

CHAPTER 5 MATERIAL ASSETS

5.1 INTRODUCTION

Coyle Environmental Limited was commissioned by Boliden Tara Mines DAC (BTM) to undertake the Material Assets Chapter of Environmental Impact Assessment Report for proposed buttressing works to be undertaken on a selection of embankment walls of the Randalstown Tailings Storage Facility (TSF). Please refer to Figure 5.1 for an aerial image of the current TSF. Boliden Tara Mines propose to construct a reinforcement buttress to sections of the existing embankment walls of the TSF with a view to increasing the Factor of Safety (FoS) associated with the dam walls.

In order to adopt the Global Industry Standard on Tailings Management (GISTM), the construction of a rockfill and earthen reinforcement buttress to the extant embankment walls of the TMF has been proposed.

The objective of the assessment contained in this Chapter is to ensure that material assets have been used in a sustainable manner with respect to operations at the Application Site. Material assets in the vicinity of the Site comprise of built services and infrastructure such as surface water drainage, telecommunications, electricity, gas, water supply infrastructure and sewerage. Other material assets include roads and traffic, archaeology / cultural heritage and land and soils.

During the Construction Phase, the potential impacts on material assets arising from the Proposed Development have been assessed, including potential impacts on utilities and potential impacts arising from the importation of construction materials.

During the Operational Phase, the potential impacts on material assets associated with changes in utility demand from any potential infrastructure associated with the Proposed Development have been assessed.



Figure 5.1 Drone image of existing Tailings Facility

5.1.1 Statement of Authority

Daniella is a Senior Environmental Consultant with over 13 years of experience in environmental management with a focus on extractive and construction industries. Daniella holds a BSc. (Hons) Environmental Science, BSc Environmental Protection, PG Cert Project Management, Adv. Diploma in Planning and Environmental Law and a City & Guilds Environmental Management for Construction and has attended several CPD courses such as EIA Report Preparation and Appropriate Assessment in line with Article 6 of the Habitats Directive.

Daniella has been involved as a Project Manager on a range of commercial, residential and industrial projects including waste permission process and managing the compliance requirements of a number of EPA licensed facilities.

Daniella fulfils a key role in the management of large multidisciplinary teams to produce EIA Reports and has project managed the Environmental Impact Assessment of a wide range of development projects within Ireland.

5.2 LEGISLATIVE REQUIREMENTS

The legislative requirements for an environmental impact assessment have been discussed and presented in Chapter 1 of this report.

5.2.1 Relevant Guidance

There is no specific Irish guidance for the assessment of material assets in the context of EIA. The following guidance documents are relevant and have been used for this material assets assessment:

- Environmental Protection Agency (EPA), 2022. Guidelines on the Information to be contained in Environmental Impact Assessment Reports
- EPA, 2003. Advice Notes on Current Practice in the Preparation of Environmental Impact Statements
- European Commission (EC) (2017). Environmental Impact Assessment of Projects - Guidance on the Preparation of the Environmental Impact Assessment Report
- Institute of Environmental Management and Assessment (IEMA) (2020). IEMA Guide to: Materials and Waste in Environmental Impact Assessment - Guidance for a Proportionate Approach
- “Traffic and Transport Assessment Guidelines” (May 2014) published by Transport Infrastructure Ireland (TII).
- “Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections” (October 2021) published by Transport Infrastructure Ireland.
- “Project Appraisal Guidelines for National Roads Unit 16.1 - Expansion Factors for Short Period Traffic Counts” (October 2016) published by Transport Infrastructure Ireland.
- TII Publications document DN-GEO-03031, “Rural Road Link Design” (June 2017, May 2023) published by Transport Infrastructure Ireland (TII).
- TII Publications document DN-GEO-03060, “Geometric Design of Junctions (priority junctions, direct accesses, roundabouts, grade-separated and compact grade-separated junctions)” (May 2023) published by Transport Infrastructure Ireland (TII).

5.2.2 Policy

The Meath County Development Plan 2021-2027, prepared in accordance with the provisions of the Planning and Development Act 2000 (as amended), sets out a range of proposed policy objectives for development up to 2027. The plan incorporates the mandatory objectives listed in the Act, including conservation and protection of the environment and promotion of compliance with environmental standards.

5.3 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

Boliden Tara Mines DAC (BTM) is proposing the following engineering works at the Randalstown Tailings Storage Facility (TSF): The construction of a rock and earthen reinforcement buttress to the extant embankment walls of the TSF.

BTM has recently become a member of the International Council for Mining and Metals (ICMM) and is in the process of adopting the Global Industry Standard on Tailings Management (GISTM).

A key objective of GISTM is to address the risk of tailings embankment failure through conservative design criteria, independent of trigger mechanisms, in order to minimise potential impacts. To increase the factor of safety of the extant embankment walls of the tailing's facility a reinforcement buttress will be constructed against the extant embankment walls of the TSF.

- The extant embankment walls have been designed and assessed to meet a target design criterion, for long-term static slope stability, with a Factor of safety (FoS) of ≥ 1.5 using effective strength parameters.
- The buttressing works will increase the Factor of Safety to
 - ≥ 1.5 for the peak strength undrained scenario and to
 - ≥ 1.1 for the residual strength undrained scenario which is now required

The Boliden Tara zinc-lead mine is situated 2 km west of Navan, County Meath, Ireland. The Randalstown tailings storage facility (TSF) is located approximately 3 km to the north of the

mine and covers an area of circa 250 hectares. Approximately half of the tailings from the mine are currently separated by cycloning and used as mine backfill. Since 1977, the remaining tailings have been pumped from the processing mill site through a pipeline for containment in the Randalstown TSF. The site is operated under Industrial Emissions License (IEL) P0516-04 issued by the Environmental Protection Agency.

The construction of the buttress will require the movement of materials to the TSF from a number of source locations, including the main Mine site at Knockumber, Navan, Co. Meath and from independent third-party development sites (predominantly via M3 motorway).

The proposed buttress is to be constructed on the downstream slope and at the crest of the Stage 1, 2 and 3 starter embankments. It will provide additional support to the Stage 4 dam embankment wall in order to increase the overall stability of the upstream raises i.e. Stages 4 and 5. The construction of the buttress will involve the placement of rock material on the crest of Stages 1, 2 and 3 supported by a widening of the side slope of Stage 1,2 and 3 using glacial till. The proposed buttress will be approximately 4 to 10m wide at the base of the starter embankment slope and 12 to 20m wide at the toe of the Stage 4 embankment. Refer to Figures 5.2 and 5.3.



Figure 5.2 Existing Embankment side profile

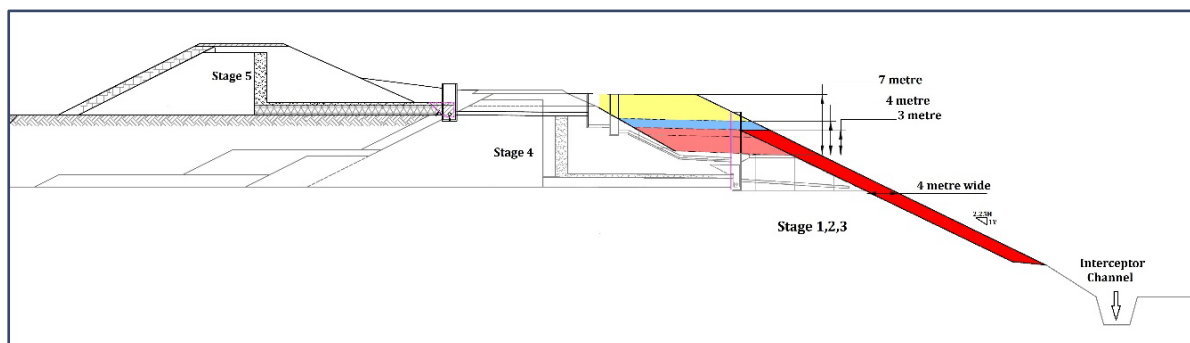


Figure 5.3 Cross section of facility embankment with proposed buttress

5.3.1 Proposed Work Schedule

Sequence of Construction

The construction works will be sequenced in two phases which may run concurrently. The works will commence at the eastern extremity of the site and proceed westward:

- Phase I will proceed on a horizontal basis along Stage 4 of the tailings dam. Works will begin at the level of the toe of the Stage 4 upstream raise against the embankment wall and will vary between 3, 4 and 7 metres in height. Material will be placed in layers along 500m sections, with each 500 m section taking approximately one month to complete. It is envisaged that the Phase I works will take approximately 30 weeks; and
- Phase 2 will proceed on a horizontal basis at ground level against the embankment wall of stages 1,2 and 3. The material will be placed in layers along 500m sections, with each 500 m section taking approximately one month to complete. It is envisaged that Phase 2 works will take approximately 80 weeks.

Works Schedule

1. Preparatory Works including cleaning the crest of the Starter Dams, removal of any topsoil, shrubs / scrub from the side-slopes over the footprint of the proposed buttress and to facilitate plant access;
2. Installation of the Phase 1 Buttress (toe of stage 4); and
3. Installation of the Phase 2 Buttress (at ground level starter embankments).

Preparatory Works

Accommodation of Monitoring Instrumentation

The construction of the buttress will require the extension or otherwise accommodation of geotechnical instruments which will be impacted by the works. These include Casagrande standpipes, environmental monitoring wells, vibrating wire piezometers and flow measurement weirs.

Clearance of Work Areas

The proposed Phase 1 buttress overlies the crest of the Starter Dams, (Stages 1, 2 and 3). The crest of this road includes a layer of rockfill material as capping and surface dressing. It is proposed that this material be salvaged where possible and where the quality of the material permits. This shall be done by either stockpiling the material temporarily for re-use or preferably, through the re-use of the material as a capping layer on a section where the buttress work has already been completed.

Removal of topsoil from the footprint of the area adjacent to the crest road, i.e. the area above the Stage 4 toe drain and the Stage 4 slope shall be completed prior to commencement of the buttressing works. For the Phase 2 buttress, it will be necessary to remove the topsoil from the entirety of the starter dam perimeter slope as well as the footprint of the buttress at the toe.

Topsoil shall be either stockpiled temporarily for re-use or preferably, through the direct re-use of the topsoil on sections where the buttressing works have already been completed. Following excavation to the Formation Level, the footprint will require trimming, grading and compaction prior to the placement of the compacted fill. The final excavated surfaces shall be trimmed and rolled to provide a clean, even and firm foundation to permit the movement of construction vehicles without causing rutting or other deleterious effects. Benching will be employed where buttress materials are being placed onto slopes to ensure that a sufficient key-in is achieved between the buttress and the dam walls.

A specified number of passes of a suitable vibratory roller will be required for the underlying soils. Soft spots and areas of unsuitable materials identified shall be excavated and replaced

with suitable material placed and compacted and / or shall be improved in-situ via compaction or the installation of appropriate geosynthetics as approved by the engineer. As part of the Phase 1 buttress construction works, the material which overlies the Stage 1,2 and 3 chimney drains shall be removed intermittently. This will allow sub-surface water drainage in the section to drain into the Stage 1,2 and 3 chimney drain. This water will then report into the Perimeter Interceptor Channel (PIC) and from there, pump returned to the tailings facility.

5.4 ASSESSMENT METHODOLOGY

Material assets are resources of both natural and human origin that have intrinsic value. The Environmental Protection Agency (EPA) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (hereafter referred to as the EPA EIAR Guidelines) (EPA 2022) discuss material assets as follows:

'In Directive 2011/92/EU this factor included architectural and archaeological heritage. Directive 2014/52/EU includes those heritage aspects as components of cultural heritage.

Material Assets can now be taken to mean built services and infrastructure. Traffic is included because in effect traffic consumes transport infrastructure. Sealing of agricultural land and effects on mining or quarrying potential come under the factors of land and soils. Cultural Heritage is assessed separately in Chapter 13.

The EPA EIAR Guidelines specifically list built services, roads and traffic, and waste management as topics which fall into the category of material assets. Further to this, the Guidance on the Preparation of the Environmental Impact Assessment Report (European Commission 2017) references buildings, other structures, mineral resources, and water resources as material assets.

Existing utility information has been collated from the utility service providers and is presented in Section 5.6.2. Estimates have been prepared for the quantities of materials that may be needed for construction to inform the impact assessment of the Proposed Development.

The impacts associated with the transportation of these materials to the site have been considered within the assessments of construction traffic in Appendix 5.A (Traffic Impact Assessment), Chapter 8 (Air Quality) and Chapter 9 (Noise).

This EIAR includes separate chapters covering a number of those listed material assets and other material assets as follows:

- Employment and land use assets - Chapter 10 (Population)
- Ecological assets - Chapter 6 (Biodiversity)
- Waterways, rivers and streams - Chapter 7 (water – Hydrology and Hydrogeology)
- Soils, lands, and mining or quarrying potential - Chapter 12 (Land and Soils)
- Cultural heritage assets - Chapter 13 (Cultural Heritage)
- Visual amenity assets - Chapter 4 (Landscape & Visual)

5.4.1 Methodology for Assessment of Impacts

The assessment of material assets has been prepared in accordance with guidance documents described in Section 5.3. The 2022 EIAR Guidelines state that material assets can now be taken to mean built services, infrastructure and traffic. They suggest headings under which material assets can be addressed within an EIAR as set out in Table 5.1 below.

Table 5.1 Material Assets – Sample Headings and Topics (EIAR Guidelines, 2022)

Headings under which Environmental Factors could be addressed in the EIAR	Typical Topics
Roads and Traffic	<ul style="list-style-type: none"> • Construction Phase • Operational Phase • Unplanned Events (i.e. Accidents)
Built Services	<ul style="list-style-type: none"> • Electricity • Telecommunications • Gas • Water Supply Infrastructure • Sewerage
Waste Management	<ul style="list-style-type: none"> • Construction Phase • Operational Phase

Based on 2022 Guidance and the nature of the Proposed Development, material assets which potentially could be impacted by the Proposed Development, and which have been identified for assessment in this EIAR are as follows:

- Non-renewable resources (minerals, soils)
- Settlement – residential development
- Land use
- Transportation infrastructure
- Built services.
- Waste management infrastructure
- Cultural assets
- Archaeological, historic, and architectural heritage
- Landscape and natural heritage.

Table 5.2 outlines the categories of assets, which the EPA suggests may need to be examined as part of the material assets study. (EPA, 2015 Guidance)

Table 5.2 Types of Material Assets (EPA, 2015)

Headings under which Environmental Factors could be addressed in the EIAR	Typical Topics
Economic Assets – Natural Origin	<ul style="list-style-type: none"> • Assimilative capacity (air, water) • Non-renewable resources (minerals, soils) • Renewable resources
Economic Assets – Human Origin	<ul style="list-style-type: none"> • Cities, towns, villages, and settlements • Transport infrastructure (roads) • Major utilities (water, sewage, power, telecommunications) • Ownership and access • Agronomy • Commercial & Industrial Development • Property, Tourism & Recreational Infrastructure
Cultural Assets – Physical Type	<ul style="list-style-type: none"> • Archaeology • Architecture • Settlements

Headings under which Environmental Factors could be addressed in the EIAR	Typical Topics
	<ul style="list-style-type: none"> • Monuments, features, and landmarks • Historic sites and structures • Landscape • Geological heritage
Cultural Assets – Social Type	<ul style="list-style-type: none"> • Language and dialects • Folklore and tradition • Religion and belief • Literary and artistic association

On the basis of categories listed in Table 5.2 and the nature of the proposal, material assets which potentially could be impacted by the Proposed Buttress Development, and which have been identified for assessment are as follows:

- Non-renewable resources (minerals, soils)
- Settlement – residential development
- Land use
- Transportation infrastructure
- Built services
- Waste management infrastructure
- Cultural assets
- Archaeological, historic, and architectural heritage
- Landscape and natural heritage.

Most of these assets have been considered within the relevant Chapters of the EIAR, as indicated below.

- Non-renewable resources (minerals, soils) & Agronomy (soil management) are discussed in Chapter 12 – Land and Soils
- Settlement, Commercial & Industrial Development, Property, Tourism & Recreational Infrastructure, and land use are discussed in Chapter 10 Population and Human Health
- Cultural Assets are discussed in Chapter 13 Cultural Heritage

- Natural Heritage is discussed in Chapter 6 Biodiversity
- Landscape is discussed in Chapter 4 Landscape & Visual Impact
- Roads, as a component of Transport Infrastructure, are addressed in the Traffic Impact Assessment – Appendix 5.A

5.4.2 Desk Study

The scope of work undertaken for the assessment included a desk-based study of Material Assets, namely built services, utilities and infrastructure associated with the existing Site and the Development. All phases of the Development were considered in the assessment of potential impacts on Material Assets.

Information on built assets in the vicinity of the Site was assembled by the following means:

- A desktop review of ESB Networks Utility Maps, Irish Water Utility Plans, Gas Networks Ireland Service plans, EIR E-Maps and other communications companies.
- Review of online and published resources,
- Review of information provided by the applicant.
- Information contained in the other sections of this EIAR.
- Ordinance survey maps and aerial photography

All assets identified during the survey were examined, described, and evaluated in terms of scale and significance prior to inclusion in this study. Construction and operational phases of the proposed Development have been considered in the assessment of potential impacts on Material Assets.

There is no decommissioning phase envisaged for the proposed development as it has been designed to achieve the factor of Safety in perpetuity. Notwithstanding this a comprehensive Closure Remediation and Aftercare Management Plan (CRAMP) developed in accordance with conditions of IEL P0516-04 and the Waste Management Act is in place. This CRAMP will be reviewed and revised where and if necessary to include for the proposed buttress works.

5.4.3 Sources of Information

The main sources of information are listed below.

- Regional Spatial and Economic Strategy for the Eastern Region
- Meath County Development Plan 2021-2027.
- Geodirectory Data
- Ordnance Survey Ireland (OSI) Mapping and aerial photography (www.osi.ie),
- Meath County Council Planning Website
- Corine land cover data (www.EPA.ie),
- Central Statistics Office (www.cso.ie),
- Open Street Mapping (www.openstreetmap.org),
- All-Island Research Observatory (AIRO) Primary and Post Primary Schools,
- Google Street Mapping,
- Health Services Executive HSE (www.hse.ie), and
- Fáilte Ireland (www.failteireland.ie).

As sector-specific guidance has not been available for technical assessments of this Chapter of the EIAR, the framework set out in Section 3.7 of the EPA (2022) Guidelines on the Information to be contained in Environmental Impact Assessment Reports have been followed in describing impact characteristics and significance of effects.

5.5 RECEIVING ENVIRONMENT

The tailings facility is located c. 2 kilometres north of the town of Navan and c. 2 kilometres southwest of the village of Kilberry. The TSF is bounded on the east by the Navan-Kingscourt railway line and the recently opened Boyne Valley to Lakelands Greenway (BVL) following the route of the old Kingscourt railway, to the west by the Yellow river, to the south by the Windtown road and to the north by the L74141 road. The primary access route to the facility is from the north from the L74141 road via the R163 Kilberry road (Kells to Slane Road). Land surrounding the facility is predominantly used for agriculture. Population density is low with ribbon development of one-off dwellings along the local road network.

The lands surrounding the subject site can be characterised as rural, with land uses in the area comprising agriculture, and single house residential. Construction traffic will use an already established entry point to the facility from the L74141 Local Road, located about 0.3km to the west of its intersection with the R163 Regional Road Trucks entering the site must approach from the R163 and therefore turn left when entering the site. Similarly, trucks exiting the site are permitted to turn right only. Signage is provided at the site access advising drivers of the permitted movements.

There are existing welfare facilities located at the TSF to include office space, canteen, toilets and a potable water supply. A permanent wheelwash is available for use by vehicles exiting the site. There is existing security at the TSF which includes 24-hour CCTV and security personnel in attendance (during acceptance of materials to the site) and this will continue for the duration of the construction period. Refer to Table 5.3 which provides details of the existing receiving environment.

Table 5.3 Receiving Environment

Feature	Detail and Comments
Topography	The proposed works would occur on the existing embankments of the Tara Mines TSF. The study area is composed of gently undulating lands between 40m and 90m OD. The tailings embankments rise c.20-28m above the surrounding terrain and are flanked to the east and west by small watercourses (Yellow River and Simonstown Stream).
Geology	<p><u>Soils</u>: There are approximately 10m of superficial deposits overlying the Bedrock however this thickness varies across the region. The superficial deposits are made up mainly of Boulder Clays and Boulder Silts (Glacial Till) to the north, east and south-east of the tailings pond. To the south and west of the TSF the superficial deposits constitute some Boulder Clays and Silts but also some poor to moderately well sorted sands and gravels. The thickness of these deposits can vary from 5m to > 10m.</p> <p><u>Bedrock</u>: The bedrock of the local area comprises Carboniferous strata incorporating the Pale Beds (Meath Formation), Mixed Beds (Liscarton Formation) and Red Beds (Old Red Sandstone) underlain unconformably by the Lower Palaeozoic sequence</p>

Feature	Detail and Comments
	<p>(Rathkenny Formation). The TMF and the surrounding areas to the north and east are dominated by the Pale Beds and Lower Palaeozoic sequence. To the south and east the Shaley Pales (Moathill Formation) appear along with the Upper Dark Limestone (Ballysteen Formation).</p> <p>The TMF is located in an area of major faults as shown on the bedrock geology map, mainly trending north-east to south-west. There is another fault that runs perpendicular to the major faults (north-west to south-east) and a smaller one in the north that trends east-west. Other bedrock in the area is made up of the Argillaceous Bioclastic Limestone to the east and some Mixed Beds in the south-east and south-west of the TMF.</p>
Hydrogeology	<p><u>Regional Classification:</u> All groundwater bodies within Ireland have been mapped as part of WFD Implementation and classified as one of two overall types: bedrock or (unconfined) sands and gravels. Groundwater within County Meath is entirely hosted by bedrock, in keeping with most of the Eastern River Basin District (ERBD). The aquifer in the vicinity of Tara mines and the TMF is classified as ‘poorly productive’ (Phillips, 2005).</p> <p>There are no superficial deposit aquifers defined at or within the immediate area of the TMF. Groundwater bodies are the management unit for groundwater under the WFD. The TMF is located within the Navan Tailings groundwater body. This is delineated on the basis of the likely area of influence of the TMF, bound to the west and southwest by the Yellow River and River Blackwater respectively, by the boundary of the TMF to the north and east and by geological boundaries to the southeast.</p> <p>The adjoining groundwater bodies are the Athboy body to the west and the Wilkinstown body to the east. According to the groundwater body descriptions, groundwater flow in these bodies will be predominantly in the upper weathered zone, described as rapid throughflow, and some deeper flow along fractures and faults (ERBD,2010). Groundwater flow pathways in these bodies will tend to be relatively short, in general between 30 and 300 m, with groundwater discharging to streams and rivers across the aquifer.</p> <p><u>Vulnerability:</u> The implementation of groundwater protection schemes in Ireland is the overall responsibility of the Environmental Protection Agency (EPA) and local government authorities. Aquifer vulnerability mapping undertaken by the Geological</p>

Feature	Detail and Comments
	<p>Survey of Ireland indicates that the general area surrounding the TMF has an interim classification of 'moderate' to 'high' vulnerability.</p> <p>Land directly to the north, west and south of the TMF is classified as having 'high' vulnerability, with a hotspot of 'extreme' vulnerability also to the west. Land to the east of the TMF is classified as having 'moderate' aquifer vulnerability. There are no Source Protection Zones (Inner or Outer) currently identified in the locality, however the implementation of groundwater protection schemes is still underway.</p>
Hydrology	<p><u>Surface Water:</u> The Tailings Management Facility (TMF) is bounded by the Yellow River to the west, the Simonstown Stream to the east and the Blackwater River to the south. There are also two smaller streams, the Duog to the south east and Blake's stream to the north. These surface water courses are tributaries in the Boyne catchment, which lies within Ireland's Eastern River Basin District (ERBD), as designated under the European WFD. The ERBD incorporates the majority of County Meath and all or part of 12 other counties, covering approximately 6,300 km² and equal to a tenth of Ireland's land mass.</p> <p>The Boyne catchment area constitutes Hydrological Area 07 within the ERBD and is made up of 89% agricultural land use, with the majority as pasture. The rivers and streams surrounding the TMF at Randalstown have been classified overall as 'at risk' of pollution from various sources, along with most of the Boyne catchment.</p> <p>The extant TMF area is approximately 2 km² making up around 10% of the Simonstown Stream catchment area and 2% of the Yellow River sub-catchment areas. The Yellow River flows southwards towards the Blackwater River draining an area of 38.1 km² north and north-west of the dam. Blake's Stream, to the north of the dam, is a tributary of the Yellow River.</p>
Natural Heritage	<p>There are two areas designated as a special area of conservation (SAC) and one area designated as a Special Protection Area within 15 km of the proposed development.</p> <p>002203 SAC GIRLEY (DREWSTOWN) BOG SAC 002299 SAC RIVER BOYNE AND RIVER BLACKWATER SAC 004232 SPA RIVER BOYNE AND RIVER BLACKWATER SPA</p>
Archaeology and historical sites	Please refer to Chapter 13

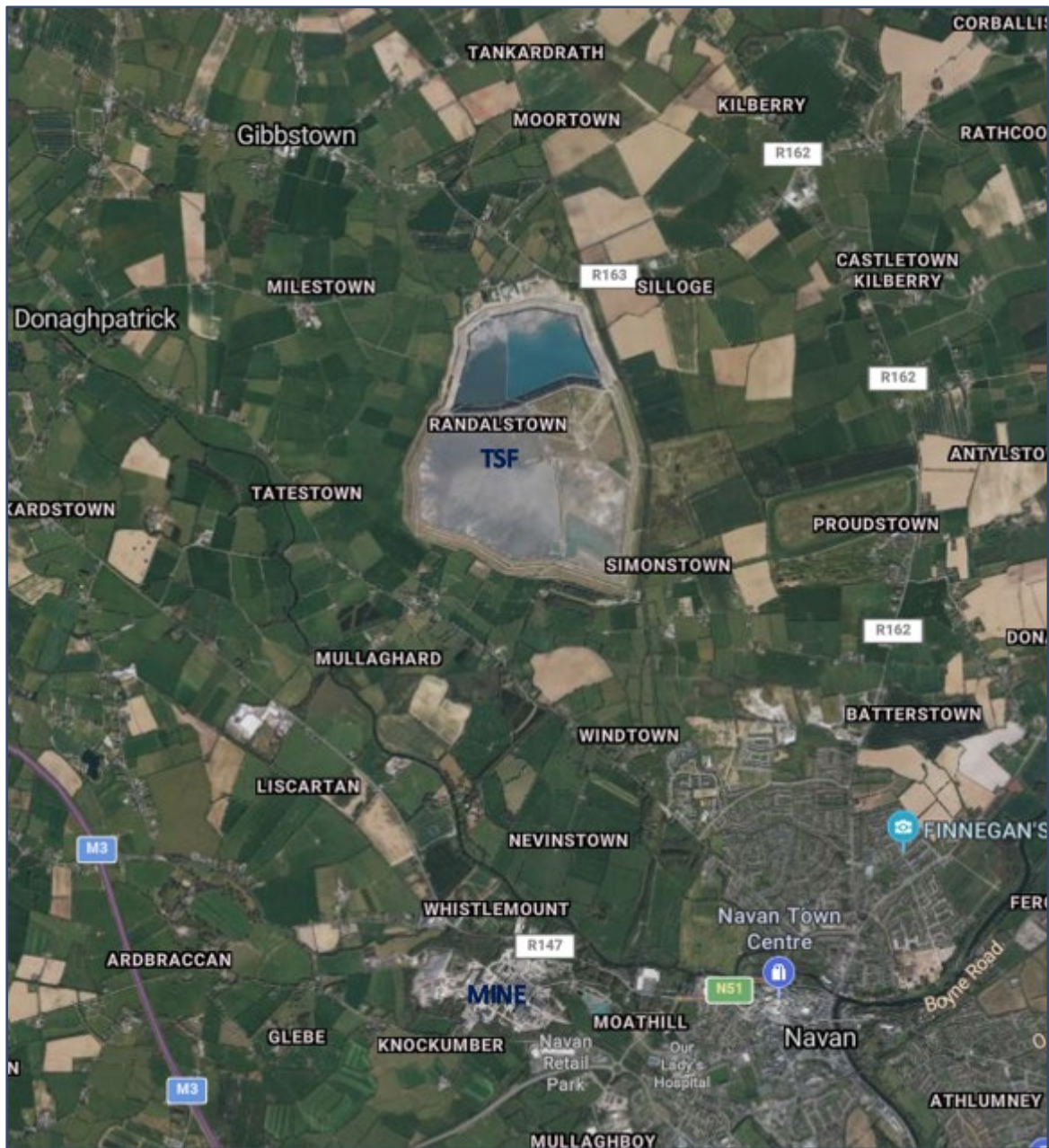


Figure 5.4 Tailings Facility and environs (Bing Maps)

5.5.1 Landscape Value and Sensitivity

The extant Tailings Storage Facility (TSF) is of a sizeable scale and has a distinct industrial character. The surrounding environs comprises of a range of agricultural land management practices, some being relatively intensive, with very few unused fields. Generally, the field boundaries appear well maintained, but there are instances where post and wire fences have replaced hedgerows. Hedgerow removal and changes in agricultural practices leading to intensification of farming and the development of the Proudstown Park Racecourse, Kilsaran Quarry and the Tara Mines Tailings Storage Facility have resulted in the field patterns within the wider study area being altered considerably.

The Landscape and Visual Impact Assessment undertaken by Macro Works concludes that the proposed development at the TSF is not considered to give rise to any significant landscape or visual impacts.

5.5.2 Built Services

Material Assets comprise of 'built services and infrastructure' such as utilities (electricity, telecommunications, water supply), infrastructure, roads, waste management and drainage and wastewater. Table 5.4 presents details of utility providers that were contacted to ascertain locations of underground assets.

Electricity Supply Network

Power to the existing development and the local residents is provided by overhead lines, which form part of the ESB's country-wide, medium and low voltage, electricity distribution network. Electricity lines are located within and adjoining the existing site. There are two ESB substations in the vicinity of the TSF, the Navan 110kv substation situated to the northeast and a smaller substation directly to the south providing supply to the site.

Construction Phase

During the construction stage there will be a minimal temporary increase in electricity demand due to additional personnel being present for the construction works. There will be no requirement to move any electrical infrastructure.

Operational Phase

Electricity demand will revert to the usual operational requirements.

Stormwater Network

The stormwater at the TSF is managed by way of an existing drainage system where rainfall and runoff are captured in the perimeter interceptor channel and pumped returned into the tailings facility. There are no Irish Water or local authority storm drains within the proposed development working area. No additional storm water will be discharged to the local storm network.

Construction Phase

The buttress works will utilise the existing site infrastructure.

Operational Phase

The TSF will utilise the existing site infrastructure.

Foul Network

The area is serviced by either septic tank systems or proprietary effluent treatment systems. There are no municipal foul lines close to or within the proposed development site location.

Construction Phase

There is an existing wastewater treatment system currently in place for use by contractors. It is not anticipated that any additional facilities will be required.

Operational Phase

The TSF will utilise the existing site infrastructure.

Potable Water Network and Drinking Water Supply

Supply of potable drinking water is provided by one of three ways in Ireland; a public water supply from Irish Water, private Group Water Schemes (GWS) and individual household wells. There are over 380 private group water schemes and an estimated 170,000 household wells

supplying water throughout Ireland. The supply of water within proximity to the Proposed Development is made up of a mix of private wells, GWS and Irish Water supplies. There are no records of Irish water infrastructure within or abutting the Proposed Development site.

Construction Phase

There is a potable water supply in place at the TSF. It is anticipated that there will be an increase in water usage during the construction phase of this project. The main increase in demand will be as a result of additional personnel during the construction phase only.

Operational Phase

The TSF potable water demand will stabilise to pre-construction levels.

Gas Network

The site is not serviced by the gas network nor is there a supply in the general location.

Telecommunications Network

The telecommunications infrastructure in the Republic of Ireland provides Internet access to businesses and home users in various forms, including fibre, cable, DSL, wireless, Fixed Wireless and mobile. There are several mobile masts or base stations for the transmission and reception of mobile telecommunication in the wider area. These masts house both point to point microwave links and cellular technologies used in the provision of telecommunications services.

There is no connection to Information and Communication Technology (ICT) at the Site. Telephone communication to and from the site is by way of mobile networks.

Table 5.4 Existing Underground Services

Service	Contact details	Presence in locality?	Confirmation date
Electricity Supply	dig@esb.ie	Yes	23/11/23
Storm water	waterservices@meathcoco.ie	No response	
Foul	datarequests@water.ie	No	24/11/23
Water mains	datarequests@water.ie	Yes	24/11/23
Telecommunications	osm.enquiries@atkinsglobal.com	No response	
	civils@virginmedia.ie	No	23/11/23
	plantenquiries@catelecomuk.com	No	23/11/23
	gis.ireland@bt.com	No	22/11/23
	customercare@openeir.ie	No response	
Gas Supply	dig@gasnetworks.ie	No	22/11/23

5.5.3 Cultural Assets

A quantitative and qualitative evaluation was carried out to assess the potential impact of the proposed development on the identified cultural heritage assets, in line with the DRAFT TII guidelines for the assessment of impacts on the cultural heritage environment (TII 2023) and the EPA guidelines (EPA 2022).

Cultural heritage receptors within a 500m radius of the proposed works were assessed for potential direct and indirect effects during the construction and operation phases of the development, as were additional cultural heritage receptors within a 20km radius that were deemed relevant to account for potential setting or visual impacts.

The proposed buttress development will not expand the current footprint and the overall height of the facility will not be increased; **therefore, there are no predicted significant effects** as a result of the proposed works. Potential impacts resulting from the construction of the

proposed scheme have been identified for cultural heritage receptors with mitigation measures that would decrease the significance of these effects to imperceptible or not significant. These are presented in Chapter 13 – Cultural Heritage.

Due to the nature of proposed works there are no predicted impacts during the operational phase. There have been no Significant Effects identified from cumulative impacts.

5.5.4 Landscape and Natural Heritage

The site and central study area are dominated by the Tara Mines facility, which has a distinctly industrial extractive character and is of a substantial scale. There is a range of agricultural land management practices within the wider study area, some relatively intensive, with few untidy, fallow or unused areas. Generally, field boundaries appear well maintained, but there are instances where post and wire fences have replaced hedgerows. The field patterns have changed dramatically within the study area due to hedgerow removal through agricultural intensification, the existing Tara Mines Tailings Storage Facility, Kilsaran Quarry and Proudstown Park Racecourse.

A Landscape and Visual Impact Assessment (LVIA) undertaken by Macro Works concludes that the proposed development is not considered to give rise to any significant landscape or visual impacts. No additional land will be taken up by the proposed development. Please see Chapter 4 for the LVIA

5.6 TRAFFIC

A Traffic Impact Assessment (TIA) was undertaken by PMCE for the proposed Buttress Works at the Tailings Storage Facility. Please refer to Appendix 5.A.

The proposed development relates to the construction of a rockfill and earthen reinforcement buttress to the extant embankment wall of the Tailings Storage Facility, Co. Meath. The main entrance to the Randalstown Tailings Storage Facility is located on the L74141 Local Road approximately 6km north of Navan, 4km northwest of N51 National Road, and 50km northwest of Dublin City. The Site and the surrounding road network is illustrated in Figure 5.5.

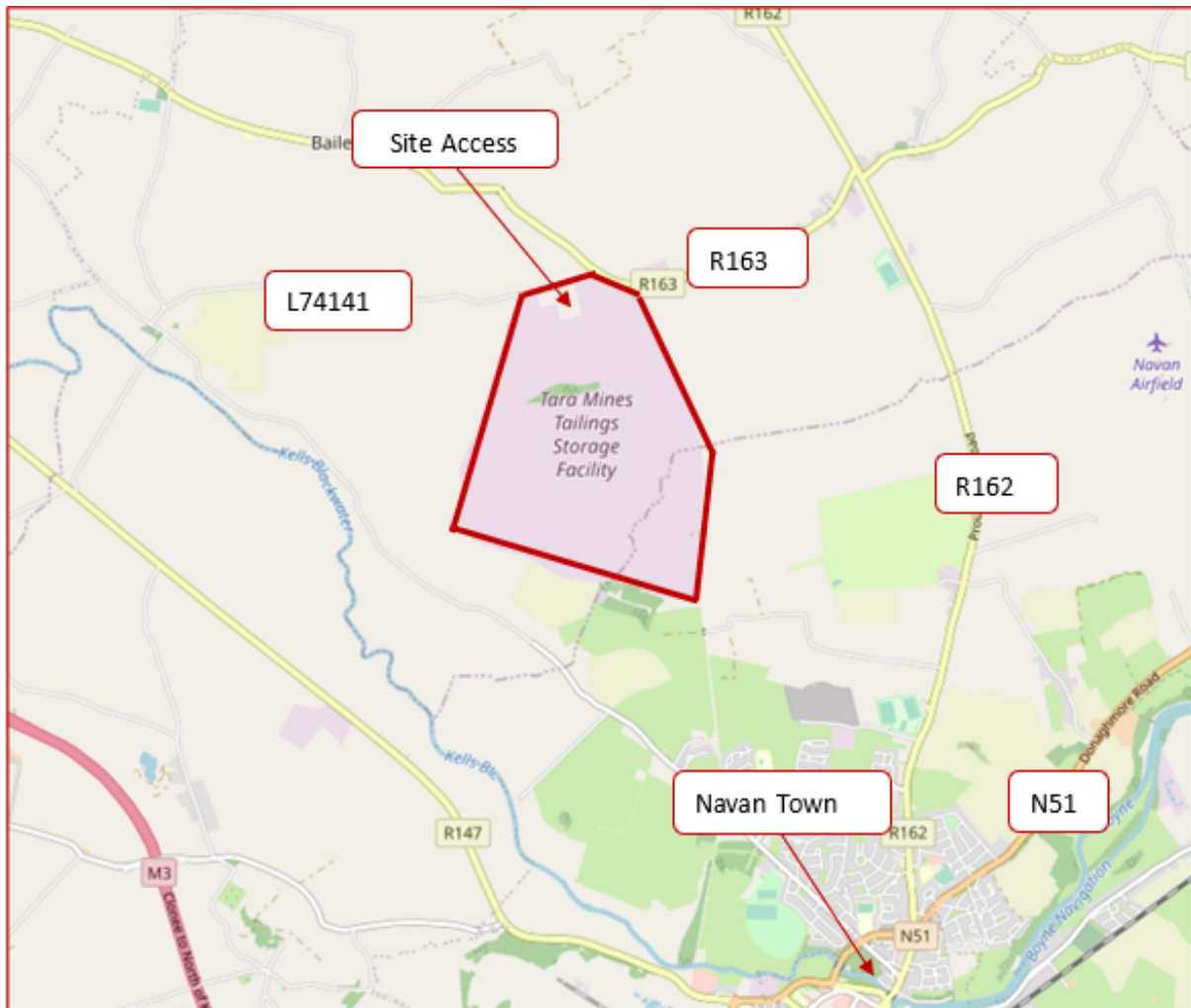


Figure 5.5 *The Site and the surrounding road network*

The construction of the buttress will require the movement of materials between the TSF and a number of existing source locations, including the Main Mine site in Navan, and between the TSF and the M3 Motorway. The route between the TSF and some of these source locations will require drivers to turn right when exiting the site towards the R163 Regional Road, then right onto the R163 before continuing on the R163 Regional Road at the R162/R163 staggered junction.

The route between the Tailings Storage Facility and the M3 Motorway will require drivers leaving the site to turn right onto the L74141 towards the R163 Regional Road, right onto the R163, right onto the R162 at the R163/R162 staggered junction towards Navan and then travel via the N3 link at the N51/N3 Link/R162 roundabout junction in Navan. Both routes are illustrated in Figure 5.6.

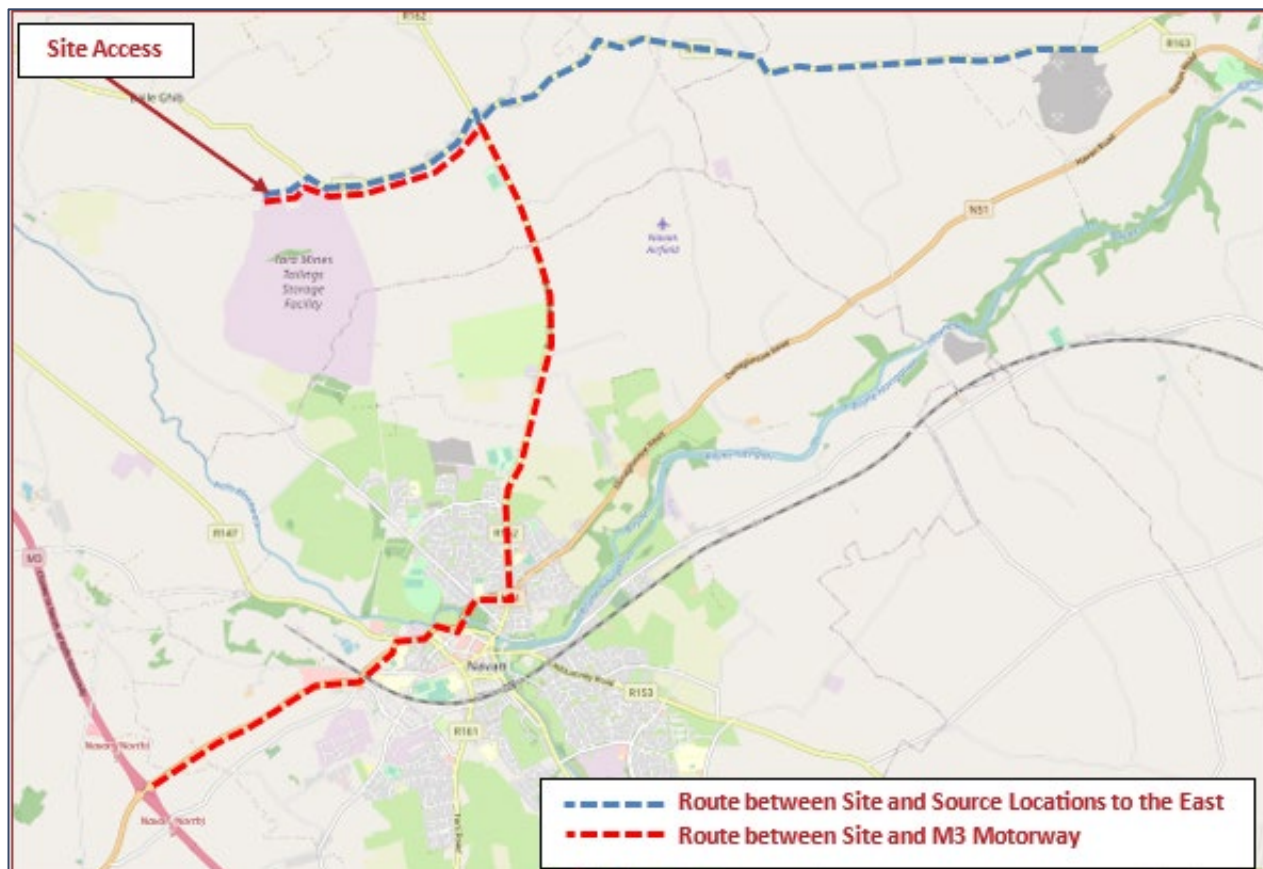


Figure 5.6 Route from The Site to Source Locations to The East and the M3 Motorway

Three options have been considered for the construction phase of the proposed buttress at the Tailings Storage Facility in Co. Meath. Each option is predicted to vary in duration due to the annual volume of material being imported to the site varying in each option.

- Option A proposes the shortest construction period of 1.5 years (823,296 tonnes per annum)
- Option B proposes a construction period of 2 years (617,472 tonnes per annum)

- Option C proposes the longest construction period of 3 years (411,648 tonnes per annum).

A total of 1,234,944 tonnes (561,340 cubic metres) of construction material will be imported to the site over the construction phase of the proposed development. Three possible construction programme options of varying duration have been considered in terms of potential impacts on the surrounding road network. Option A proposes the shortest construction period of 1.5 years (823,296 tonnes per annum) over 2024 and 2025, Option B proposes a construction period of 2 years (617,472 tonnes per annum), also over 2024 and 2025 and Option C proposes the longest construction period of 3 years (411,648 tonnes per annum) over 2024, 2025 and 2026.

The trips per day for each option will depend on the length of the construction period. In determining the daily traffic volumes associated with construction, for each option, an average of between 65 and 142 loads per day arriving at the site has been calculated based on the following assumptions:

- Construction will take place for 48 weeks per year.
- On average, material will be transported to / from the site in 26.5 tonne loads.
- Construction at the facility will take place for five days per week.
- Construction will take place for 10 hours a day.

5.6.1 Conclusion of the TIA

The Traffic and Transport Assessment makes the following conclusions:

1. **Link Capacity analysis** was carried out on the L74141, R163, R162 and N51 within the vicinity of the Site, and along the routes between the site and the source of materials/M3 Motorway, with reference to TII Publication's document DN-GEO-03031, "Rural Road Link Design." It was determined that the L74141, R162 and R163 will continue to operate within capacity for each of the assessment years for all construction phase options.

The N51 however currently exceeds capacity during the base year¹ and will continue to exceed capacity both with, and without, the traffic generated by the construction of the proposed buttress in all future assessment years for all construction phase options. The traffic associated with the construction of the proposed buttress however represents a small percentage of total traffic on the N51 during the proposed construction period including between:

- a. 0.79% and 0.78% during construction years 2024 and 2025 (Option A).
- b. 0.61% and 0.60% during construction years 2024 and 2025 (Option B).
- c. 0.43% and 0.42% during construction years 2024, 2025 & 2026 (Option C).

The traffic associated with the construction of the proposed rock and earthen reinforced buttress during the assessment years for all construction phase options therefore has a negligible impact on the capacity of the N51 during this period. It is also noted that construction traffic will be temporary. The site and surrounding road network are illustrated in Figure 5.4.

2. **Junction Capacity Analysis** was undertaken at four junctions in the vicinity of the Site, and along the routes between the site and the source of materials/M3 Motorway. The results of the Junction Capacity Analysis indicate that the site access junction, the L74141/R162 junction and the R162/R163 junction currently operates within capacity and will continue to operate within capacity for each of the assessment years for all construction phase options both with, and without, the construction of the proposed rock and earthen reinforcement buttress.

The R162 arm of the R162 / N51 roundabout, however, currently operates at capacity and will exceed capacity in all future assessment years for all construction phase options. This would however occur both with and without traffic generated by the construction of the proposed rock and earthen reinforcement buttress. The impact of the additional construction related traffic on vehicle queues and delay at the roundabout is considered negligible with regards to the operation of the junction during the proposed construction period for all options assessed and can be summarised as follows:

¹ Refer to Appendix 5-A

Option A

There will be a maximum increase in vehicle queues of 1 vehicle and a maximum increase in delay of 4.49 seconds on the R162 in 2024 and a maximum increase in vehicle queues of 1.2 vehicles and a maximum increase in delay of 5.63 seconds on the R162 in 2025. It also should be noted that construction traffic will be temporary.

Option B

There will be a maximum increase in vehicle queues of 0.7 vehicles and a maximum increase in delay of 3.32 seconds on the R162 in 2024 and a maximum increase in vehicle queues of 0.9 vehicles and a maximum increase in delay of 4.17 seconds on the R162 in 2025. It also should be noted that construction traffic will be temporary.

Option C

There will be a maximum increase in vehicle queues of 0.5 vehicles and a maximum increase in delay of 2.19 seconds on the R162 in 2024, a maximum increase in vehicle queues of 0.6 vehicles and a maximum increase in delay of 2.76 seconds on the R162 in 2025 and a maximum increase in vehicle queues of 0.9 vehicles and a maximum increase in delay of 3.47 seconds on the R162 in 2026. It also should be noted that construction traffic will be temporary.

Visibility

Visibility in both directions from the site access has been assessed in accordance with Section 5.6.3 of TII Publication's document DN-GEO-03060. The posted speed on the L74141 is 80kph. For a Design Speed of 85kph, unobstructed visibility of 160m to the high object height (1.05m) is required in both directions from a distance of 3m back from the edge of the major road. Pillars located at the site access may partially encroach on the visibility splay of drivers of private cars however, for HGV drivers, who are positioned higher in their vehicle, the full 160m visibility is achievable in both directions from the site access. The traffic volumes recorded on the L74141 are low with an AADT in the base year of 515 and an estimated AADT in 2026 of 565. Table 5.4 in TII Publication's document DN-GEO-03060 allows the setback distance, from which visibility is measured, to be relaxed from 3m to 2m at accesses on lightly trafficked Regional and Local Roads. The full required visibility splay of 160m is achievable at the access in both directions, for all drivers, from a distance of 2.0m back from the public road.

5.7 RESOURCE AND WASTE MANAGEMENT

Construction Phase

Any waste generated during the construction phase will be managed in accordance with a construction environmental management plan (CEMP) and a resource waste management plan. These documents will be prepared by the main contractor and the Boliden management team prior to the works commencing and in accordance with the conditions of planning and as approved by the planning authority.

The likely sources of waste during the construction phase are:

- Concrete from manholes which will be re-used in the works;
- Road fill which will be re-used in the works;
- Electrical cables will be segregated and removed off site for recovery by licenced waste contractor;
- Waste steel will be segregated and removed off site for recovery by licensed waste contractor; and
- Spoils from site clearance will be placed to form site clearance spoil heaps, compacted, and trimmed (so side slopes are at a safe angle), and reused. These heaps may need to be vegetated if conditions are very dry.

Operational Phase

It is not anticipated that there will be any additional waste generated during the operational phase of the development.

5.7.1 The use of natural materials under Article 27

The proposed buttress support works will involve infilling works using both mine rock and glacial till (greenfield soil). The indicative volumes of materials required for these works have been calculated at 561,340 cubic metres.

It is estimated that approximately 265,690 m³ of mine rock will be provided from within the underground mine (EPA approval will be sought to use mine rock as a construction material

under existing IEL conditions²), with some 295,650 m³ of inert greenfield soil being sourced from a number of third-party development sites that would otherwise have gone to landfill. Greenfield soil will be transported under Article 27 as it is considered a by-product and not waste. Determination by the EPA via EPA Eden portal must be undertaken prior to importation and acceptance of this material at the application site. Drainage stone will be sourced locally from Slane Quarry or O'Reilly Concrete in Kingscourt.

5.7.2 Invasive Species Spread

Given the requirement for importation of soil material, there is potential for the introduction of propagules of one or more Alien Invasive Plant species primarily through:

- Importation of material contaminated with propagules;
- Importation of propagules on the tyres / body of vehicles.

An Alien Invasive Plant Species Management and Control Plan has been undertaken (refer to Appendix 6-B) in order to ensure that no propagules of any plant species listed in Part (1) of the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations of 2011 (as amended) are introduced to the site during the construction phase. Risks regarding the importation, spread or dispersal of potential propagules of Alien Invasive Plant Species to/within the proposed development site (and in particular Japanese Knotweed, Himalayan Balsam and Giant Hogweed) have been taken into account in this plan.

Soil used as construction material is imported under conditions specified in the Company's IEL P0516-04³.

² Condition 8.15: *Unless otherwise agreed by the Agency, rock used in surface construction works at the installation shall have a maximum sulphide content (measured as S%) of 0.1%, or a maximum sulphide content (measured as S%) of 1 % and a neutralising potential ratio, determined on the basis of a static test EN15875, of greater than 3.*

Condition 8.13.7: *Design and construction details, including full method statements and technical specifications, for all basal and side-wall containment engineering works. proposed for any part of the TMF shall be agreed in writing by the Agency prior to construction.*

³ Conditions 8.13.23 to 8.13.28 and Schedule A of IEL Reg. No. P0516-04

5.8 IDENTIFICATION OF LIKELY SIGNIFICANT IMPACTS

The following section is an evaluation of the likely impacts as a result of the anticipated activities during the construction and operation of the proposed development without any mitigation measures.

This chapter should be read in combination with Chapter 8 (Air Quality), Chapter 9 (Noise) and the TIA in Appendix 5.1 for impacts associated with the transportation of materials as part of the proposed development.

5.8.1 'Do Nothing' impacts

In order to adopt the Global Industry Standard on Tailings Management (GISTM), the construction of a rock and earthen reinforcement buttress to the extant embankment walls of the TMF has been proposed.

The purpose of these works is to increase the Factor of Safety (FoS) at the downstream toe of the Stage 4 embankment and to address the risk of tailings embankment failure through conservative design criteria, independent of trigger mechanisms, in order to minimize potential impacts to what is required under the GISTM. If this work does not proceed then the tailings facility will fail to meet the standards of GISTM.

5.8.2 Direct Impacts

It is expected that potential negative impacts on material assets of the area arising from the Proposed Development will relate primarily to nuisance from noise, dust, and traffic. These impacts are anticipated to be short in duration and will be confined to the construction phase of the project only.

5.8.3 Indirect Impacts

Indirect impacts are dealt with where necessary under the respective chapters in this EIAR.

5.8.4 Cumulative Impacts

Cumulative impacts associated with other developments within the area are addressed where necessary under their respective EIAR chapters. The cumulative effects of development on material assets have been assessed taking other planned, existing, and permitted developments in the surrounding area into account,

A review of extractive and other nearby industrial activities has determined two industrial facilities operating approximately 1.2 km southeast of the facility, Kilsaran Quarry and Bord Na Mona Recycling Plant. These facilities are well established and assessed within the various chapters of the EIAR. Cumulative effects are therefore not anticipated.

A query of the EIA portal indicates there are a number of recent projects requiring EIAR and an online review of the Meath Planning resource indicates two significant planning permissions within a distance of 2km of the proposed development. Refer to Table 5.5.

Table 5.5 Significant Development within 2km of the proposed site

Application Number	Development Description	Address	Distance from site	Application Status
221558	Amendments to the south-eastern portion (0.71ha) of a residential development permitted under Meath County Council Reg. Ref. NA/181326	Lands to the north of the Clonmagaddan Road, Clonmagaddan, Navan Co Meath	1500	Appealed
22924	Large Scale Residential Development	Lands north of Clonmagaddan road, Clonmagaddan , Navan	850	Applicaiton finalised

The permitted development on the application site and the adjacent permitted developments in the area, coupled with the proposed development are not considered to contribute significantly to any impact on material assets when considered cumulatively.

The cumulative effects of development on foul and surface water disposal, potable water supply, natural gas supply, electrical supply, telecoms and municipal waste, are anticipated to be negligible.

5.8.5 Residual Impacts

The impacts associated with the proposed development will have an imperceptible effect on the local road network.

It is considered that the proposed development will have no significant effects in terms of other material assets.

Once the identified mitigation measures, appropriate design standards and operational infrastructure management plans are adhered to, it is considered that any impacts on the Material Assets surrounding the Proposed Development will be Not Significant.

5.9 INTERACTIONS ARISING

The vehicular traffic flows that shall be generated by the proposed development during the construction phase may result in corresponding changes to noise levels and air quality in the vicinity of the surrounding road network. The nature, extent and consequences of these changes are examined in Chapters 8, 9 and 10 of this EIAR.

5.9.1 Human Health / Risk of Accidents

The comprehensive evaluation undertaken as part of this assessment is addressed within Chapter 10 (Population and Human Health) of this EIAR.

BTM have conducted an Environmental Liabilities Risk Assessment (ELRA) to consider the risk of unplanned events occurring during the operation of a facility that could result in unknown liabilities. The purpose of the ELRA is to identify risks to the environment.

Emergency Response plans and procedures are in place and will be communicated to all personnel who attend the TSF.

5.10 MITIGATION MEASURES

No significant effects were identified with the proposed development with regard to Material Assets and therefore no mitigation measures are proposed.

A Construction Environmental Management Plan should be developed once the main contractor has been identified. This plan should include provisions for complying with any relevant conditions imposed with the grant of planning, environmental control measures, monitoring requirements and reporting procedures as proposed by the co-authors of this report.

A Traffic Management Plan, Resource and Waste Management Plan and an Invasive Species Plan for the construction stage should also be included with the Construction Environmental Management Plan (CEMP). The proposed development can be controlled and regulated in accordance with the mitigation measures as outlined in the CEMP, through continued environmental monitoring and by conditions imposed by the relevant regulatory authority. The development does not have a significant impact on lands, property or amenity within the area and hence will have no significant effect on material assets.

5.11 MONITORING

Any environmental monitoring programme should provide for on-going monitoring of environmental emissions (dust, noise, and water) from the site, thereby assisting in ensuring compliance with any future requirements or regulations. The results of this monitoring programme should be made available to the relevant regulatory Authorities.

Appropriate warning signs to the public have been provided on the approaches to the site, and. There is manned at the TSF which includes 24-hour CCTV and security personnel in attendance during construction and acceptance of materials). The access gate is kept padlocked shut outside of normal working hours.

There is an ongoing environmental monitoring programme carried out around the tailings facility in accordance with conditions of IEL P0516-04 which will be continued.

5.12 REFERENCES

- Environmental Protection Agency (EPA) (2022). Guidelines on the Information to be Contained in Environmental Impact Assessment Reports
- European Commission (EC) (2017). Environmental Impact Assessment of Projects - Guidance on the Preparation of the Environmental Impact Assessment Report
- Institute of Environmental Management and Assessment (IEMA) (2020). IEMA Guide to: Materials and Waste in Environmental Impact Assessment - Guidance for a Proportionate Approach
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessments (August 2018)
- 'Draft Advise Notes for preparing Environmental Impact Statements' (2015)
- Meath County Development Plan 2021-2027.

Appendix 5.A Traffic and Transport Impact Assessment.....Appendices Volume I