Contents

13 MATERIAL ASSETS

13.1 INTRODUCTION

The Assessment area, for the purposes of this Chapter, refers to the area in which works are proposed for the Limerick City Greenway (UL to NTP) as described in Chapters 3 & 4 of the EIAR.

This chapter assesses the impacts of the scheme, hereafter referred to as the proposed development, under the heading of Material Assets on the Assessment area during both construction and operational phases.

Material Assets are generally considered to be the physical resources in the environment, which may be of man-made or natural origin and have intrinsic value to an area. These resources can be assigned economic value based on their significance within the overall socio-economics of an area. The impact of the proposed development on transport infrastructure, traffic, sub-surface infrastructure and management of waste are assessed in this chapter.

The EPA's *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (May, 2022) states that Material Assets can be "taken to mean built services and infrastructure". Given this, "Land Use" is additionally discussed under Chapter 7 "Land Use, Soils & Geology". This assessment will identify the existing material assets in the assessment area, determine the impacts, if any, that the proposed development may have on these resources, and as necessary, detail proposed mitigation measures.

Material Assets are additionally appraised in a number of other Chapters within this EIAR Report as follows:

Natural Resources:

- Chapter 7: Land Use, Soils & Geology
- Chapter 8: Water Quality

Cultural Heritage:

- Chapter 12: Cultural Heritage

Towns and settlements:

- Strategic & Statutory Planning Context within Chapter 1
- Chapter 5: Human Beings, Population & Human Health

A number of documents were consulted in the preparation of this assessment, including:

(i) Limerick Development Plan (2022 - 2028)
(ii) Limerick Shannon Metropolitan Area Transport Study (LSMATS)
(iii) Southern Region Waste Management Plan 2015 – 2021 (as implemented through the Local Authority Development Plans)
(iv) EPA Wastewater Discharge Licence Applications database
(v) EPA, Guidelines on the information to be contained in Environmental Impact Statements
(vi) EPA, Guidelines on the information to be contained in Environmental Impact Assessment Reports, 2022
(vii) Guidance for the Control and Management of Traffic at Road Works, Department of Transport, 2010
(viii) Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects, EPA, 2021.

13.2 Assessment Methodology

This assessment is based on a desktop study with details of major utilities taken from information supplied by Limerick City & County Council (LCCC) and various utilities providers. It includes plans and drawings of existing utilities along with data provided by site investigations. The data collection is in line with the requirements of the EPA advice notes and guidelines on the production of Environmental Impact Assessment Reports (2022).

This chapter sets out a baseline of the existing infrastructure and lands on which the development is proposed, assesses the potential for impacts that the proposed development may have on those lands and infrastructure and identifies mitigations that will be employed to minimise those impacts.

An analysis of land quality, sensitivities and use together with an assessment of impacts of the proposed development on land is provided in Chapter 7 of this EIAR.

13.3 Assessment of Impacts

This section is based on criteria and best practice guidance contained in the '*Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR)*'[1] and under EU legislation contained in EIA Directive (2014/52/EU) as adopted by Ireland in 2014.

Impacts are assessed using the following criteria:

- Duration of Effect – ranging from Brief (<1day) to Permanent.
- Quality of Effect – Neutral/Negative/Positive.
- Type of Effect – Direct/Indirect.
- Value of Receptor – ranging from Negligible to High.
- All above contribute to an assessment of the Significance of Effect – ranging from Imperceptible to Profound.

13.4 Receiving Environment – Infrastructure

The proposed development, as described in Chapter 4, comprises the construction of approximately 4.25 km of Greenway extending from the River Groody bridge, past the University of Limerick, and eastwards to the National Technology Park (NTP) at Castletroy.

The works involve the upgrade of an existing gravel and paved pathway and undeveloped amenity parklands along the southern bank of the River Shannon, turning towards McLaughlan Road, with one spur turning south to run past Kilmurry student village then along University Road to join Plassey Park Road.

Subject to agreement the proposed works will impact on the existing footpaths within the NTP and along McLaughlan Road.

Subject to agreement, construction traffic will pass by Dromroe student village and Kilmurry student village, and through a private road (for LCCC/Uisce Éireann (UE) network operations use) within the UL Campus.

Due to the linear nature of the proposed works, the construction of the proposed Greenway will be divided into five sections, each serviced by separate temporary construction compounds and haul routes, to facilitate sequencing of works, as illustrated in Figure 13-1. This sectional approach will mean that one section of the

1 EPA, 2022

proposed Greenway can be constructed while the adjacent sections are kept in use for both cyclists and pedestrians.

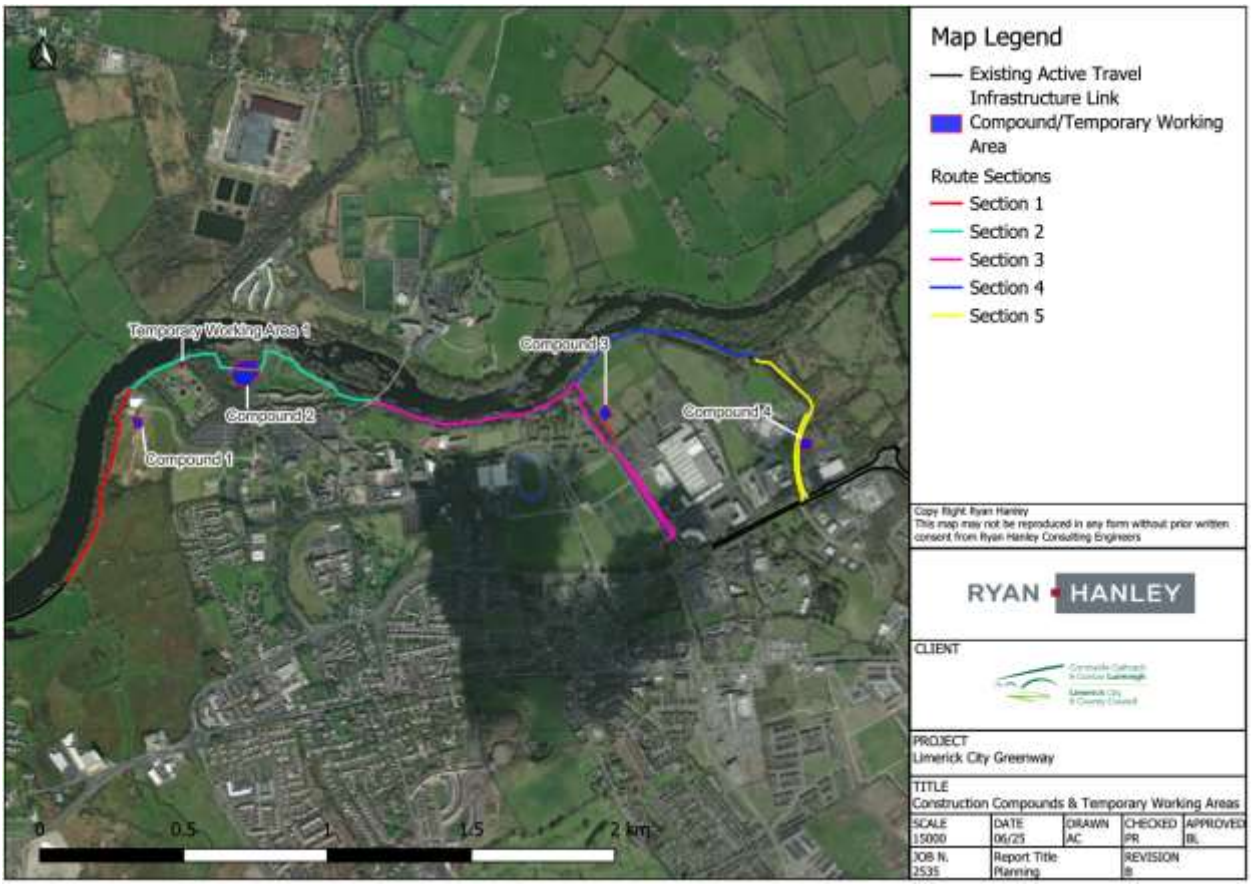

Figure 13-1: Schematic of construction sections and compounds

Potential impacts to Material Assets are restricted to the defined areas where works are proposed and areas that may be impacted during the construction of the proposed development.

Proposed Construction Methodologies are detailed in Section 4.1 of Chapter 4 and will comprise:

- Site investigation;
- Site clearance (tree removal and earthworks);
- Set up of temporary working areas and site compounds;
- Construction of temporary access roads;
- Traffic management;
- Relocation of existing utilities/services;
- Construction of Greenway;
- Construction of new bridges and culvert crossings;
- Construction of concrete retaining wall;
- Construction of access ramp;
- Construction of concrete steps;
- Construction of drainage infrastructure (Swales and culverts);
- Installation of Public Lighting;
- Installation of wooden and anti-climb fencing along path;
- Interfaces with roads (beacon lighting, safety barriers, dipped kerbs, and safety barriers);

- Ancillary and amenity (fencing, signage, bike racks, park benches); and,
- Reinstatement works.

The development location is primarily set within both a rural, riverside amenity area and suburban, residential area. The existing pathway developed from a 19th -century towpath built as part of the Shannon Navigation programme. Parts of the Greenway will diverge from the riverside pathway to facilitate access and egress to UL campus, NTP and the wider Castletroy residential areas. In some locations the proposed greenway route will also diverge from the existing riverside pathway to avoid mature trees and roosting habitat.

The proposed Scheme will have potential to impact on the following:

- Transport Infrastructure - including Roads & Traffic;
- Waste Management;
- Water Distribution Network
- Drainage Network; including Foul & Storm Water;
- Bord Gáis Distribution Network;
- Electricity Network - including public services, street lighting, etc;
- Broadband Network - Fibre & Satellite; and
- Telecommunications Network - including cable & mobile;

These elements are further assessed in Chapter 5 – Human Beings, Population & Human Health and Chapter 8 – Water.

13.4.1 Transport Infrastructure – Roads & Traffic

Road and transportation infrastructure in the townlands of Dromroe, Sreelane, Newcastle and Castletroy comprise Regional, Local Primary, Local Secondary and Local Tertiary roads. All public roads works in the assessment area are overseen by LCCC Roads Department and any works within the University of Limerick campus are maintained by that institution. Table 13-1 provides details of the relevant existing road network in the assessment area:

Table 13-1: Existing road network within the assessment area

Name/Descriptive Location	Road Title (LCCC)	Class
M7	M7	Motorway
Dublin Road	R445	Regional
Plassey Park Road	-	-
University Road	-	-
McLaughlan Road	-	-
Castletroy WWTP Access Road/Harvard Close	-	Private – LCCC/UÉ access

The primary haulage routes are anticipated to be the M7 and R445 for primary access to the assessment area. Within the assessment area, haulage routes will utilise a series of Local Roads including Plassey Park Road, McLaughlan Road, University Road and several unnamed roads within the UL campus.

13.4.1.1 Existing Traffic and Transport Network

TII maintain two traffic counters on the M7 and the Dublin Road (R446). LCCC was consulted in March 2024 and it is understood that no traffic counters or relevant data for the Castletroy and environs area exist. Data is presented in Table 13-2.

Table 13-2: TII and Limerick City and County Council AADT data

Road Class	Road Number	Road name & Location	Count Date	AADT	Count Type
Motorway	M7	East & South of UL	January to March 2024	30,866	Traffic Counter
Regional	R445	Dublin Road	January to March 2024	17,703	Traffic Counter

Relevant data compiled by TII for AADT and percentage of Heavy Goods Traffic (%HGV) on the R445 road and M7 Southern Ring Road are presented in Table 13-3 and Table 13-4.

Table 13-3: Traffic Flow data for the R445 Regional Road between Castletroy & Annacotty Roundabouts *(Source: TII - https://trafficdata.tii.ie)*

Year	ADT	% HGV	Coverage
2024*	17,703	1.0%	20.0%
2023	17,788	1.3%	100.0%
2022	16,751	1.2%	100.0%
2021	13,450	1.5%	100.0%
2020	14,748	1.5%	99.7%

Table 13-4: Traffic Flow data for the M7 Between Jn28 Castletroy and Jn29 M7/N24 Ballysimon, Castletroy, Co. Limerick (Source: TII. *(Source: TII - https://trafficdata.tii.ie)*

Year	ADT	% HGV	Coverage
2024	30,866	6.8%	20.0%
2023	31,619	6.9%	99.0%
2022	29,645	7.2%	100.0%
2021	25,367	8.3%	100.0%
2020	22,277	8.9%	100.0%

The area under assessment is served by the following bus links:

- Bus Éireann Route 323, City Centre - Castleconnell
- Bus Éireann Route 304, Ballycummin - UL
- Bus Éireann Route 304A, Raheen UHL - UL
- Eurobus Route 307, William Street - Cappavilla.
- Eurobus Route 308, William Street – University (Stables).
- Dublin Coach M7, Arthur's Quay via University (Stables) – Dublin City.

The area under assessment is not served by a rail link.

13.4.1.2 Potential Impact on Road Infrastructure

Construction Phase: ***Potential Temporary Slight to Moderate Negative Impact***

Operational Phase: ***Potential Permanent Significant Positive Impact***

The proposed development will involve construction of a path along an existing route which will be approx. 4.25km in length. The proposed route is detailed in Chapter 3 and illustrated in the Preliminary Design drawings. Cumulative impacts of these closures and/or diversions are assessed in Chapter 5: Human Beings, Population & Human Health.

Construction Phase:

The potential impacts of the proposed development on the road network, due to works being carried out on and in the vicinity of the road network, are as follows:

- Temporary moderate negative impact where road re-profiling and re-kerbing
- Temporary moderate negative impact during haulage of materials such as quarried imports and other deliveries
- Temporary slight negative impact during site clearance and preparation of temporary works compounds.
- Temporary slight negative impact during construction of culverts and installation of bridges and decking along route.
- Temporary slight negative impact during construction of drainage and lighting infrastructure.
- Temporary moderate negative impact during construction of road crossings.

The temporary traffic management plans that would be in place during the construction stage are included in the Design Process Traffic Management Plan in Appendix A.

Operational Phase:

- Permanent significant positive impact during operational phase due to increased usage of route and enhancement of amenity value of area.

13.4.1.3 Potential Impact of Construction on Traffic

Construction Phase: ***Potential Short-Term Slight to Moderate Negative Impact***

Operational Phase: **No Impact**

Construction Phase

An additional short-term slight to moderate negative impact on traffic as a result of the proposed development will be a short-term increase in traffic volumes as a result of construction activity. This section assesses this impact on existing traffic volumes in the assessment area and Section 13.6 of this chapter details mitigation measures to be implemented in advance of and during construction phase.

Some localised traffic disruption is likely to occur at locations of proposed works on, or in the immediate vicinity of the road network due to construction works and traffic entering and exiting the works areas as well as along the proposed haulage routes.

Table 13-5 details the predicted average construction traffic volumes across the road network including the main routes into and out of construction sites/compounds within the assessment area. To determine the impact on existing traffic, a peak value of 28. No round trips per day was used to calculate the impact potential. This is assuming a worst-case scenario based on the maximum predicted number of round trips per day in a works area. This scenario is unlikely to occur routinely during the construction phase.

Vehicles used in construction phase will not be using the road network at the same times for all sites. Certain vehicles, plant and materials will be required to be delivered once only and then transported within the works area. Additionally, delivery and removal of any materials will occur intermittently over specified and staggered time periods. The impacts across the road network will be minimised with the phasing and spread of works as detailed in Table 13-5. The programme indicates that all the works will be completed in sections and all plant and materials for each task delivered in the required time. The table below indicates traffic at peak volumes to allow for maximum impact determination.

Chapter 4, Section 4.3 outlines the predicted duration and sequencing of the works. Delivery of plant and materials will not have a long-term negative impact to existing traffic.

LCCC Roads, Traffic & Transportation section were consulted, and it is understood that no traffic counters or current data exist within the Castletroy area. It is expected that during construction Plassey Park Road, University Road, McLaughlan Road and the Castletroy WWTP Access Road will experience an increase in traffic volumes during construction, however it is not anticipated that this will result in notable traffic congestion.

It is predicted that the Dublin Road (R445) will have the largest increase in traffic volumes during the construction phase of the proposed project however it is not anticipated that this will result in notable traffic congestion.

Table 13-5: Break down of estimated trips for proposed Limerick City Greenway (UL to NTP)

	LOCATION	Soil Exported (m^3)	GRAVEL IMPORTED (m^3)	MACADAM IMPORTED (m^3)	CELL-WEB (m)	GEOTEXTILE (m)	PRE-CAST PIPES (#)	CONCRETE TRUCKS (Total #)	MISC DELIVERIES (Total #)	WORKFORCE TRIPS (Total #)	Movements (Total #)
SECTION 1/COMPOUND 1											
Compound Set Up and Operations No. 1		0	392	0	0	327	0	0			
Site clearance		0	0	0	0	0	0	0			
Installation of haul road		0	487	0	0	464	0	0			
Construction of cycle path		0	451	0	0	0	0	0			
Surfacing of path		0	0	193	0	0	0	0	38	752	945
Bank stabilisation		0	129	0	0	0	0	0			
Utilities/Services/Lighting		0	0	0	0	0	0	0			
Construction of drainage infrastructure		0	261	0	0	0	2	0			
Installation of root protection CellWeb		0	0	0	737	0	0	0			
SECTION 2/COMPOUND 2 + TEMPORARY WORK AREA 1											
Compound Set Up and Operations No. 2 + Temporary Working Area 1		0	2040	0	0	1700	0	0			
Site clearance		0	0	0	0	0	0	0			
Installation of haul road		0	641	0	0	611	0	0			
Construction of Bridge 1, 2, 3 & 4		0	366	7	0	0	0	11			
Construction of cycle path		0	614	0	0	0	0	0			
Surfacing of path		0	0	264	0	0	0	0	51	1027	1448
Bank stabilisation		0	173	0	0	0	0	0			
Utilities/Services/Lighting		0	0	0	0	0	0	0			
Construction of drainage infrastructure		0	343	0	0	0	3	0			
Installation of root protection CellWeb		0	0	0	991	0	0	0			
SECTION 3											
Compound Set Up and Operations		0	0	0	0	0	0	0			
Site clearance		0	0	0	0	0	0	0			
Installation of haul road		0	92	0	0	88	0	0			
Construction of Bridge 5		0	0	0	0	0	0	20			
Construction of cycle path		0	1043	0	0	0	0	0			
Surfacing of path		0	0	478	0	0	0	0	88	1766	2027
Bank stabilisation		0	174	0	0	0	0	0			
Utilities/Services/Lighting		0	0	0	0	0	0	0			
Construction of drainage infrastructure		0	50	0	0	0	0	0			
Installation of root protection CellWeb		0	0	0	996	0	0	0			
SECTION 4/COMPOUND 3											
Compound Set Up and Operations No. 3		0	510	0	0	425	0	0			
Site clearance		0	0	0	0	0	0	0			
Installation of haul road		0	25	0	0	24	0	0			
Construction of cycle path		0	444	0	0	0	0	0			
Surfacing of path		0	0	190	0	0	0	0	37	740	884
Bank stabilisation		0	127	0	0	0	0	0			
Utilities/Services/Lighting		0	0	0	0	0	0	0			
Construction of drainage infrastructure		0	13	0	0	0	0	0			
Installation of root protection CellWeb		0	0	0	724	0	0	0			
SECTION 5/COMPOUND 4											
Compound Set Up and Operations No. 4		0	480	0	0	400	0	0			
Site clearance		0	0	0	0	0	0	0			
Installation of haul road		0	298	0	0	283	0	0			
Construction of cycle path		0	553	0	0	0	0	0			
Surfacing of path		0	0	264	0	0	0	0	47	935	1130
Bank stabilisation		0	50	0	0	0	0	0			
Utilities/Services/Lighting		0	0	0	0	0	0	0			
Construction of drainage infrastructure		0	159	0	0	0	1	0			
Installation of root protection CellWeb		0	0	0	284	0	0	0			

Table 13-6: Peak Daily Construction Traffic as a Percentage of Existing Traffic on Anticipated Construction Traffic Routes

Road Name	Annual Average Daily Traffic	Construction Traffic	
		Peak Daily Construction Traffic (Round Trips)	As a Percentage of Existing Traffic
M7	30,866	28	0.091%
Dublin Road (R445)	17,703	28	0.158%

It is predicted based on available data that the R445 will have the largest increase in traffic volumes during the construction phase of the proposed Greenway, however again it is not anticipated that this will result in notable traffic congestion. Based on Table 13-6, construction traffic is predicted to have a **short-term minimal to moderate impact** on traffic during the construction phase.

Operational Phase:

There will be **no predicted negative impact** due to construction traffic during Operational Phase of the proposed development.

There will be a **predicted significant positive impact** on traffic flows where the proposed works will increase Greenway users connecting to the various residential, educational, commercial and industrial, areas.

13.4.1.4 Potential Impact of Road Closures on Traffic

Potential Temporary Slight to Moderate Impact

Existing traffic, together with access for businesses and local property owners, will have to be facilitated along Harvard Close, Dromroe & Kilmurry Student Villages within the University of Limerick Campus, Plassey Park Road.

It is expected that some temporary road closures and lane closures will be required to facilitate the construction the proposed Greenway.

Road opening licences will be submitted to LCCC six weeks in advance of works. A Traffic Management Plan will be implemented, and the works will be planned to minimise disruption to the UL campus, NTP and residential areas. Details will be specified in the any Road Opening Licences in liaison with LCCC.

It is possible that extended working hours or night-time works could be used to minimise the impact on traffic flows in the locality. University exam times will have to be taken into consideration for working hours in detailed planning of the works. Design parameters are provided in Tables below and proposed road closure locations and details are further described in the Traffic Management Plan.

University Road

Construction traffic will use University Road to access Compound No. 3 and the Magenta and Purple sections of the proposed path.

It is planned that the western lane of University Road will be temporarily closed during the works to permit construction of the works associated with the Greenway (cycle path & pedestrian path). The proposed cycle path will be situated in the existing grassed verge area to the west of the road. The proposed pedestrian path will occupy the western extent of the existing parking bays.

The existing footpath on the eastern side of the road will remain in use during the works. It will be the responsibility of the PSCS to maintain the footpaths for the duration of the works. The requirements of clause 8.3.11 of 'Traffic Signs Manual (Chapter 8 – Temporary Traffic Measures and Signs for Roadworks)' must be adhered to.

Once work has been complete on the western side, it will reopen to allow pedestrian access during construction of the eastern path. At which point the eastern lane of University Road will be temporarily closed during the works to permit construction of the works associated with the Greenway (cycle path & pedestrian path).

A shuttle system shall be adopted to enable traffic to pass through the works using one lane. This may be operated by two methods, Stop and Go and Temporary Traffic Signals.

McLaughlan Road

Construction traffic to Compound No. 4 and the Yellow Section of the proposed path will use McLaughlan Road.

It is planned that the eastern lane on McLaughlan Road will be temporarily closed during the works to permit construction of the proposed combined cycle and pedestrian path. The proposed combined cycle and pedestrian path will be situated along the easter and western extent of the existing road in place of the existing footpaths and verge.

The existing footpath on the western side of the road will remain in use during works on the eastern cycle and pedestrian path and vice versa. It will be the responsibility of the PSCS to maintain the footpaths for the duration of the works. The requirements of clause 8.3.11 of 'Traffic Signs Manual (Chapter 8 – Temporary Traffic Measures and Signs for Roadworks)' must be adhered to.

A shuttle system shall be adopted to enable traffic to pass through the works on one lane. This may be operated by two methods, Give & Take and Priority (Yield Sign)

13.4.2 Red Section

During construction along the Red section of the proposed path, cyclists and pedestrians will use the existing path for much of its length between the River Groody and Construction Compound 1 because the red section diverts of the existing path in many locations. In areas between the River Groody and Construction Compound 1 where the proposed route overlaps the existing towpath, a pedestrian route shall be maintained during the works. Once pedestrians reach Construction Compound 1, they will be diverted away from the Red Section and towards south and east of the UL Boat House and rejoin the existing riverside path as long as Section 2 (cyan) is open.

13.4.3 Cyan Section

During construction along the Cyan Section of the proposed path, cyclists and pedestrians will be diverted away from the tow path at the UL Boat House and continue past the entrance of Castletroy WwTP until reaching the Tierney Building. They will then head north for a short distance until travelling through Dromroe Student Village and to the Foundation Building. From here they will continue past the White House and rejoin the tow path at the Magenta section via an existing footbridge at the back of the PESS building.

13.4.4 Magenta Section

During construction along the Magenta Section of the proposed path, cyclists and pedestrians will be diverted away from the tow path at Dromroe Student Village and be diverted to the Foundation Building. From here they will continue past the White House and behind the PESS building, all weather pitch and tennis court until reaching Kilmurry Student Village. Pedestrians will then use the existing pathway from Kilmurry Student Village which runs between the Acres Maguires Pitches until reaching Plassey Park Road.

13.4.5 Purple Section

During construction along the Purple Section of the proposed path, cyclists and pedestrians will be diverted away from the tow path at Kilmurry Student Village and be diverted along University Road until reaching Plassey Park Road.

13.4.6 Yellow Section

During construction along the Yellow Section of the proposed path, cyclists and pedestrians will be diverted away from the tow path at Kilmurry Student Village and be diverted along University Road until reaching Plassey Park Road.

13.4.7 Harvard Close

It is proposed that construction traffic will access proposed construction Compound 1 and Temporary Works Area 1 along the red section of the proposed path via Harvard Close. The road is normally only used by maintenance and operations vehicles accessing the WwTP. Adequate signage will be required along this route during construction works to ensure the safety of existing users. Flagmen will be required to manage construction traffic at junctions and where construction vehicles will join Plassey Park Road.

13.4.8 Dromore Village Road

It is proposed that construction traffic will access a proposed Construction Compound 2 along the Cyan Section of the proposed path via the road to the west of Dromroe Student Village on the UL campus. The road is normally used to access Dromroe Student Village, the North UL Campus including Thomond Student Village and Cappavilla Student Village, and Parteen via the road bridge over the River Shannon. Pedestrian and Cycle lanes are present on both the west and east lane of the road. Flagmen will be required to manage construction traffic where vehicles will access Dromore Village Road from the construction compound.

13.4.9 University Road

It is proposed that construction traffic will access construction Compound 3 along the Magenta and Purple Sections of the proposed path via University Road. The works along University Road will operate in all flow and visibility conditions and will remain in position for a duration of more than 24 hours, it is anticipated that the class of the roadworks will be 'Type A'.

Refer to Table 13-7 for details. Adequate signage will be required along this route during construction works to ensure the safety of existing users.

Table 13-7: Road and Traffic Management details along University Road

Works Class	Speed Limit (kph)	Footpath	Road Width	Hazard	Traffic Management Layout	Notes
A	Assumed 50 - 60	Existing along eastern side of road to remain operational throughout the works	Varies, approx. 7-12m	Existing road traffic, pedestrians, construction traffic accessing Compound 3.	One lane closure with stop and go, or traffic lights	Provision must be maintained for pedestrian use of footpath. The proposed pedestrian path will occupy approx. 50% of the width of the parking bays at the western side of the road. Parking bays will remain functional post construction.

13.4.10 McLaughlan Road

It is proposed that construction traffic will access proposed construction Compound 4 along the Yellow Section of the proposed path via McLaughlan Road. It is proposed to facilitate existing traffic, and pedestrian walkway, along the section of McLaughlan Road.

The works along McLaughlan Road will operate in all flow and visibility conditions and will remain in position for duration of more than 24 hours, it is anticipated that the class of the roadworks will be 'Type A'. Works along the entrance and exit to the car park of Cook Medical, Greentech Plastics Ltd will be temporary and it is anticipated that the class of the roadworks in will be 'Type B'. Refer to Table 13-8 for details.

Table 13-8: Road and Traffic Management details along McLaughlan Road

Works Class	Speed Limit (kph)	Footpath	Road Width	Hazard	Traffic Management Layout	Notes
A	Assumed 50 - 60	Existing along both sides of road. Path along one side of road to remain operational throughout the works	Varies, 5 -10m	Existing road traffic, pedestrians, construction traffic accessing Yellow Section of proposed route and Compound 3	One lane closure with stop and go, or traffic lights	Provision must be maintained for pedestrian use of footpath

B	Assumed 50 - 60	Existing along both sides of road. Path along one side of road to remain operational throughout the works	Approx. 7m	Existing road traffic, pedestrians, construction traffic accessing Yellow Section of proposed route and Compound 3	One lane closure with stop and go, or traffic lights	Provision must be maintained for pedestrian use of footpath

13.4.11 Plassey Park Road

Works related to the end of the pedestrian and cycle path on McLaughlan Road, will be carried out at the junction of McLaughlan Road and Plassey Park Road. The proposed path will merge onto Plassey Park Road and connect to existing active travel infrastructure at this location.

It is proposed to facilitate existing traffic, and pedestrian walkways, along Plassey Park Road. The works will operate in all flow and visibility conditions and will be temporary, it is anticipated that the class of the roadworks will be 'Type B'. Refer to Table 13-9 for details.

Table 13-9: Road and Traffic Management details along Plassey Park Road

Works Class	Speed Limit (kph)	Footpath	Road Width	Hazard	Traffic Management Layout	Notes
B	60	Existing along both sides of road. Path along southern side of road to remain operational throughout the works	Approx. 8m	Existing traffic, existing pedestrian and cyclist traffic	Works at a Junction in addition to 'Stop and Go' or 'Temporary Traffic Signals'	Provision must be maintained for pedestrian use of footpath

13.4.12 Road Closures & Diversionary Measures

Where temporary road closures are required, diversionary measures will require to be implemented which are detailed below. The proposed works will impact on the existing footpaths within UL, University Road, and McLaughlan Road. Construction traffic will pass by Dromroe and Kilmurry Student Villages and through Harvard Close, a private road (for LCCC/UÉ network operations use) within the UL Campus.

There will likely be some disruption in journey times for road users on some roads mainly within the campus area. Some road closures will be required when it is not possible to operate a one lane system (e.g.: when works are being carried out on particularly narrow stretches of road). However, it is expected that these periods will be minimal and phased so that any road closures will not occur concurrently.

Full descriptions of proposed diversion routes are provided in the Traffic Management Plan. These routes will be assessed by the contractor prior to the development of detailed traffic management plans.

The primary area for disruption are as follows:

- Traffic Control measures in the form of a static lane closure will be required on University Riad, to facilitate construction works on the west and east greenway lanes, parking bay and along the footpath to the edge of the road and construction of the proposed raised table.
- Traffic Control measures in the form of a static lane closure will be required on McLaughlan Road to facilitate construction works on the west and east greenway lanes
- Out of hours work is needed at the entrance and exit to Greentech Plastics Ltd, accessed via McLaughlan Road while construction works are ongoing for the cycle lane passing along the entrance and exit of the organisation's car park.
- Traffic Control measures in the form of a static lane closure will be required on Plassey Road, at the junction with McLaughlan Road, to facilitate construction works connecting the proposed cycle and pedestrian path with existing active travel infrastructure.
- Cycle and pedestrian traffic diversions for the duration of works will be carried out along the proposed path where required.
- Flagmen should be positioned at the entrances to the construction site to control construction traffic entering and leaving the site.
- Where traffic control measures are required their impact on roads and footpaths is to be minimised. The Contractor shall inform local businesses/education facilities and the public in advance of the works by means of written communications, local signs and Variable Message Signs (VMS) boards as well as detailing construction from "start date" to "end date".
- Temporary safety barriers placed around the working area should be clearly defined by temporary road markings, signage and coning as specified in the Traffic Signs Manual. The Project Supervisor Construction Stage (PSCS) shall carry out a risk assessment before commencing any works on site, to determine the type of barriers and cones most suitable for the works.
- The appropriate level of signage and temporary traffic measures required for a static lane closure is detailed in the Traffic Management Plan. Following lane closure design, the PSCS shall develop a suitable method of controlling vehicular/cycle/pedestrian traffic passing the works

sites. The factors affecting the choice of traffic control method are summarised in Traffic Management Plan. The PSCS shall consult Limerick City and Council's Roads Department, The University of Limerick, The NTP, and the Garda Siochána prior to implementing traffic control measures on site

Based on the above, there will be slight levels of traffic disruption during construction phase of the proposed development and not anticipated that these levels will result in any notable traffic congestion.

There will be a predicted **temporary moderate negative impact** on Traffic and Transport during the Construction Phase of the project in the absence of mitigation.

13.4.13 Water Distribution Network

The following presents a description of the existing water distribution network within the assessment area and assesses the potential impacts that the proposed development may have on that network.

Distribution watermains are present in the vicinity of the proposed Greenway at the following locations:

- At UL Boat House and Castletroy WwTP (100mm uPVC);
- At University Bridge and Drumroe Student Village into UL Campus (200mm DI), structures within the campus were unsurveyed;
- At Kilmurry Village structures remain unsurveyed but there are records of watermains for distribution;
- Within the grounds of The National Technology Park (ranging from 75mm to 150mm uPVC).

All information is sourced from UÉ GIS records and is to serve as an indication of the **approximate location** of the underground distribution main network. Refer to Figure 13-2.

The existing network is entirely sub-surface, comprising pipelines of various dimensions and materials which provides for fire hydrants, air valves, sluice valves and scour valves at various locations throughout the assessment area.

Additionally, groundwater well card data produced by the Geological Survey of Ireland (GSI) indicates that there are 3. No boreholes within the assessment area. These are used primarily for agricultural and commercial water supply purposes. The yield from these wells has been determined as poor to moderate and the mapping indicates that the wells were bored in the 1960's and 1970's and likely have limited usage in the present today.

13.4.13.1 Potential Impact on Water Distribution Network

Construction Phase:

There is potential for **temporary moderate negative impact** on underground services during Construction Phase works. These impacts may include disruption to the water supply due to accidental damage during excavation works.

Operational Phase:

There are **no predicted negative impacts** to the existing watermain infrastructure during Operational Phase.

Table 13-15: Locations of Impacts on the potable water distribution network

Utility	Greenway crossing (itm)		Description	Construction phase impact	Operational phase impact
Potable Water	561016.2	658634.55	Section 2 Chainage: 1340m	Temporary moderate negative impact	No Impact
	562135.1	658367.16	Section 3 Chainage: 203_C m	Temporary moderate negative impact	No Impact
	562133.9	658355.56	Section 3 Chainage: 220_C m	Temporary moderate negative impact	No Impact
	562229.9	658252.11	Section 3 Chainage: 353_C m	Temporary moderate negative impact	No Impact
	562361.4	658048.9	Section 3 Chainage: 603_C m	Temporary moderate negative impact	No Impact
	562380.6	658019.86	Section 3 Chainage: 644_C m	Temporary moderate negative impact	No Impact
	562397.4	657994.34	Section 3 Chainage: 672_C m	Temporary moderate negative impact	No Impact
	562865.2	658417.58	Section 5 Chainage: 3506m	Temporary moderate negative impact	No Impact
	562842.6	658370.75	Section 5 Chainage: 3558m	Temporary moderate negative impact	No Impact
	562846.1	658368.59	Section 5 Chainage: 3559m	Temporary moderate negative impact	No Impact
	562851.6	658365.44	Section 5 Chainage: 3560m	Temporary moderate negative impact	No Impact
	562829	658274.18	Section 5 Chainage: 3658m	Temporary moderate negative impact	No Impact
	562835.2	658274.24	Section 5 Chainage: 3658m	Temporary moderate negative impact	No Impact
	562829	658272.42	Section 5 Chainage: 3660m	Temporary moderate negative impact	No Impact
	562835.1	658272.4	Section 5 Chainage: 3660m	Temporary moderate negative impact	No Impact
	562826.5	658262.18	Section 5 Chainage: 3670m	Temporary moderate negative impact	No Impact
	562837.1	658262.76	Section 5 Chainage: 3670m	Temporary moderate negative impact	No Impact
	562836.2	658252.02	Section 5 Chainage: 3682m	Temporary moderate negative impact	No Impact
	562837.4	658232.97	Section 5 Chainage: 3701m	Temporary moderate negative impact	No Impact
	562839	658220.47	Section 5 Chainage: 3712m	Temporary moderate negative impact	No Impact

Utility	Greenway crossing (itm)		Description	Construction phase impact	Operational phase impact
	562862.37	658138.53	Section 5 Chainage: 3804m	Temporary moderate negative impact	No Impact
	562865.56	658133.14	Section 5 Chainage: 3807m	Temporary moderate negative impact	No Impact
	562872.56	658134.07	Section 5 Chainage: 3813m	Temporary moderate negative impact	No Impact
	562848.59	658121.51	Section 5 Chainage: 3812m	Temporary moderate negative impact	No Impact

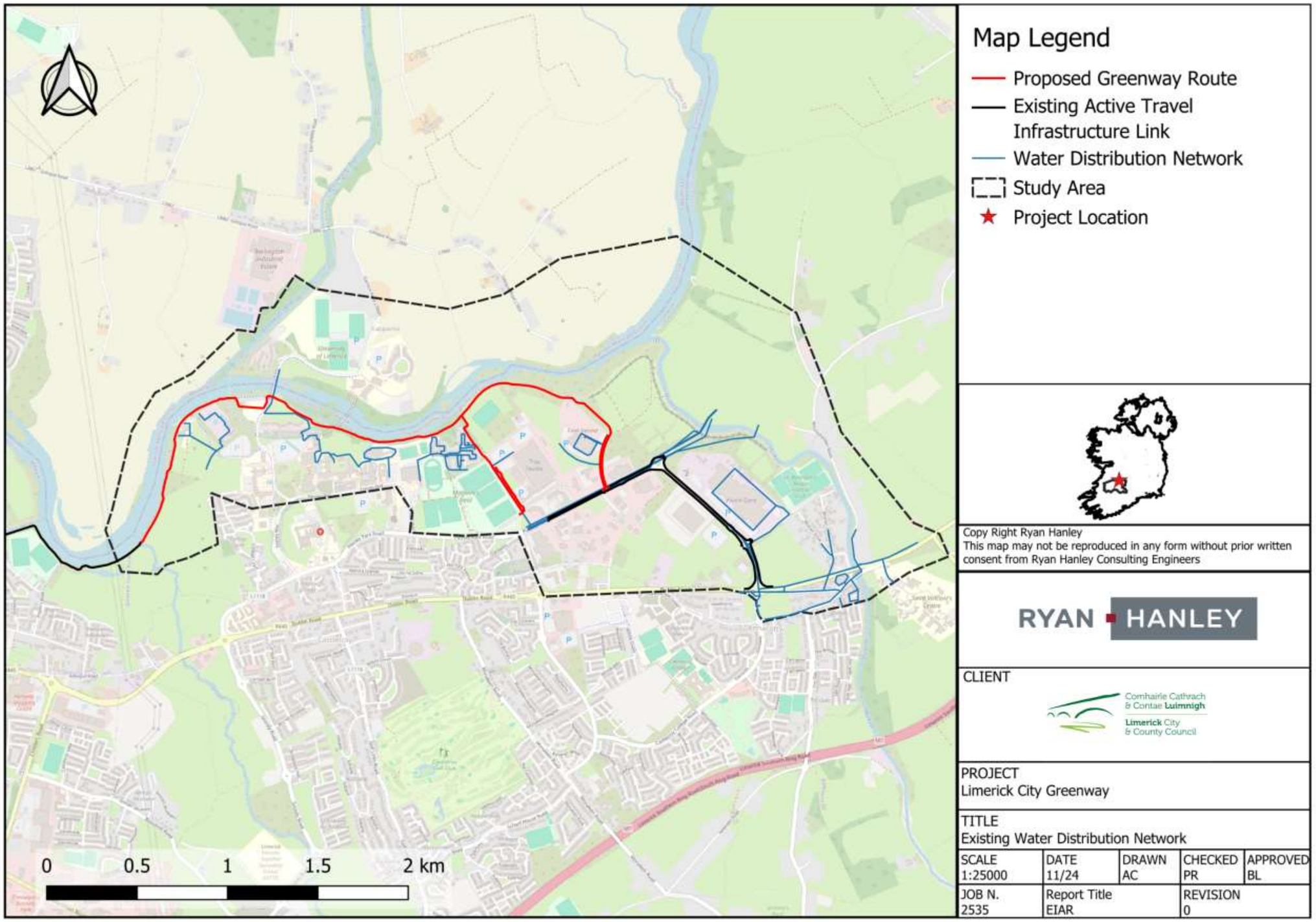

Figure 13-2: Schematic of existing water distribution network within assessment area & environs

13.4.14 Drainage Network

An existing foul and storm water system exists throughout the Greenway assessment area. The surface water collection system within the assessment area comprises a combined system some of which conveys water to Castletroy WwTP and storm water systems which discharge to the River Shannon. Using existing drainage datasets, a model of the main branches of both the storm and foul sewerage network within the assessment area was constructed.

13.4.14.1 Storm Water

The existing storm water network is shown in Figure 13-3. The route of the Greenway is not anticipated to interact with existing storm water however, where points of the Greenway transect with the existing stormwater drainage network, due care should be taken during construction works to ensure that network remains undisturbed.

13.4.14.2 Potential Impact on Drainage – Storm Water

Construction Phase:

There will be a predicted **temporary minimal negative impact** to the existing storm water drainage infrastructure within the scheme area during construction phase. The route of the proposed Greenway and additional measures will interact with the existing storm sewer at approx. 13 no. locations as detailed in Table 13-16. These impacts may include accidental damage during excavation works.

Table 13-16: Predicted Impacts on existing storm water drainage network

Utility	Greenway crossing (itm)		Description	Construction phase impact	Operational phase impact
Storm Water	562051.51	658522.77	Section 3 Chainage: 2484m	Temporary minimal negative impact	No Impact
	562085.28	658470.42	Section 3 Chainage: 80_C m	Temporary minimal negative impact	No Impact
	562194.38	658301.82	Section 3 Chainage: 291_C m	Temporary minimal negative impact	No Impact
	562398.12	657995.37	Section 3 Chainage: 671_C m	Temporary minimal negative impact	No Impact
	562602.24	658634.14	Section 4 Chainage: 3120 m	Temporary minimal negative impact	No Impact
	562885.16	658446.29	Section 5 Chainage: 3472 m	Temporary minimal negative impact	No Impact
	562865.64	658417.37	Section 5 Chainage: 3506 m	Temporary minimal negative impact	No Impact
	562824.98	658271.58	Section 5 Chainage: 3661 m	Temporary minimal negative impact	No Impact
	562827.45	658260.93	Section 5 Chainage: 3670m	Temporary minimal negative impact	No Impact
	562828.13	658253.20	Section 5 Chainage: 3680m	Temporary minimal negative impact	No Impact

Utility	Greenway crossing (itm)		Description	Construction phase impact	Operational phase impact
	562828.70	658246.71	Section 5 Chainage: 3686m	Temporary minimal negative impact	No Impact
	562830.44	658226.75	Section 5 Chainage: 3707m	Temporary minimal negative impact	No Impact
	562834.01	658185.95	Section 5 Chainage: 3748m	Temporary minimal negative impact	No Impact

There will be a predicted **temporary minimal negative impact** to the storm water drainage infrastructure during Construction Phase where works are proposed in areas where existing services are located.

Operational Phase:

There are **no predicted negative impacts** to the existing stormwater infrastructure during Operational Phase.

There would be no significant change to the existing environment in the absence the proposed development.

13.4.14.3 Foul/Combined Sewerage Network

A foul sewer network extends throughout the assessment area. Castletroy Wastewater Treatment Plant (WwTP) (D0019-01) is located on the banks of the River Shannon on the western extent of the proposed Greenway area directly adjacent to the University of Limerick Boat House. The WwTP has a PE design capacity of 45,000 PE.

13.4.14.4 Potential Impact on Drainage Network - Foul/Combined

Construction Phase: There will be a predicted **temporary minimal negative impact** on the foul/combined sewer infrastructure within the assessment area. The proposed works have potential to impact on the existing foul/combined sewer network where the linear scheme works traverse areas that the existing network is located.

Impacts may take the form of accidental disruption of the existing services. There would be no significant change to the existing environment in the absence the proposed development.

Table 13-17: Predicted Impacts on existing foul sewer network

Utility	Greenway crossing (itm)		Description	Construction phase impact	Operational phase impact
Foul	561630.58	658384.08	Section 3 Chainage: 2024m	Temporary minimal negative impact	No Impact
	561762.81	658400.13	Section 3 Chainage: 2158m	Temporary minimal negative impact	No Impact
	561845.72	658413.14	Section 3 Chainage: 2241m	Temporary minimal negative impact	No Impact
	561847.25	658413.02	Section 3 Chainage: 2243m	Temporary minimal negative impact	No Impact
	561872.94	658419.31	Section 3 Chainage: 2272m	Temporary minimal negative impact	No Impact

Utility	Greenway crossing (itm)		Description	Construction phase impact	Operational phase impact
	561911.55	658430.55	Section 3 Chainage: 2312m	Temporary minimal negative impact	No Impact
	561916.24	658429.95	Section 3 Chainage: 2315m	Temporary minimal negative impact	No Impact
	561916.81	658430.05	Section 3 Chainage: 2316m	Temporary minimal negative impact	No Impact
	561941.94	658442.39	Section 3 Chainage: 2345m	Temporary minimal negative impact	No Impact
	562068.23	658519.86	Section 3 Chainage: 11_C m	Temporary minimal negative impact	No Impact
	562695.98	658605.56	Section 5 Chainage: 3220m	Temporary minimal negative impact	No Impact
	562880.03	658463.64	Section 5 Chainage: 3457m	Temporary minimal negative impact	No Impact
	563734.05	657561.13	Section 6 Chainage: 75m	Temporary minimal negative impact	No Impact
	564151.48	657564.86	Section 4 Chainage: 511m	Temporary minimal negative impact	No Impact
	564154.84	657574.10	Section 4 Chainage: 516m	Temporary minimal negative impact	No Impact
	564224.65	657637.85	Section 4 Chainage: 614m	Temporary minimal negative impact	No Impact
	564236.34	657634.53	Section 4 Chainage: 624m	Temporary minimal negative impact	No Impact

Operational Phase:

There are **no predicted negative impacts** to the existing foul/combined sewer network Operational Phase.

There would be no significant change to the existing environment in the absence the proposed development.

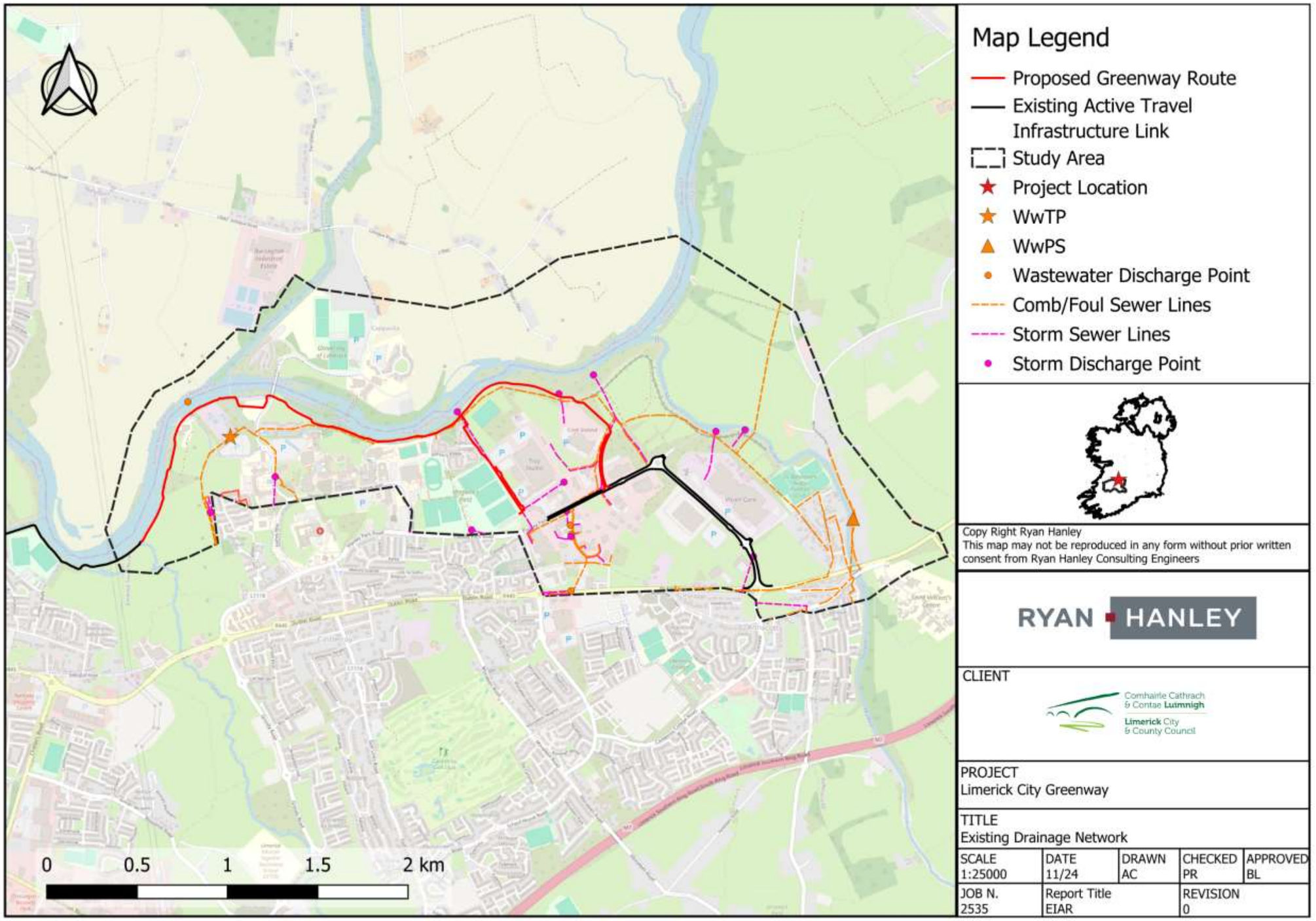

Figure 13-3: Schematic of existing drainage network within assessment area & environs

13.4.15 Gas Network

Gas distribution services are present along the route at the following locations:

- At the existing road bridge crossing the River Shannon,
- Along Plassey Park Road,

All information is sourced from Gas Networks Ireland records and is to serve as an indication of the **approximate location** of underground Gas services. Refer to Figure 13-4.

13.4.15.1 Potential Impact on the Gas Network

Construction Phase:

Proposed Construction Phase works will have a predicted **temporary minimal negative impact** on existing gas services at 1 no. location as detailed in Table 13-18. Impacts may include accidental damage to unmarked shallow services which could result in explosions and risk of serious injury or death.

Operational Phase:

There will be **no predicted negative impacts** on the existing electricity supply network during operational phase.

Table 13-18: Predicted Impacts on existing gas network

Utility	Greenway crossing (itm)		Description	Construction phase impact	Operational phase impact
Gas	561019.99	658632.87	Section 2 Chainage: 1345m	Temporary minimal negative impact	No Impact

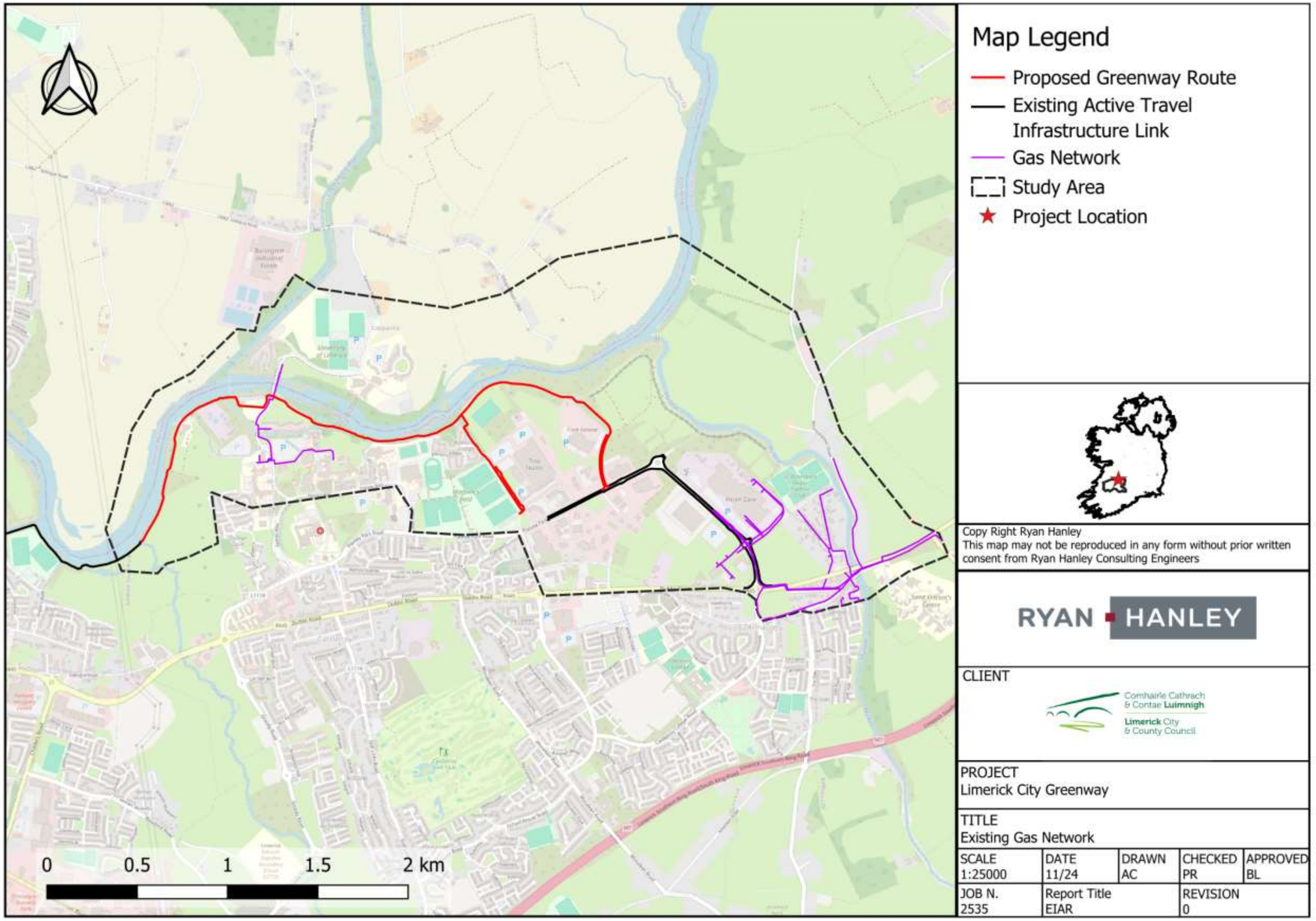

Figure 13-4: Schematic of existing gas network within assessment area & environs

13.4.16 Electricity Network

There is an extensive electricity supply network within the assessment area comprising both overhead power lines and underground services. Refer to Figure 13-5.

13.4.16.1 Potential Impact on the Electricity Network

Construction Phase:

Proposed Construction Phase works will have a predicted **temporary slight to moderate negative impact** on existing overhead services at 4 no. locations and on underground services at 12 no. locations as detailed in Table 13-19. Impacts may include accidental damage to overhead and/or underground electricity cables which could result in power outages and risk of serious injury or death.

Operational Phase:

There will be **no predicted negative impacts** on the existing electricity supply network during operational phase.

Table 13-19: Predicted Impacts on existing electricity network

Utility	Greenway crossing (itm)		Description	Construction phase impact	Operational phase impact
Electricity (Overhead)	560568.56	658545.45	Section 2 Chainage: 797m	Temporary slight to moderate negative	No Impact
	562169.59	658657.55	Section 4 Chainage: 2663m	Temporary slight to moderate negative	No Impact
	562273.24	658709.08	Section 4 Chainage: 2779m	Temporary slight to moderate negative	No Impact
	562347.96	658703.44	Section 4 Chainage: 2852m	Temporary slight to moderate negative	No Impact
	560982.87	658618.64	Section 2 Chainage: 1297m	Temporary slight to moderate negative	No Impact
	561008.58	658636.80	Section 2 Chainage: 1335m	Temporary slight to moderate negative	No Impact
	561996.76	658469.22	Section 3 Chainage: 2406m	Temporary slight to moderate negative	No Impact
	562019.74	658484.95	Section 3 Chainage: 2435m	Temporary slight to moderate negative	No Impact
	562095.45	658575.00	Section 4 Chainage: 2552m	Temporary slight to moderate negative	No Impact
	562145.46	658633.80	Section 4 Chainage: 2630m	Temporary slight to moderate negative	No Impact
	562881.07	658460.78	Section 5 Chainage: 3457m	Temporary slight to moderate negative	No Impact
	562830.70	658211.88	Section 5 Chainage: 3721m	Temporary slight to moderate negative	No Impact
	562830.74	658201.66	Section 5 Chainage: 3732m	Temporary slight to moderate negative	No Impact

Utility	Greenway crossing (itm)		Description	Construction phase impact	Operational phase impact
Electricity (Underground)	562833.51	658188.23	Section 5 Chainage: 3745m	Temporary slight to moderate negative	No Impact
	562848.34	658140.26	Section 5 Chainage: 3796m	Temporary slight to moderate negative	No Impact
	562852.55	658125.58	Section 5 Chainage: 3811m	Temporary slight to moderate negative	No Impact

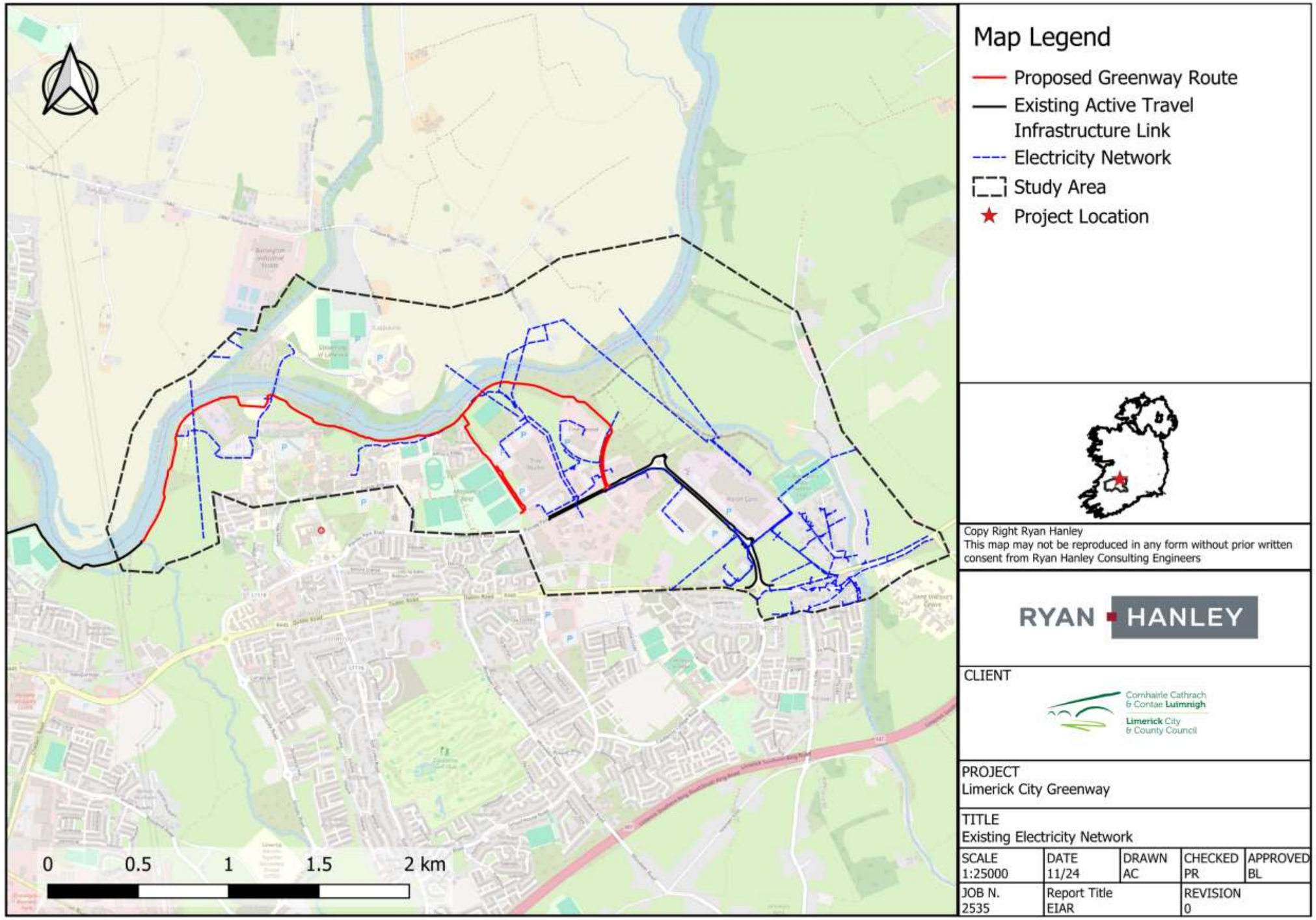

Figure 13-5: Schematic of existing electricity network within assessment area & environs

13.4.17 Telecommunications & Broadband Network

Telecommunications & Broadband within the assessment area are currently provided by seven suppliers:

- Eir;
- Vodafone;
- Sky;
- Pure Telecom;
- Regional Braodband;
- Virgin Media;
- Digiweb;

Eir have primary responsibility for sub-surface cabling (including fibre-optic) and overhead lines and maintenance of same. Refer to Figure 13-6.

13.4.17.1 Potential Impacts on the Telecommunication & Broadband Network

Construction Phase:

There will be a predicted **temporary significant negative impact** on the overhead and underground communications network where proposed works are located in proximity to existing services. Impacts may include accidental damage to overhead and underground telecommunications & broadband cables which could result in outages and thus loss of vital communications such as to emergency services. Locational details are provided in Table 13-20. There will be **no predicted negative impacts** on satellite services within the assessment area during Construction Phase.

Operational Phase:

There are **no predicted negative impacts** on the existing Telecommunication & Broadband network during Operational Phase.

There are **no predicted negative impacts** on **satellite** services within the assessment area during Operational Phase.

There would be no significant change to the existing environment in the absence of the proposed development.

Table 13-20: Predicted Impacts on existing telecommunication and broadband network

Utility	Greenway crossing (itm)		Description	Construction phase impact	Operational phase impact
Eir	561016.41	658634.47	Section 2 Chainage: 1341m	Temporary significant negative impact	No Impact
	562866.11	658417.14	Section 5 Chainage: 3506m	Temporary significant negative impact	No Impact
	562839.83	658348.10	Section 5 Chainage: 3582m	Temporary significant negative impact	No Impact
	562845.65	658345.98	Section 5 Chainage: 3582m	Temporary significant negative impact	No Impact
	562825.01	658266.55	Section 5 Chainage: 3666m	Temporary significant negative impact	No Impact

Utility	Greenway crossing (itm)		Description	Construction phase impact	Operational phase impact
	562827.05	658260.77	Section 5 Chainage: 3672m	Temporary significant negative impact	No Impact
	562836.06	658263.52	Section 5 Chainage: 3670m	Temporary significant negative impact	No Impact
	562827.56	658253.64	Section 5 Chainage: 3679m	Temporary significant negative impact	No Impact
	562836.31	658252.09	Section 5 Chainage: 3680m	Temporary significant negative impact	No Impact
	562837.73	658232.51	Section 5 Chainage: 3701m	Temporary significant negative impact	No Impact
	562839.25	658220.76	Section 5 Chainage: 3714m	Temporary significant negative impact	No Impact
	562830.32	658203.76	Section 5 Chainage: 3730m	Temporary significant negative impact	No Impact
	562854.95	658130.40	Section 5 Chainage: 3807m	Temporary significant negative impact	No Impact
	562865.83	658132.97	Section 5 Chainage: 3808m	Temporary significant negative impact	No Impact
Enet	561001.39	658638.54	Section 2 Chainage: 1326m	Temporary significant negative impact	No Impact
	562831.75	658196.76	Section 5 Chainage: 3737m	Temporary significant negative impact	No Impact
	562842.19	658157.93	Section 5 Chainage: 3777m	Temporary significant negative impact	No Impact
Virgin Media	562832.92	658191.12	Section 5 Chainage: 3743m	Temporary significant negative impact	No Impact
	562842.46	658157.12	Section 5 Chainage: 3778m	Temporary significant negative impact	No Impact

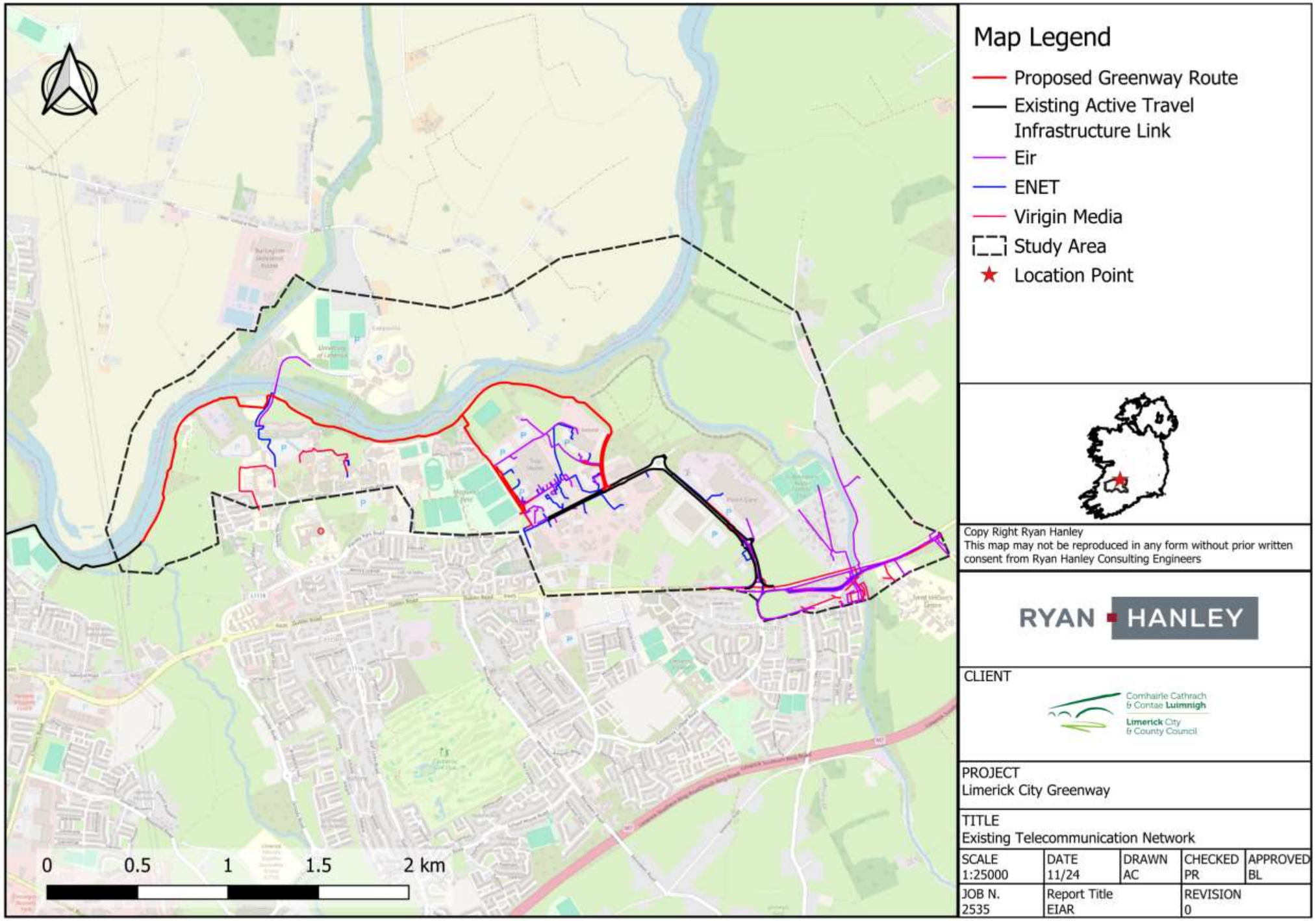

Figure 13-6: Schematic of existing telecommunications network within assessment area & environs

13.5 WASTE MANAGEMENT DURING CONSTRUCTION

The Limerick City Greenway (UL to NTP) will produce a significant volume of excavated material during the construction phase. This section examines the potential impacts associated with this waste and any mitigation measures required.

13.5.1 Background Information

'Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects' (2006) were published by the DoEHLG. These Guidelines outline the issues that need to be addressed at the pre-planning stage of a development all the way through to its completion.

Best Practice Guidelines sets thresholds to ascertain which projects require the preparation of construction & demolition (C&D) plans. The proposed development, exceeds the following threshold and therefore requires a C&D Waste Management Plan;

- Civil Engineering projects producing in excess of 500 m^3 of waste, excluding waste materials used for development works on the site.

A Waste Management Plan is included in the Construction Environmental Management Plan (CEMP) appended to this EIA report. As outlined in Chapter 7, no soil will be exported off site and excavated material will be reused on site as much as practicable. Where this is not possible, the recycling rates for the C&D waste produced throughout the construction of the Greenway should be maintained at or above 85%, if possible, as outlined in the Waste Management (Planning) Regulations 1997.

13.5.2 Classification of Waste

Excavations for the proposed scheme, pedestrian/road crossings and road works will give rise to a surplus volume of material during the construction phase of the proposed scheme. The excavated material will be reused as a subbase layer and/or edge grading. It is anticipated that no soil will require exporting off site.

The European Waste Codes (EWC) for typical waste materials that may possibly be generated during the construction phase are outlined in Table 13-21.

Table 13-21: Applicable List of Waste (LoW) Code

Waste Material	LoW
Soil, stones and dredged spoil	17 05
Bituminous mixtures, coal tar and tarred products	17 03
Concrete, Bricks, Tiles and Ceramics	17 01
Metals (including their alloys)	17 04
Waste Hydraulic Oils*	13 01
Wastes of Liquid Fuels*	13 07
* Denotes Hazardous Materials	

The estimated construction and demolition waste resulting from the proposed scheme is provided in Table 13-22. There will be Bitumous Material and Concrete arising from existing road/footpath surfaces on University Road, and McLaughlan Road.

Table 13-22: Estimated C&D Waste resulting from the proposed scheme

Origin of Waste	LoW Code	Estimated Tonnage of Waste
Red Section	17 05/17 03	0
Cyan Section	17 05/17 03	
Magenta Section	17 05/17 03	897
Purple Section	17 05/17 03	
Yellow Section	17 05/17 03	
Miscellaneous	17 01, 17 04, 13 01, 13 07	746
	Total	**1643**

Himalayan balsam and Giant Hogweed were identified during walkover surveys and are listed as invasive plants under the EC (Birds and Natural Habitats) Regulations 2011 (S.I. 477/2011). These regulations prohibit the introduction and dispersal of these species. Any soil removed from any effected areas must be managed in accordance with the Invasive Species Management Plan (ISMP) and the Outline Construction Environmental Management Plan (OCEMP) as appended to this EIAR.

13.5.3 Potential Impact during Construction Phase

Potential Permanent Moderate Negative Impact

As detailed in Chapter 7, most surplus material will be generated during the construction of active travel sections along the Magenta, Purple, and Yellow Sections, primarily consisting of concrete and Bituminous mixtures. It is expected that miscellaneous fill materials generated will include some small amounts of bitumen tarmacadam.

Poor management of waste has the potential to cause nuisance and an adverse environmental impact, particularly due to the presence of Himalayan balsam and Giant Hogweed in the proposed working areas. Mismanagement of soil removed from these areas could lead to the spreading of invasive alien species in other areas. Waste that is not managed and stored appropriately on site may result in water and ground pollution on or in the vicinity of the site. Litter and debris may be generated from leftover construction materials, packaging from materials and mixed waste produced by the site staff.

Poor management of excavated waste could lead to the disposal of waste deemed unsuitable for reuse or recycling in facilities that do not carry the appropriate licenses.

In addition, if waste is not managed and stored correctly on site, it has the potential to cause nuisance and environmental impact. Litter may be generated from packaging taken from materials, mixed waste produced by the construction workers (lunches, cigarette waste, etc.), or from debris from leftover/damaged construction materials. Poor management of waste may also result in water and ground pollution on the site or adjacent to the site.

Fuels and hydraulic oils/lubricants that will be used during the construction phase are classed as hazardous. There will be fuels stored on site for plant, machinery and construction vehicles along with oils and lubricants. Should any spillages, waste or surplus liquids be disposed of incorrectly it could cause serious harm to the surrounding environment.

The potential impacts of construction and demolition waste on the environment are predicted to be temporary and moderate.

13.5.4 Potential Impact during Operational Phase

Potential Temporary Slight Negative Impact

The operational phase of the proposed Greenway is unlikely to produce any waste of significant volume. Periodic maintenance of the route by LCCC will be required mainly in the areas of general maintenance of scheme and vegetation. Such maintenance could generate very small volumes of litter and dog waste, that, if not disposed of correctly, could adversely affect the local environment.

13.6 MITIGATION MEASURES - INFRASTRUCTURE

The following provides details of proposed mitigation measures designed to offset predicted potential impacts on identified Material Assets.

13.6.1 Transport Infrastructure – Roads & Traffic

Localised traffic disruptions during the construction phase of the proposed development will be mitigated through the use of industry standard traffic management measures. These measures should be designed in accordance with the '*Guidance for the Control and Management of Traffic at Roadworks – Second Edition*' (Dept. of Transport; Road Safety Authority of Ireland – 2010).

- Construction works will be sequenced so as to avoid unnecessary interruption to road users insofar as is practicable.
- All residents and interested parties shall be consulted when planning anyroad disruptions to optimise the timing of same.
- A complete schedule of road disruptions will be published in advance of the works commencing to facilitate residents in making alternative arrangements where necessary.

A Traffic Management Plan (TMP) will be developed in advance of the construction phase incorporating road disruptions, diversions and/or closures where necessary. Local access will be maintained where possible throughout construction phase of the various sections of the Greenway with diversionary routes as specified in Section 13.4.1. Any Increased vehicular activity during construction phase will be managed by the Traffic Management Plan.

It is proposed that the site construction hours will be as per standard site working hours – 07.00 am – 19.00 pm on weekdays and 08.00 am –13.00 pm on Saturdays with no works on Sundays or Bank Holidays. It may on occasion be necessary during certain stages of construction to work outside of the permitted working hours. In the event that these hours need to be extended, consultation will be undertaken and agreement sought from LCCC in advance. Any road disruption/closures will be localised and confined to specified proposed works areas. All excavations in the sectioned areas will be reinstated immediately - as per the following guidance:

- Guidelines for Managing Openings in Public Roads (April 2017) – for Local and Regional Roads.
- Requirements for the Reinstatement of Openings in National Roads (TII, May 2019) – for National Roads.

Any road closures will be agreed in advance with LCCC and implemented as per conditions set out in Traffic Management Plans and Road Opening Licences.

The following mitigation measures will also be required:

- Road signage on the public road network must comply with the Department of the Transport's Traffic Signs Manual "Chapter 8 - Temporary Traffic Measures and Signs for Roadworks".
- The contractor shall provide general condition and structural surveys of all transport infrastructure (roads, bridges, access tracks) on all routes, including haulage routes, that may be impacted as a result of the proposed scheme before works commence on site and after completion and provided to the relevant PSDP engineer.
- Site entrance locations from public roads may require a durable bound surface.
- Secure and visible junctions must be developed between access roads and public roads.
- A durable bound surface is required on access roads for a minimum distance of 10m from the public road.
- Adequate drainage to be maintained at all times to ensure that no surface water from the site or site access discharges to the public roads.
- Cleaning regime for plant to be implemented in order to minimise mud/dust or other contaminants on public roads.

13.6.2 Water Distribution Network

The installation and location of the Greenway has been designed to avoid, where possible, any interference with the existing potable water distribution network in the area. As identified in Section 13.4.21, the proposed development has the potential to impact on the existing water distribution mains during the construction phase.

It is not expected that interference will occur however any temporary service diversions will be agreed with Uisce Éireann and LCCC and implemented in advance of and during the construction phase of the proposed scheme.

All possible precautions will be taken to avoid unplanned disruptions to any services during the proposed works. This will include thorough investigations to identify and reconfirm the location of all utility infrastructure within the works areas, and the implementation of robust procedures when undertaking works in the around known infrastructure services.

Service disruptions impacting the surrounding educations, residential, social and commercial properties shall be kept to a minimum, only occurring where unavoidable. Prior notification of disruptions shall be given to all impacted properties. This shall include information on when disruptions are scheduled to occur and the duration of the disruption. Consultation with relevant neighbouring parties shall be undertaken prior to any proposed disruptions.

A CEMP will be prepared and implemented by the works contractor in consultation with LCCC and their Environmental Clerk of Works.

There will be no interference with, or impact on, the existing UÉ potable water supply during the Operational Phase of the proposed development.

13.6.3 Electricity Network

Locations of overhead lines, pole-sets and underground cabling will be fully identified and considered during project design, in consultation with ESB networks and in development of Traffic Management

Plans. Works will be carried out in accordance with best practice policies and guidelines[2], in particular HSA (2019) ESB Networks Code of Practice for Avoiding Danger from Overhead Electricity Lines. As identified in Section 13.4.24, the proposed scheme will transverse the the existing electricity supply network under overhead services at 11 no. locations and over underground services at 31 no. locations.

Temporary service diversions if required or permanent re-alignment will be agreed with ESB and implemented prior to and during the construction phase of the proposed scheme.

All possible precautions will be taken to avoid unplanned disruptions to any services during the proposed works. This will include thorough investigations to identify and reconfirm the location of all utility infrastructure within the works areas, and the implementation of robust procedures when undertaking works in the around known infrastructure services.

Service disruptions impacting the surrounding educational, residential, social and commercial properties shall be kept to a minimum, only occurring where unavoidable. Prior notification of disruptions shall be given to all impacted properties. This shall include information on when disruptions are scheduled to occur and the duration of the disruption. Consultation with relevant neighbouring parties shall be undertaken prior to any proposed disruptions.

A CEMP will be prepared and implemented by the nominated contractor in consultation with LCCC and their Environmental Clerk of Works.

There will be no predicted interference with, or impact on, the existing electricity supply network during the Operational Phase of the proposed development.

13.6.4 Telecommunications & Broadband Network

Locations of all underground and overhead services will be identified and considered during Project Design and avoided during Construction Phase in accordance with best practice as outlined by HSA Construction Codes of Practice [3] .

As identified in section 13.4.25, it is not expected that the proposed works will impact on the existing telecommunication & broadband network locations.

Any temporary service diversions or permanent re-alignment if required will be agreed with the service providers and implemented prior to and during construction of the proposed development.

All possible precautions will be taken to avoid unplanned disruptions to any services during the proposed works. This will include thorough investigations to identify and reconfirm the location of all utility infrastructure within the works areas, and the implementation of robust procedures when undertaking works in the around known infrastructure services.

Service disruptions impacting the surrounding educational, residential, social and commercial properties shall be kept to a minimum, only occurring where unavoidable. Prior notification of disruptions shall be given to all impacted properties. This shall include information on when disruptions are scheduled to occur and the duration of the disruption. Consultation with relevant neighbouring parties shall be undertaken prior to any proposed disruptions.

[2] https://www.esbnetworks.ie/tns/publications/-in-category/categories/publications/safety
[3] https://www.hsa.ie/eng/Publications_and_Forms/Publications/Construction

A CEMP will be prepared and implemented by the nominated contractor in consultation with LCCC and their Environmental Clerk of Works.

There will be no predicted interference with, or impact on, the existing electricity supply network during the Operational Phase of the proposed development.

13.6.5 Waste Management

All current and applicable waste management legislation will be applied and adhered to. Contractors that are engaged in the transport of waste off-site will comply with the provisions of the Waste Management Act (1996) (as amended), associated Regulations and the Waste Management Plan prepared in accordance with 'Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects (2021)'. The Contractor must handle, transport, and dispose of waste in a manner that ensures that no adverse environmental impacts occur as a result of any of these activities. A waste collection permit to transport the waste which has been issued by the National Waste Collection Permit Office must be held by the relevant contractor.

Waste receiving facilities must also be appropriately licensed or permitted for the waste being received. Operators of such facilities cannot receive any waste, unless in possession of a waste permit granted by the Local Authority under the 'Waste Management (Facility Permit & Registration) Regulations 2007' (as amended) or a waste license granted by the EPA. The permit/license held will specify the type and quantity of waste able to be received, stored, sorted, recycled and/or disposed of at the specific site. The contractor shall provide details of all proposed waste facilities to the Contract Administrator before works commence on site. It has been confirmed that there are appropriate facilities in the area available to receive and process waste material.

The construction compounds for the proposed works will have a dedicated Waste Storage Area (WSA) for any construction waste generated. Receptacles/skips or bays will be provided for relevant recyclable material.

13.6.5.1 Bedrock, Block and Concrete

Minimal excavation works are expected along sections of the Red, Cyan, and Magenta Sections which are located on the existing towpath. It is reasonable to assume that gravels and some bedrock may be encountered during the excavation along these sections alongside the existing towpath. Excavations will be required along the desire line in the purple section and waste material arising will be used to build up the ramps adjacent to the proposed path.

Made ground is likely to be encountered in areas where works occur at junctions and where existing carriageways and footpaths will be remodelled. Any material which is not reused will be separated out and sent to the appropriate recycling facility or waste facility if deemed unsuitable for recycling.

During and installation of bridge structures, decking and culverts, access roads and kerbing; it is reasonable to assume that there will be some waste concrete and blocks generated. This waste will be adequately contained and stored within the construction compounds. It will then be disposed of to a permitted or licensed facility.

13.6.5.2 Soil/Subsoil

All works carried out in areas where Himalayan balsam and Giant Hogweed have been identified will be managed in accordance with the measures set out in the ISMP.

Soils generated from excavations which are not in a Giant Hogweed or Himalayan Balsam infested area will be stored separately and will be managed in accordance with the Invasive Species Management Plan.

Although it is not foreseen, if contaminated soils are encountered, they will be stored separately to inert material. Samples will be taken and tested to appropriately classify the material as non-hazardous or hazardous to establish the criteria for the acceptance of waste at landfills. These materials will then be transported to an appropriately licensed facility by permitted contractors.

13.6.5.3 Scrap Metal

Precast concrete bridge decks and precast concrete culverts are to be used as part of the construction of bridges and culverts along the route. As such it is reasonable to assume that only a small amount of scrap metal will be generated.

Existing concrete decks for bridges and parapet railings will generate scrap metal arisings. Scrap metal is highly recyclable and as such it will be segregated from other waste and recycled accordingly.

13.6.5.4 Timber

A small amount of timber waste may also be generated from hoarding around works areas, plywood, pallets etc. It is likely that this timber can be reused for different functions throughout the construction phase, however, a small amount of waste will be generated, and the timber as a whole could be disposed of as the construction phase comes to a close.

Timber that is uncontaminated, i.e. free from paints, preservatives, glues etc, will all be recycled. Should any timber be deemed to be contaminated it will be collected by an appropriately permitted specialist contractor and disposed of in an appropriately licensed facility.

13.6.5.5 Hazardous Materials

Where hazardous materials are used/encountered on site, i.e. bituminous mixtures containing coal tar, timber with paint; a specialist contractor will be engaged to carry out an environmental clean-up to remove all traces of contaminated material from site. It is not anticipated that there will be any Asbestos material encountered during the construction works. The specialist contractor will be licensed under the 'Waste Management (Collection Permit) Regulations, 2007' (as amended). All contaminated materials will be disposed of at an appropriately licensed facility.

In order to avoid any hazardous materials (if encountered) infiltrating the ground water or surface water during construction works, there will be a bunded area constructed within site compounds with sufficient volume to contain any spills. All plant refuelling, maintenance or washing will be carried out within the bunded areas. Spill kits will also be available at these areas to facilitate the quick and effective cleaning of any substances.

<u>Documentation</u>

Waste will be weighed, either by weighing mechanism on the truck or at the receiving facility, and these records will be kept by the contractor (both hard and soft copies).

A copy of all waste collection permits, for all waste contractors will be kept by the Waste Manager, working on behalf of the Contractor, on-site.

If any waste is being transported to another site, a copy of the waste permit or EPA Waste License for that site must be provided and kept by the Waste Manager. If the waste is being shipped abroad, a copy of the Transfrontier Shipping (TFS) document must be obtained from Dublin City Council (as the relevant authority on behalf of all local authorities in Ireland) and kept on-site along with details of the

final destination (permits, licenses etc). A receipt from the final destination of the material will be kept as part of the on-site waste management records.

All information will be entered into the waste management system to be maintained on site.

13.7 Assessment of Residual & Cumulative Impacts

With mitigation in place there will be no predicted **negative residual impacts** on the Water Distribution, Drainage, Electricity & Telecommunications networks within the proposed Greenway route area.

There will be a predicted **negative minimal residual impact** on Traffic with mitigations in place.

There will be a predicted **significant positive cumulative impact** on Roads and traffic within the scheme area due to the nature of the proposed development.

There will be a predicted **neutral residual impact** on Waste Management where mitigation measures are implemented during the construction phase of the proposed development.

The Limerick Development Plan 2022-2028 and planning register were consulted to identify developments which could cause cumulative impacts with the proposed project. No significant industrial/housing/commercial developments are planned for the area within the envisaged works period.

The Limerick City Greenway (UL to NTP) has been determined to have a **permanent positive impact** if all issues raised in the EIAR are adequately addressed.

Past grants of planning, current projects at design or construction stages and current planning applications were reviewed as part of the assessment. The combination of these plans would not give rise to a significant change in the Material Assets of the area.

Overall, there will be a **positive significant residual impact** on Material Assets within the Greenway area.

REFERENCES

Department of Environment, Heritage and Local Government (2021). Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects.

Department of Transport (2021). Traffic Signs Manual (Chapter 8 – Temporary Traffic Measures and Signs for Roadworks.

Department of Transport, Road Safety Authority of Ireland (2010). Guidance for the Control and Management of Traffic at Roadworks – Second Edition.

Department of Transport, Tourism and Sport (2017). Guidelines for Managing Openings in Public Roads.

Directive 2014/52/EU. On the assessment of the effects of certain public and private projects on the environment.

EPA Waste Water Discharge Licence Applications database.

EPA (2015), 'Advice Notes on Current Practice in the preparation of Environmental Impact Statements' (Draft).

EPA (2022), Guidelines on the information to be contained in Environmental Impact Assessment Reports.

Health and Safety Authority. Construction Codes of Practice.

Limerick Development Plan (2022 - 2028).

National Transport Authority, Limerick Shannon Metropolitan Area Transport Strategy (LSMATS)

S.I. No. 821/2007 - Waste Management (Facility Permit and Registration) Regulations 2007

Southern Region Waste Management Plan 2015 - 2021(as implemented through the Local Authority Development Plans).

Transport Infrastructure Ireland (2019). Requirements for the Reinstatement of Openings in National Roads.

Waste Management Act (1996) (as amended).