

2<sup>nd</sup> October 2019



Comhairle Ceantair  
**Lár Uladh**  
**Mid Ulster**  
District Council

To: Councillor Gildernew )  
Councillor Graham )  
Councillor McAleer )  
Councillor McGuigan ) Mid Ulster District Council  
Councillor Robinson )

Mr A Cassells

Councillor Clarke )  
Councillor Fitzgerald )  
Councillor Garrity )  
Councillor Rainey ) Fermanagh & Omagh District  
Councillor Thompson )

Mr B Hegarty

Dear Sir/Madam

**Re: Tullyvar Landfill Site Joint Committee Meeting**

A meeting of the Management Committee for the development of Tullyvar Landfill Disposal Site will be held in the Office at Tullyvar Landfill Site on **Wednesday 9<sup>th</sup> October 2019 at 10.30am.**

1. Confirmation of Minutes of the AGM and Ordinary Meeting held on Wednesday 12<sup>th</sup> June 2019 (copies herewith)
2. Matters Arising from the Minutes
3. Landfill Capacity Report (copy herewith)
4. Financial Matters
  - 4.1 An update will be provided at the meeting
5. Update from Head of Environmental Services/Site Manager's Report
6. Any Other Business

7. Date of Next Meeting  
- Wednesday 12<sup>th</sup> February 2020

Yours faithfully

**Andrew Cassells**

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Director of Environment & Property

Copy: A Tohill  
K O'Gara  
M McAdoo  
A McIlwrath  
K McGowan

**MINUTES OF TULLYVAR JOINT COMMITTEE AGM MEETING HELD ON  
WEDNESDAY 12<sup>TH</sup> JUNE 2019 AT 10.30AM AT TULLYVAR LANDFILL SITE**

**PRESENT:**

- MID ULSTER:** Councillor McGuigan (Chair)  
Councillor Gildernew, Graham, McAleer & Robinson
- FERMANAGH & OMAGH:** Councillors Clarke, Fitzgerald, Garrity & Thompson
- OFFICERS:** A Cassells, M McAdoo, K McGowan, K O'Gara &  
A McIlwrath
- APOLOGIES:** Councillors Rainey  
Mr Hegarty

***Meeting commenced at 10.30am***

**1. WELCOME/OUTGOING CHAIR'S REMARKS**

The outgoing Chair, Councillor McGuigan welcomed new Members to Tullyvar Joint Committee and introductions were made.

The outgoing Chair thanked Members and Officers for their support throughout his term of Office.

Councillor McGuigan called for nominations for Chair.

**2. ELECTION OF CHAIR**

Proposed by Councillor Garrity  
Seconded by Councillor Thompson and agreed

That Councillor Rainey be elected Chair.

**3. ELECTION OF VICE CHAIR**

Proposed by Councillor Gildernew  
Seconded by Councillor McGuigan and agreed

That Councillor McAleer be elected Vice Chair.

Councillor McAleer thanked Members for her nomination and election and paid tribute to the outgoing Chair for his leadership and direction over the past year.

In the absence of the Chair, the meeting was Chaired by the Vice Chair.

**4. OVERVIEW REPORT – SITE MANAGER**

The Site Manager delivered a detailed power-point presentation which outlined the stages of early site development through to current day operations.

Copy presentation attached as appendix one.

The Vice Chair thanked the Site Manager for the comprehensive and informative presentation and acknowledged the good work and positive benefits from the site for both Councils.

**5. 2018/19 ANNUAL REPORT – SITE MANAGER**

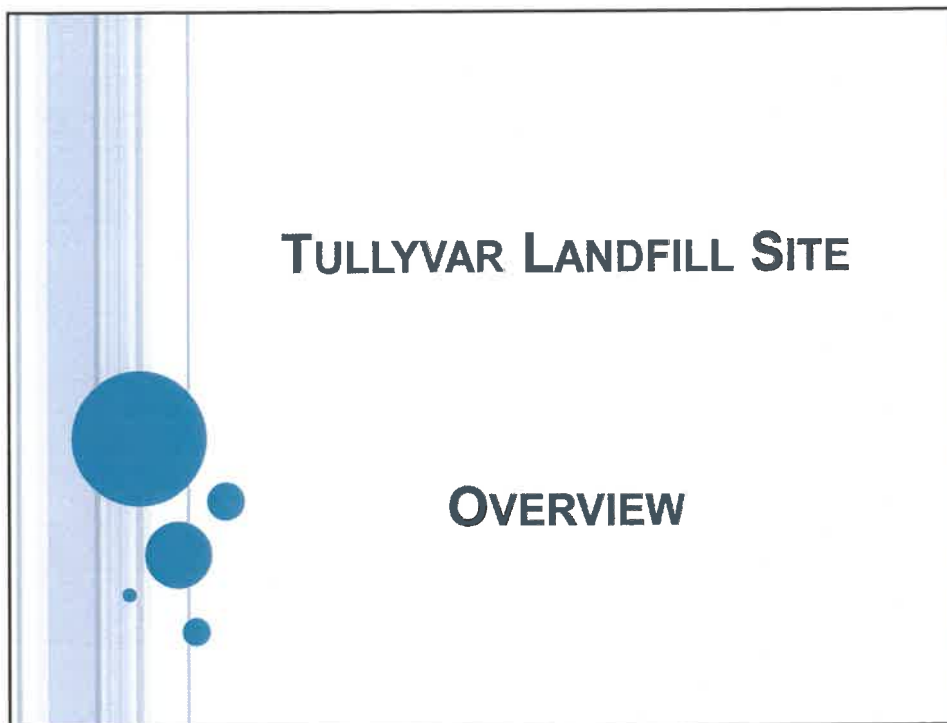
The Site Manager delivered a brief presentation detailing the financial status of the site including current aftercare provision.

Copy presentation attached as appendix two.

Councillor Thompson paid tribute to the Site Manager and commended his work and efforts in Managing the Landfill.

***Meeting ended at 10.45am***


# APPENDIX ONE



**TULLYVAR LANDFILL SITE -- OVERVIEW**

**Background**

- Opened 1995
- Jointly owned and managed by Mid Ulster and Fermanagh & Omagh District Councils.
- Until the site was mothballed in October 2018 it accepted a full range of household, inert, commercial and industrial waste each year.
- To date the site has accepted over 1.1 Million tonnes of waste with space for a further potential 630,000 Tonnes in, the as yet undeveloped, Cell 4.
- Tullyvar was one of the first fully engineered landfill sites to be built in Northern Ireland.
- Tullyvar was also one of the first sites in Northern Ireland to harness landfill gas to generate electricity.
- The site was awarded a Biodiversity Project of the Year award at the 2015 Sustainable Ireland Awards for our Integrated Constructed Wetlands.
- Following an initial investment of £800,000 to purchase the site, over £2 Million has since been returned to the 2 Councils as dividends in addition to providing 23 years of landfilling at below market rates.



### TULLYVAR LANDFILL SITE – OVERVIEW



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## TULLYVAR LANDFILL SITE – OVERVIEW

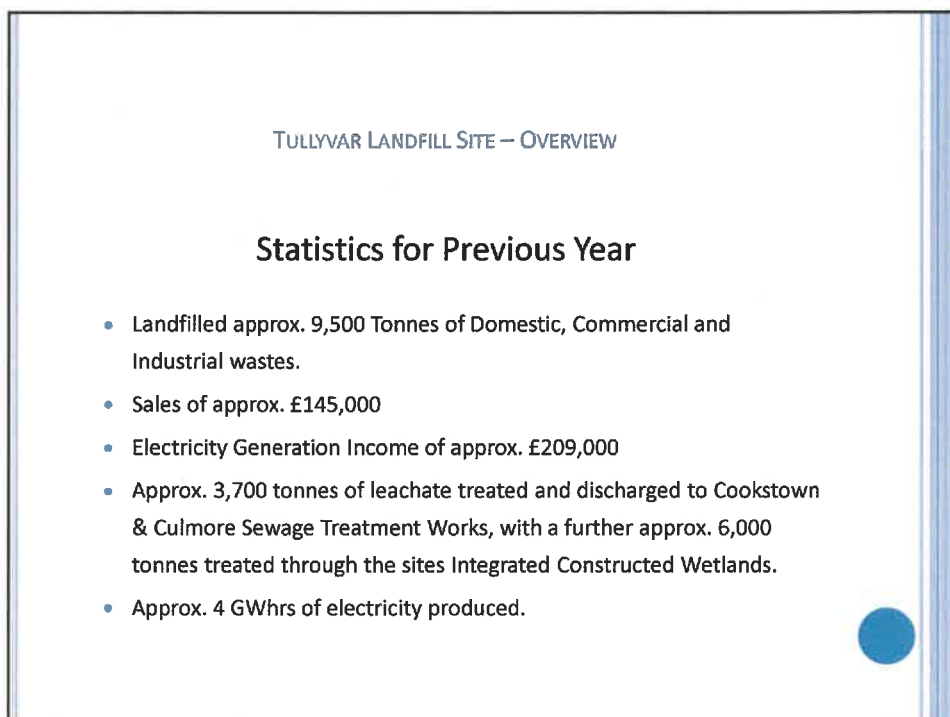
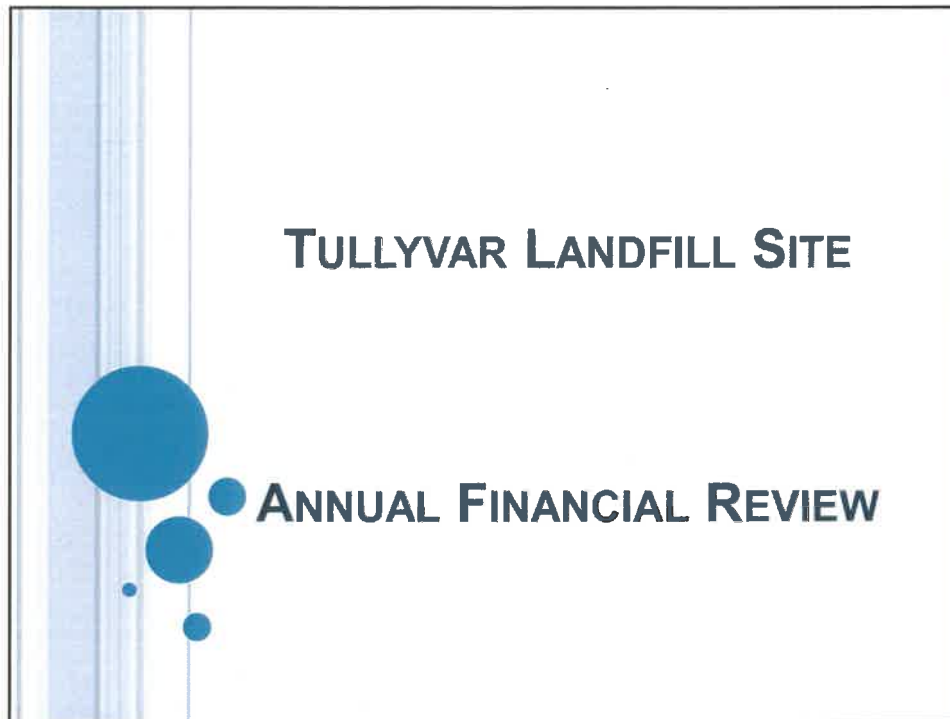


## TULLYVAR LANDFILL SITE – OVERVIEW

**Current & Future Operations**

- Operation of the mothballed site with ongoing leachate treatment and gas management.
- Permanent / Interim Capping of the remainder of Cell 1 covering approx. 17,000m<sup>2</sup> in Summer / Autumn 2019 at a cost of approx. £490,000.
- Installation of a 3<sup>rd</sup> set of Integrated Constructed Wetlands with a view to ceasing the tankering of leachate off-site within next 5 years and to automate the process as much as possible.
- Development of restoration scheme and investigating potential end uses for the site
  - e.g. - Waste Treatment Facility
  - Light Industrial
  - Amenity / Sports

## APPENDIX TWO



## TULLYVAR LANDFILL SITE – OVERVIEW

## Profit &amp; Loss Account

- Total Income for 2017/18 of approx. £355,000
- Operational expenses for 2017/18 of approx. £340,000
  - Salaries & Wages - £90,000
  - Plant Hire - £36,000
  - Rates - £35,000
  - Maintenance - £29,000
  - Environmental Monitoring - £23,000
  - Electricity - £19,000
  - Leachate - £18,000

## TULLYVAR LANDFILL SITE – OVERVIEW

## Balance Sheet

• Current Assets	-	£2,260,387.02
• Current Liabilities	-	£113,687.34
• Net Current Assets / Liabilities	-	£2,146,699.68

*Other Items*

• Projected Discounted Gas Income	-	£1,018,969.14
• Projected Discounted C & A Costs	-	£1,279,652.47

**MINUTES OF TULLYVAR JOINT COMMITTEE MEETING HELD ON WEDNESDAY  
12<sup>TH</sup> JUNE 2019 AT 10.30AM AT TULLYVAR LANDFILL SITE**

**PRESENT:**

<b>MID ULSTER:</b>	Councillor McAleer (Vice Chair) Councillor Gildernew, Graham, McGuigan & Robinson
<b>FERMANAGH &amp; OMAGH:</b>	Councillors Clarke, Fitzgerald, Garrity & Thompson
<b>OFFICERS:</b>	A Cassells, M McAdoo, K McGowan, K O'Gara & A McIlwrath
<b>APOLOGIES:</b>	Councillor Rainey Mr Hegarty

***Meeting commenced at 10.45am***

**1. CONFIRMATION OF MINUTES – 13<sup>TH</sup> FEBRUARY 2019**

The above minutes were adopted.

Proposed by Councillor Thompson

Seconded by Councillor McGuigan and agreed.

**2. MATTERS ARISING**

**2.1 Acceptance of Farm Plastics**

Councillor Robinson raised the issue of acceptance of farm plastics at Tullyvar and the need for farmers to have a disposal outlet. As a Council the Members did not wish to see an increase in fly tipping of this type of material.

Councillor Gildernew concurred with Councillor Robinson and requested that the matter be considered.

A Cassells advised that the matter was essentially one for MUDC as acceptance of waste at the CA site was an MUDC function. It was indicated that MUDC had a policy of accepting only commercial waste at its three principal sites.

Following discussion, the Joint Committee recommended and agreed that the respective Councils be requested to consider the matter.

Proposed by Councillor Gildernew  
Seconded by Councillor Robinson and agreed.

Councillor Fitzgerald also asked that the matter be considered in Fermanagh & Omagh Council. K O'Gara advised that commercial waste would require full cost recovery and a handling charge. It was suggested that it was cheaper to go to the private sector to collect and process.

### **3. FINANCIAL MATTERS**

The Statement of Payment dated December 18 Specials; December 18-January 19 and February 19-March 19 were presented for approval.

Proposed by Councillor Thompson  
Seconded by Councillor Robinson and agreed.

### **4. SITE MANAGER'S REPORT**

The Site Manager's Report was presented, copy attached as appendix one, reference being made to the undernoted:

#### **4.1 Reduction in Aftercare**

A Cassells advised that the reduction in aftercare from 60 years to 19 years was very positive. It was reported that the site management had been financially prudent over the years and Councils had not been asked for any financial contributions for the operation of the site. K O'Gara concurred adding that every operational and contract cost to date had been self-funded due to good management.

Councillor McGuigan enquired about future site development projects. A Cassells advised that the site was currently mothballed and therefore still had an active permit. A Landfill Capacity report currently under review would indicate when Tullyvar would be required to make a decision on the development of Cell 4. It was indicated there was a further 11 acres of the site available for future development and the utilisation of the grid connection was a valuable asset.

Councillor Clarke sought clarification on the implications of Brexit. A Cassells advised that the targets were currently enshrined in legislation (50% by 2020) and pending Brexit the UK will be required to establish its own targets.

#### **4.2 Capping Contract**

Site Manager outlined details of the proposed capping contract and following a procurement exercise it was recommended to award the contract to CivCo at a cost of £489,000 + 10% Contingency.

Members agreed to award the contract.

#### **4.3 Adoption of Report**

The Site Manager's Report and all foregoing recommendations were adopted.

Proposed by Councillor Fitzgerald  
Seconded by Councillor Thompson and agreed.

#### **5.0 ANY OTHER BUSINESS**

##### **5.1 Break-In**

Members were informed of a break-in at the site where a tractor, contractor digger and site tools were taken. It was confirmed that the matter was being dealt with by the PSNI and the Council's Insurer.

As a consequence, some planned changes would be required to what machinery would be retained and not sent for disposal as planned.

#### **6.0 DATE OF NEXT MEETING**

It was agreed to convene the next meeting on **Wednesday 9<sup>th</sup> October 2019 at 10.30am at Tullyvar Landfill Site.**

***Meeting ended at 11.15am***

**TULLYVAR JOINT COMMITTEE – 12<sup>th</sup> JUNE 2019****SITE MANAGER'S REPORT****1. Site Operational Update**

Between February and May approx. 215 tonnes of leachate per week was discharged to Cookstown Sewage Treatment Works. This is lower than normal for this time of year due to use of the sites Integrated Constructed Wetlands (ICW) which has reduced the need for tankering.

The electricity generation plant is currently operating at approx. 480kW (60% Capacity). This is lower than normal, partially due to some wells being temporarily disconnected for short periods to facilitate site capping preparation works. However, as the site ceased accepting most wastes over a year ago and has not taken any waste at all since October 2018 it is expected that electricity generation will continue to steadily fall. Current models have the site ceasing electricity production in 2027, however, microgeneration engines and the importing of surplus biogas from anaerobic digesters may be considered in the future to prolong generation at Tullyvar.

**2. Site Mothballing**

Works are currently ongoing to mothball the site and prepare for Phase 4 Capping, these works include:

- Finishing the regulation of Cell 1 leaving it ready for the application of geotextiles.
- Regrading of the soil stockpile area to reduce erosion.
- Comprehensive site clean-up and disposal of obsolete equipment.
- Regrading of the quarry rock face / Cell 4 to prepare for either lining or restoration.

Other works to be completed over the next year include:

- Excavations at the SW corner of the site to prepare for the installation of a drainage line from the base of Cell 4 to the settlement & discharge point.
- Minor site landscaping works and fencing repairs.
- Alterations to the site leachate treatment plant to increase automation and reduce the time officers need to spend on-site.
- Re-positioning of the gas ring main to allow for Phase 4 Capping (works to be carried out by Renewable Power Systems).

**3. Acceptance of Agricultural Plastic**

At the previous meeting it was agreed to investigate the acceptance of waste agricultural plastic at Tullyvar. In the year prior to the landfill site being mothballed, the site accepted approx. 50 tonnes of agricultural plastic over approx. 200 transactions ranging from 20kg to several tonnes. It is not currently possible to accept this waste at Tullyvar following the mothballing of the landfill site for a number of reasons. They are; this waste type is not permitted by the recycling centre site licence, there are no free bays for an additional skip to accommodate this waste, and finally Mid Ulster Council only accepts commercial waste at the three main recycling centres in



Dungannon, Cookstown and Magherafelt following the implementation of a prepay card system. There are a number of factors to consider:

- a) NIEA fees and possibly consultant costs in varying the site licence,
- b) Significant capital costs installing an extra skip bay,
- c) Costs in upgrading weighbridge software & equipment to allow for prepayment,
- d) A change in Mid Ulster District Council policy regarding the acceptance of commercial waste at smaller sites.

Given the above, members are therefore requested to consider the matter, and should they wish to pursue the matter to seek a fully costed proposal in relation to items a – c above in the knowledge that these costs may have to be borne by the Joint Committee.

#### **4. Closure & Aftercare Provisions**

Due to the potential environmental impact of large waste facilities it is necessary to model the long term financial liabilities and make provision for this liability in the Councils annual audited accounts. These models have recently been reviewed by our consulting engineers, WDR & RT Taggart with a view to more accurately predicting the number of years that the site must be managed for. The site must meet a number of closure criteria before the PPC Permits may be surrendered and a detailed computer model of the site is developed to predict when these criteria are likely to be achieved. This modelling takes into consideration the surrounding geology of the site, its lining system and the types and volumes of waste accepted at the site.

It is also a regulatory requirement for large waste facilities to have a financial bond in place to safeguard against operators going bankrupt or otherwise abandoning the site post closure. This would leave the Northern Ireland Environment Agency (NIEA) responsible for any clean-up or aftercare of the site. Local authorities are able to use a Local Authority Deed Agreement in lieu of a financial bond and at the previous major review in 2014 the 2 legacy councils established a joint Local Authority Deed Agreement with the NIEA. The value of these bonds / local authority deed agreements are typically based on the financial models generated for each site.

The review undertaken by WDR & RT Taggart resulted in a reduction in the number of years the site is predicted to require aftercare. The previous review in 2014 was based on an aftercare period of 60 years which was the standard at the time and the period recommended by the NIEA. The most recent modelling has estimated a revised aftercare period of 19 years for Tullyvar with the permit being surrendered in 2038. The value of the Deed is currently £1,374,869, and will rise slightly to £1,396,596 as a result of the most recent review. At the previous review Tullyvar offset a large proportion of the Local Authority Deed value by committing the sites future gas income and monies held in the sites provision account solely to aftercare and closure. Therefore, the large reduction in costs achieved by reducing the number of aftercare years has allowed greater flexibility for these monies to be used for other purposes. In practice the NIEA will be very unlikely to exercise this Deed as Tullyvar is fully provisioned for restoration and aftercare and both Councils are keenly aware of their environmental responsibilities at the site. Members are therefore requested to approve the revision of the sites Local Authority Deed to £1,396,596 and for it to be signed and sealed by both Councils.



## 5. Phase 4 Capping

The sites PPC Permit / Planning Permission require that the landfill must be suitably capped within 12 months of the infilling of waste ceasing in any particular Cell. Cell 1 ceased accepting waste in October 2018 and is therefore due for capping. The works will mainly consist of the installation of a composite capping system over an area of approximately 17,000m<sup>2</sup> as well as the installation of a bund for stability and drainage. Of the capped area, approx. 10,500m<sup>2</sup> will be final capping and restoration and the remainder as an interim cap. Carrying out the final capping and restoration as soon as possible after the rapid phase of settlement has completed will have major benefits in terms of leachate reduction and visual impact. The interim cap while serving a similar purpose to the final cap is designed to be cheaper to install, utilise leftover geotextiles from the previous capping operation while still being able to be upgraded to a permanent cap with minimal additional works should Cell 4 not be developed.

The composite capping system will capture the gases produced from degradable wastes and will mitigate the infiltration of surface water into the waste body. The composite capping system will consist of the following:

- Soil Regulation Layer (min. 200mm);
- Geosynthetic Clay Liner;
- Surface Water Drainage Layer;
- Protection Layer (min. 300mm); and
- Restoration Soils (min. 700mm of subsoil and/or top soil).

The waste surface has already been prepared, including regrading where necessary to create a profile that will direct surface water to the new and existing surface water drains. The sloped profile will allow for a degree of settlement to prevent surface water ponding above the cap. A flat plateau on the top of the site has been created to accommodate the new Constructed Wetlands. These wetlands will be planted with 2 different species of reeds and once established will allow for additional leachate treatment capacity at Tullyvar. It is envisaged that once all of the wetlands become established the site will be able to discontinue leachate tankering.

A new groundwater drainage line is also being installed on the floor of the unlined Cell 4 which will prevent flooding and reduce costs during the mothball and aftercare period. This line will take groundwater away from the floor of Cell 4 to the existing settlement pond prior to discharging into the adjacent Hadden's Burn, without the need for pumping.

Tenders were received for this project via the eTendersNI web portal and were assessed in conjunction with our consultants (WDR & RT Taggarts) and the procurement section, on the 29<sup>th</sup> May 2019. Members are therefore requested to approve the award of the contract for the Phase 4 Capping Works and Constructed Wetlands at Tullyvar Landfill Site to CivCo Ltd. in the Tender Assessment Total Price of Four Hundred and Eighty Eight Thousand, Eight Hundred and Ten Pounds and Fifty Pence (£488,810.50) plus VAT and a 10% contingency. The monies for this project are already provisioned for in the sites restoration and aftercare fund. The proposed project is expected to begin in July and run for a period of 6 months.

THE RISKS NOTED ARE IN ADDITION TO THE NORMAL RISKS FACED BY A COMPETENT CONTRACTOR DEALING WITH THE TYPE OF WORKS DETAILED ON THIS DRAWING.

- THE KEY RESIDUAL/SIGNIFICANT RISKS ARE IDENTIFIED BELOW**
1. CONTAMINATED LAND AND GROUND GASES
  2. UNSTABLE SLOPES - SLIPPS, TRIPS AND FALLS
  3. UNDERGROUND SERVICES
  4. SITE TRAFFIC HAZARDOUS
  5. CONFINED SPACES
  6. HEALTH ISSUES - WORKING CLOSE TO LANDFILL WASTE



CAPPING AREA  
PROPOSED SOIL CONTOURS  
EDGE OF EXISTING CAP  
GAS WELL / GAS MANIFOLD BOX

PHASE 1 CAPPING AREA

### PROPOSED EXTENSION TO

MAIN

**OVERFLOW PIPE 160mm HDPE**

**DRAIN**

1000

## MANHOLES

## RODDING EYE

550mm SUBSOIL &amp; 150mm TOPSOIL.

700mm SUBSOIL (70 topsoil)

**FOR TENDER**

Rev. No. A

INDUMENT DETAILS	BY	DATE
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### PROPOSED SOIL LEVELS AND INFRASTRUCTURE

**TULLYVAR LANDFILL SITE  
PHASE 4 CAPPING WORKS AND  
CONSTRUCTED WETLANDS**

SHEET SIZE DATE

0.04.2019	1:500	RY	AT
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DRG No.

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Rev.

**Russell Business Centre**  
40-42 Lisburn Road  
Belfast BT9 6AA  
Tel 028 9521 3654



WDR &amp; RT TAGGART

Architects  
Civil Engineers  
Environmental Engineers  
Landscape Architects  
Town Planning Consultants  
Project Managers



# WASTE & ENERGY



**WDR & RT TAGGART**



Comhairle Ceantair  
**Lár Uladh**  
**Mid Ulster**  
District Council

## **NORTHERN IRELAND LANDFILL CAPACITY REPORT 2019**

Version 00 – 14<sup>th</sup> June 2019


**Architects**  
**Civil Engineers**  
**Structural Engineers**  
**Environmental Engineers**  
**Landscape Architects**  
**Town Planning Consultants**  
**Health & Safety Consultants**  
**Project Managers**

**HEAD OFFICE**  
Laganwood House  
Newforge Lane  
Malone Road  
**BELFAST**  
**BT9 5NX**

t: 028 9066 2121  
e: [mail@wdr-rt-taggart.com](mailto:mail@wdr-rt-taggart.com)  
w: [www.wdr-rt-taggart.com](http://www.wdr-rt-taggart.com)



<b>TITLE</b>	<b>NORTHERN IRELAND LANDFILL CAPACITY REPORT 2019</b>
<b>PROJECT</b>	NORTHERN IRELAND LANDFILL CAPACITY
<b>CLIENT</b>	MID ULSTER DISTRICT COUNCIL
<b>DATE</b>	14 <sup>th</sup> JUNE 2019
<b>STATUS</b>	FINAL
<b>VERSION</b>	00
<b>AUTHOR</b>	ADRIAN THOMPSON



**WDR & RT TAGGART**

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**DOCUMENT CONTROL**



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# **1 Introduction**

WDR & RT Taggart have been appointed by Mid Ulster District Council to undertake a study into future landfill capacity in Northern Ireland. This is the second review of Northern Ireland landfill capacity which allows a tracked comparison of changes in the market.

Northern Ireland has seen a change in the management of waste over the past 15 years, moving from landfill disposal of waste to the recycling and composting of appropriate wastes with a large volume of the residual waste sent for processing and energy recovery.

Even with the waste treatment and processing solutions currently delivered and proposed by the private and public sector it is acknowledged that there will still be the need for non-hazardous landfill capacity in Northern Ireland to deal with material that cannot be recovered.

The purpose of this report is to look at the existing landfill capacity in Northern Ireland and assess the potential future capacity requirements.

# **2 Scope of the Study**

The scope of this study is to assess:

1. Current landfill capacity;
2. The latest reported volume of waste landfilled;
3. Northern Ireland future landfill capacity looking at a number of scenarios such as the early closure of Local Authority owned sites, the potential implementation of the arc21 EfW facility (Beacon), potential waste growth and statutory recycling targets;
4. Identification of potential sites for development; and
5. Ranking of potential development sites based on a series of criteria.

# **3 Policy Context**

## **3.1 Introduction**

Current and future waste management activities are influenced by the legislative and policy framework in Northern Ireland. This includes EU waste policy which aims to reduce the environmental and health impacts of waste and improve resource efficiency. The majority of waste policy and guidance is based on EU Directives which are then translated into National legislation and policy within certain timescales.

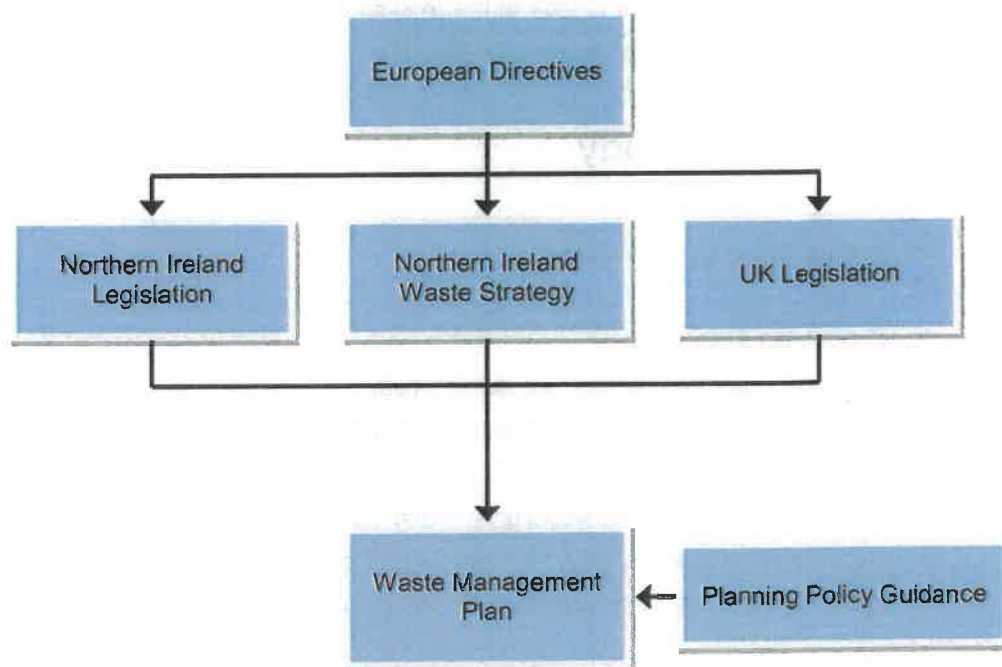


Waste legislation in Northern Ireland is implemented in three levels, comprised of European Union Directives, UK wide legislation and Northern Ireland specific legislation and policy (Northern Ireland Orders, Regulations and national planning guidelines). In Northern Ireland, EU Directives are implemented through primary and secondary legislation. Primary legislation includes Orders and Acts and secondary legislation includes Regulations and planning guidelines.

This Section provides an overview of current and anticipated waste policy and legislative measures in order to identify and understand the key issues that need to be taken into account when assessing landfill capacity requirements.

The overall place and strategic influence of EU policy in the legislative and policy framework in Northern Ireland is set out in Figure 3.1 below.

**Figure 3.1 Legislative and Policy Framework**



It should be stressed that this Section provides a simple overview of waste policy and legislation. It is not exhaustive, and does not detail every piece of legislation or every policy measure.





### 3.2 Current EU Waste Policy and Legislation

The EU gives strong direction to its member states on waste issues and much of UK and NI waste policy and guidance is based on EU legislation. EU waste policy and legislation had an initial focus in putting in place measures to manage and control waste and this led to the adoption of the Waste Framework Directive (75/442/EEC) in 1975. This, together with the Hazardous Waste Directive, which was also originally adopted in 1975, and the Waste Shipment Regulation (Regulation (EEC) 259/93) put in place the regulatory framework for waste. These pieces of legislation define waste, and other fundamental concepts including licensing, and put in place controls for the handling and movement of waste, to prevent damage to the environment or human health.

Recycling, re-use and energy recovery, in preference to the disposal of waste came with the 1996 Waste Strategy Communication from the European Commission which:

- Reinforced the Waste Hierarchy.
- Re-affirmed the 'polluter pays' principle for waste; and
- Developed the concept of Priority Waste Streams.

The Thematic Strategy on the Prevention and Recycling of Waste is one of the seven thematic strategies programmed by the Sixth Community Environmental Action Programme which was adopted by the European Commission on 21 December 2005. The Strategy confirmed the need to shift direction in order to meet the challenges of the future in delivering a sustainable approach to waste and resource management. The Strategy noted the need to assess the existing definitions of recovery and disposal, the need for a generally applicable definition of recycling and a debate on the definition of waste.

Directive 2006/12/EC of the European Parliament and of the Council of 5 April 2006 on waste established the legislative framework for the handling of waste. It defines key concepts such as waste, recovery and disposal and puts in place the essential requirements for an establishment of waste management operations to have a permit or to be registered and placed an obligation for member States to prepare waste management plans. Furthermore is also established principles such as an obligation to handle waste in a way that does not have negative impacts on the environment or human health, an encouragement to apply the waste hierarchy and, in accordance with the polluter-pays principle, a requirement that the costs of disposing of waste must be borne by the holder of waste, by previous holders or by the producers of the product from which the waste came.

The outcome of the Thematic Strategy on the Prevention and Recycling of Waste resulted in the revision of the Waste Framework Directive.

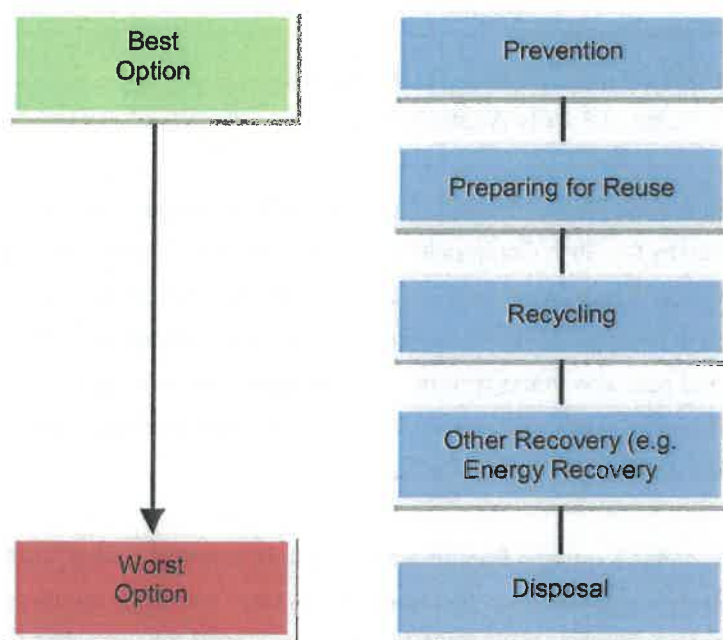


### 3.2.1 Revised Waste Framework Directive (WFD)

The Waste Framework Directive (2008/98/EC) is the overarching legislative framework and is of particular significance to the study. It provides a foundation for sustainable waste management practice and defines waste. This Directive, which was adopted on the 19th November 2008, sets out measures to minimise the negative effects of the generation and management of wastes on human health and the environment and aims to reduce the use of resources. This Directive also repealed the directive on Waste Disposal (75/439/EEC).

A key component of the revised WFD is the new Waste Hierarchy, the primary purpose of which is to, minimise adverse environmental effects from waste and to increase resource efficiency in waste management and policy. Article 4 of the WFD sets out the new Waste Hierarchy as a priority order for waste management, as set out in Figure 3.2 below.

**Figure 3.2 Waste Management Hierarchy**



Waste prevention is set out as the most favourable option even though it is not technically a waste measure, as it occurs before a material becomes waste. However, the reduction of waste through reuse or other policy initiatives is a key objective of turning waste into a resource. Preparing for Reuse has also been included in the new Waste Hierarchy above Recycling with the aim of also improving resource efficiency.

When applying the Waste Hierarchy the WFD states that measures should be taken to encourage the options that deliver the best overall environmental outcomes.



In order to move towards a recycling society with a high level of resource efficiency the revised WFD also implements new targets for the reuse and recycling of materials.

- To achieve a recycling rate of 50% (including preparing for reuse) of household waste by 2020.
- To achieve a recovery rate of 70% (including preparing for reuse, recycling and other materials recovery) for all non-hazardous construction and demolition waste by 2020.

The revised WFD also specifies the requirement for waste management plans and strategies to be established which set out the current waste management situation, as well as the measures to be taken to improve reuse, recycling, recovery and disposal of waste.

The requirements of the revised WFD have been transposed into Northern Ireland legislation through the Waste Regulations (Northern Ireland) 2011.

### **3.2.2 Landfill Directive**

The aim of the Landfill Directive (99/31/EC) is to provide measures, procedures and guidance to prevent or reduce as far as possible the negative effects on the environment from landfill waste. This is to be implemented through changing the way waste is disposed and progress up the waste management hierarchy achieved, through the minimisation of waste being sent to landfill.

Key objectives of the Landfill Directive include:

- The categorisation of landfills as inert, non-hazardous and hazardous;
- Ban on the co-disposal of hazardous and non-hazardous waste;
- Ban on the disposal of tyres;
- Ban on the landfill of certain types of hazardous wastes such as clinical or infectious;
- Standard waste acceptance procedures, which include the treatment of waste prior to landfilling;
- Operating permits, including the provisions for closure and aftercare;
- Technical standards for the lining and capping of landfills;
- Practice pre-treatment of waste going to landfill; and
- Reduction in the amount of biodegradable waste sent to landfill.

The requirements of this Directive are implemented in Northern Ireland through the Landfill (Northern Ireland) Regulations, 2003 SR 297 (as amended) and the Landfill (Amendment) Regulations (Northern Ireland), 2011 SR 101.



### **3.2.3 Industrial Emissions Directive**

The Industrial Emissions Directive (2010/75/EC) recasts seven existing EU Directives including the Waste Incineration Directive, the Integrated Pollution Prevention and Control (IPPC) Directive, Solvents Directive and Large Combustion Plants Directive.

The Directive aims to improve the interaction between the seven Directives that it will replace, as well as strengthening the provisions in them.

The current legislative framework uses the concept of "best available techniques" (BAT) for dealing with potential pollution. Under this, the conditions in each installation's permit have to be based upon the application of BAT relevant to the industry sector concerned.

The Directive gives more emphasis to BAT requirements and some activities become newly subject to IPPC, but the framework of the existing Directives as currently implemented in the UK remain otherwise mostly unchanged.

The Directive was implemented into UK law in January 2013 and is implemented in Northern Ireland through the Pollution, Prevention and Control (Industrial Emissions) Regulations (Northern Ireland), 2012.

### **3.2.4 Transfrontier Shipment of Waste Regulations**

The Transfrontier Shipment of Waste Regulations 2007 as amended by the Transfrontier Shipment of Waste (Amendment) Regulations 2008 set out procedures for the movement of all waste materials within and outside the EU.

They are made in accordance with and deal with the enforcement of Regulation (EC) 1013/2006 on shipments of waste, which sets out details for the supervision and control of shipments of waste.

### **3.2.5 Environmental Impact Assessment Directive**

The Environmental Impact Assessment Directive (85/337/EC), as amended by Directive 97/11/EC, concerns the impact of the development on the environment prior to the granting of planning permission for a proposed development.

This Directive is implemented in Northern Ireland through the Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 1999.



### **3.2.6 Environmental Liability Directive**

The Environmental Liability Directive (2004/35/EC) aims to establish a framework of environmental liability based on the 'polluter-pays' principle, in order to prevent and remedy environmental damage.

This Directive applies to:

- Environmental damage, or the threat of any damage, from any of the following occupational activities;
  - operation of installations under Directive 96/61/EC, on integrated pollution prevention and control,
  - waste management operations,
  - discharges into inland surface waters,
  - discharges into groundwater,
  - discharge or injection of pollutants into surface water or groundwater,
  - water abstraction and impoundment of water,
  - manufacture, use, storage, processing, filling, release and transport of dangerous substances or preparations, plant protection products or biocidal products,
  - transport of dangerous or polluting goods,
  - operation of installations under Directive 84/360/EEC, on air pollution from industrial plants,
  - any contained use or deliberate release of genetically modified organisms,
  - transboundary shipments of waste,
- operation of storage sites in accordance with Directive 2009/31/EC, on the geological storage of carbon dioxide; and
- damage, or the threat of any damage, to protected species and natural habitats caused by any occupational activities not listed above.

The Directive is implemented in Northern Ireland through the Environmental Liability (Prevention and Remediation) Regulations (Northern Ireland) 2009 SR2009/252.

## **3.3 EU Thematic Strategies**

Thematic Strategies have been developed to reorganise the legislation concerning the environment with an aim of simplifying the complex legislative package. Seven separate strategies have been developed. These strategies focus on key environmental impacts, three of which are relevant to waste management in Northern Ireland.



### **3.3.1 Thematic Strategy on the Prevention and Recycling of Waste**

This strategy is concerned with the environmental impact of emissions from poorly managed waste and inefficient consumption and production patterns. Additionally the Strategy intends to encourage more recycling within Member States.

A report from the Commission to the European parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on the Thematic Strategy on the Prevention and Recycling of Waste was completed in 2011. This Communication reviewed progress towards achieving the Strategy's objectives.

This communication concluded that the Strategy has played an important role in guiding policy development and that significant progress has been achieved on a number of fronts, particularly in the improvement and simplification of legislation, the establishment and diffusion of key concepts such as the waste hierarchy and life-cycle thinking, on setting focus on waste prevention, on coordination of efforts to improve knowledge, and on setting new European collection and recycling targets.

## **3.4 National and Local Policy and Legislative Context**

### **3.4.1 Introduction**

The framework within which waste facilities are developed is provided by specific legislative and policy measures which include:

- Waste Legislation - including UK legislation and Northern Ireland Orders and Regulations.
- Waste Management Strategy - setting out government's policy for the management of waste. Associated guidance provides clarification and information on aspects of waste management policy, and its implementation.
- Land Use Planning - Strategies, Area Plans and Planning Policy Statements.

It is the framework that implements the requirements of EU policy and Directives, as set out in above, at the regional level. This section therefore provides an overview of waste policy and legislation in place in Northern Ireland to consider those issues relevant to the study.

Waste legislation is a complicated issue, and this section seeks to provide a simple overview, summarising the key relevant legislative provisions of the main pieces of legislation.





### 3.4.2 Waste Management Policy

#### **Northern Ireland Waste Management Strategy: Delivering Resource Efficiency**

The Strategy is a revision of the current Northern Ireland Waste Management Strategy: Towards Resource Management which was published in March 2006 and set the strategic direction for waste management in Northern Ireland at the time.

The Strategy moves the emphasis of waste management in Northern Ireland from resource management (with landfill diversion as the key driver) to resource efficiency, that is, using resources in the most effective way while minimising the impact of their use on the environment. This Strategy has a renewed focus on waste prevention (including reuse), preparing for reuse and recycling in accordance with the waste hierarchy, as set out in Figure 3.2.

The key principles of the Strategy are:

- Waste Hierarchy – indicates the relative priority of the different methods of managing waste.
- Life Cycle Approach – to take into account the overall impacts that an approach or service will have throughout its whole life, that is, from cradle to grave.
- Polluter Pays Principle – means that waste generators should pay the costs of providing services to manage their wastes.
- Proximity Principle – emphasises the need to treat or dispose of waste as close as practicable to the point of generation, to minimise the environmental impact of waste transportation
- Integration of Waste Streams – encouraging the development of waste management solutions that encompass all waste.

In agreement with the European Commission the definition of municipal waste in Northern Ireland has been broadened and this is reflected in the revised Strategy. The definition now includes waste from all households and all wastes of similar nature and composition to households, including commercial wastes, whoever collects it. Previously, the definition only included wastes which were collected by Councils and these are now defined as Local Authority Collected Municipal Waste. These revised definitions are set out below.

- Municipal Waste – waste from households and other waste which is similar in nature to waste from a household. This includes Commercial and Industrial waste which is similar in nature to waste from a household.
- Local Authority Collected Municipal Waste – waste that is collected by, or on behalf of, a Council



The targets set out in the Strategy include:

#### **Household Waste**

- To achieve a recycling rate of 45% (including preparing for reuse) of household waste by 2015 (Programme for Government Target).
- To achieve a recycling rate of 50% (including preparing for reuse) of household waste by 2020.
- To achieve a recycling rate of 60% (including preparing for reuse) of Local Authority Collected Municipal Waste)

### **3.4.3 Waste Management Legislation**

#### **Primary Legislation**

##### **Waste and Contaminated Land (Northern Ireland) Order, 1997 SI 2778 (including Amendments)**

This Order was enacted into Northern Ireland legislation in March 1998 and largely incorporates European Waste Framework Directive 75/442/EEC and Amendments. The aim of the Order is to set out provisions relating to waste on land, the collection and disposal of waste, land contamination by pollution, the controlled use, supply or storage of prescribed substances and articles and the obtaining of information on potentially hazardous substances. The Order enacts provisions relating to the effective management of wastes including Duty of Care Regulations, Registration of Carriers, Waste Management Licensing, Hazardous Waste and Producer Responsibility.

The Order also included the requirement for a Waste Management Strategy to be developed for the recovery and disposal of waste in Northern Ireland, along with a Waste Management Plan to be prepared for each Council including appropriate arrangements for managing controlled waste arisings.

##### **The Waste and Emissions Trading Act, 2003**

The main aim of this Act is to meet European Landfill Directive objectives and develop a system for the disposal of biodegradable waste, including biodegradable municipal waste. Within this Act, Government have been allocated landfill allowances to distribute to waste disposal authorities on a yearly basis. Landfill allowances can be bought, traded or sold to allow targets to be met. The DAERA NI determine how much biodegradable municipal waste can be sent to landfill and it is the responsibility of the allocating authority to ensure that these levels are not exceeded.





## **Secondary Legislation**

### **The Waste Regulations (Northern Ireland) 2011 SR 127**

These Regulations came into effect in April 2011, and implement the revised Waste Framework Directive. The Regulations apply the waste hierarchy as a priority order in waste prevention and management policy:

- Prevention;
- Preparing for re-use;
- Recycling;
- Other recovery (e.g. energy recovery); and
- Disposal.

The provisions relating to:

- The Waste Hierarchy, came into force on 8 October 2011; and
- The separate collection of at least paper, metal, plastic and glass will come into force on 1 January 2015.

These Regulations implement Directive 2008/98/EC, on waste (the revised Waste Framework Directive), in order to help achieve its overall objectives of:

- Protecting the environment and human health;
- Reducing waste and encouraging it to be used as a substitute for other non-renewable resources;
- Making sure the EU becomes a recycling society by applying the principles of:
  - Self-sufficiency,
  - Polluter pays, and
  - Proximity.

### **The Landfill Allowance Scheme (Amendment) Regulations (Northern Ireland) 2011**

The Northern Ireland Landfill Allowances Scheme (NILAS) came into force on 1st April 2005 and applies to Northern Ireland only. They supplement the Waste and Emissions Trading Act, 2003 by making detailed provisions for the allocation, borrowing, transfer and monitoring of landfill allowances allocated to Councils.

The Landfill Allowances Scheme (Amendment) (Northern Ireland) Regulations, 2005 came into force on 1st March 2006 and provide an amendment to the Landfill Allowances Scheme whereby the level of penalty to which a Council is liable for failing to meet the landfill diversion targets is reduced from £200 per tonne, as specified in the Waste and Emissions Trading Act, 2003 to £150 per tonne.



The Landfill Allowances Scheme (Amendment) Regulations (Northern Ireland) 2009, No. 46 came into operation on 1 April 2009, amend the NILAS 2004 Regulations by reducing from 71% to 64% by weight (rounded up to the nearest tonne), the assumed amount of biodegradable municipal waste in an amount of collected municipal waste.

It should be noted that Defra has been in discussions with the European Commission in regard to changing the way in which the UK meets its landfill allowance targets. As a result of this, a consultation was issued in March 2010 with the aim of addressing the implications of changing the approach adopted by the UK in meeting the diversion targets. Key to this was a change in the way in which municipal waste is classified with plans proposed to broaden this definition to include most notably commercial or industrial wastes not collected by or in control of Councils. The implication of this was a significant increase in the amount of waste classified as municipal waste.

This would subsequently require a change to the targets for diverting BMW from landfill, although it has been stated that the Authority allowances will not be affected for the portion of the waste formally defined as municipal. In order to achieve this, there was a need for the UK to review the way in which obligations have been reported. It would appear that the current preferred option would be to measure the BMW content of the waste at the point at which it is landfilled, based on the tonnages of the waste and the European Waste Catalogue Codes to which the waste pertains.

In addition, consideration has been afforded to changing the approach adopted by the UK in meeting the targets. The proposals for this include additional landfill restrictions as well as using the statutory recycling targets and waste prevention plans within the revised Waste Framework Directive as drivers for change.

The Landfill Allowances Scheme (Amendment) Regulations (Northern Ireland) SR 2011/373 amend the Landfill Allowances Scheme (Northern Ireland) Regulations 2004 by providing for the use of the term "local authority collected municipal waste". The term "local authority collected municipal waste" was introduced to the Waste and Emissions Trading Act 2003 (c.33) (the "2003 Act") by the Waste and Emissions Trading Act 2003 (Amendment) Regulations 2011 (S.I.2011 No.2499). The term is used in provisions relating to the setting up and operation of landfill allowance schemes and is distinguished from the use of the term "municipal waste" to describe the waste that must be diverted from landfills under Article 5(2) of Council Directive 1999/31/EC on the landfill of waste.

It is the Department's view that NILAS will, in the short term at least, maintain an important role in contributing to reductions in BMW to landfill in line with the new EU landfill diversion targets.



### **Waste Management Licensing Regulations (Northern Ireland), 2003 and Amendments**

The Waste Management Licensing Regulations (Northern Ireland) 2003, which came into operation on 19th December 2003, implement the waste licensing requirements of the Waste and Contaminated Land Order. Northern Ireland Environment Agency is directly responsible for the implementation of these Regulations.

Under the 1997 Order, licenses will be required to authorise:

- The deposit of controlled waste in, or on, land;
- The disposal and treatment (including recovery) of controlled waste; and
- The use of certain mobile plant to control or treat controlled waste.

All facilities must be covered by a licence unless they hold Pollution Prevention and Control (PPC) permits (as is the case for incinerators and landfills) or they hold a registered exemption from licensing.

### **Transfrontier Shipment of Waste Regulations, 2007 SI 1711 (as amended)**

These Regulations enforce Regulation (EC) No 1013/2006 of the European Parliament and of the Council on shipments of waste.

These Regulations:

- Set out the competent authorities for the purposes of the Community Regulation.
- Requires the Secretary of State to implement a waste management plan that contains his policies on the bringing into, or dispatch from, the United Kingdom of waste for disposal.
- Requires the Secretary of State to consult on that plan and requires the competent authorities of dispatch and destination to object to shipments of waste that do not comply with that plan.
- Creates a number of offences in relation to the shipping of waste which breach and/or fail to comply with the requirements of the Community Regulation in relation to management of shipments such as shipments of waste to or from the United Kingdom to or from other member States, to exports of waste to and from the United Kingdom to third countries, to the transit of waste through the United Kingdom to and from third countries.
- Sets out the fees that will apply in Northern Ireland. Regulation 47 provides for competent authorities to recover the costs of take-back under Articles 22 and 24 of the Community Regulation.
- Sets out the procedure applicable to the application for an approval of a financial guarantee or equivalent insurance.



- Provides that the Regulations must be enforced by the competent authorities and sets out the enforcement powers of competent authorities, authorised persons and officers of Revenue and Customs.

#### **The Controlled Waste Regulations (Northern Ireland), 2002 (as amended)**

These Regulations came into force on the 27 August 2002 and apply to Northern Ireland only. They allow Regulations to be made for the treatment of waste of any description and are made in accordance with the Waste and Contaminated Land (Northern Ireland) Order. The Regulations provide definitions of the wastes to be classified under household waste, commercial and industrial waste as well as classifying the types of household waste for which a collection charge may be made by Councils.

#### **Pollution, Prevention and Control Regulations (Northern Ireland), 2003 SR46**

The Pollution, Prevention and Control Regulations (Northern Ireland), 2003 establishes a regulatory system that employs an integrated approach to controlling the environmental aspects of industrial activities such as energy generation, metals, minerals, waste management of chemicals, textile treatment, food production and intensive farming. This system is designed to protect the environment as a whole through a single permitting process by promoting the use of clean technology using Best Available Techniques (BAT). These regulations were amended in 2004 and 2007 to include additional activities.

It should be noted that these regulations will be revoked and replaced on 14th January 2014 by the Pollution, Prevention and Control (Industrial Emissions) Regulations (Northern Ireland), 2012. These are discussed in further detail below.

#### **Pollution, Prevention and Control (Industrial Emissions) Regulations (Northern Ireland) SR 2012 / 453**

These new Regulations came into force in January 2013. They implement Directive 2010/75/EU on industrial emissions (integrated pollution, prevention and control) and incorporates a number of other EU measures on industrial pollution (including those on waste incineration, large combustion plant and solvent emissions). These new regulations will revoke the current Pollution, Prevention and Control Regulations (Northern Ireland), 2003 on 7<sup>th</sup> January 2014.

In particular, the regulations will require those facilities that recover, or undertake a mix of disposal and recovery of non-hazardous waste with a capacity exceeding 75 tonnes per day involving one or more of the following activities to operate under a Pollution Prevention and Control permit. With regard to waste management, these activities include:



- Biological treatment;
- Pre-treatment of waste for incineration or co-incineration;
- Treatment of slags and ashes; and
- Treatment in shredders of metal waste, including waste electrical and electronic equipment and end-of-life vehicles and their components.

#### **Landfill Tax Regulations, 1996 and Amendments**

The Landfill Tax Regulations outline various administrative procedures which relate to the operation of the landfill tax system, specifically the registration of those organisations that intend to make disposals covered by the tax and the payment of tax.

These Regulations came into force on 1st May 2004 and apply to England, Wales and Northern Ireland. They amend the Landfill Tax Regulations, 1996 by increasing the maximum credit that landfill site operators may claim against their annual landfill tax liability.

The Landfill Tax (Amendment) Regulations 2009 which come into force on 1st September 2009 revoke Part of the Landfill Tax Regulations 1996 which relates to temporary disposals of material on a landfill site and introduce a new requirement to give information and keep records in relation to information areas. Material on a landfill site which is not going to be disposed of as waste must be deposited in an information area until the Commissioners clarify the taxable status of the material.

The Landfill Tax (Prescribed Landfill Site Activities) Order 2009, which comes into force on 1st September 2009, prescribes certain activities which take place on a landfill site for the purposes of the Finance Act. The effect of this is that the prescribed activities will be treated as disposals and will be subject to landfill tax. Three of the activities are the use of material to create or maintain temporary hard standing, the use of material to create or maintain a temporary screening bund and the use of material to create or maintain a temporary haul road. The Regulation provides for landfill tax to be re-credited when material has been used in one of these three ways and is subsequently used for site restoration.

### **3.5 Waste Management Plans**

#### **3.5.1 Waste Management Plans**

The aim of the current 3 Waste Management Plans are to develop a waste management system that meets the region's needs and contributes to economic and sustainable development. The defined objectives of the Plans are as follows:



1. To develop treatment facilities and / or let contracts to meet the needs of the individual regions.
2. To minimise the amount of waste produced within the region.
3. To maximise resource efficiency.
4. To minimise environmental impacts.
5. To ensure, as a minimum, that the identified facilities and services are in place in time to enable district councils to meet their statutory targets and obligations.
6. To encourage regional self-sufficiency, as far as practicable and economical, within the Regions.
7. To ensure that the actions and measures identified in the Plan are:
  - a. Deliverable, with respect to timescales for implementation; and
  - b. Practical, building upon existing services and facilities within the region.
8. To identify and manage risks (financial, planning and contractual) in a systematic manner, to ensure that risks lie with those parties' best placed to manage them effectively.
9. To adopt a regional approach to the sharing of targets to ensure that Northern Ireland as a whole is able to meet its targets, with individual action and targets agreed for each Council, taking into account demographic factors, including spread of population and associated costs for the provision of services.

## **3.6 Planning Policy**

### **3.6.1 Shaping Our Future- Regional Development Strategy for Northern Ireland 2035**

Shaping Our Future: The Regional Development Strategy for Northern Ireland (RDS 2035 'Building a Better Future') was published in March 2012 and informs the spatial aspects of all other strategies. It complements the Sustainable Development Strategy and highlights the contribution that recycling more waste and recovering energy from it can make to a reduction in carbon footprint and Greenhouse Gas Emissions (GHG).

The Strategy recognises that managing our waste is a significant part of how we treat our environment and highlights the need to manage waste sustainably. This will be achieved by applying both the waste hierarchy, introduced by the Waste Framework Directive, and the proximity principle when developing treatment or disposal facilities in order to minimise the environmental impacts of waste transport.

### **3.6.2 Northern Ireland Sustainable Development Strategy**

The Northern Ireland Sustainable Development Strategy ('Everyone's Involved') was adopted by the Northern Ireland Executive in May 2010. The Strategy sets out the principles and





strategic objectives to ensure socially responsible economic development while protecting the resource base and the environment for future generations.

The six strategic objectives of the strategy are:

- Building a dynamic, innovating economy that delivers the prosperity required to tackle disadvantage and lift communities out of poverty;
- Strengthening society such that it is more tolerant, inclusive and stable and permits positive progress in quality of life for everyone;
- Driving sustainable, long term investment in key infrastructure to support economic and social development;
- Striking an appropriate balance between the responsible use and protection of natural resources in support of a better quality of life and a better quality environment;
- Ensuring reliable, affordable and sustainable energy provision and reducing our carbon footprint; and
- Ensuring the existence of a policy environment which ensures the overall advancement of sustainable development in and beyond government.

## **4 Review of Existing Landfill Capacity**

### **4.1 Assessment of Active Sites in Northern Ireland**

WDR & RT Taggart have extensive knowledge of the waste industry in Northern Ireland. This has been gained through our involvement in the majority of municipal and commercial and industrial waste infrastructure in Northern Ireland.

Using this knowledge, backed up by the NIEA public register of PPC Permitted sites, we have developed a list of active and recently closed landfill sites. The status of landfill sites in Northern Ireland is identified in Table 4.1.



**Table 4.1 Status of Northern Ireland Landfill Sites**

Landfill	Operator	Status
Drummee	Fermanagh and Omagh District Council	Active
Craigmore	Coleraine Skip Hire and Recycling	Active
Cottonmount	Biffa	Active
Aughrim	Clearway	Active
Mullaghglass	Alpha Resource Management	Active
Magheraglass	Mid Ulster District Council	Closed April 2017
Lisbane	Armagh Power Generation Ltd	Closed and Closure Plan implemented. Only receiving inert waste for restoration
Craigahulliar	Causeway Coast and Glen Borough Council	Active
Drumanakelly	Newry Mourne and Down District Council	Closed 2016
Tullyvar	Mid Ulster District Council	Mothballed 2018. Remaining phase can be developed for future capacity
Ballymacombs	Mid Ulster District Council	Scheduled to close 2021
Crosshill	Eastwoods	Active
Aughnagun	Newry Mourne and Down District Council	Closed 2015

## 4.2 Assessment of Capacities and Input Rates

In order to undertake an assessment of the current remaining landfill capacities, waste input rates and total tonnage of waste landfilled in Northern Ireland, WDR & RT Taggart lodged an Environmental Information Request with NIEA.

This Environmental Information Request included:

1. Reported remaining landfill capacities from the Annual Reports submitted in January 2019;
2. Tonnage landfilled in each site during 2018; and
3. Total tonnage landfilled in Northern Ireland during 2018.

A summary of this information is presented in Table 4.2.





**Table 4.2 Reported Landfill Capacities 2019**

Landfill	Landfilled 2018 (t)	Remaining Capacity for 2019 (t)
Drummee	26,270	120,000 <sup>1</sup>
Craigmore	165,482	224,000
Cottonmount	98,933	3,089,000
Aughrim	68,795	2,125,000
Mullaghglass	274,086	395,000
Magheraglass	0	0
Lisbane	0	0
Craigahulliar	38,255	134,000
Drumanakelly	0	0
Tullyvar	18,048	0 <sup>2</sup>
Ballymacombs	0	29,000
Crosshill	74,553	465,000
<b>Total</b>	<b>764,422</b>	<b>6,581,000</b>

<sup>1</sup> Drummee landfill capacity based on our working knowledge of the site.

<sup>2</sup> Phase 4 can be developed in the future is required. Phase 4 has a capacity of 650,00m<sup>3</sup> / 650,000t

<sup>3</sup> Based on site data

As can be seen from Table 4.2 at the start of 2019 there was approximately 6.6m tonnes of landfill capacity in Northern Ireland. The majority of this landfill capacity is held in two sites by two private sector operators, Cottonmount Landfill and Aughrim Landfill. This capacity has the potential to rise to 7.2m tonnes of waste if Phase 4 of Tullyvar was to be developed in the future.

Table 4.2 also highlights the current trend in the Local Authority owned and operated landfill sites going through a phase of early closure, with both Magheraglass and Drumanakelly receiving their last waste inputs in 2017 and 2016 respectively. This trend is further outlined by the early closure of Aughnagun 2015 and the mothballing of Tullyvar in 2018.

It is evident that there is a declining capacity in Local Authority owned landfills sites as well as a decline in overall operators.

## 5 Northern Ireland Future Landfill Capacity

In order to determine landfill capacity in Northern Ireland WDR & RT Taggart considered it necessary to look at this in two stages. The first is current filling rates up to 2020.



This allows an assessment of when current sites will reach capacity and close as well as allowing an assessment of landfill rates prior to the Statutory recycling target of 50% by 2020.

The second step is an assessment of landfill capacity required post the 50% recycling target up to 2030. This assessment allows a prediction as to when landfill capacity in Northern Ireland will reach a deficit.

Finally a sensitivity analysis has been completed on the post 2020 scenario. This sensitivity analysis assesses the impact a 60% recycling rate as well as the impact of the arc21 energy from waste (EfW) (the Beacon Project), if it was to be developed.

## 5.1 Assessment of Landfill Capacity 2019 – 2020

In order to calculate the future landfill capacity in Northern Ireland it was considered an important task to calculate when Local Authority and Privately owned landfill capacity would run out based on current landfilling rates.

In order to complete this assessment it was predicted that waste landfilled would increase year on year by 1.4%. This assumption is based on the waste growth figure reported through WasteDataFlow for the years 2013/14, 2014/15, 2015/16, 2016/17 and 2017/18. Table 5.1 highlights the Local Authority Collected Municipal Waste (LACMW) arisings and percentage growth rate for the above years.

**Table 5.1 Reported LACMW Figures and Growth Rate**

	2013/14	2014/15	2015/16	2016/17	2017/18	Average
<b>Northern Ireland LACMW</b>	924,412	951,423	969,157	985,994	977,817	
<b>% Growth Rate</b>	1.2	2.9	1.9	1.7	-0.8	1.4

The 1.4% waste growth figure was applied to an assessment of the waste landfilled at each site outlined in Table 4.2 as well as the reported total Northern Ireland landfill figure for 2018.

Based on the figures reported for LACMW landfilled (WasteDataFlow) and the total tonnage of waste landfilled (NIEA), it has been possible to calculate the tonnage of waste landfilled that is not LACMW. It has been assumed that this difference is associated with commercial and industrial (C&I) waste.



**Table 5.2 LACMW and C&I Waste Tonnages**

Waste Type	Tonnage Landfilled
LACMW	319,212
Commercial and Industrial	445,210*
Total	764,422

\*Assumed C&I waste landfilled due to difference between overall landfill rate and LACMW landfilled

By comparison to the Northern Ireland Landfill Capacity Report 2016 there has been a decrease in the total weight of LACMW landfilled from 390,256t to 319,212t. However, the overall tonnage landfilled has increased from 694,417t to 764,422t. This has been assumed to be an increase in C&I waste landfilled.

The assumed and modelled overall landfill tonnage including both LACMW and C&I waste is presented in Table 5.3.

**Table 5.3 Predicted Landfill Tonnages**

Total	2018	2019	2020
Landfilled	764,422*	775,124	785,976

\*Actual reported figured to NIEA

An assessment was completed based on the above assumptions of waste growth, commercial and industrial waste and LACMW arisings landfilled and the total tonnage of waste landfilled. The waste input rates in 2018 plus a 1.4% waste growth were assumed for the waste input rates to each landfill. The outcome of this assessment and the predicted years for closure for each landfill up to 2020 is presented in Table 5.4.

**Table 5.4 Predicted Landfill Rates to 2020**

Landfill	2019 Capacity <sup>1</sup>	2018 Landfilled	Year of Filling		Remaining Capacity for 2021 <sup>2</sup>
			2019	2020	
Drummee <sup>3</sup>	120,000	26,270	26,638	27,011	66,352
Craigmore	224,000	165,482	167,799	56,201 <sup>4</sup>	0
Cottonmount	3,089,000	98,933	100,318	102,324	2,886,358
Mullaghglass	395,000	274,086	277,923	117,077	0
Aughrim	2,125,000	68,795	69,758	70,735	1,984,507
Craigahulliar	134,000	38,255	38,791	39,334	55,876
Tullyvar	0	18,048	0	0	0
Ballymacombs	29,000	0	0	29,000	0
Crosshill	465,000	74,553	75,597	76,655	312,748

<sup>1</sup> As of 1<sup>st</sup> January 2019

<sup>2</sup> As of 1<sup>st</sup> January 2021

<sup>3</sup> Drummee based on current site information

<sup>4</sup> Capacity and closure does not represent the development of the new phase currently granted planning permission



As each site closes there will be the need to direct waste to other active landfill sites. Based on the waste flow model and Table 5.4 it is possible to predict the tonnage of waste that will have to be diverted to other sites each year.

The additional waste requiring landfill capacity each year and a total capacity requirement by 2020 is presented in Table 5.5.

**Table 5.5 Additional Waste Requiring Landfill Capacity**

2019	2020	Total Capacity Required (t)
18,301	267,639	285,940

From the assessment outlined in Table 5.4 by 2020 it is anticipated that all Local Authority owned landfill sites will be closed / mothballed, with the exception of Drummee and Craigahulliar.

Post 2020 the only sites with remaining active landfill capacity will be:

- Drummee;
- Cottonmount;
- Aughrim;
- Craigahulliar; and
- Crosshill.

Based on the modelled assumptions, Drummee and Craigahulliar will have limited capacity, circa 66,000 tonnes and 56,000 tonnes respectively. It should also be noted that Crosshill's planning and PPC Permit limits the waste acceptance to wastes excluding domestic, household and food wastes. The PPC Permit for the site does not permit EWC Code 20 03 01 Mixed Municipal Waste.

Based on the assessment of capacity at the end of 2020 there would be an estimated circa 5m tonnes of capacity. This capacity figure does not take account of the potential 650,000 tonnes ( $650,000\text{m}^3 @ 1.0\text{t/m}^3$ ) of capacity if Phase 4 at Tullyvar was developed (Density value based on the infilling of fines from mechanical processing of residual waste post 2020). The future capacity in Phase 4 of Tullyvar is further considered in Section 6 and 7 of this report.

Post 2020 landfill capacity is summarised in Table 5.6.

**Table 5.6 Post 2020 Landfill Capacity**

Item	Capacity (t)
Remaining Capacity	5,019,900



As outlined above the capacity post 2020 will be held in 5 sites. Drummee and Craigahulliar have limited capacity post 2020. Crosshill is not permitted to directly accept domestic/household waste. This results in the majority of the landfill capacity being held in 2 private sector sites, Aughrim and Cottonmount.

It has been estimated based on current fill rates that Aughrim and Cottonmount will have circa 2m and 2.9m tonnes of capacity respectively, post 2020. This figure does not take account of the additional circa 290,000 tonnes of waste that will require landfill capacity between 2019 and 2020 due to the closure of landfill sites.

If an assumption was made that this waste was landfilled in Cottonmount, then post 2020 the capacity of the Cottonmount landfill would be reduced to circa 2.6m tonnes.

As the majority of landfill capacity will be held by 2 sites this may have the potential to increase landfill gates fees for those parties looking to dispose of waste in landfill. A summary of the estimated landfill capacity post 2020 is provided in Table 5.7.

**Table 5.7 Summary of Estimated Landfill Capacity Post 2020**

Landfill	Remaining Capacity Post 2020 (t)
Drummee	66,352
Cottonmount	2,886,358
Aughrim	1,984,507
Craigahulliar	55,876
Crosshill	312,748
<b>Total</b>	<b>5,305,840</b>
Additional Capacity Required due to Waste Diverted from Closed Sites	285,940
<b>Revised Estimated Capacity</b>	<b>5,019,900</b>

## 5.2 Assessment of Landfill Capacity Post 2020

### 5.2.1 Impact of 50% Recycling Rate

The main impact on post 2020 landfill capacity will be the volume of residual waste to be landfilled. If Local Authorities were to achieve the 50% Statutory Recycling Rate this would have a knock on effect on the total residual waste generated.





A model was created to estimate the potential LACMW generation between 2020 and 2030. This model takes account of the current generation of LACMW and applies a 1.4% waste growth up to 2030. The model also applies the current Northern Ireland recycling rate up to 2020 with statutory 50% recycling rate applied post 2020. Table 5.8 outlines the predicted LACMW and residual waste up to 2030.

**Table 5.8 Predicted LACMW and Residual Waste**

Year	Predicted LACMW (t)	Predicted Residual (t)
2017/18*	977,817	512,376
2018/19*	991,506	519,549
2019/20**	1,005,388	502,694
2020/21**	1,019,463	509,731
2021/22**	1,033,735	516,868
2022/23**	1,048,208	524,104
2023/24**	1,062,883	531,441
2024/25**	1,077,763	538,881
2025/26**	1,092,852	546,426
2026/27**	1,108,152	554,076
2027/28**	1,123,666	561,833
2028/29**	1,139,397	569,699
2029/30**	1,155,349	577,674

\*Current Northern Ireland Recycling Rate 47.6%

\*\*Statutory 50% recycling rate

### 5.2.2 Assumption of all LACMW Post 2020 Pre-Treated

In order to derive a prediction of landfill capacity requirements post 2020, an assumption has been made that all LACMW is sent for pre-treatment. This is due to the closure of all but 2 Council owned landfill sites. Using the WasteDataFlow reported figures it has been assumed that 35% of LACMW sent for pre-treatment is not suitable for energy recovery and is landfilled.

A model was therefore created to assess the tonnage of waste to be landfilled post 2020 if all LACMW was pre-treated in MRF's with a 35% to landfill rate. The outcome of this model is presented in Table 5.9.





**Table 5.9 Prediction of Landfill Tonnages if all LACMW is Pre-Treated**

Year	Predicted Residual (t)	Predicted Landfill (t)
2020/21	509,731	178,406
2021/22	516,868	180,904
2022/23	524,104	183,436
2023/24	531,441	186,004
2024/25	538,881	188,609
2025/26	546,426	191,249
2026/27	554,076	193,927
2027/28	561,833	196,642
2028/29	569,699	199,394
2029/30	577,674	202,186

### 5.2.3 Estimation of C&I Waste Landfilled

Landfill capacity requirements cannot be viewed just in the context of what will be required for LACMW. C&I waste also represents a significant source of waste requiring landfill capacity. The published information on the Northern Ireland quantity of C&I waste is very limited, however this is believed to be similar in quantity to the tonnage of LACMW.

In order to calculate the tonnage of C&I waste an Environmental Information Request was lodged with NIEA. This Environmental Information Request sought details on the total volume of waste landfilled in 2018.

A known tonnage of LACMW waste was landfilled in 2017/18 (WasteDataFlow). The known tonnage of LACMW landfilled was subtracted from the total tonnage of waste landfilled. The difference in landfill figures was then assumed to be C&I waste.

The above calculation allowed a ratio of LACMW to C&I waste landfilled to be assumed. It has been assumed that 139.5% of the tonnage of LACMW landfilled will equate to the tonnage of C&I waste landfilled.

The above calculation for C&I waste, as well as a 1.4% waste growth, was applied to calculate the tonnage of waste up to 2030.

The summary of the C&I waste landfilled up to 2030 is presented in Table 5.10.



**Table 5.10 Prediction of C&I Waste Landfilled**

Year	Estimated C&I Waste Landfilled (t)
2017/18	445,210
2018/19	451,443
2019/20	457,763
2020/21	464,172
2021/22	470,671
2022/23	477,260
2023/24	483,942
2024/25	490,717
2025/26	497,587
2026/27	504,553
2027/28	511,617
2028/29	518,779
2029/30	526,042

#### 5.2.4 Review of Capacity up to 2030

Taking into consideration the assumptions outlined in Sections 5.2.1 to 5.2.3 of this report, it is possible to estimate the landfill capacity requirements year on year from 2020 to 2030. Table 5.11 summaries the annual and total landfill capacity requirements for both LACMW and C&I waste between 2020 and 2030.

**Table 5.11 LACMW and C&I Landfill Capacity Requirements**

Year	LACMW Landfill (t)	C&I Waste Landfill (t)	Total Landfill Requirement (t)
2020/21	178,406	464,172	642,578
2021/22	180,904	470,671	651,574
2022/23	183,436	477,260	660,696
2023/24	186,004	483,942	669,946
2024/25	188,609	490,717	679,325
2025/26	191,249	497,587	688,836
2026/27	193,927	504,553	698,480
2027/28	196,642	511,617	708,258
2028/29	199,394	518,779	718,174
2029/30	202,186	526,042	728,228
<b>Total</b>	<b>1,900,757</b>	<b>4,945,340</b>	<b>6,846,096</b>

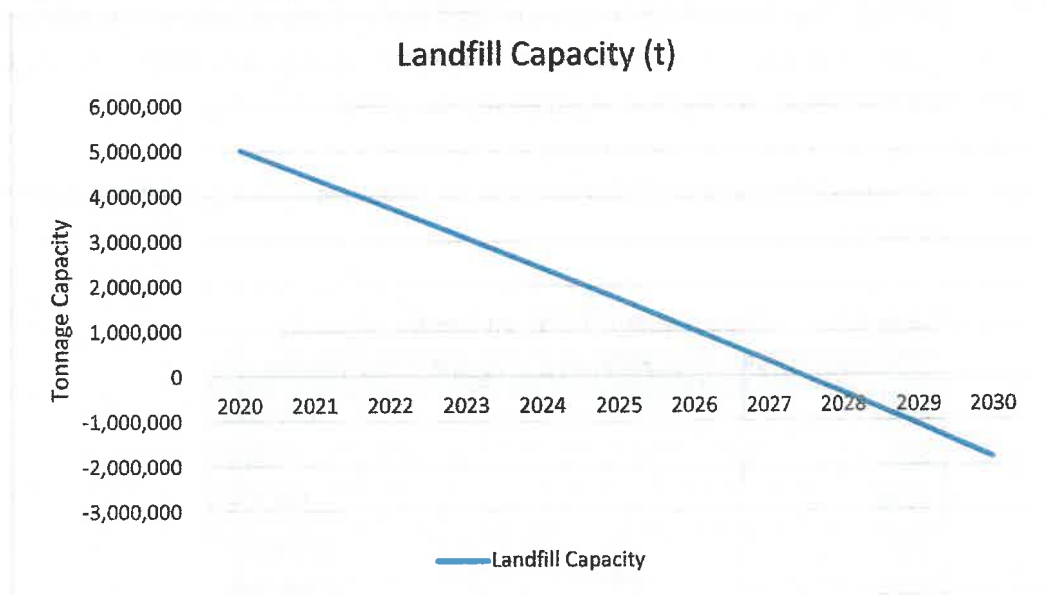


Using the figures presented in Table 5.11 it is possible to calculate the declining landfill capacity and when a deficit in landfill capacity occurs. The predicted declining landfill capacity is presented in Table 5.12 and Figure 5.1.

**Table 5.12 Declining Landfill Capacity**

Year	Landfill Capacity (t)
2020	5,019,900
2021	4,377,322
2022	3,725,748
2023	3,065,052
2024	2,395,106
2025	1,715,780
2026	1,026,944
2027	328,465
2028	-379,793
2029	-1,097,967
2030	-1,826,196

**Figure 5.1 Declining Landfill Capacity**



As can be seen from Table 5.12 and Figure 5.1 it is predicted that there will be a deficit in landfill capacity by 2028. When compared to the 2016 report the year of landfill capacity deficit does not change, however the shortfall in deficit increases from 239,670t to 379,793t.



### 5.3 Impact of arc21 EfW on Post 2020 Landfill Capacity

arc21 is the waste management group covering 6 Local Authorities in the east of Northern Ireland. arc21 is currently in a procurement process looking to deliver a Mechanical Biological Treatment facility and an incinerator with energy recovery at Hightown Quarry, Newtownabbey.

The implementation of the arc21 EfW will result in no LACMW to landfill due to the proposals including incineration and an incinerator bottom ash processing plant.

On 13<sup>th</sup> September 2017 the Department for Infrastructure granted planning permission for the development. However, the outcome of a Judicial Review on 14<sup>th</sup> May 2018 ruled that the granting of permission was unlawful in the absence of a minister.

The outcome of the Judicial Review has further delayed the project. The Northern Ireland Landfill Capacity Report 2016 modelled the impact of the arc21 project as a sensitivity analysis. This sensitivity analysis was previously modelled to have an impact from 2021/2022.

This sensitivity analysis has been revised with a new operational year of 2023/2024 assuming the project can reach financial close in 2020 with a 3 year construction and commissioning phase. The impact was modelled on the landfill capacity up to 2030. This excluded the predicted arc21 LACMW that would be sent to landfill.

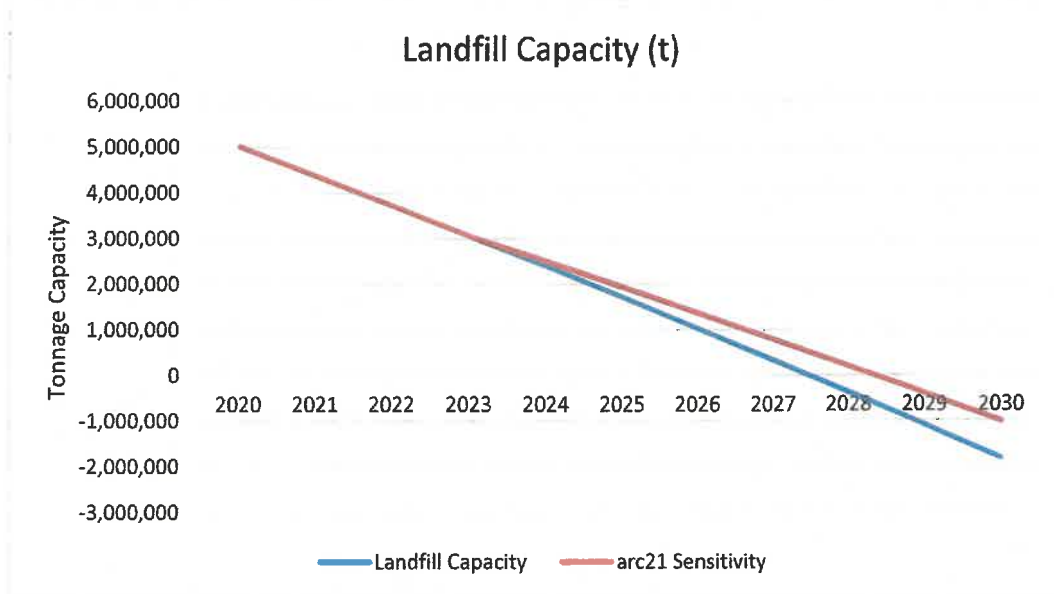
The impact that the arc21 EfW facility has on landfill capacity is presented in Table 5.13 and Figure 5.2.

**Table 5.13 Impact of arc21 EfW on Landfill Capacity**

Year	Landfill Capacity arc21 Sensitivity
2020	5,019,900
2021	4,377,322
2022	3,725,748
2023	3,065,052
2024	2,505,629
2025	1,938,375
2026	1,363,180
2027	779,931
2028	188,517
2029	-411,176
2030	-1,018,133



**Figure 5.2 Impact of arc21 EfW on Landfill Capacity**



As can be seen from Table 5.13 and Figure 5.2 under the arc21 sensitivity there will be a predicted deficit in landfill capacity by 2029.

#### 5.4 Impact of arc21 EfW and 60% Recycling on Post 2020 Landfill Capacity

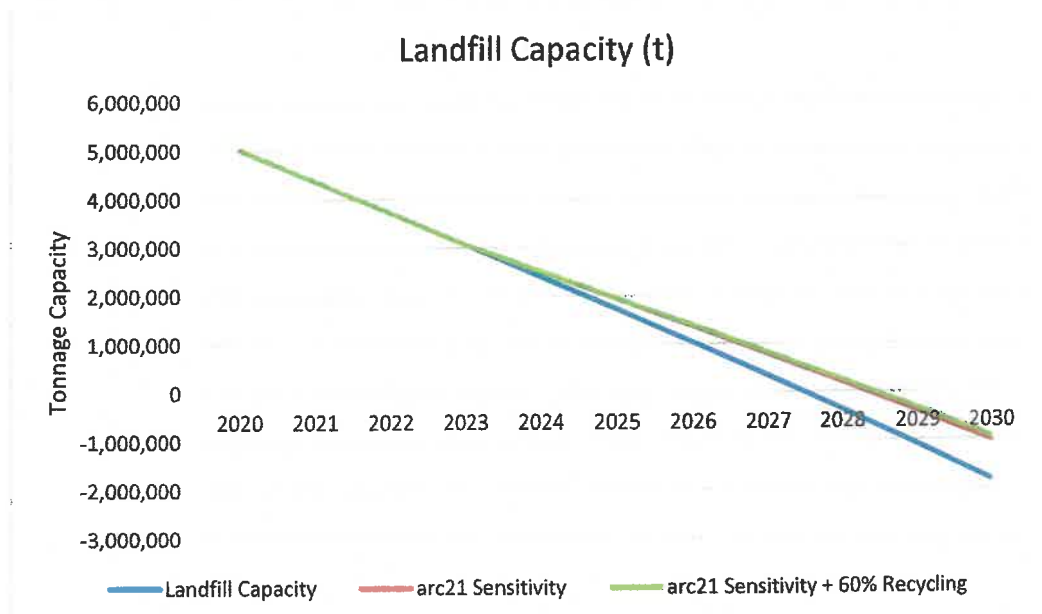
A further sensitivity on landfill capacity was assessed. This sensitivity included the implementation of the arc21 EfW facility and Local Authorities reaching a 60% recycling rate in 2025. The impact that the arc21 EfW facility and a 60% recycling rate in 2025 has on landfill capacity is presented in Table 5.14 and Figure 5.3.

**Table 5.14 Impact of arc21 EfW & 60% Recycling Rate on Landfill Capacity**

Year	Landfill Capacity arc21 & 60% Recycling Sensitivity
2020	5,019,900
2021	4,377,322
2022	3,725,748
2023	3,065,052
2024	2,505,629
2025	1,938,375
2026	1,378,701
2027	811,192
2028	235,738
2029	-347,773
2030	-938,547



**Figure 5.3 Impact of arc21 EfW & 60% Recycling on Landfill Capacity**



As can be seen from Table 5.14 and Figure 5.3 the implementation of a 60% recycling rate in 2025 has a minimal impact on landfill capacity in 2030.

## 6 Identification of Potential Development Sites

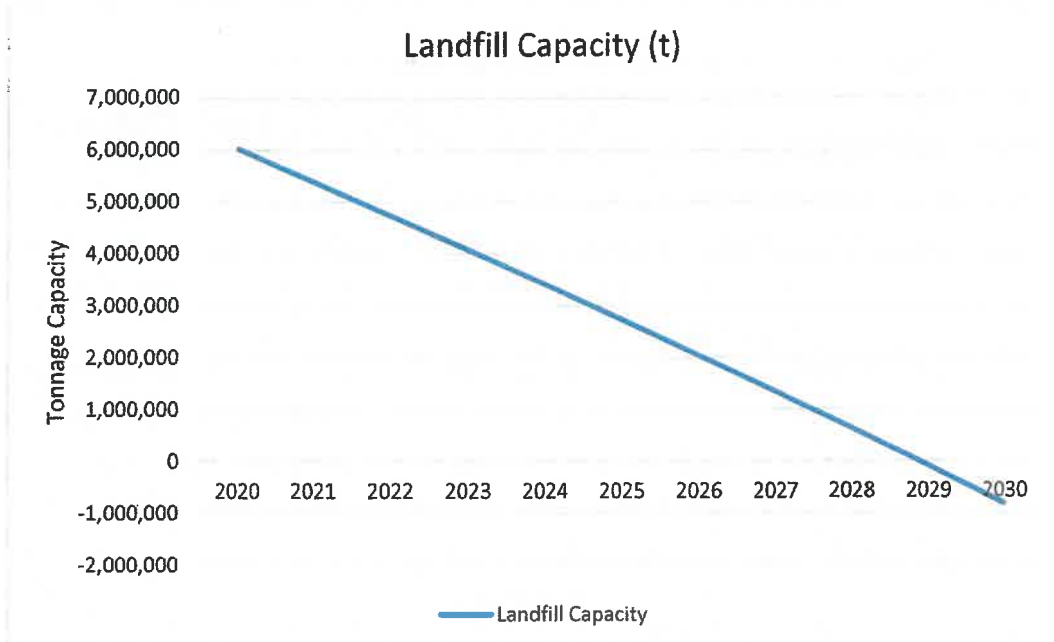
As highlighted in Section 5 of this report, post 2020 there will be limited competition in the landfill market with the majority of landfill capacity held between two privately owned sites, Aughrim and Cottonmount. Limited capacity will be held in Drummee and Craigahulliar post 2020 (circa 66,000 and 56,000 tonnes respectively) with circa 150,000 tonnes available at Crosshill which is not permitted to accept domestic/household waste.

RiverRidge Holdings Limited have secured planning permission for an extension of the Craigmore Landfill Site, LA01/2018/1154/F dated 19<sup>th</sup> February 2019. This approval grants permission for an increase in height to the existing landfill as well as the creation of additional landfill cells. We are aware that construction works associated with this planning approval have started. It is understood that this development will increase the sites capacity prior the current capacity running out in 2020 as detailed in Table 5.4. We have estimated that this planning permission may increase the capacity at the site by 1m tonnes. This increase in void created at Craigmore only extends Northern Ireland's landfill capacity to 2029, with a deficit of 18,133 tonnes in 2030. Figure 6.1 represents the revised landfill capacity taking account of the additional void to be created at Craigmore.





**Figure 6.1 Impact of Craigmore Landfill Extension on Landfill Capacity**



Even with the increased capacity at Craigmore there will still only be a small number of landfill site operator's post 2020, all of which will be private sector. Therefore, there is the potential that landfill gate fees may increase.

An assessment has been created of potential sites that could be developed post 2020 to provide additional capacity and prevent a lack of competition in the landfill market. Of the list below only 1 Local Authority site was considered due to the potential void and the consents that are currently in place.

1. Develop Phase 4 at Tullyvar;
2. Cam Road, Macosquin, development of the landfill site;
3. Ladyhill Quarry, Antrim, try and reinstate previous planning permission and PPC Permit for the non-hazardous landfill;

A high level assessment has been completed of the above options and is presented in Section 7 of this report.

## 7 Ranking of Proposed Development Sites

In order to provide a ranking of the most viable option for the development of future landfill capacity a pro's and cons assessment of the options identified in Section 6 of this report was undertaken.



This pros and cons assessment is presented in Tables 7.1 to 7.3.

**Table 7.1 Assessment of Additional Void at Tullyvar**

Pro's	Cons
<ul style="list-style-type: none"> <li>Existing planning permission and PPC Permit for the development of Phase 4.</li> <li>Existing infrastructure such as leachate treatment plant, landfill gas engine, weighbridge and offices.</li> <li>Established grid connection for landfill gas engine.</li> <li>Established landfill site, therefore landfill principle established in the area.</li> <li>Significant void circa 650,000m<sup>3</sup>. Based on a density of 1t/m<sup>3</sup> could represent a capacity of 650,000t.</li> <li>Well established wetlands for leachate treatment and discharge to surface water.</li> <li>Council owned site therefore security in gates fees.</li> </ul>	<ul style="list-style-type: none"> <li>May face local objection to continued operation as residents may have the opinion that the site is due to close, extended impact on residential receptors.</li> <li>CQA Plan to be submitted to NIEA detailing the design of Phase 4.</li> <li>Wetlands not designed to take leachate from Phase 4.</li> </ul>

\*Density of 1t/m<sup>3</sup> assumed based on the majority of waste infilled being MRF fines.



**Table 7.2 Assessment of Additional Void at Cam Road**

Pro's	Cons
<ul style="list-style-type: none"> <li>▪ Planning permission expiry 14<sup>th</sup> April 2016, however NIEA have released an update on landfill capacity in which they state the site has planning permission.</li> <li>▪ Significant void circa 1.25m m<sup>3</sup>. Based on a density of 1t/m<sup>3</sup> could represent a capacity of 1.25m t.</li> <li>▪ NIEA report that this site is currently going through the permitting process.</li> <li>▪ Close proximity to existing waste management facilities.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Uncertainty in the capital development costs.</li> <li>▪ May face local objection as residents may believe the site will not be developed due to the former developer going into administration (B Mullan and Sons Ltd).</li> <li>▪ All infrastructure such as leachate treatment plant, landfill gas engine, weighbridge and offices would have to be constructed prior to waste acceptance. Significant capital expenditure prior to revenue generation.</li> <li>▪ Uncertainty in ability to get a grid connection for a landfill gas engine.</li> </ul>

\*Density of 1t/m<sup>3</sup> assumed based on the majority of waste infilled being MRF fines.



**Table 7.3 Assessment of Additional Void at Ladyhill**

Pro's	Cons
<ul style="list-style-type: none"> <li>Significant void circa 3.2m m<sup>3</sup>. Based on a density of 1t/m<sup>3</sup> could represent a capacity of 3.2m t.</li> </ul>	<ul style="list-style-type: none"> <li>The site is believed to have Planning permission.</li> <li>PPC Permit has been revoked. A new PPC Permit application would be required.</li> <li>May face local objection as residents may believe the site will not be developed due to the potential expiration of planning.</li> <li>All infrastructure such as leachate treatment plant, landfill gas engine, weighbridge and offices would have to be constructed prior to waste acceptance. Significant capital expenditure prior to revenue generation.</li> <li>Void is based on the steep wall of the quarry. Expensive steep wall lining system required.</li> <li>Road improvements required to widen Ladyhill Road to 6m in width. Expensive capital works.</li> <li>Uncertainty in ability to get a grid connection for a landfill gas engine.</li> </ul>

\*Density of 1t/m<sup>3</sup> assumed based on the majority of waste infilled being MRF fines.

## 7.1 Final Ranking of Sites

Following the above high level pros and cons assessment it is considered that the ranking of most viable future landfill capacity would be as follows:



**Table 7.5 Ranking of Sites**

Ranking	Site	Comments
1 <sup>st</sup>	Tullyvar Landfill Site	<ul style="list-style-type: none"> <li>Existing Planning Permission</li> <li>Existing PPC Permit</li> <li>Site Infrastructure in place</li> <li>Council control over landfill gate fees</li> </ul>
2 <sup>nd</sup>	Cam Road Landfill Site	<ul style="list-style-type: none"> <li>Reported that planning permission is still active</li> <li>Large void</li> <li>All infrastructure would have to be developed</li> <li>Development of a new landfill site in a new area</li> </ul>
3 <sup>rd</sup>	Ladyhill Landfill Site	<ul style="list-style-type: none"> <li>May need to confirm planning permission</li> <li>Expensive lining works required</li> <li>Large capital expenditure required for road upgrade</li> </ul>



## 8 Conclusions

It is acknowledged that there will still be the need for non-hazardous landfill capacity in Northern Ireland to deal with material that cannot be recovered.

The waste hierarchy implemented through the Revised Waste Framework Directive and the Northern Ireland Waste Management Strategy places the following priority in waste management:

- Prevention;
- Preparing for re-use;
- Recycling;
- Other recovery (e.g. energy recovery); and
- Disposal.

However, it is accepted that landfill disposal is a key element of the waste management mix to deal with waste that cannot be recycled or disposed with energy recovery.

A waste flow model was created to assess the landfill capacity up to 2020 based on the current filling of landfill sites and a 1.4% waste growth. This waste flow model identified that post 2020 the majority of landfill capacity will be held by 2 sites. Therefore, this may have the potential to increase landfill gates fees for those parties looking to dispose of waste in landfill.

The outcome of landfill capacity post 2020 is summarised in Table 8.1.

**Table 8.1 Summary of Estimated Landfill Capacity Post 2020**

Landfill	Remaining Capacity Post 2020 (t)
Drummee	66,352
Cottonmount	2,886,358
Aughrim	1,984,507
Craigahulliar	55,876
Crosshill	312,748
<b>Total</b>	<b>5,305,840</b>
Additional Capacity Required due to Waste Diverted from Closed Sites	285,940
<b>Revised Estimated Capacity</b>	<b>5,019,900</b>





A model was created to estimate the potential LACMW generated between 2020 and 2030. This model took into account a 1.4% waste growth up to 2030. In order to derive a prediction of landfill capacity requirements post 2020, an assumption has been made that all LACMW is sent for pre-treatment, as all but 2 Local Authority landfill site will be closed. Using the WasteDataFlow reported figures it is evident that 35% of LACMW sent for pre-treatment is not suitable for energy recovery and is currently landfilled. A calculation of C&I waste was also completed to estimate the required landfill volume for this waste stream. This calculation outlined that 139.5% of the tonnage of LACMW landfilled will equate to the tonnage of C&I waste landfilled.

Using the above inputs to a waste flow model the 2020 to 2030 landfill capacity requirements have been estimated. The landfill capacity requirements are presented in Table 8.2 and Figure 8.1.

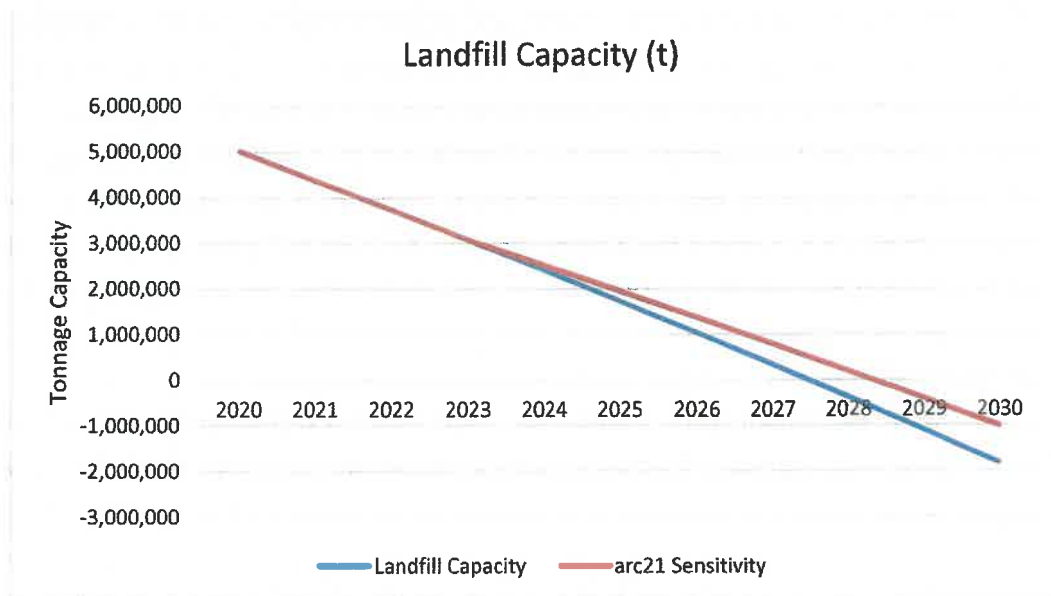
A sensitivity analysis was applied to the landfill capacity requirements in terms of the development and operation of the arc21 EFW facility. The impact of this sensitivity is presented in Table 8.2 and Figure 8.1.

**Table 8.2 Declining Landfill Capacity Assessment**

Year	Landfill Capacity (t)	Landfill Capacity arc21 Sensitivity (t)
2020	5,019,900	5,019,900
2021	4,377,322	4,377,322
2022	3,725,748	3,725,748
2023	3,065,052	3,065,052
2024	2,395,106	2,505,629
2025	1,715,780	1,938,375
2026	1,026,944	1,363,180
2027	328,465	779,931
2028	-379,793	188,517
2029	-1,097,967	-411,176
2030	-1,826,196	-1,018,133



**Figure 8.1 Declining Landfill Capacity**



As can be seen from Table 8.1, 8.2 and Figure 8.1 there is a landfill deficit in 2028 and 2029 under the pre-treatment and arc21 sensitised models respectively.

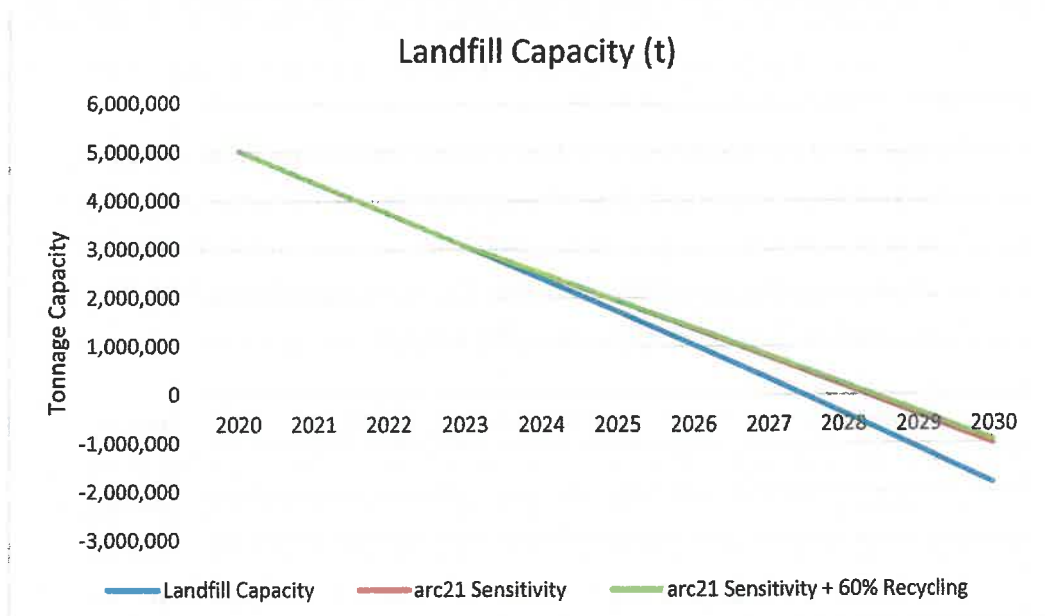
A further sensitivity on landfill capacity was assessed. This sensitivity included the implementation of the arc21 EfW facility and Local Authorities reaching a 60% recycling rate in 2025.

**Table 8.3 Impact of arc21 EfW & 60% Recycling Rate on Landfill Capacity**

Year	Landfill Capacity arc21 & 60% Recycling Sensitivity
2020	5,019,900
2021	4,377,322
2022	3,725,748
2023	3,065,052
2024	2,505,629
2025	1,938,375
2026	1,378,701
2027	811,192
2028	235,738
2029	-347,773
2030	-938,547



**Figure 8.2 Impact of arc21 EfW & 60% Recycling on Landfill Capacity**



As can be seen from Table 8.3 and Figure 8.2 the implementation of a 60% recycling rate in 2025 has a minimal impact on landfill capacity in 2030.

Given the potential lack of competition in the landfill market post 2020 it is considered that landfill gate fees may rise.

RiverRidge Holdings Limited have been granted planning permission for an extension to the existing landfill as well as an increase in overall levels at the site. It is reported in the planning documentation that the new cell will have a capacity of 600,000m<sup>3</sup>. Including for an increase in levels across the site it is our estimation that this could increase landfill capacity post 2020 by a further 1m tonnes. This would therefore increase the modelled 2020 landfill capacity from 5,019,900 tonnes to 6,019,900 tonnes. Whilst this is a large increase in capacity this would only increase overall Northern Ireland Capacity to 2029, with a deficit of 18,133 tonnes in 2030.

A study of the most viable future landfill capacity was completed using a high level pros and cons assessment. This assessment considered that the ranking of most viable future landfill capacity would be as follows:

1. Tullyvar Landfill Site – due to the existing Planning Permission and PPC Permit with site infrastructure in place. This option could also offer Councils control over landfill gate fees.
2. Cam Road Landfill Site – it is reported that planning permission is still active for the site with the site having a significant void capacity. However, all infrastructure would need to be developed at this site.



3. Ladyhill Landfill Site – planning permission may still be active for the site. The development of the site would include expensive lining works due to the steep wall of the quarry. A large capital expenditure would also be required to upgrade the road to the site.

There is the potential for all Local Authority landfill sites to be closed in the early to mid 2020's. This will result in all landfill capacity being controlled by the private sector. If landfill gates fees were to rise due to only a small number of operators in the market, it is our view that competition in the market would develop. This is demonstrated by NIEA reporting that the site at Cam Road is undergoing the permitting process.

In order to protect Local Authorities from the potential rise in landfill gate fees it is considered that the most viable option for future landfill capacity would be the remaining capacity at Tullyvar Landfill Site. This would be the preferred site due to the infrastructure that is currently in place such as the welfare facilities, leachate treatment plant, wetlands and landfill gas infrastructure. Therefore, the development costs of landfill capacity at Tullyvar verses Cam Road and Ladyhill would be substantially lower.

It is recommended that a bi-annual review of landfill gates fees is undertaken to assess the landfill market and any potential risks associated with landfill gate fee increases.

## 9 Recommendations

Tullyvar represents the most viable future landfill capacity in the event of landfill gate fees increasing due to lack of competition in the market.

It is recommended that this landfill capacity review is completed every 2 years in order to assess the future landfill capacity and any impacts that new technologies / processes may have on the volume of waste landfilled.

It is recommended that reviews of this landfill capacity study are completed on the total volume of waste landfilled in 2020 and 2022.

Based on the figures presented in this report, there may be merit in developing Phase 4 of Tullyvar in 2023. This would include agreeing design works with NIEA, the Construction Plan, and letting a contract for site engineering works. This could result in capacity coming online in mid 2024. The decision to proceed with the development of Phase 4 at Tullyvar can be ratified following the outcome of the 2022 landfill capacity report, if this report identifies a significant decrease in landfill capacity with a significant increase in landfill gate fees.