

Lincolnshire Minerals and Waste Local Plan Evidence Base

Lincolnshire Waste Needs Assessment 2021 –
Supporting Report 5

Scoping of Management Requirements for 'Other'
Waste Generated in Lincolnshire

Final Issue

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Abbreviations and Glossary of Terms

Abbreviations

Abbreviation	Explanation
AD	Anaerobic Digestion
AMP	Asset Management Plan
C & I	Commercial & Industrial Waste
C, D & E / CDEW	Construction, Demolition & Excavation Waste
DEFRA	Department for Environment, Food and Rural Affairs
EA	Environment Agency
EfW	Energy from Waste
EWC	European Waste Catalogue
GVA	Gross Value Added
HLW	High Level Radioactive Waste
HWDI	Hazardous Waste Data Interrogator
HWRC	Household Waste Recycling Centre
IDP	Infrastructure Development Plan
ILW	Intermediate Level Radioactive Waste
LACW	Local Authority Collected Waste
LLW	Low Level Radioactive Waste
NPPW	National Planning Policy for Waste
PI	Pollution Inventory
PPG	Planning Policy Guidance
VLLW	Very Low Level Radioactive Waste
WDI	Waste Data Interrogator
WNA	Waste Needs Assessment
WPA	Waste Planning Authority
WwTW	Wastewater Treatment Works

Glossary of Terms

Term	Explanation
Agricultural Waste	Waste produced on a 'farm' in the course of 'farming'. Agricultural waste takes both 'natural' (or organic) and 'non- natural' forms e.g. plastics.
Anaerobic Digestion	A process to manage organic matter including green waste and food waste broken down by bacteria in the absence of air, producing a gas (biogas) and nutrient rich solid or liquid (digestate). The biogas can be used to generate energy either in a furnace, gas engine, turbine or to power vehicles, and digestate can be applied to land as a fertiliser.
Commercial Waste	Waste arising from premises which are used wholly or mainly for trade, business, sport, recreation or entertainment, excluding household and industrial waste.
Controlled Waste	Waste subject to controls emanating from the EU Waste Framework Directive.
Construction, Demolition and Excavation Waste	Controlled waste arising from the construction, repair, maintenance and demolition of buildings and structures.
DEFRA	The UK Government department responsible for developing national waste management policy (non planning).
Energy from Waste	The conversion of the calorific value of waste into energy, normally heat or electricity through applying thermal treatment of some sort. May also include the production of gas that can be used to generate energy.
Environment Agency	The body responsible for the regulation of waste management activities through issuing permits to control activities that handle or produce waste. It also provides up-to-date information on waste management matters and deals with other matters such as water issues including flood protection advice.
European Waste Catalogue (EWC)	Comprehensive listing of wastes, divided into 20 chapters, most of which are industry-based, although some are based on materials and processes. Each waste type is assigned a unique six-digit code. The EWC is transposed into UK law through The List of Wastes (LOW) Regulations.
Hazardous Waste	Waste requiring special management under the Hazardous Waste Regulations 2005 due to it posing potential risk to public health or the environment (when improperly treated, stored, transported or disposed). This can be due to the quantity, concentration, or its characteristics
Incineration	The controlled burning of waste. Energy may also be recovered in the form of heat (see Energy from Waste).
Industrial Waste	Waste arising from any factory and from any premises occupied by an industry (excluding mines and quarries).
Landfill (including land raising)	The permanent disposal of waste to land, by the filling of voids or similar features, or the construction of landforms above ground level (land-raising).

Term	Explanation
Non Hazardous Waste Landfill	A landfill permitted to accept non-inert (biodegradable) wastes e.g. LACW and commercial and industrial waste and other non-hazardous (including inert) wastes. May only accept hazardous waste if a special cell is constructed.
Recovery	Subjecting waste to processes that recover value including recycling, composting or thermal treatment to recover energy.
Recycling	The reprocessing of materials extracted from the waste stream either into the same product or a different one.
Waste Planning Authority (WPA)	The local authority responsible for waste development planning and control. In this case Lincolnshire County Council.

1 Context

BPP Consulting LLP was commissioned by Lincolnshire County Council (Lincs CC) to produce a 'Waste Needs Assessment' (WNA) for the county of Lincolnshire. This work is being carried out in the context of the National Planning Policy for Waste (NPPW) and the waste chapter of the Planning Practice Guidance (PPG) which expects that:

"Planned provision of new capacity and its spatial distribution should be based on robust analysis of best available data and information, and an appraisal of options." (emphasis added)¹.

The Lincolnshire Waste Needs Assessment 2021 updates an earlier report produced in 2017. It consists of an overall main report and five waste stream specific supporting reports, namely:

1. Local Authority Collected Waste;
2. Commercial and Industrial Waste;
3. Construction and Demolition Waste;
4. Hazardous Waste; and
5. a Scoping report for Other Waste.

This report comprises the Scoping report for 'Other' Waste streams.

1.1 'Other' waste streams include:

- Wastewater
- Agricultural Waste
- Low Level Radioactive waste.

1.2 As PPG advises that Waste Planning Authorities (WPAs) should seek to plan for these streams, this report scopes the likely impact of these streams on the wider waste management system in Lincolnshire. It determines the quantities that may arise within each stream, how well existing arrangements may cope in future and whether it is necessary to expressly plan for them, and therefore account for them, in the Waste Needs Assessment in detail.

1.3 While the established data sources can inform the generation of estimates for the principal waste streams, the data to estimate arisings of the 'other' streams is less readily available. As a result quantifying and forecasting arisings are more problematic. Given the lack of information, this scoping assessment comprises a review of the earlier Waste Needs Assessment update of 2017² (WNA 2017) and provides update where more current information is available.

¹ DEFRA. 2014. National Planning Policy for Waste.

² Lincolnshire County Council - Waste Needs Assessment Update, WYG February 2017.

2 Wastewater

- 2.1 In Lincolnshire, Anglian Water Services Ltd (Anglian Water) and SevernTrent Water Plc (Severn Trent) are the designated sewerage undertakers with responsibility for providing wastewater treatment capacity. Every five years these water and sewerage undertakers are required to submit to the water regulator, Ofwat, business plans known as Asset Management Plans that explain what services and infrastructure improvements each water and sewerage undertaker is planning to make and how these are to be funded. Ofwat sets price limits for the next five years based around the water companies' AMPs. As such, there cannot be certainty over infrastructure provision over the medium and long terms until future funding is secured through the asset management planning process. The current AMP period (known as AMP7) runs from 1 April 2020 to 31 March 2025 and does not therefore cover the whole Plan period. In addition it is understood that Anglian Water will be preparing a long term wastewater strategy.
- 2.2 While wastewater treatment plants are considered to be waste developments and therefore planning applications relating to their provision are handled by the waste planning authority, the assessment of the need for future wastewater management is led by the water and sewerage undertakers and informed by requirements for improvements in the water environment regulated by the Environment Agency. Therefore PPG advises that early discussions take place between local planning authorities and water and sewerage undertakers, so that proposed growth and environmental objectives, set out in the utility company business plans, are reflected in local plans. This in turn should help ensure that the necessary infrastructure is funded through the water industry price review mechanism regulated by Ofwat.³
- 2.3 There are two aspects of wastewater treatment that need to be addressed:
1. The provision of capacity to treat wastewater itself; and
 2. the provision of capacity to manage the resultant solid wastes (sewage sludge) that arise from the treatment process.

Both of these are covered in the following sections.

Wastewater Treatment Capacity

- 2.4 The WNA update 2017 reported that:

³ PPG Paragraph: 002 Reference ID: 34-002-20140306

- the County is served by 194 STWs, of which all but 7 (located in West Lindsey) are operated by Anglian Water⁴; and,
- both companies have not opened any new STWs since the previous consultation on the plan and that any additional capacity and waste network upgrades required to accommodate growth and expansion, will be provided as and when required.

2.5 The 2017 update reported that at that time the County was served by 1 sewage sludge treatment works located in Lincoln, which processes effluent from waste water treatment. The sewage sludge treatment facility in Gainsborough was closed to provide space to allow expansion of the co-located STW providing additional capacity to meet demand from housing growth in the vicinity of Gainsborough. The sludge is tankered to Severn Trent's energy generation plant at Stoke Bardolph in Nottingham instead.

Update

2.6 Anglian Water and Severn Trent assess the need for additional future waste water treatment capacity required to meet future growth in their own Asset Management Plans. In addition, these utility companies are consulted in the production of Infrastructure Delivery Plans (IDPs) to which the County Council is party. These IDPs have informed the development of joint local plans which cover development within the county. The following IDPs have been reviewed to establish if potential shortfalls in wastewater treatment capacity have been identified as a critical issue affecting the growth ambitions within the county:

- South East Lincolnshire Infrastructure Delivery Plan
- Central Lincolnshire Infrastructure Delivery Plan

The review shows that neither document identifies potential shortfalls in capacity, with reliance being placed on the water and sewerage companies making provision through their own Asset Management Plans scrutinised by OFWAT. On the above basis, it is concluded that no special provision needs to be made for additional wastewater treatment capacity within Lincolnshire.

2.7 In 2018 Ofwat changed the way it regulates the sludge treatment activities of water companies. These activities are no ring fenced and water companies must now release data on sludge treatment facilities that may be available for the use of others under commercial arrangements. This is intended to bring about a *"..change (in) the thought process from viewing this as an inconvenient waste produced by treating wastewater, to seeing it as an opportunity. The*

⁴ See LCC latest AMR for full listing of works

*trading of bioresources could be a real breakthrough – economically and environmentally.*⁵ This means that listings of facilities in the form of Biosolids Assets Registers are in the public domain so that synergies between areas and across waste streams for organic waste treatment, may be facilitated given the right commercial incentives.

Management of Sewage Sludge

This section looks at the current capacity of wastewater treatment works for the management of sewage sludge⁶ and requirements for future capacity.

2.8 The WDI 2019 reports overall sewage sludge production from Lincolnshire to be around 388,000 tonnes. Of this, 42,500 tonnes was managed within Lincolnshire at the Canwick Sludge Treatment Centre located near Lincoln operated by Anglian Water. This site also received c17,000 tonnes of septic tank sludge arising in Lincolnshire and a small amount of sludge from surrounding WPAs. This site is identified in the Anglian Water Biosolids Assets Register as a dewatering centre but does not undertake any further treatment of the resultant sludge. The WDI 2019 reports outputs of sludge from Canwick Sludge Treatment Centre at approximately 38,000 tonnes. This tonnage was reported as being recovered or treated within Lincolnshire. Most, if not all of this sludge will have been applied to agricultural land as a fertiliser in accordance with the Sludge (Use in Agriculture) Regulations 1989 and its associated best practice guidance. The remainder of Lincolnshire sludge is managed at facilities outside Lincolnshire, with the bulk managed at one of four facilities as shown in Table 1 below. All sites undertake treatment including anaerobic digestion, so the final output is expected to be applied to agricultural land as well. Given that the receiving facilities are operated by Lincolnshire's two sewerage undertakers the out of county movements are considered to be a normal part of their asset utilisation strategy which extends beyond Lincolnshire.

⁵ <https://www.ofwat.gov.uk/regulated-companies/markets/bioresources-market/>

⁶ Sewage sludge is taken to be 'sludge arising from the treatment of urban waste water' as set out in the List of Wastes, with code 1908 05.

Table 1: Principal receiving sites for Lincolnshire Sewage Sludge outside Lincolnshire – Source: WDI 2019

Operator	Facility Name	Tonnes Received
Anglian Water Services Ltd	King's Lynn Sludge Treatment Centre	26,449
Anglian Water Services Ltd	Pyewipe Treatment Facility	169,919
Anglian Water Services Ltd	Flag Fen Sludge Treatment Centre	66,625
Severn Trent Water Ltd	Scunthorpe Sewage Treatment Works inc AD	76,827

Sludge Storage Exemptions

Given that sewage sludge is classed as controlled waste, its management is subject to the requirements of the Environmental Permitting Regulations 2016. However the storage of sludge at the place where it is to be used is exempt from the need to obtain an environmental permitting. Up to 1,250 tonnes of sludge can be stored at any one time for up to 12 months before being applied to agricultural land. Review of the Environment Agency list of exempt sites in Lincolnshire indicates that Anglian Water had 1,366 locations registered as exempt and Severn Trent had 1,349 locations registered as exempt within Lincolnshire at the end of 2019. It should be noted that the exemption registrations last for three years so this includes sites registered between Jan 2017 and Dec 2019. These exemptions only provide interim storage for the sludge arising from WwTWs prior to application so are complementary to, rather than additional to sludge management capacity itself.

Inputs of Other Waste to Wastewater Treatment Works in Lincolnshire

2.9 WwTWs can provide a valuable function in managing wastes, other than wastewater, that arise in liquid and sludge form such as septic tank emptyings. Sites that receive such waste require an environmental permit. Review of the data presented in the Waste Data Interrogator (WDI) 2019 indicates that Canwick Sludge Treatment Centre received c17,000 tonnes of septic tank waste for treatment. Inputs of other liquid waste reported through the WDI as having been received at WwTWs only cover that waste delivered to the plant by road tanker, industrial effluent discharged to the sewer is not recorded as a separate input as it is received directly mixed with other wastewater.

Conclusion

2.10 Having reviewed the evidence while there is a reasonable understanding of present and future needs, ongoing consultation with Anglian Water and Severn

Trent (to a lesser degree) is crucial to determine what if any provision for additional capacity for management of this waste stream may need to be included in any update of the Waste Local Plan and what opportunity the opening of the sludge market may present for cross treatment of organic wastes from other streams.

3 Agricultural Waste

- 3.1 The Waste Management (England and Wales) Regulations 2006 brought agricultural waste under legislative control for the first time. Prior to this a significant proportion was managed on farms by burning or deposit into farm tips which became illegal under the 2006 Regulations.
- 3.2 In advance of the introduction of the regulations the following research projects were undertaken to establish quantities and composition of arisings from this stream⁷ and understand management arrangements in place at the time⁸ with a view to identifying management needs at national level:
- 1998 survey reported in a 2001 Environment Agency report
 - Agricultural Waste Survey reported in a 2003 Environment Agency report
- 3.3 These remain the most current sources of data available for the stream as a whole and therefore continue to be relied upon when seeking to generate local estimates for planning purposes.
- 3.4 Following the introduction of the regulations, certain agricultural waste is considered more likely to be managed in the same way as the commercial and industrial waste stream, thus placing some additional capacity requirements on the network used to manage this stream.
- 3.5 In order to identify whether waste from agricultural sources needs separate consideration in the Plan, the following three aspects have been considered:
1. The nature of different agricultural wastes;
 2. the likely current level of arisings;
 3. the way in which the arisings are managed.

The Nature of Different Agricultural Wastes

- 3.6 To be regarded as agricultural, waste must have been produced on a 'farm' in the course of 'farming'. Agricultural waste takes both 'natural' (or organic) and 'non- natural' forms.

Natural Agricultural Waste Arisings

- 3.7 This is the predominant waste stream produced by the sector and the most commonly produced natural waste are wastes from livestock farming such as

⁷ Environment Agency (2001). *Towards Sustainable Agricultural Waste Management*. Environment Agency R&D Technical Report P1-339. <https://www.gov.uk/government/uploads/.../geho0003bieo-e-e.pdf>

⁸ Environment Agency *Agricultural Waste Survey 2003* www.voluntaryinitiative.org.uk/importedmedia/library/1082_s4.pdf

slurries and manure. In the UK, if manures and slurries are used as a fertiliser on agricultural land then they are technically not seen as a waste and are excluded from waste management regulation (although there are controls on the application). Since natural wastes are outside formal control it is considered that they are unlikely to enter the formal waste management system which needs to be planned for. Therefore this report focuses on non natural waste arisings. Non natural waste arisings may include organic waste such as crop residues.

Non Natural Agricultural Waste Arisings

3.8 'Non-natural' agricultural waste is waste other than 'natural' organic waste arising from farming activities. This includes discarded pesticide containers, plastics, tyres, batteries, clinical waste, old machinery, waste oil and packaging waste. The only recognised source of national estimates for arisings of non-natural agricultural waste available is the 2001 Environment Agency Report entitled '*Towards Sustainable Agricultural Waste Management*'. This presents estimates of arisings down to regional level for 1998. For the East Midlands region as a whole, the report estimates that approximately 41,544 tonnes of non-natural agricultural waste was produced on an annual basis.

Management Options

3.9 The 2006 DEFRA '*Waste Minimisation Manual: A Practical Guide For Farmers & Growers*'⁹ identifies three principal routes for managing agricultural waste as follows:

1. Remove waste from the farm and deliver to an appropriately permitted facility.
2. Apply to the Environment Agency for a permit to manage certain waste on-farm.¹⁰
3. Register an appropriate exemption to recover or dispose of some waste on-farm.

Each route is considered below.

Delivery to a permitted facility

3.10 This route would mean that any waste produced will be recorded at the permitted facility and hence reported through the WDI and hence captured for the purposes of quantifying this waste stream.

⁹ DEFRA 2006 Product code PB 11674

¹⁰ Intensive farming units such as pig or poultry farms are subject to environmental permitting.

Applying for a permit

3.11 Where agricultural waste is being managed on a farm in sufficient quantities or on an ongoing basis an environmental permit may be required. Where a permit is granted by the Environment Agency the quantities of waste managed through such facilities would be reported through the WDI and hence captured for the purposes of quantifying this waste stream. Incinerators used to burn only animal carcasses or parts of carcasses, must be approved by the farm's local authority. Permitted facilities may also require express planning consent.

Registering an exemption

3.12 Typical exemptions that farmers apply for include the ability to burn waste in the open (D7), spreading waste to benefit agricultural land (U10) and the use of waste in construction (U1), which covers the use of waste hardcore to maintain farm tracks and roads. However these exemptions may also be used to cover activities taking place on farmland involving waste from non agricultural sources. The specific exemptions that relate solely to the management of agricultural waste are as follows:

- Deposit of agricultural waste consisting of plant tissue under a Plant Health notice.
- Treatment of sheep dip for disposal.
- Treatment of non-hazardous pesticide washings by carbon filtration for disposal.
- Spreading pig and poultry ash mixed with manure on farmland.

Agricultural Waste managed at Permitted Sites

3.13 When estimating agricultural waste arising in Lincolnshire, the WNA update 2017 used the previous estimate included in the 2011 WNA of just over 2 million tonnes (2,089,136) of agricultural waste (natural and non-natural) in a single year. Of this only 17,700 tonnes was managed offsite. It is not clear how these estimates were arrived at, but it was concluded that the local plan would only need to plan for 17,700 tonnes which was equivalent to the amount managed offsite at that time.

3.14 The update concluded that "*The amount of capacity needed to manage this waste stream off-site is likely to continue to be small, even with an increase in waste managed off-site in the future. Therefore, there is no immediate need to provide new facilities specifically for agricultural wastes apart from additional capacity to recycle agricultural plastics. There are already two sites within Lincolnshire that recycle agricultural plastics providing an annual combined*

capacity of 3,500 tonnes, leaving a shortfall of at least 3,570 tonnes (assuming all agricultural plastics are collected for recycling)."

Update

- 3.15 This section provides an update on the WNA 2017 utilising data from the DEFRA Farm Business survey of 2018/19¹¹ and the WDI 2019. The Farm Business Survey data indicates that the total number of farms in Lincolnshire was 2,636. Hence Lincolnshire accounts for 38% of farm holdings in the East Midlands as whole. If one simply uses this value to apportion the regional non natural agricultural waste arising estimate for 1998¹² (41,544 tonnes) to Lincolnshire an annual arisings value of non natural waste of 15,000 tonnes is derived for the county.
- 3.16 Analysis of the WDI 2019 identified that in 2019, around 51,000 tonnes of waste from agricultural sources (List of Waste (EWC) chapter 02 01) from Lincolnshire were managed at permitted sites. This was composed of just over 1,500 tonnes of non natural waste and 48,000 tonnes of organic waste¹³. The primary recipients of the waste are displayed in Table 2 below

¹¹ The Farm Business Survey is conducted on behalf of, and financed by, the Department for Environment, Food and Rural Affairs The Farm Business Survey 2018/19 <http://www.farmbusinesssurvey.co.uk/DataBuilder/>

¹² 2001 Environment Agency Report

¹³ Organic waste covers waste arising from agricultural sources such as crop residues, whereas the term 'natural' waste is intended to capture manure and slurries arising from livestock.

Table 2: Permitted Destination sites receiving Agricultural Waste Arising in Lincolnshire – Source: WDI 2019

WPA	Site Name	Anaerobic Digestion	Composting	Non-Haz Waste Transfer / Treatment	Grand Total
Lincolnshire	Ansons Farm	0	3,372	0	3,372
Lincolnshire	Decoy Farm	0	3,654	0	3,654
Lincolnshire	Grange Farm	5,336	0	0	5,336
Lincolnshire	Holbeach	8,462	0	0	8,462
Lincolnshire	Laburnum House	8,788	0	0	8,788
Lincolnshire	Limestone Farming	1,507	0	0	1,507
Lincolnshire	Pimlico Farm	1,185	0	0	1,185
Lincolnshire	The Ranch Scrapyard	0	0	1,687	1,687
Managed in Plan Area	Total	16,816	7,026	1,687	33,991
Leeds	Ridge Road Farm	1,281	0	0	1,281
North Lincolnshire	North Moor Farm	5,345	0	0	5,345
Nottinghamshire	Retford	1,227	0	0	1,227
Nottinghamshire	Stoke Bardolph WwTW	3,848	0	0	3,848
Managed outside Plan Area	Total	11,701	0	0	11,701
Grand Total	Total	28,517	7,026	1,687	45,692

Based on the above the total quantity of agricultural waste arising that may require offsite management would be around 50,000 tonnes per annum - 2,000 (non natural) plus 48,000 tonnes (organic/natural).

Conclusion

3.17 The estimation of non natural agricultural waste arisings that may require formal management of around 50,000 tonnes per annum - 2,000 (non natural) plus 48,000 tonnes (organic/natural). suggests that this waste stream does not justify provision of additional management capacity in its own right. However the quantity of waste of organic waste managed through permitted facilities does indicate that some account ought to be taken of it when considering available capacity at organic waste processing sites within Lincolnshire.

4 Low Level Radioactive Waste

Introduction to Radioactive Waste

4.1 Solid radioactive waste is divided into three principal categories (and a sub category) according to its radioactivity content and the heat it produces. These categories are:

- **High-level radioactive waste (HLW)** is waste in which can generate significant heat as a result of its radioactivity, and so this factor has to be taken into account in the design of storage or disposal facilities.
- **Intermediate level radioactive waste (ILW)** has lower levels of radioactivity than HLW and does not generate sufficient heat for this to be taken into account in the design of storage or disposal facilities.
- **Low level radioactive waste (LLW)** is radioactive waste having a low radioactive content. LLW makes up more than 90% of the UK's radioactive waste by volume but contains less than 0.1% of the total radioactivity. Within the definition of LLW, there is a sub-classification, known as Very Low Level radioactive waste (VLLW).
 - Very low level waste (VLLW) is defined as either low volume VLLW or high volume VLLW. The principal difference between the two definitions is the need for controls on the total volumes of high volume VLLW being deposited at any one particular landfill or other waste management facilities.

Policy Relevant to Lincolnshire Arisings

4.2 In the absence of any nuclear sector facilities within Lincolnshire, the primary national Government policy document that still affects the management of radioactive waste that may arise within Lincolnshire is the *UK Strategy for The Management Of Solid LLW Arising From The Non-Nuclear Industry*¹⁴ (hereinafter referred to as 'the LLW strategy').

4.3 The LLW strategy is primarily aimed at non-nuclear industry waste producers, the environment agencies and waste planning bodies and:

- Provides guidance and background information to enable planning authorities to make informed decisions on planning applications and to respond to concerns from their communities;

¹⁴ <https://www.gov.uk/government/publications/strategy-for-the-management-of-solid-low-level-radioactive-waste-from-the-non-nuclear-industry-part-1-anthropogenic-radionuclides>

- clarifies the respective roles of waste producers, the environment agencies, planning authorities and the Nuclear Decommissioning Authority to enable decisions to be made that properly recognise the responsibilities of others; and,
- informs waste producers and regulators of how the regulatory framework applies to LLW, particularly the need for producers of LLW to produce waste management plans, consider waste minimisation at source and apply the waste hierarchy.

Low Level Radioactive Waste from Non-Nuclear Sources

Nature

4.4 The majority of radioactive waste that is not classed as high or intermediate level is produced by sectors outside the nuclear industry and hence is termed 'non-nuclear'. Most radioactive waste produced by non-nuclear sources contains very small levels of radioactivity and is therefore classed as VLLW. The majority of this material is similar in its physical and chemical nature to general wastes from household, commercial or industrial sources.

Sources

4.5 Non-nuclear sources of radioactive waste include hospitals, the pharmaceutical sector, and research and education establishments, all of which use radioactive materials which ultimately leads to the generation of radioactive waste. Individually these sources generate relatively small volumes of radioactive waste. Further information regarding these sources is provided below.

- Hospitals - Solid low level radioactive wastes arise as a result of traces of radiopharmaceuticals in used syringes, needles, vials from which radiopharmaceuticals have been withdrawn and absorbent or protective materials (e.g. swabs, dressings, sheets and plastic film) which may be contaminated with small amounts of radiopharmaceutical. Traditionally, most hospital waste has been designated as clinical waste, much of which is incinerated. However, hospitals are now segregating wastes at source distinguishing between that waste that requires management as clinical and that which can be managed as 'general' waste. This may result in some LLW being managed as general waste.
- Industry - The pharmaceutical industry carries out drug and technology development in specific areas of disease research and, in doing so, makes wide use of radiopharmaceuticals. Solid LLW from the pharmaceutical industry comprises general laboratory plastics, vials, sharps (i.e. needles and blades), gloves and any material which may be contaminated. LLW from

biotechnology companies includes equipment to count the radioactivity, gloves, protective overalls and vials, and the waste is treated as either clinical or general waste

- Research - Radioactive tracers are used in universities, colleges and other research laboratories, to study the incorporation of chemical compounds into cells and organisms and also to study their transfer and metabolism. LLW arising at medical schools and biomedical research laboratories is similar to that from hospital laboratories and the pharmaceutical and biotechnology industries. The waste typically includes disposable plasticware, sample tubes, paper and plastic coverings, paper tissues, and organic liquids that are used to count certain types of radioactivity (called scintillation fluids). Agricultural and animal research will result in rather more bulky wastes (for example plant matter and animal bedding).
- Contaminated Land - Whilst waste arisings from the remediation of land contaminated with radioactivity from non-nuclear sources are potentially significant in terms of volumes, their ad hoc nature makes it difficult to undertake any meaningful long term planning for disposal of associated soils. In its strategy, the Government does not therefore expect planning authorities to make specific provision for this within their planning frameworks. However, it does consider it prudent for waste planning authorities to make reference in their planning documents to the possibility that radioactively contaminated soil might arise where historical activities involving radioactive sources may have taken place, and that such waste might require disposal to specially authorised landfills.

Management of VLLW and LLW

Very Low Level Waste (Exempt Waste)

- 4.6 A site producing or managing less than 50 m³ of VLLW per year is classed as a low volume VLLW source and as such is exempt from reporting quantities of waste produced and managed. VLLW from such sources is not required to be managed separately and so will generally be managed in the same manner as general waste produced on the source site. As a result any landfill or incinerator in the UK may accept small volumes of VLLW mixed in with the other wastes. On that basis it may be assumed that any waste management facility receiving mixed waste might receive low volumes of VLLW depending on whether source sites fall within their catchment. However VLLW is rarely (if ever) declared as such in any waste returns submitted so there are no specific records of its management to draw on. The LLW strategy states that Government considers that the present arrangements for low volumes of exempt VLLW are satisfactory and does not expect waste planning authorities to make specific provision for the management of VLLW in their waste plans.

Low Level Waste

- 4.7 When considered on its own, the very small quantity of LLW is insufficient to drive the provision of dedicated management facilities via the market. Therefore, the LLW Strategy concludes that producers of these wastes will nearly always have to rely on waste management networks provided for other large volume wastes. This can be problematic as the public perception of the risks associated with the management of LLW can deter waste facility operators from providing such a disposal service.
- 4.8 Most disposal of LLW requires a permit to be held by both the waste producer and the operator of the waste management facility that receives it. LLW can go either to a landfill as a 'controlled burial', the national Low Level Waste Repository (LLWR) at Drigg in Cumbria, or may be dealt with by incineration (with or without energy recovery). To extend its life, use of the national LLWR is reserved for particular types of LLW, so LLW disposal usually takes place at specially authorised facilities used for the management of other types of waste. Unlike the network of facilities available to take VLLW there are considerably fewer facilities across the UK that currently take LLW. While operators of appropriate facilities may apply to take LLW at any time, in England there are currently only three landfill sites granted permits to do so. These are shown in Table 3. The closest site to Lincolnshire is the East Northants Resource Management Facility (ENRMF), so current and future arrangements at this site may be of greatest relevance. The ENRMF has development consent including provision for disposal of LLW up to 2026 and a DCO application to extend its capacity and life is imminent. However there is nothing to indicate that any LLW that would not be managed as VLLW is produced in Lincolnshire.

Table 3: Landfill Sites Permitted to Receive LLW in the UK

Site Name	Operator	Waste Type	Source Specific	Host WPA
East Northants Resource Management Facility	Augean South PLC	LLW	Waste mainly generated from the decommissioning and clean up of nuclear industry sites ¹⁵	Northants
Clifton Marsh	Sita (Lancashire) Ltd	LLW	Small quantities of lower activity low level radioactive wastes ¹⁶ .	Lancashire
Lillyhall Landfill Site	Waste Recycling Group Ltd	High Volume -VLLW	No more than 26,000 m ³ of HV-VLLW per year and if the landfill remains operational until 2031 no more than 582,000 m ³ of HV-VLLW in total. ¹⁷	Cumbria

Planning for the Management of Low Level Waste (LLW)

4.9 The LLW strategy exhorts producers of LLW to work with planning authorities, to ensure that such wastes may be effectively handled through the preparation of local plans and in determining planning applications. It also suggests that any waste management plans produced by LLW producers should take account of the proximity principle alongside other considerations. It states that:

*“Waste planning authorities should consider how to manage LLW and VLLW arising in their areas as part of the preparation of their local waste plans. They should seek advice from waste producers and the environment agencies to ensure that the waste is being sent to a suitable waste management facility. If necessary and feasible, they should work with other waste planning authorities to share facilities.”*¹⁸

It also says:

*“Data has shown that the majority of non-nuclear industry wastes are of very small volume in comparison to the annual volumes of controlled waste (very unlikely to exceed 0.1% by volume, and there is some evidence that it will reduce). Therefore, waste planning authorities are unlikely to need to make any special provisions to cope with an increase in volumes of radioactive waste.”*¹⁹

¹⁵ <https://www.augeanplc.com/enrmf-planning/>

¹⁶ Sita Ltd 2020 <http://www.sita.co.uk/>

¹⁷ Environment Agency. 2011. Environmental Permitting (England and Wales) Regulations 2010 Decision Document. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/303034/WRG_Decision_Document.pdf

¹⁸ LLW Strategy key point page 18

¹⁹ Para 2.34 page 17

LLW - The Proximity Principle

- 4.10 The LLW strategy recognises that planning, by waste producers, for the disposal of VLLW and LLW involves balancing regulatory and policy requirements with what appropriate disposal routes are actually available. In the case of most low volume VLLW from non-nuclear sources, its management route/fate is purely dependent on that of general waste with which it is mixed at the point of production i.e. waste producers have little influence on choice of destination at which the waste is ultimately disposed unless they segregate it at source.
- 4.11 In the case of deciding on disposal routes for LLW, the LLW strategy states that the Government wishes to see “appropriate and explicit consideration” of the proximity principle. “Appropriate and explicit consideration” means that proximity must be a feature of any options assessment process which supports a proposed waste management plan. “Appropriate” consideration means that the proximity principle will assume a different importance in an options assessment for, say, a site producing large volumes of contaminated steel, for which only a limited number of decontamination facilities are available, compared to a hospital generating low volumes of radioactive waste suitable for (local) incineration or landfill.
- 4.12 The LLW Strategy also states that
- “Communities which benefit from the beneficial uses of radioactive materials (including direct benefit such as the use of radiopharmaceuticals, and indirect benefits such as contributions to a local economy from commercial bodies using radioactive materials) should take a share in the responsibility for managing the radioactive wastes which inevitably arise from their use, where possible”*
- It does however go on to recognise that *“...each and every local authority cannot necessarily be self-sufficient in the matter of waste management.”*²⁰

Production and Management of LLW in Lincolnshire

- 4.13 The WNA Update 2017 did not update LLW arisings for Lincolnshire on the basis that “...the level of LLW produced in Lincolnshire is very minimal and unlikely to change significantly. As reported in the previous WNA, it is very unlikely that LLW will increase over the plan period given the absence of nuclear industry in the County.”
- 4.14 A review of radioactive source permits records granted by the Environment Agency indicates that there are six authorisations held by four entities within Lincolnshire as shown in Table 4 below.

²⁰ LLW Strategy key point page 17

Table 4: Radioactive Source Authorisations held within Lincolnshire – Source: Environment Agency Public Register accessed January 2021

Entity	Activity	Location	n.
Chrysaor Production (UK) Limited	Keeping and Use of Radioactive Materials and Disposal of Radioactive Waste (G)	Theddlethorpe Gas Terminal, Mablethorpe Road, Theddlethorpe St Helen, LN12 1NQ	1
Teledyne e2v (UK) Limited	Keeping and Use of Radioactive Materials and Disposal of Radioactive Waste (G)	Firth Road Business Centre, Firth Road, Lincoln, LN6 7AA	2
United Lincolnshire Hospitals NHS Trust	Keeping and Use of Radioactive Materials and Disposal of Radioactive Waste (G)	Lincoln County Hospital, Greetwell Road, Lincoln, LN2 5QY	3
United Lincolnshire Hospitals NHS Trust	Keeping and Use of Radioactive Materials and Disposal of Radioactive Waste (G)	Grantham District Hospital, 101 Manthorpe Road, Grantham, NG31 8DG	4
United Lincolnshire Hospitals NHS Trust	Keeping and Use of Radioactive Materials and Disposal of Radioactive Waste (G)	Pilgrim Hospital, Sibsey Road, Boston, PE21 9QS	5
University of Lincoln	Keeping and Use of Radioactive Materials and Disposal of Radioactive Waste (G)	Joseph Banks Laboratories, Green Lane, Lincoln, LN6 7DL	6

These permits are issued to establishments which use radioactive substances and it is possible therefore, that as part of their activities, they will generate some LLW or VLLW requiring disposal offsite.

4.15 In addition to the establishments authorised to hold radioactive sources listed in Table 4, there are a number of entities that hold permits for the disposal of radioactive waste within Lincolnshire. These are referred to as grade H and O permits. These are listed in Table 5. The entities holding these permits are principally energy exploration companies. In the process of drilling for oil and gas, these companies they might extract ‘naturally occurring radioactive materials’ (NORM) as NORM is present in many geological formations including oil-and gas-bearing strata. These NORM wastes may include waste water resulting from the production of oil and gas and waste solids such as sands, sediments, scales and sludges removed from process vessels; and waste equipment such as pumps, process vessels or pipework, contaminated with NORM. Holders of these permits (listed below) are required to have contracts in place for the management of waste arisings in advance of commencement of production.

Table 5: Radioactive Substances Permit involving Disposal of Radioactive Waste held within Lincolnshire – Source: Environment Agency Public Register accessed January 2021

Entity	Location	n.
Egdon Resources UK Limited	Keddington Oilfield, Stewton Newkin Lane, South Cockerington, Louth, LN11 7EX	1
Egdon Resources UK Limited	Biscathorpe Well site, Land off High Street, Biscathorpe, LN11 9RA	2
Egdon Resources UK Limited	Fiskerton Airfield Well site, Fiskerton, LN3 4HZ	3
Europa Oil and Gas Limited	West Firsby Well site, Cliff Road, Spridlington, Market Rasen, LN8 2DN	14
IGAS Energy Production Limited	Cold Hanworth Well Site, Wetmoore Lane, Welton Low Fields, Welton, LN2 3RD	5
IGAS Energy Production Limited	Beckingham 1, Oil Depot, Ramper Road, Gainsborough, DN21 1AY	6
Island Gas Limited	Scampton North Sites Operational Wells, Welton Cliffe, Lincoln, LN2 3PU	7
Island Gas Limited	Welton Gathering Centre, Barfield Lane, Sudbrooke, Lincoln, LN2 2QU	8
WINGAS Storage UK Limited	Wingas Storage UK Operations, Saltfleetby Well Sites, Saddleback Road, Howdales, South Cockerington, LN11 7DJ	

Conclusion

4.16 This review has found that there are non sources of nuclear waste and only a small number of permitted sources of non nuclear radioactive waste within Lincolnshire. This strongly suggests that there is no critical mass of material requiring specialist capacity provision that needs to be planned for within the county. Most radioactive waste produced, classed as VLLW is likely to be disposed of through conventional management routes. Holders of permits for NORM arising from oil and gas exploration can be expected to make their own management arrangements.

5 Conclusion

- 5.1 Review of the above data sources allows the following conclusions to be reached about the need to plan for 'other wastes' in the Waste Local Plan:
1. Wastewater and the associated sludge appears to be catered adequately through arrangements made by Anglian Water & Severn Trent, the statutory sewerage undertakers. It is recommended that these undertakers be given specific opportunity to comment on the findings of this report and draft emerging policy positions to ensure that the proposed policies are sufficiently flexible to allow appropriate consideration of any proposals related to the expansion of wastewater and sludge treatment capacity that may come forward.
 2. Lincolnshire is not considered to generate sufficient quantities of agricultural waste that would warrant specific separate provision assuming the continuation of the existing arrangements. However, account ought to be taken of the current demand for the management of organic waste of agricultural origin at permitted organic waste treatment facilities (such as composting and anaerobic digestion) within Lincolnshire when accounting for future organic waste capacity requirements.
 3. This review has found that there are non sources of nuclear waste and only a small number of permitted sources of non nuclear radioactive waste within Lincolnshire. This strongly suggests that there is no critical mass of material requiring specialist capacity provision that needs to be planned for within the county. Most radioactive waste produced, classed as VLLW is likely to be disposed of through conventional management routes. Holders of permits for NORM arising from oil and gas exploration can be expected to make their own management arrangements.
- 5.2 On the basis of the above, it is considered that there is no need for the Waste Needs Assessment to involve further assessment of the 'other waste' streams.