundwater vulnerability
- Soil metal levels (cadmium and nickel)

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National Wastewater Sludge Management Plan

National Wastewater Sludge Management Plan

NWSMP – Published 2016, ongoing five yearly reviews – 2021

Objectives

- To establish long-term, secure and sustainable reuse/disposal methods
- To maximise the benefits of wastewater sludge as a soil conditioner
- To establish cost effective and efficient treatment and reuse methods
- To reduce potential for disruption from sludge transport and sludge facilities
- To extract energy and other resources where economically feasible
- To drive operational efficiencies
- To ensure that all regulatory and legislative controls are met and Codes of Practice and Industry Guidance

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Challenges

Challenges Ahead

- What if Legislation changes?
- Need to reverse negative perception.
- What are the effects of microplastics, AMR's & emerging contaminants on sludge and how do they effect soils where sludge is applied?

Continue with knowledge transfer with International Utilities. Knowledge Sharing-twining with Latvia.

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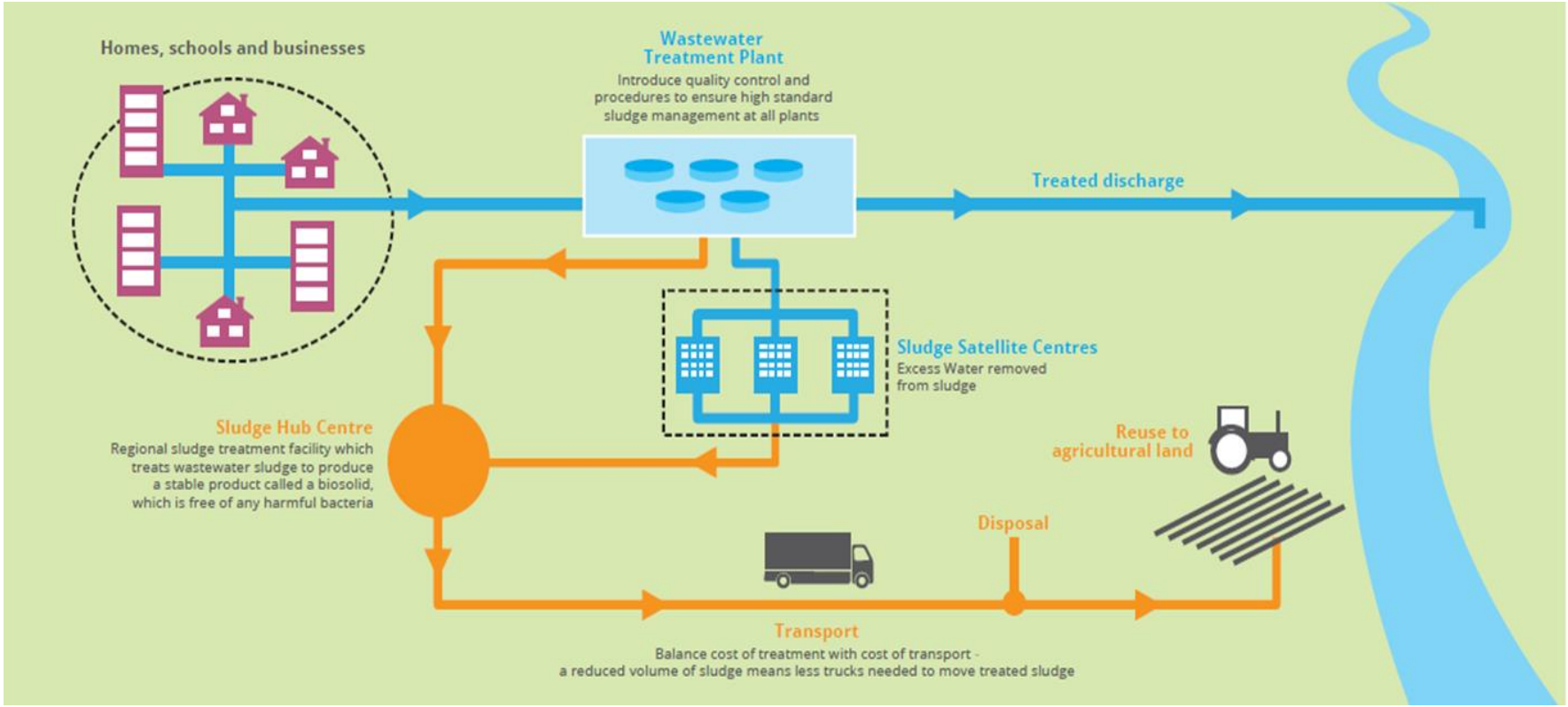
What is Irish Water currently doing to meet Challenges now and in the Future?

Role of Sludge Hubs and Satellite Dewatering Centres



Biosolids – Quality Assurance ‘Certified’ Product

Assured Biosolids Scheme

- Irish Water are investigating the option to develop a quality control assured biosolids scheme

Irish Water - Sludge Studies

Feasibility Study – Sludge Outlet Options

- Investigation options available to demonstrate a circular economy approach to sludge reuse
- Review alternative non-agriculture land options

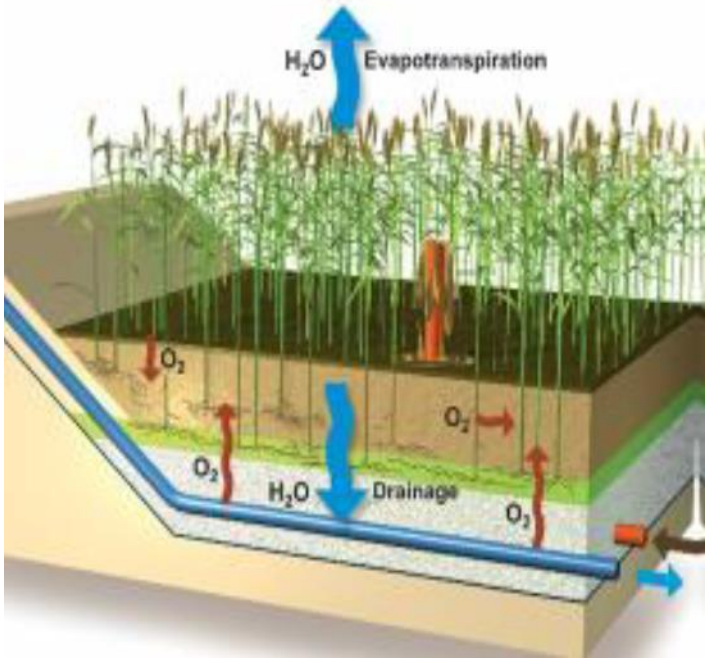
Feasibility Study - Potential for biomethane production at Ringsend WWTP

Feasibility Study – Thermal Treatment Options

- Incineration, Advanced Thermal Treatment – Thermal Hydrolysis/Anaerobic Digestion, Gasification, Pyrolysis ,Thermal Dryers

Investigate End-of-Waste options with EPA

Nature based sludge treatment solutions – Sludge Reed Bed



Bioresource Strategy Decision Support Tool

- Irish Water has engaged Business Modelling Associates to carry out a ‘Pilot’ study to validate our Sludge Strategy which combines manufacturing principles, detailed financial accounting and physical process modelling with an advanced optimisation engine.

Thank you for your time

info@water.ie