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Forge Hill Materials Recycling Facility

Forge Hill Recycling Limited

Odour Impact Assessment

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1.0 INTRODUCTION

This report presents an assessment of potential odour impact from the Materials Recycling Facility (MRF) in Forge Hill, Cork.

The MRF has not been operational since 2011; the license application proposes the re-commencement of operations at the facility to receive and sort Dry Mixed Recycling (DMR) waste.

The focus of the assessment is to determine the potential odour emissions from the recommencement of operations at the Site, the magnitude of any emissions and their potential impact on local sensitive receptors. Any change in odour as a result of the proposed development would be assessed against the baseline scenario.

1.1 Scope

The scope of the assessment involves the assessment of odour impact which has been requested verbally by the Environment Protection Agency (EPA). The assessment of dust emissions from the proposed development has been undertaken separately and can be found in Attachments E.6 and I.1.

Where development proposals are described, or this assessment touches on other technical issues covered in greater detail within the associated licence application for the proposed re-development, descriptions will refer to those aspects critical to the assessment of odour only.

1.2 Overview of Historic Operations

The Forge Hill MRF commenced operations as a waste facility in the late 1970s. In September 2003, a waste licence (ref. no. W0173-01) was obtained for the facility by its operator at the time, IPODEC Ireland Limited.

Up until the time of its recent temporary closure (2011), the facility was licensed to accept and process up to 82,000 tonnes per annum (tpa) of mixed non-hazardous, municipal, commercial, industrial and construction / demolition waste.

The facility was licensed to operate between 0600 and 2200 hours from Monday to Saturday and between 0900 and 1800 hours on public holidays. No waste intake or other operations were permitted on Sundays. Waste was brought onto the Site by both Greenstar and approved third party waste collectors.

1.3 Overview of Proposed Operations

The proposed development comprises the resumption of the MRF operations at the Forge Hill Site. The existing building, following some improvements, would continue to house the separation plant as well as all storage and loading / unloading areas. Waste accepted by the MRF would be restricted to DMR waste, of which paper and cardboard would make up the majority of the waste received.

The capacity of the development would continue to be a maximum of 82,000 tpa. A Waste Facility Permit for the Site was issued by Cork County Council in December 2015 (WFP-CK-15-0148-01).

1.4 Structure of Report

The remainder of this report is structured as follows:

- section 2 describes the relevant legislation and guidance used in the assessment;
- section 3 describes the assessment methodology used to identify sources and receptors and describes the assessment approach;
- section 4 characterises the baseline environment in the vicinity of the Site from an air quality perspective with regard to site location, local meteorology and nearby receptors;
- section 5 details the odour emission sources and the significance of impacts;
- section 6 presents the recommended mitigation measures and the resulting residual impacts; and
- section 7 concludes the assessment.

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2.0 LEGISLATION FRAMEWORK, GUIDANCE & PLANNING POLICY

2.1 Odour Legislation

There are no specific European or Irish regulatory numerical standards for the assessment of the impact of odours. However, it can be reasonably argued that complaints are likely to occur only when odours become detectable and recognisable on a routine basis. The longer and more frequently the odour detection persists for an individual, the greater the level of complaints may be expected, particularly if the odours are unpleasant.

Facilities which are licensed to operate under the Environmental Protection Agency Act (1992) and its subsequent amendments are required to operate in such a way where:

“[...] environmental protection includes [...] the prevention, limitation, elimination, abatement or reduction of environmental pollution”.

Where ‘environmental pollution’ is defined as:

- “(i) the disposal of waste in a manner which would endanger human health or harm the environment and, in particular*
- (ii) cause a nuisance through [...] odours.”*

Odour is therefore defined as pollution as it may cause offence to human senses and consequently must be controlled to the satisfaction of the EPA.

Air Guidance Note (AG5) Odour Impact Assessment Guidance for EPA Licensed Sites has been issued by the EPA to address the impact of odorous emissions from processes authorised under the EPA Acts 1992 and subsequent amendments. AG5 provides a consistent and systematic approach to the assessment of odours on and in the local area of facilities and installations licensed by the EPA. The principles of AG5 have been applied to the qualitative assessment of odour impacts relating to the proposed development.

2.2 Planning Policy Guidance

2.2.1 Cork County Development Plan

The Cork County Development Plan¹ 2014 came into effect on 15th January 2015 and is expected to remain in force until 2020. It is a six year development plan for the County that attempts to set out Cork County Council’s current thinking on planning policy looking towards the horizon year of 2022.

There are no specific policies within the County Development Plan relating to odour or amenity issues at proposed waste facilities.

2.2.2 Southern Region Waste Management Plan 2015-2021

The waste management plan² is a statutory document prepared by the local authorities of the region; it provides a framework for the prevention and management of wastes in a safe and sustainable manner. This waste plan covers the period 2015 to 2021 and is required to be revised or replaced every 6 years.

¹ Cork County Council, 2014. Cork County Development Plan 2014 [WWW] <http://corkcocodevplan.com>

² Southern Waste Region, 2015. Southern Region Waste Management Plan 2015-2012. [WWW] <http://southernregion.ie/publications>

Policy E19 of the plan states that *“The waste plan supports the development of indigenous reprocessing and recycling capacity for the treatment of non-hazardous and hazardous wastes where technically, economically and environmentally practicable. The relevant environmental protection criteria for the planning and development of such activities needs to be applied.”*

The environmental criteria set out in the plan must be applied in order to ensure that the impact on communities, human health, ecology and the wider environment can be avoided where possible and minimised, managed and mitigated, where necessary.

Policy G3 states: *“Ensure there is a consistent approach to the protection of the environment and communities through the authorisation of locations for the treatment of wastes.”*

2.3 Institute of Air Quality Management

The Institute of Air Quality Management (IAQM) is a UK professional body for air quality professionals. The IAQM produces useful guidance on matters affecting air quality professionals, the document considered relevant to this assessment being the *Guidance on the Assessment of Odour for Planning*³.

This document was prepared in order to assist in the assessment of odour for planning purposes, describing what the IAQM considers to be best practice. The document is peer reviewed and is considered to provide a transparent piece of guidance in the assessment of odour at both proposed and existing developments.

Although primarily aimed for use within the UK, it recognises that due to the international memberships of the IAQM guidance published may be applied elsewhere.

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³ Bull *et al* (2014) IAQM Guidance on the assessment of odour for planning, Institute of Air Quality Management, London, 2014.

3.0 ASSESSMENT METHODOLOGY

This chapter provides information relating to methods used in this assessment. The methodologies used are consistent with the source literature and regulations detailed in chapter 2 of this assessment.

Wherever bulk quantities of waste are handled and disposed of there is potential for the generation of odours. Potential odour sources associated with the proposed development have been identified by consideration of the nature of wastes received, current operations at the Site and how the development of the Site may change the existing potential odour sources onsite.

EPA Guidance Note AG5 proposes the systematic approach of field observations to undertake an assessment of odour. Given that the facility is not currently operational; a desk top based assessment approach has been undertaken as an alternative.

Potential odour impacts during the operational phase have been assessed qualitatively using the approach defined in the Guidance on the Assessment of Odour for Planning by the IAQM⁸.

Fugitive releases of odour have been assessed using a qualitative approach by consideration of the following:

- additional potential for odour release as a result of the redevelopment;
- the nature, scale and duration of activities undertaken on site to determine the potential magnitude of releases;
- the land uses and location of receptors in the surrounding area;
- the local climate and meteorology; and
- existing odour control measures and their effectiveness.

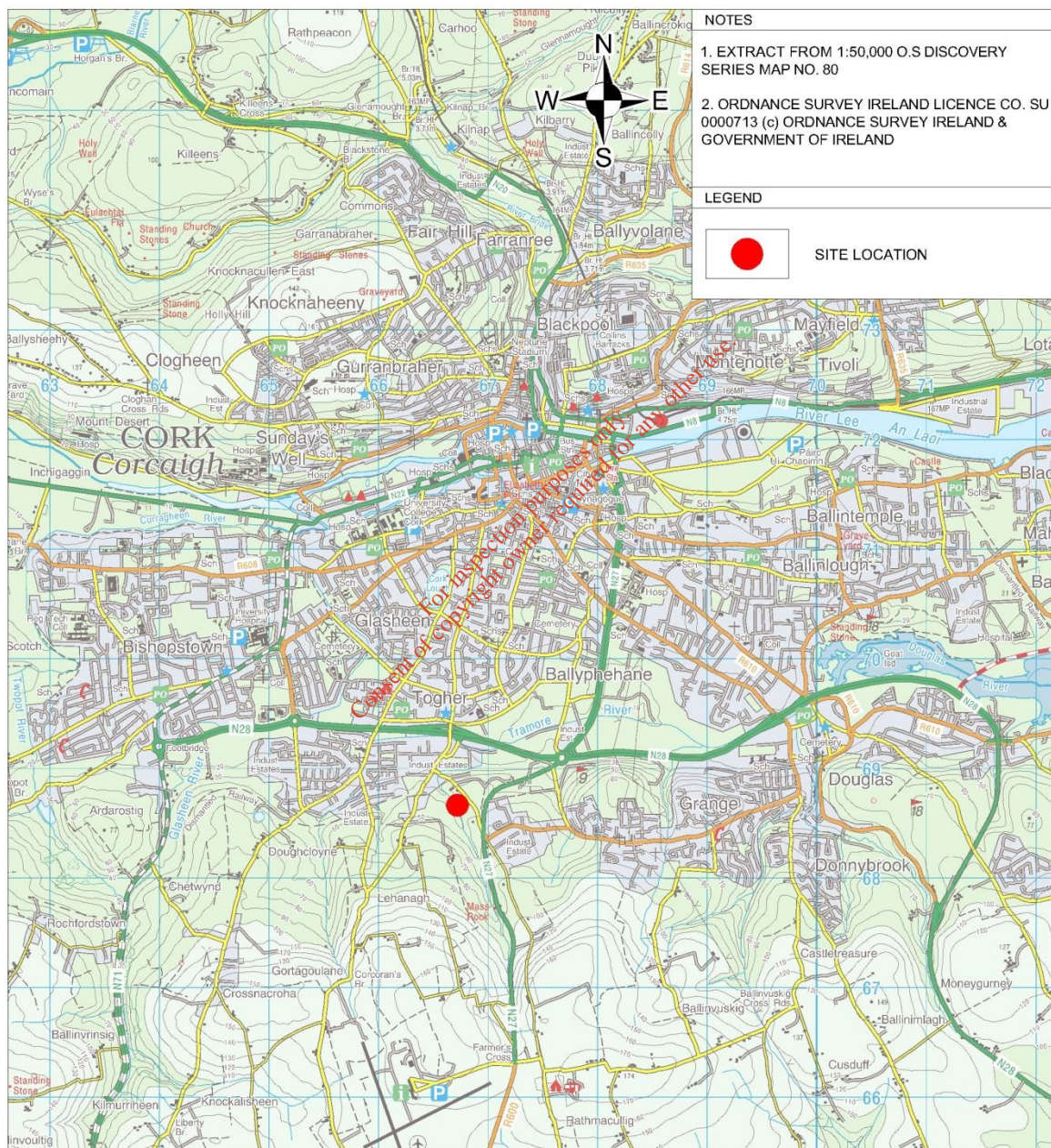
Subsequently, recommendations for any further mitigation measures as and where necessary on site will be undertaken and the residual impacts following the implementation of such measures re-assessed. The IAQM assessment methodology is presented in Appendix AQ1.

4.0 BASELINE ENVIRONMENT

4.1 Location

The Site is located on the southern fringe of Cork City, within the townland of Ballycurreen. The facility covers an area of approximately 1.03 hectares (2.48 acres) and is accessed from the Forge Hill Road via a junction on the N27 National Primary Road (Kinsale Road) leading from the N40 Southern Ring Road to Cork Airport.

The location of the proposed development is shown in Figure 4-1 below.



**Figure 4-1
 Site Location**

The proposed development is bounded to the north and south by other industrial and commercial premises. It is bounded to the west by a public road (Forge Hill) with other industrial premises on the opposite side of the road. To the east of the Site is an area of undeveloped Greenfield land and beyond that is the N27 Kinsale Road. Figure 4-2 shows an aerial view of the Site and the surrounding area.



Figure 4-2
Aerial View of Site and Surrounding Area (from Microsoft Bing Maps)

4.2 Meteorology

The generation, release and dispersion of fugitive odours are particularly dependent upon weather conditions. The prevailing meteorological conditions at any site would be dependent upon many factors including its location in relation to macroclimatic conditions as well as more site specific, microclimatic conditions. The most important climatic parameters governing the emission and the magnitude of impact and odour are:

- wind direction which determines the broad transport of the emission and the direction in which it is dispersed; and
- wind speed will affect ground level emissions by increasing the initial dilution of pollutants in the emission.

The closest meteorological station considered to be representative of local site conditions is located at Cork Airport, approximately 3km south of the Site. A wind rose for the Cork Airport Observation Station covering the period 1962 to 2010 is shown in Figure 4-3. Although Cork Airport is relatively close to the proposed facility, it is considered the wind speeds would be slightly less at Forge Hill due to the fact that there is a height difference of approximately 100m. Wind directions however would be considered to be similar.

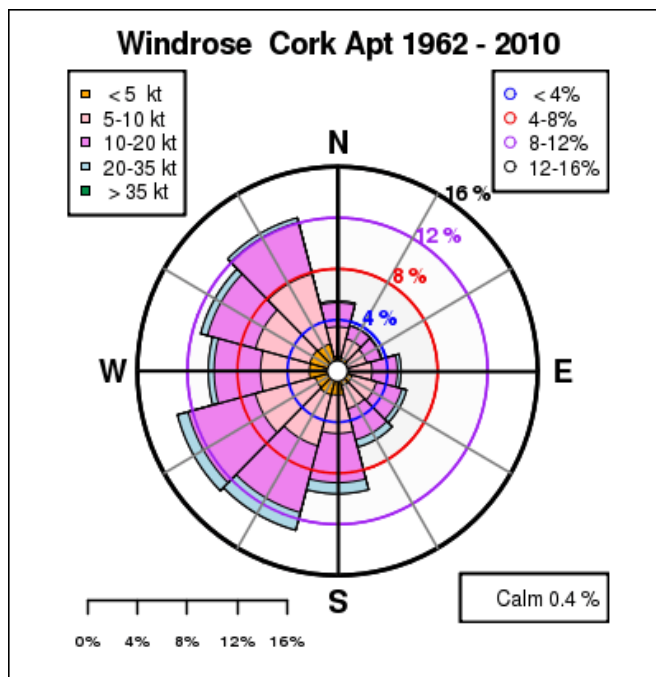


Figure 4-3
Windrose for Cork Airport Observation Station 1962 - 2010

Based on the wind speed and direction information from Cork Airport meteorological station, the dominant wind direction fluctuates between South Westerly to North Westerly.

An additional wind-rose for the year 2012 is provided in Figure 4-4, confirming the prevailing wind directions from western sectors. Winds from the north-easterly sectors occur least frequently.

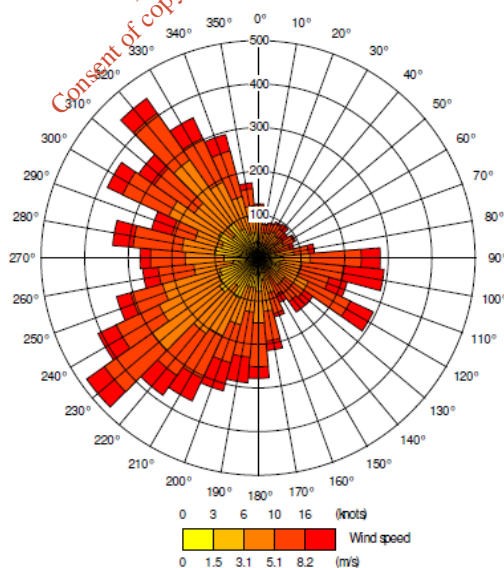


Figure 4-4
Windrose for Cork Airport Observation Station (2012)

4.3 Sensitive Receptors

Sensitive receptor locations are those where the public may be exposed to odour emissions potentially arising from the Site. The sensitivity of receptors with regard to odour is presented in more detail in Appendix AQ1.

The surrounding area mainly comprises of commercial / industrial activities within the adjacent business parks. The closest residential properties are approximately 80m to the northwest and 120m to the east. The location of the odour sensitive receptors considered within this assessment are summarised in Table 4-1 and presented in Drawing AQ1 'Odour Sensitive Receptors'.

**Table 4-1
 Odour Discrete Receptor Locations**

Receptor	Sensitivity	Location	Distance & Direction from Site Boundary
R1 City Link Park west	Medium	51°52'14.13" 8°28'57.35"	<20m, North
R2 City Link Park east	Medium	51°52'15.74" 8°28'50.01"	<20m, North
R3 John S & Son Business Park	Medium	51°52'19.36" 8°28'38.08"	245m, Northeast
R4 Residential Property, N27	High	51°52'13.28" 8°28'43.92"	120m, East
R5 Kinsale Rd Accommodation Centre	High	51°52'07.94" 8°28'48.24"	165m, South
R6 Forge Hill Business Park	Medium	51°52'11.37" 8°28'52.70"	30m, South
R7 Manor Road Residences	High	51°52'07.47" 8°29'03.88"	215m, Southwest
R8 Offices / Industrial Premises	Medium	51°52'12.51" 8°28'58.66"	30m, West
R9 Dan Seaman Car Garage	Medium	51°52'13.83" 8°28'59.62"	30m, West
R10 Residence fronting Forge Hill	High	51°52'15.40" 8°29'01.54"	80m, Northwest

4.4 Baseline Odour

The previous MRF at the Site accepted, amongst other wastes, residual municipal waste and relatively small quantities of food waste. These wastes are both considered to have potential to generate odours. The Annual Environmental Reviews (AER's) for the final 4 years of operation (2008 to 2011) indicated that no odour complaints were received during that period⁴. There have been no operations at the Site since 2011.

The surrounding area is dominated by industrial and commercial uses, with limited potential to produce significant odour emissions.

⁴ SLR Consulting Ltd, 2013. Forge Hill Environmental Liabilities Risk Assessment, April 2013. Report Ref: 501.00303.00001.011.

5.0 ASSESSMENT OF EFFECTS AND SIGNIFICANCE

Wherever bulk quantities of waste are handled there is potential for the generation of offensive odours. Typically, odour may be generated as a result of the receipt and handling of wastes with a biodegradable fraction. Wastes handled at the proposed development will be solely DMR waste and therefore of negligible risk of odour generation. No food wastes or residual municipal wastes are to be received onsite.

5.1.1 Source Odour Potential

The expected throughput of the MRF will be a maximum of 82,000 tpa. The DMR waste would comprise mainly of paper, plastic and metals, with a potential for other recyclables such as glass, wood and textiles. A full breakdown of the permitted wastes to be accepted onsite can be found in Attachment B.3.2 (Condition 5 of the Site's Permit).

All waste material would be delivered, processed and stored inside the fully contained buildings. Waste would arrive onsite in bulk loads and infrequently by Refuse Collection Vehicles; both of which would ensure the waste is enclosed during transport. All unloading, loading, storage and operation of plant would be undertaken within the enclosed MRF buildings. Full details of the proposed operations and plant can be found in Attachment D.2.1, with associated drawings in Attachment D.2.2.

There is not anticipated to be any putrescible waste within the incoming waste source that would have the potential to generate malodours during storage and processing. However should a delivery be contaminated with putrescible waste this scenario would allow potential for the generation of odour.

The design of the MRF incorporates a number of 'designed-in' mitigation measures that require consideration when assessing the source odour potential during the operation of the facility. These include the following:

- all waste handling operations will be conducted indoors with full containment of the buildings;
- roller shutter doors installed;
- no materials will be stored outside;
- concrete floors in buildings and yards with drainage of trade effluent to the sewer; and
- all baled wastes will be stored indoors so no leachate will be generated.

Based upon the nature of the material received and the enclosed nature of all aspects of the operations, the odour source is considered to present a 'small' odour potential.

5.1.2 Effectiveness of the Pollutant Pathway

The descriptors for the effectiveness of dispersion are set out in Appendix AQ1. Factors that are considered include distance from source, location of receptors with regard to the prevailing wind direction, and frequency of low winds / calm periods.

High wind speeds tend to lead to odour emissions being more rapidly dispersed and diluted due to turbulence, and low wind speeds inhibit the dilution of odours. Therefore the incidence of low wind speed conditions of less than 3m/s have been used to inform the odour risk assessment as presented.

The incidence of low wind conditions at Cork Airport Observation Station indicates that about 55% of hourly observations are less than 3.1m/s with calm conditions (being less than 0.5m/s) occurring about 0.4 % of the year. As previously discussed, given the height

difference between the Site and the airport, the proportion of low wind conditions could be greater than those indicated from the observation station dataset.

From Figure 4-3 it can be seen that the prevailing wind directions are from the south-western and north-western quadrants. Receptors to the north east and southeast are therefore considered to be at a higher risk of odour impact, should odour generation occur, during periods of low wind speeds.

Taking the distance and direction of the receptor locations from the source, the effectiveness of the pathway for odour is presented in Table 5-1.

**Table 5-1
 Summary of Pathway Effectiveness**

Receptor Location	Distance from Source (approx.)	Downwind / Upwind	Pathway Effectiveness
R1 City Link Park west	<20m	Downwind	Highly Effective
R2 City Link Park east	<20m	Downwind	Highly Effective
R3 John S & Son Business Park	245m	Downwind	Ineffective
R4 Residential Property, N27	120m	Downwind	Moderately Effective
R5 Kinsdale Rd Accommodation Centre	165m	Downwind	Ineffective
R6 Forge Hill Business Park	30m	Downwind	Highly Effective
R7 Manor Road Residences	215m	Upwind	Ineffective
R8 Offices / Industrial Premises	30m	Upwind	Moderately Effective
R9 Dan Seaman Car Garage	<20m	Upwind	Moderately Effective
R10 Residence fronting Forge Hill	80m	Upwind	Moderately Effective

5.1.3 Risk of Odour Exposure (Impact)

Based on the ‘small’ odour source potential and the pathway effectiveness at each identified receptor (see Table 5-1), the risk of odour exposure (impact) at each receptor is determined using the matrix provided in Appendix AQ1. The risk of exposure for each receptor is presented in Table 5-2.

**Table 5-2
 Summary of Risk of Odour Exposure at Sensitive Receptors**

Receptor Location	Odour Source Potential	Pathway Effectiveness	Risk of Exposure (Impact)
R1 City Link Park west	Small	Highly Effective	Low Risk
R2 City Link Park east	Small	Highly Effective	Low Risk
R3 John S & Son Business Park	Small	Ineffective	Negligible
R4 Residential Property, N27	Small	Moderately Effective	Negligible
R5 Kinsdale Rd Accommodation Centre	Small	Ineffective	Negligible
R6 Forge Hill Business Park	Small	Highly Effective	Low Risk
R7 Manor Road Residences	Small	Ineffective	Negligible
R8 Offices / Industrial Premises	Small	Moderately Effective	Negligible
R9 Dan Seaman Car Garage	Small	Moderately Effective	Negligible
R10 Residence fronting Forge Hill	Small	Moderately Effective	Negligible

5.1.4 Effect of Odour Impact

The effect of odour at the receptor locations was determined using the matrix provided in Appendix AQ1. This uses the risk of exposure of each receptor (Table 5-2) and the sensitivity of the receptors (see Table 4-1). A summary of the likely odour effect at each sensitive receptor is presented in Table 5-3.

**Table 5-3
 Summary of Likely Impacts at Sensitive Receptors**

	Receptor Location	Risk of Exposure (Impact)	Receptor Sensitivity	Likely Odour Effect
R1	City Link Park west	Low Risk	Medium	Negligible
R2	City Link Park east	Low Risk	Medium	Negligible
R3	John S & Son Business Park	Negligible	Medium	Negligible
R4	Residential Property, N27	Negligible	High	Negligible
R5	Kinsale Rd Accommodation Centre	Negligible	High	Negligible
R6	Forge Hill Business Park	Low Risk	Medium	Negligible
R7	Manor Road Residences	Negligible	High	Negligible
R8	Offices / Industrial Premises	Negligible	Medium	Negligible
R9	Dan Seaman Car Garage	Negligible	Medium	Negligible
R10	Residence fronting Forge Hill	Negligible	High	Negligible

The likely effect of odour is predicted to be negligible for all receptors. The potential for odour impact on the surrounding receptors is therefore considered not to be significant.

The outcome of the assessment is consistent with the fact that no odour complaints were received in the last 4 years of operations of the previous MRF at the Site (2008 to 2011); during which putrescible wastes with a high potential for odour generation were received as opposed to the proposed future DMR waste with very low odour potential.

6.0 MITIGATION MEASURES & RESIDUAL IMPACTS

The potential risk of odour impact is considered to be low or negligible with a consequential negligible risk of effect on nearby receptors. Waste is not anticipated to be odorous given that the waste stream is entirely DMR material; however as discussed previously there is a small risk of contamination of residual waste within the waste stream.

6.1 Existing Permit Conditions

The operation of the facility would be under the strict conditions of the existing permit (WFP-CK-15-0148-01) issued by Cork County Council (see Attachment B.3.2). Controls relating to odour within the existing permit include the following taken from Condition 6 of the permit document:

“The permit holder shall, in advance of the commencement of waste activities, install and provide adequate measures for the control of odours and dust emissions, including fugitive dust emissions, from the facility. Such measures at a minimum should include [...]: maintenance of integrity throughout the building to ensure no significant escape of odours.”

“The permit holder shall ensure that all waste for disposal stored overnight at the facility shall be stored in suitably covered and enclosed containers, and shall be removed from the facility within forty eight hours of its arrival at the facility except at Bank Holiday Weekends. At Bank Holiday Weekends, waste for disposal shall be removed from the site within seventy-two hours of its arrival on site.”

Given the daily throughput of circa 300 tonnes and the 100 tonnes storage limit, material would typically be removed from the facility within 24 hours.

6.2 Recommended Odour Control Measures

Mitigation measures to prevent the contamination of the waste with putrescible waste include the following:

- waste profiling and characterisation to ensure that only dry recyclables are delivered to the facility (see attachment F.1);
- waste acceptance procedures to ensure that only dry recyclables are accepted at the facility (see attachment F.1);
- a dedicated waste inspection area to identify non-DMR waste on receipt (see attachment D.1(i));
- a dedicated waste quarantine area for non-recyclable non-hazardous wastes (see attachment D.1(h));
- rejected material store in an enclosed compactor prior to removal off site to an appropriate disposal or recovery facility;
- spill kits provided in vehicles and at appropriate locations to quickly contain any spills of potentially polluting liquids (see attachment F.1);
- any putrescible waste delivered to the Site removed with minimum delay (see attachment I.1.3);
- any source of waste that contains putrescible waste removed and the source of the material contacted regarding same (see attachment I.1.3);
- the suppliers of waste to the Site given strict instructions to ensure that waste does not contain putrescible fraction. Suppliers who breach this requirement refused entry to the Site (see attachment I.1.3);

- no materials stored outside of buildings (see attachment I.1.3);
- operations at the Site carried out under strict Standard Operating Procedures. These procedures will form part of the Environmental Management System that will be installed at the Site (see attachment I.1.3); and
- a high standard of cleaning and general good housekeeping;

6.3 Odour Monitoring & Complaints Management

In addition to the implementation of the recommended mitigation measures, daily patrols will monitor odour around the Site (see attachment F.2).

In accordance with the conditions of the Sites permit (see Attachment B.3.2) a register of all complaints relating the operation of the facility shall be kept. Each record shall give details of the following:

- time and date of the complaint;
- name of the complainant;
- details and nature of the complaint;
- actions taken to deal with the complaint, and the results of such actions; and
- the response made to each complainant.

The Local Authority or the EPA (as appropriate) shall be made aware of each complaint and receive full details of the complaints register.

6.4 Residual Effects

In the absence of mitigation measures, there is considered to be a 'negligible' risk of effect at surrounding receptors from onsite odour. Taking into account the conditions of the existing permit, and the control measures recommended, there continues to be a 'negligible' risk of effect on the surrounding receptors. The residual effect on surrounding receptors is therefore considered to be not significant.

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