Flood Consequence Assessment: South Dock, ABP Newport Docks

Prepared for Cemminerals NV

July 2024

CONFIDENTIAL

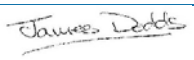
Midlands Office
The Bank Chambers
39 Market Place
Melbourne
Derbyshire
DE73 8DS

Tel: 01332 871 882
E mail: info@envireauwater.co.uk
Web: www.envireauwater.co.uk

Quality Control Sheet

Title	Flood Consequence Assessment: South Dock, ABP Newport Docks
Client	Cemminerals NV
Issue Date	05/07/2024
Reference	3490703 SH Newport Docks \ RPT FCA Newport

Authors

	Name	Signed
Prepared by	Michael Underwood – Senior Hydrologist	
Checked by	Lee Clarke – Principal Hydrologist	
Approved by	James Dodds – Director, Water Management Specialist	

Revision History

Revision	Details	Prepared by	Checked by	Approved by	Issue Date
REV01	Draft for client comment	MU	LC	JD	14/05/2024
REV02	Final for issue	MU	LC	JD	05/07/2024

Contents

Figures

Tables

Appendices

1 INTRODUCTION

1.1 Background

Envireau Water has been commissioned by Stephenson Halliday, on behalf of Cemminerals NV ('the Applicant'), to prepare a Flood Consequence Assessment (FCA) to support a full planning application for the construction and operation of an industrial plant for the manufacture of cement substitute from recycled waste products ('the Proposed Development') on land at South Dock of the Alexandra Docks, Associated British Ports (ABP) Newport Docks ('the Site').

This FCA has been prepared in accordance with the requirements set out in Planning Policy Wales (PPW) (Welsh Government, 2024) and Technical Advice Note 15 Development and Flood Risk (TAN15) (Welsh Government, 2004), Development Advice Maps (Natural Resources Wales, 2024b) and adopted Local Development Plan (Newport City Council, 2015).

This FCA identifies and assesses the risks of all forms of flooding to and from the Proposed Development and demonstrates how these flood risks will be managed to an acceptable level so that the development remains safe throughout the lifetime, taking climate change into account.

1.2 Report Structure

This FCA has the following report structure:

- Section 2 outlines the sources of information that have been consulted.
- Section 3 describes the local physical and hydrogeological setting of the Site.
- Section 4 describes the Proposed Development.
- Section 5 outlines the potential sources of flood risk to the Proposed Development.
- Section 6 provides a detailed assessment of tidal flood risk to the Proposed Development.
- Section 7 outlines the measures to reduce the risk of tidal flooding to the Proposed Development.
- Section 8 justifies the location and acceptability of consequences of the Proposed Development.
- Section 9 presents the conclusions of this FCA.

2 SOURCES OF INFORMATION

2.1 Natural Resources Wales

The Flood and Water Management Act 2010 gives Natural Resources Wales (NRW) a strategic overview role for all forms of flooding and coastal erosion. They also have direct responsibility for the prevention, mitigation and remediation of flood damage for main rivers and coastal areas. NRW is the statutory consultee with regards to flood risk and planning.

NRW Flood Risk Standing Advice and TAN15 have been consulted and reviewed as part of this FCA. Information regarding the current flood risk at the Site and local flood defences has been obtained from the Flood Map for Planning (Natural Resources Wales, 2024b).

As of September 2020, NRW no longer provide detailed flood risk information (Product 4) such as flood levels, flood depths and hazard ratings to support an FCA for a given development site. Therefore, A Freedom of Information (FOI) request was submitted to NRW in September 2023 to obtain Product 6 data which includes the output files from the flood model covering the Site and Newport area (Caldicot and Wentlooge Coastal Model).

2.2 Newport City Council

Newport City Council (NCC) is the LPA, the LLFA and therefore, has responsibilities for 'local flood risk', which includes surface runoff, groundwater and ordinary watercourses. Planning guidance written by NCC was consulted to assess the mitigation policies in place. The adopted Local Development Plan was also consulted to determine the appropriate flood risk policies (Newport City Council, 2015).

2.3 Welsh Water/Dŵr Cymru

Welsh Water/Dŵr Cymru is responsible for the disposal of wastewater and supply of clean water for this area. Information with regards to sewer and water main flooding contained within the NCC Strategic Flood Consequence Assessment (SFCA) (JBA Consulting, 2022) has been consulted as part of this FCA. Sewer plans have been sourced to determine whether there are any assets at the Site or within the vicinity.

3 SITE DESCRIPTION

3.1 Location

The Site is located on the South Dock of ABP Newport Docks, Newport, Pillgwenilly, NP20 2WF (see Figure 1). The National Grid Reference for the Site is ST 31873 84394.

3.2 Existing Development

The Site is previously developed land which covers approximately 4.7 ha (Figure 2). It consists of an existing coal terminal with ship loading equipment, material stockpiles, rail sidings, small built structures and scrubland. Road access to the Site is gained via East Way Road security station (NGR ST 315860) giving access directly from and onto the A48, Usk Way (Southern Distributor Road) situated to the north of the docks (see Figure 1).

To the east of the Site is ABP Newport Steel Terminal. To the south are several large warehouse buildings used for the production and distribution of packaging materials. To the west of the Site is an area for unloading, loading and stockpiling of scrap metal and other recycled wastes.

3.3 Topography

The topography of the Site has been identified from NRW LiDAR digital terrain model (DTM) data (see Figure 3) and topographical survey carried out in October 2020 (see Appendix A). Ground elevations generally range from 8.0 to 8.8 m AOD. Land rises gently in a northerly direction towards East Way Road and rail sidings which are at an elevation of 8.8 to 9.1 m AOD. The average elevation of the Site is 8.6 m AOD.

3.4 Soils and Geology

The local geology has been identified from the British Geological Survey (BGS) 1:50,000 scale mapping on the Onshore GeoIndex (British Geological Survey, 2024). The BGS mapping indicates that the bedrock geology underlying the Site is the Mercia Mudstone Group comprised of mudstone. Superficial deposits overlying the bedrock, are Tidal Flat Deposits comprised of clay and silt. Given that the Site has been developed previously it is likely that there will also be Made Ground present.

Soilscapes describes the natural soils at the Site as “Loamy and clayey soils of coastal flats with naturally high groundwater” (Cranfield Soil and Agrifood Institute, 2024). The drainage of these soils is described as “naturally wet”.

3.5 Watercourses

The nearest river to the Site is the River Usk (Afon Wsyg) which flows 200 m to the south of the Site (see Figure 1). A tributary of the River Usk, River Ebbw (Afon Ebwy), joins the Usk approximately 500 m to the west of the Site beyond which it flows into the Severn Estuary. These watercourses are designated as Main Rivers (Natural Resources Wales, 2024a).

There are several small Ordinary Watercourses present on mud banks to the east of the Site which drain directly southwards into the River Usk.

3.6 Artificial Waterbodies

The only artificial waterbody within the vicinity of the Site is the South Dock of Newport Docks. The water level in the docks is controlled by a series of lock gates. These are used to manage and protect the dock impoundment and locking operation.

3.7 Sewers

The Welsh Water/Dŵr Cymru register of public sewers indicates that there are no sewers present at the Site or surrounding local area (see Appendix B).

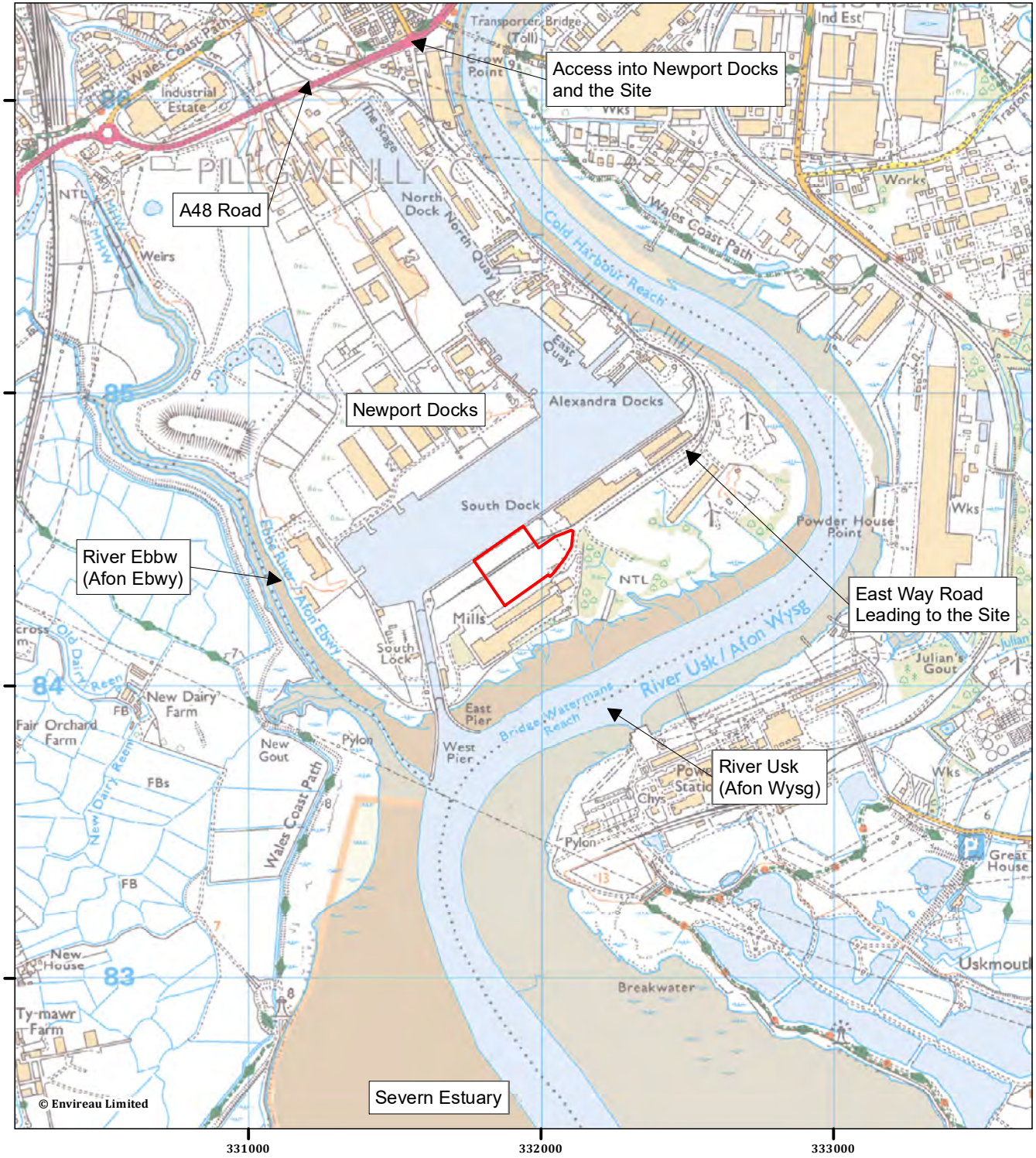


Figure 1: Location and Setting

Newport Docks, Newport

Application Site Boundary

Notes:

0 250 500 750 1,000 Meters

Scale: 1:20,000 at A4

02 May 2024

NGR: 331,940 E / 184,410 N

Project No.	3490703
Client:	Cemminerals NV
Drawn by:	MU
Ref:	Site Location and Setting

envireau WATER

Figure 2: Existing Development

Newport Docks, Newport

Application Site Boundary

Notes:

0 50 100 150 200 Meters

Scale: 1:5,000 at A4

25 April 2024

NGR: 331,911 E / 184,384 N

Project No. 3490703

Client: Cemminerals NV

Drawn by: MU

Ref: Existing Development

envireau WATER

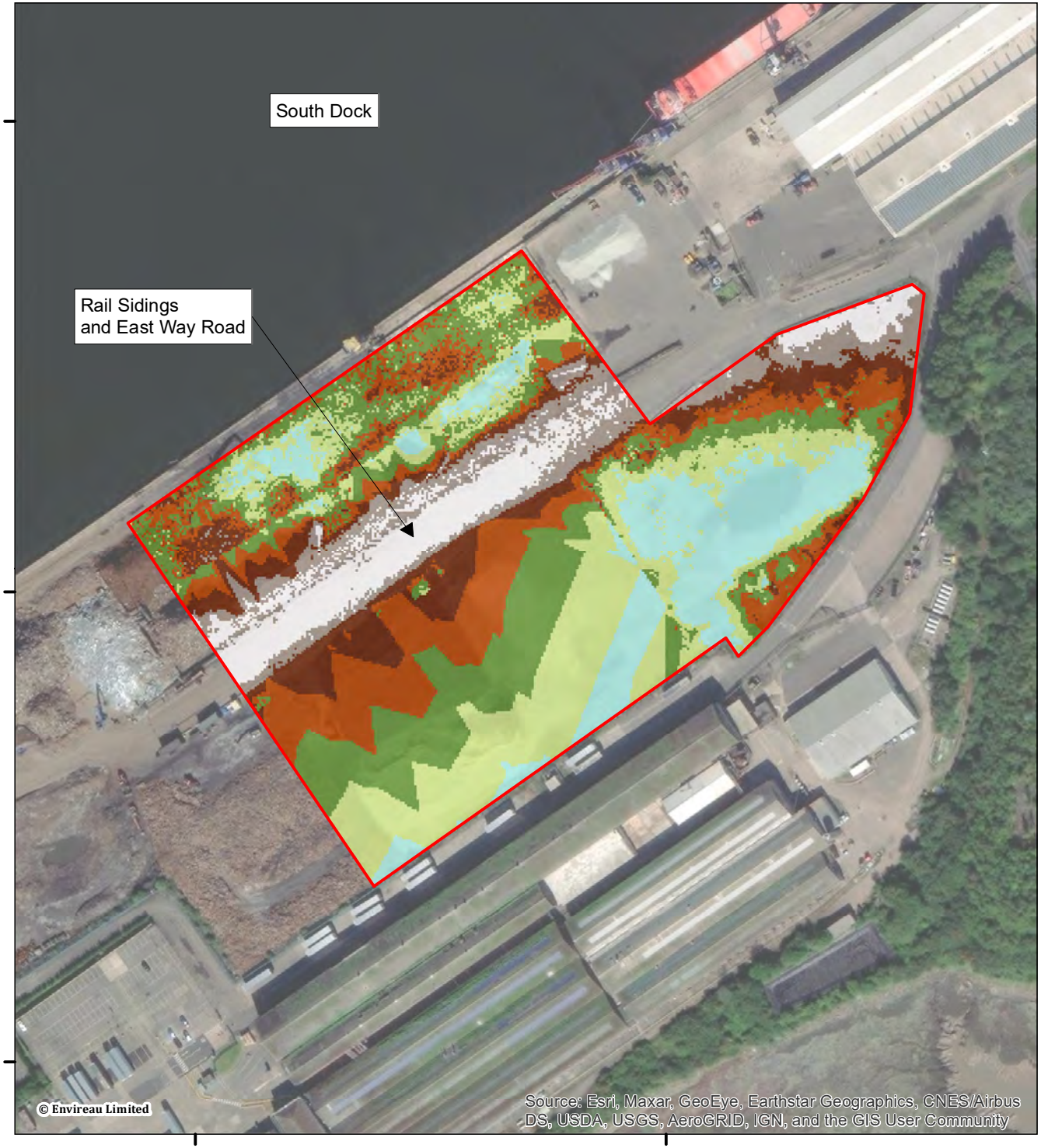


Figure 3: Site Topography

Newport Docks, Newport

Application Site Boundary

LiDAR Ground Elevation

m AOD

- 8.04 - 8.39
- 8.4 - 8.50
- 8.51 - 8.60
- 8.61 - 8.70
- 8.71 - 8.82
- 8.83 - 8.96
- 8.97 - 9.10

Notes:

0 25 50 75 100 Meters

Scale: 1:2,500 at A4

02 May 2024

NGR: 331,940 E / 184,410 N

Project No.	3490703
Client:	Cemminerals NV
Drawn by:	MU
Ref:	Site Topography

envireau WATER

4 PROPOSED DEVELOPMENT

4.1 Description

The Proposed Development is for the Importation of cement and cement substitutes at South Dock and construction and operation of a mill for processing, manufacture of cement and cement substitutes and onward distribution. Development drawings and visuals are presented in Appendix C.

The development will consist of a Clinker Storage Building in the east of the Site, Mill Building in the centre and a Stockroom Building in the south-west corner, adjacent the dock. The Clinker Storage Building will only have intermittent use by employees in order to fill hoppers within. The Mill Building will be two storeys with the lower storey being for storage of site vehicles. The upper floor is where personnel will be situated and will include a site office, welfare facilities and canteen. The Stockroom Building will house materials and equipment only.

4.2 Phasing

There are three phases to the development as follows:

1. Site preparation, connection to services, security fencing, provision of foundations. This will involve the removal of existing redundant temporary buildings, scrub and the provision of temporary welfare facilities.
2. Importation, storage and onward distribution of estimated approximately 100,000 tonnes per annum of cement and or cement substitutes. The cement coming from the import of vessels will be unloaded pneumatically and transported via pipes to 4 No. storage silos of approximately 45 m height with weighbridges beneath the silos.
3. Importation of estimated approx. 1,000,000 tonnes per annum of raw materials such as cement clinker and slag, construction and operation of a mill for processing, manufacture of cement and cement substitutes and onward distribution. Phase 3 also includes permanent office/welfare facilities.

5 FLOOD RISK ASSESSMENT

5.1 Introduction and Policy Context

This FCA identifies and assesses the risks of all forms of flooding to and from the Proposed Development and demonstrates how these flood risks will be managed so that the development remains safe throughout its lifetime, taking account of climate change.

In line with the requirements of TAN15, all potential sources of flooding have been considered, these are: fluvial (river) flooding, tidal (coastal) flooding, groundwater flooding, surface water (pluvial) flooding, sewer flooding and flooding from artificial waterbodies (reservoirs, canals and lakes).

5.2 Flood Map for Planning

The Welsh Government is due to implement a revised TAN15 in the near future. This will be supported by the Flood Map for Planning (FMfP) (Natural Resources Wales, 2024b). The new TAN15 will replace the Development Advice Map (DAM) with the FMfP, which will be used to trigger different planning actions based on a precautionary assessment of flood risk. Importantly, the FMfP takes into account the predicted effects of climate change over the next century, whereas the DAM does not. This difference is particularly important in coastal locations where rising sea levels can significantly extend the extent of flood risk zones.

The FMfP has no official status until the Welsh Government implements the revised TAN15 which has currently been suspended for further consultation. However, while the new TAN15 is not a material consideration, NRW are advising that consideration is given to the FMfP as best available information on flood risk and is being used to inform their planning advice (Natural Resources Wales, 2024b).

5.3 Historic Flooding

The NRW Recorded Flood Extents mapping indicates that the Site is not situated within an area that has been recorded to have flooded in the past from rivers, the sea or surface water (Natural Resources Wales, 2024c). The records come from several evidence sources including NRW, its predecessors or other Risk Management Authorities.

5.4 Strategic Flood Consequence Assessment

The NCC SFCA Level 1 provides a district-wide assessment of the risk of flooding in the Newport area (JBA Consulting, 2022). The Severn Estuary and the tidally influenced River Usk and River Ebbw are the primary sources of tidal flooding in the NCC authority area. Tidal flooding is most likely to occur during storm surge conditions characterised by wind-driven waves, low atmospheric pressure, and high spring tides. A large part of the area at risk of flooding is the Caldicot and Wentlooge levels located along the tidal estuary.

The groundwater flood risk map indicates that the majority of the NCC authority area shows areas where groundwater levels are at least 5 m below the ground surface, suggesting a low risk of groundwater flooding. Areas in the north-eastern part of Newport have large areas where the groundwater is between 0.025 and 5 m below the surface, making groundwater flooding more likely in these areas (JBA Consulting, 2022).

5.5 Flood Defences

The TAN15 Defended Zones dataset indicates that Site is not afforded protection by flood defences that are owned and maintained by Risk Management Authorities (Natural Resources Wales, 2024b). The Defended Zone is defined as those areas that are served by formal flood defences with a standard level of protection of 1:100 year (1% AEP) plus climate change fluvial risk or 1:200 year (0.5% AEP) tidal risk.

Flood defences in the form of concrete walls are present at South Dock, along the northern boundary of the Site and on both the eastern and western sides of Alexandra Dock as shown in Figure 5-21 of the Caldicot and Wentlooge Coastal Modelling Report (JBA Consulting, 2016).

The lock gates of Newport Docks also act as flood defences (reducing the risk of tidal flooding). The outer and middle lock gates of the South Lock were recently refurbished and upgraded as commissioned by the port owner and operator ABP in 2018. This essential replacement and refurbishment of the Newport Dock outer and middle lock gates will ensure that they can continue to protect the dock impoundment and locking operation for at least the next 60 years (Associated British Ports, 2018).

5.6 Potential Sources of Flood Risk

5.6.1 Sea (Tidal)

The FMfP shows that the Site is located within Flood Zone 3, including the future effects of climate change due to sea-level rise (see Figure 4). This means that there is a 0.5% (1:200) chance of flooding from the sea in a given year, ignoring the presence of flood defences, by the next century. The Site in the present day lies within Flood Zone 2 and is at low risk of tidal flooding (Natural Resources Wales, 2024d).

Based on the above, the risk of tidal flooding at the Site, taking account of future climate change is **High**.

5.6.2 Rivers (Fluvial)

The FMfP shows that the Site is located within Flood Zone 1, including the effects of climate change (see Figure 5). This means that there is less than a 0.1% (1 in 1,000) chance of flooding from rivers in any given year.

The Site is therefore at a **Very Low** risk of flooding from rivers.

5.6.3 Surface Water (Pluvial) and Small Watercourses

The FMfP indicates that the Site lies within Flood Zone 1, including the effects of climate change (see Figure 6). This means that there is less than a 0.1% (1 in 1,000) chance of flooding from surface water and small watercourses in any given year.

The Site is therefore at **Very Low** risk from surface water flooding and small watercourses.

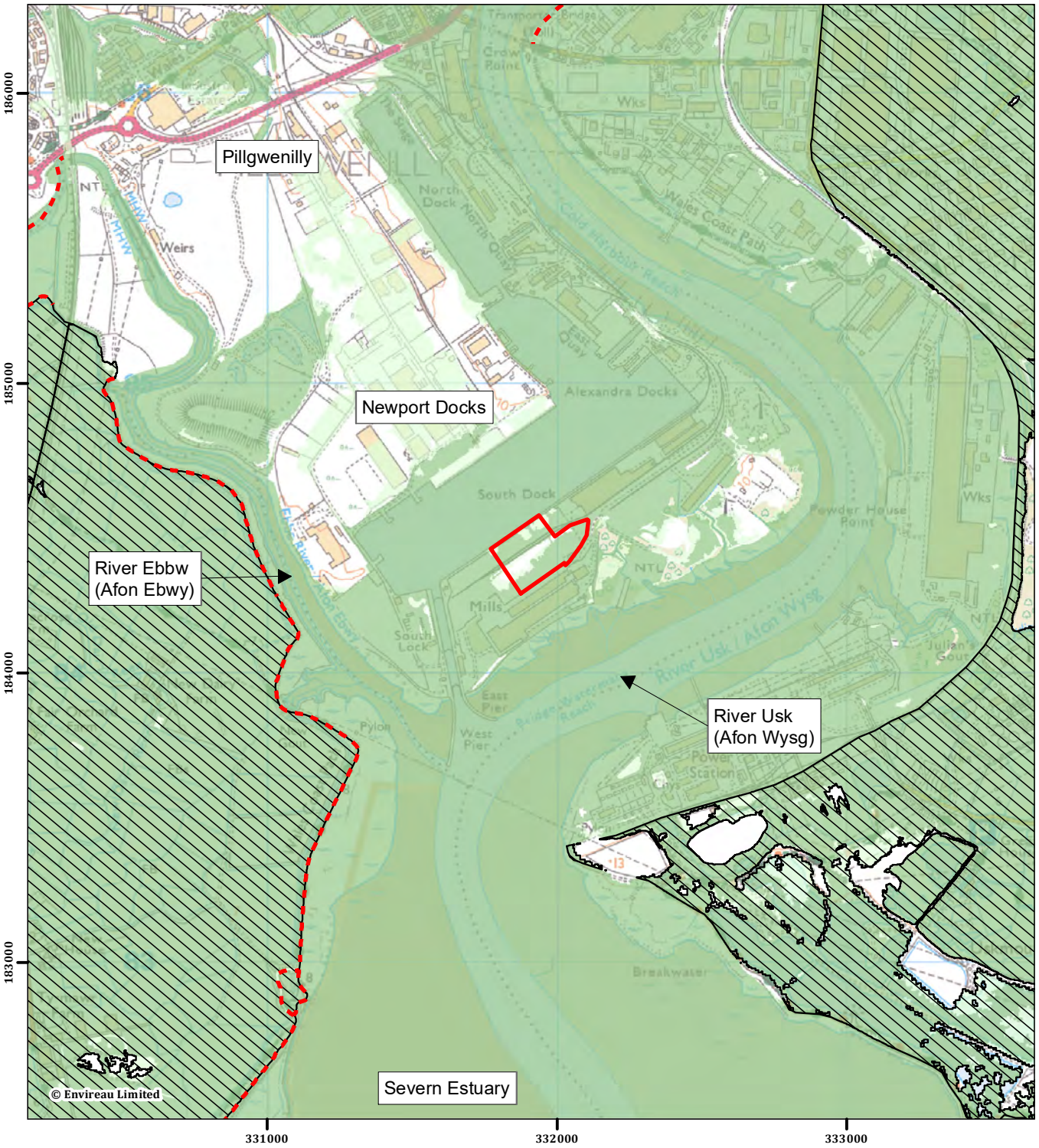


Figure 4: Flood Map for Planning - Tidal

Newport Docks, Newport

Application Site Boundary

Flood Defence Locations

TAN15 Defended Zones

Sea

Flood Map for Planning - Sea

Flood Zone 3

Flood Zone 2

Notes:

0 250 500 750 1,000 Meters

Scale: 1:20,000 at A4

25 April 2024

NGR: 331,911 E / 184,384 N

Project No.	3490703
Client:	Cemminerals NV
Drawn by:	MU
Ref:	Flood Map Tidal

envireau WATER

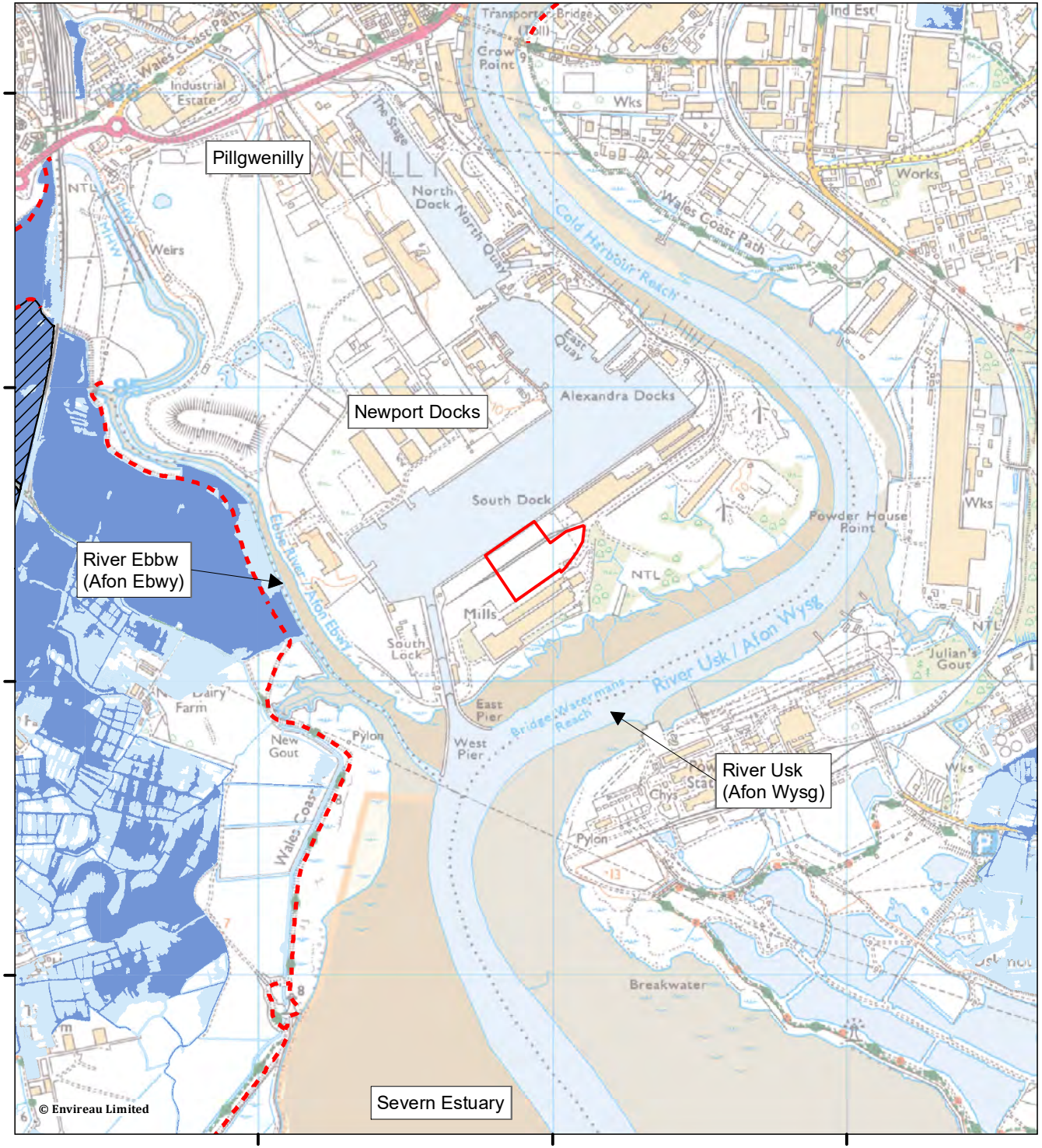


Figure 5: Flood Map for Planning - Rivers

Newport Docks, Newport

Application Site Boundary

Flood Defence Locations

TAN15 Defended Zones

Rivers

Flood Map for Planning - Rivers

Flood Zone 3

Flood Zone 2

Notes:

0 250 500 750 1,000 Meters

Scale: 1:20,000 at A4

25 April 2024

NGR: 331,911 E / 184,384 N

Project No.	3490703
Client:	Cemminerals NV
Drawn by:	MU
Ref:	Flood Map Fluvial

envireau WATER

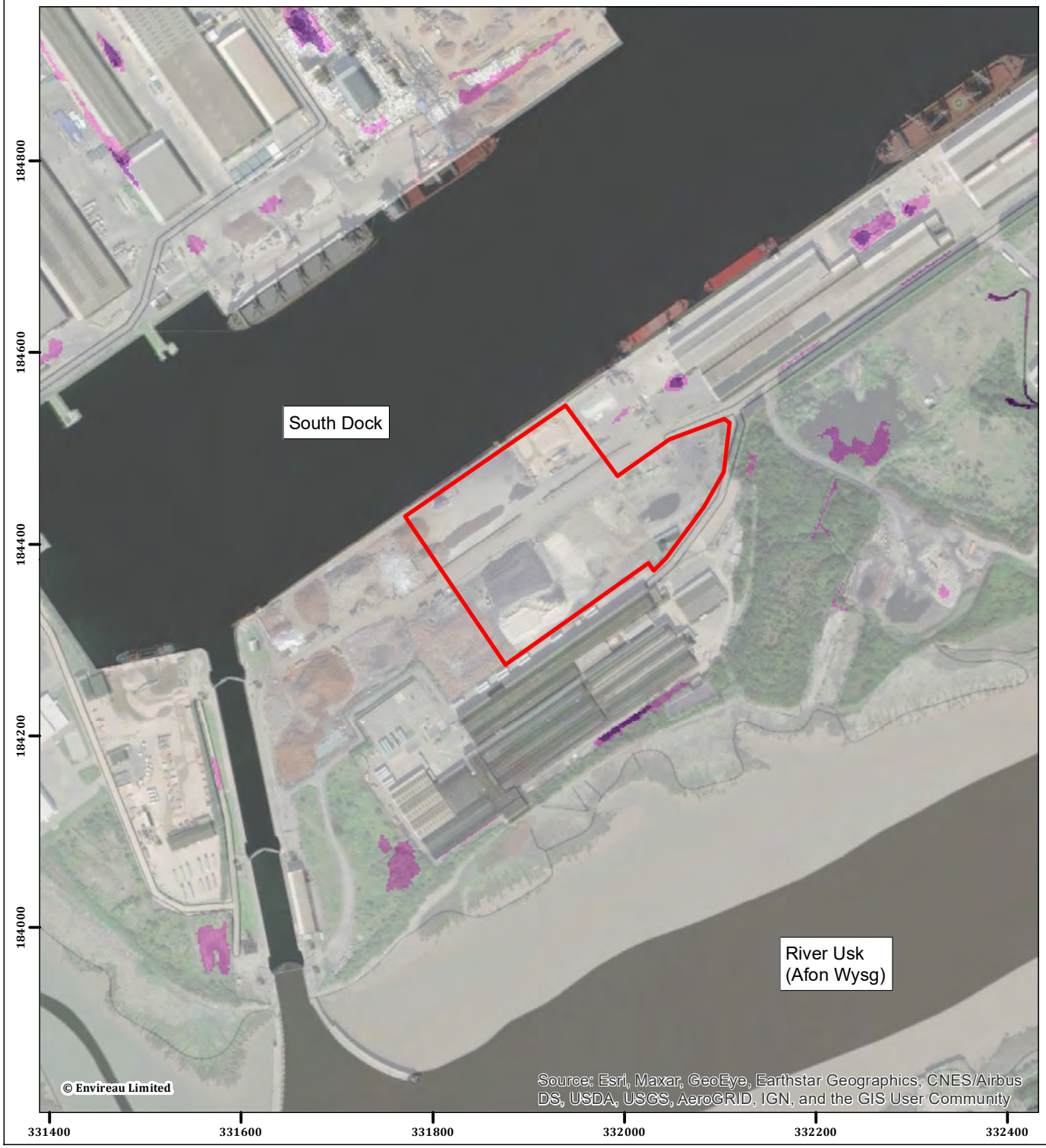


Figure 6: Flood Map for Planning - Surface Water

Newport Docks, Newport

Application Site Boundary

Flood Map for Planning - Surface Water and Small Watercourses

Flood Zone 3

Flood Zone 2

Notes:

0 50 100 150 200 Meters

Scale: 1:6,000 at A4

25 April 2024

NGR: 331,911 E / 184,384 N

Project No.	3490703
Client:	Cemminerals NV
Drawn by:	MU
Ref:	Flood Map SW

envireau WATER

5.6.4 Groundwater

Groundwater flooding is the emergence of groundwater at the ground surface. Groundwater flooding occurs in response to a combination of already high groundwater levels (usually during mid or late winter) and intense or unusually lengthy storm events. Groundwater floods are often slow, prolonged and very localised.

The groundwater level is expected to be only a few metres below ground level at the Site given the underlying geology and proximity to major rivers. Ground raising/levelling works and foundation excavations required during the construction of the development could be at risk from shallow groundwater. However, these potential construction risks will be managed accordingly as part of the construction management.

The risk of the Proposed Development impacting on groundwater, is **Very Low.** The Proposed Development will not increase the risk of groundwater flooding at the Site or elsewhere.

5.6.5 Sewers

Dŵr Cymru/Welsh Water sewer asset plans indicate that there are no sewers within the Site or in the vicinity. Therefore, there is **No Risk** of sewer flooding.

5.6.6 Artificial Waterbodies

The FMfP indicates that the Site is not at risk of flooding from the failure of a large reservoir. This is shown by a transparent layer on the FMfP and as such a figure has not been provided in this assessment.

There are no canals near to the Site. Newport Docks, whilst an artificial waterbody, are a waterbody managed and controlled to maintain an appropriate water level and reduce the risk of flooding to the docks.

Based on the above, the risk of flooding from reservoirs, canals and artificial waterbodies is **Very Low**.

5.7 Flood Risk Summary

Table 1 provides a summary of the risk of flooding to and from the Proposed Development from the flood risk assessment above.

Table 1 Overall Flood Risk to and from the Proposed Development

Flood Source	Risk of Flooding				
	No Risk	Very Low	Low	Medium	High
Sea (Tidal)					X Requires mitigation (see Section 7)
River (Fluvial)		✓			
Surface Water (Pluvial) and Small Watercourses		✓			
Groundwater		✓			
Sewers	✓				
Artificial Waterbodies (Reservoirs, Canals and Lakes)		✓			

6 DETAILED ASSESSMENT OF TIDAL FLOOD RISK

6.1 Introduction

The flood risk assessment of Section 5 identified tidal flooding as the main source of flooding risk to the Site. The Flood Map for Planning shows the Site is located within Flood Zone 3, and therefore at High risk of flooding during a 1:200 year (0.5% AEP) tidal event, accounting for future climate change due to sea level rise.

This section provides a more detailed assessment of tidal flood risk using Product 6 data (modelled outputs) taken from the Caldicot and Wentlooge Coastal Modelling Study (JBA Consulting, 2016) which was provided to Envireau Water by NRW as part of a FOI request in September 2023. As described previously in this report, as of September 2020, NRW no longer provides detailed site-specific flood risk data (Product 4) and therefore the Product 6 data has been interrogated to determine the predicted flood depths/levels and flow velocities at the Site.

Climate change scenarios were simulated as part of the modelling study to assess coastal flood risk in the event of sea-level rise and increased wave heights (JBA Consulting, 2016). The 1:200 year (0.5% AEP) and 1:1,000 year (0.1%) events were simulated for the climate change horizon year 2115 compared to the baseline of 2014 (101 years). To account for possible changes in wind (wave overtopping) due to climate change, 10% was added to the offshore wind speeds modelled (JBA Consulting, 2016). The study states that the expected sea-level increase between 2014 and 2115 is 1.06 m.

The Welsh Government's Flood Consequences Assessments: Climate Change Allowances for Planning Purposes document requires that the development lifetime for an industrial site is taken to be 75 years (2100) (Welsh Government, 2021). The mean sea-level rise for Newport by 2100 is 0.85 m (Welsh Government, 2021). Therefore, an assessment of flood depth and levels at the Site has been based on the predicted sea-level rise by 2100. To reflect this, the modelled flood depths were reduced by 0.21 m (i.e. the difference between sea-level rise by 2115 and 2100). The assessment of flood velocities has been made based on the year 2115 data given that this cannot be adjusted.

6.2 Flood Depth and Level

The maximum predicted flood depths and corresponding levels based on the existing topography of the Site are shown in Table 2. The depth grids for the year 2100, 1:200 and 1:1,000 year climate change events are presented in Appendix D.

Table 2 Flood Depths and Levels (2100)

Return Period / Event Annual Exceedance Probability (AEP)	Average Flood Depth (m)	Maximum Flood Depth (m)	Maximum Flood Level (mAOD)
1:200 (0.5%)	0.7	1.1	9.35
1:1,000 (0.1%)	1.0	1.5	9.75

6.3 Floodwater Velocities

The maximum predicted flood flow velocities are provided in Table 3. The velocity grids for the year 2115, 1:200 and 1:1,000 year event plus climate change are presented in Appendix E.

The maximum flood flow velocities are predicted in the far eastern corner of the Site, adjacent East Way Road and along of the existing rail siding running through the approximate centre of the Site. However, the majority of the area to be developed is predicted to experience significantly lower flood velocities that are close to the mean values.

Table 3 Floodwater Velocities (2115)

Return Period / Event Annual Exceedance Probability (AEP)	Average Flood Velocity (m/s)	Maximum Flood Velocity (m/s)
1:200 (0.5%)	0.3	1.3
1:1,000 (0.1%)	0.4	1.8

6.4 Rate of Rise and Speed of Inundation

The NRW Newport Tide Gauge indicates that for a spring tide (March 2024) the astronomical tidal range is from a low of -5.4 m AOD to a peak of 8.0 m AOD (13.3 m change) over a period of 4.5 hours which equates to a tidal rate of rise of 3 m/hr (Natural Resources Wales, 2024e).

Flooding at the Site is caused by a combination of high tide and extreme storm surge (i.e. wind and wave action). Before or around the peak of the tidal parabola, storm surge processes account for additional rise in sea water level to the point of inundation of the Site. The peaks in the predicted astronomical tide and storm surge do not always coincide and are dependent on the location and meteorological characteristics of the storm (e.g. wind speed). The passage of a storm surge to peak can be expected to be at a lower rate compared to the astronomical tidal rate of rise. Based solely on the astronomical tide, there would be sufficient early warning in the event of a flood warning to evacuate personnel from the Site.

7 FLOOD RISK MANAGEMENT

7.1 Introduction

The Flood Map for Planning and Caldicot and Wentlooge Coastal Modelling Study indicate that the Site is at High risk of tidal flooding due to the predicted effects of climate change (sea-level rise). To mitigate the risk of tidal flooding over the development lifetime (year 2100) to an acceptable level, mitigation measures will be implemented as part of the development design as described in the following sections.

7.2 Finished Floor Levels

The footprint of the Mill Building will be raised to achieve a Finished Floor Level (FFL) of at least 9.35 m AOD which is equivalent to the 1:200 year (0.5% AEP) plus climate change flood level (see Table 2). This will ensure that the Mill Building is flood free for the development lifetime (75 years) for all events up to the 1:200 year plus climate change tidal event, in accordance with Criteria A1.14 of TAN15. The upper storey, where personnel (offices) will primarily be based will be at a level in excess of the 1 in 1,000 year flood level (9.7 m AOD).

The Clinker Storage Building will not be raised as personnel will not be stationed in this building; it will contain hoppers anchored to the floor which can accept inundation.

All other structures will be placed on supports that raises them above the 1 in 1,000 year flood level.

7.3 Flood Storage

Ground level raising associated with the Mill Building and erection of the Clinker Storage Building and Stockroom Building will remove a volume of tidal floodwater storage from the floodplain. To calculate the volume of storage lost, the 'Volume to Datum' tool within LSS software was used. The input to the tool was the LiDAR DTM data for the building footprints and 1 in 200 year plus climate change flood level of 9.35 m AOD as the datum. The calculated volume of storage lost is 10,044 m^3 as shown in the tool output in Appendix F.

Based on the tidal floodplain in the estuary as shown on the Flood Map for Planning – Tidal (Natural Resources Wales, 2024b), the area of undefended floodplain extending along the River Usk and into the Severn Estuary is approximately 29,000,000 m^2. Therefore, the loss of floodwater storage equates to a 0.3 mm increase in flood depth which is extremely small within the context of the whole tidal floodplain. Due to the close proximity to the estuary, this increase would be displaced into the sea. This level of change will not impact on nearby tidal flood defences or increase the risk of flooding to other existing development. Floodwater storage compensation at the Site is therefore not required.

7.4 Flood Warning and Evacuation

The Site lies within a Flood Warning Area (Natural Resources Wales, 2024f). The developer will sign up to NRW's Flood Warning Service (Floodline) to receive flood warnings and alerts.

A site-specific Flood Evacuation Plan will be drawn up for the Proposed Development and will be integrated into the existing ABP Newport Docks Flood Evacuation Plan. This will ensure awareness of flood risk and appropriate actions are taken in the event of a flood warning being issued to ensure safety of personnel on-site. All personnel working on the Site will be trained in the evacuation plan.

Due to the layout of Newport Docks and presence of tidal lock gates, the only means of accessing and egressing the Site is via East Way Road; there are no other routes available outside of the tidal flood zone for people or vehicles to evacuate the Site. The elevation of East Way Road cannot be raised as it would impact on access to other adjacent existing development. Therefore, a robust emergency protocol, based on egress eastwards on East Way Road, will be employed. This is appropriate as the expected tidal rate of rise of 4.5 hours (see Section 6.4), would provide adequate time to evacuate personnel from the Site in the event of an extreme flood event.

In the unlikely event of an unsuccessful evacuation, the upper storey of the Mill Building (offices) would provide a safe refuge area as the floor level is above the 1 in 1,000 year plus climate change tidal flood level.

8 JUSTIFYING THE LOCATION OF THE DEVELOPMENT

8.1 Flood Risk Vulnerability Classification

TAN15 assigns one of three flood risk vulnerabilities to development as set out in Table 4.

The Proposed Development is for the construction and operation of an industrial plant for the manufacture of cement substitute from recycled waste products. This type of development is therefore classed as '**Less Vulnerable**'.

Table 4 TAN15 Development Vulnerability Classifications

Development Category	Types
Emergency services	Hospitals, ambulance stations, fire stations, police stations, coastguard, command centres, emergency depots and buildings used to provide emergency shelter in time of flood.
Highly vulnerable	All residential premises (including hotels and caravan parks), public buildings (e.g. schools, libraries, leisure centres), especially vulnerable industrial development (e.g. power stations, chemical plants, incinerators) and waste disposal sites.
Less vulnerable	General industrial, employment, commercial and retail development, transport and utilities infrastructure, car parks, mineral extraction sites and associated processing facilities, excluding waste disposal sites.

8.2 Development Advice Map

The Development Advice Map (DAM) is used to determine when flood risk issues need to be taken into account in planning future development. Three development advice zones are described on the maps, to which are attributed different planning actions.

Table 5 describes the composition and use of these zones to control and manage development. The DAM indicates that the Proposed Development (buildings and infrastructure) lie within **Zone C2.** Access roads lie in **Zone B** (see Figure 7).

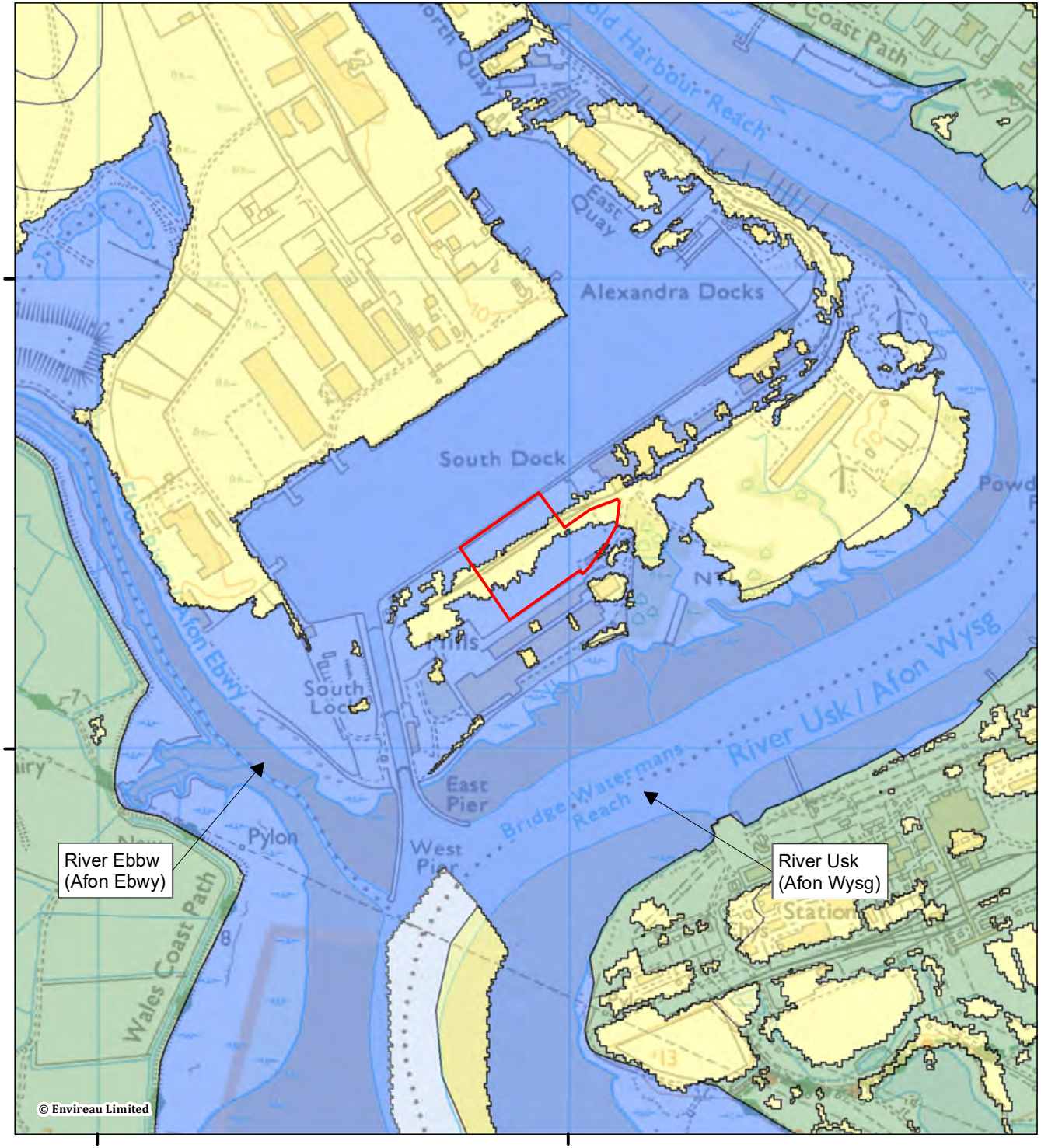
Table 5 Development Advice Map Zones

DAM Zone	Description of Zone	Use within the Precautionary Framework
A	Considered to be at little or no risk of fluvial or tidal/coastal flooding.	Used to indicate that justification test is not applicable and no need to consider flood risk further.
B	Areas known to have been flooded in the past evidenced by sedimentary deposits.	Used as part of a precautionary approach to indicate where site levels should be checked against the extreme (0.1%) flood level. If site levels are greater than the flood levels used to define adjacent extreme flood outline there is no need to consider flood risk further.

DAM Zone	Description of Zone	Use within the Precautionary Framework
C	Based on Natural Resources Wales extreme flood outline, equal to or greater than 0.1% (river, tidal or coastal).	Used to indicate that flooding issues should be considered as an integral part of decision making by the application of the justification test including assessment of consequences.
C1	Areas of the floodplain which are developed and served by significant infrastructure, including flood defences.	Used to indicate that development can take place subject to application of the Justification Test, including Acceptability of Flooding Consequences.
C2	Areas of the floodplain without significant flood defence infrastructure.	Used to indicate that only '**less vulnerable development'** should be considered subject to application of the Justification Test, including meeting the Acceptability of Flooding Consequences criteria. Emergency services and 'highly vulnerable development' should not be considered.

Figure 7: Development Advice Map

Newport Docks, Newport



Notes:

0 150 300 450 600 Meters

Scale: 1:12,500 at A4

02 May 2024

NGR: 331,911 E / 184,384 N

Project No.	3490703
Client:	Cemminerals NV
Drawn by:	MU
Ref:	DAM

envireau WATER

8.3 Justification Test

The Justification Test sets out the details required to justify siting a new development in an area believed to be at risk of flooding and is defined in Section 6 of TAN15.

Section 6.2 of TAN15 states that:

"New development should be directed away from Zone C and towards suitable land in Zone A, otherwise to Zone B, where river or coastal flooding will be less of an issue. In Zone C, the tests outlined in sections 6 and 7 will be applied, recognising, however, highly vulnerable development and Emergency Services in Zone C2 should not be permitted. All other new development should only be permitted within Zones C1 and C2 if determined by the planning authority to be justified in that location. Development in these zones will only be justified if it can be demonstrated that:

i. Its location in Zone C is necessary to assist, or be part of, a local authority regeneration initiative or a local authority strategy required to sustain an existing settlement; ***or,***

ii. Its location in Zone C is necessary to contribute to key employment objectives supported by the local authority, and other key partners, to sustain an existing settlement or region;

and,

iii. It concurs with the aims of PPW and meets the definition of previously developed land (PPW fig 2.1);

iv. The potential consequences of a flooding event for the particular type of development have been considered, and in terms of the criteria contained in Sections 5 and 7 and appendix 1 found to be acceptable."

Justification for meeting each of the tests above is provided in Table 6.

Table 6 TAN15 Justification Test

Condition	Justification	Condition Met
i / ii	The location of the Proposed Development within Newport Docks is both for operational needs and strategic to the proposed uses. The development type fits within ABP's growth strategy for Newport Docks as a major employer within Wales. The development being sited within the docks has sustainability as well as economic benefits in a location suitable for increased HGV traffic. Therefore, even though the development lies within DAM Zone C2, it is an industrial manufacturing plant which is to be located within a key employment area and will add to the existing industrial logistics functions of the docks. As noted in the Local Development Plan (LDP) EM2 "The council will support such development where it can be demonstrated that the development is complementary to and does not hinder the operational use of the port." As such, would meet the requirements of this test.	✓
iii	As above in (i/ii), the development meets the aims of PPW. The Site comprises previously developed land per the definition in PPW. The requirements of this test are therefore met.	✓

Condition	Justification	Condition Met
iv	All criteria contained in Sections 5 and 7 and Appendix 1 of TAN15 have been met and found to be acceptable as detailed in Table 7 of this FCA.	✓

8.4 Acceptability of Consequences

Section 7.1 of TAN15 states:

"If a development proposal in zone C1, or in C2 if it is defined as being of low vulnerability, meets the test outlined in section 6, the justification will be in the knowledge that those developments will flood and will need to be planned accordingly. This section will apply in zone C, and those parts of zone B where flooding has been identified as a material consideration to allow for localised problems."

Section 7.2 of TAN15 states:

"Whether a development should proceed or not will depend upon whether the consequences of flooding of that development can be managed down to a level which is acceptable for the nature/type of development being proposed, including its effects on existing development."

Section 7.3 of TAN15 states:

"Where development is justified the assessment can be used to establish whether suitable mitigation measures can be incorporated within the design to ensure that development is as safe as possible and there is:

- *minimal risk to life;*
- *minimal disruption to people living and working in the area,*
- *minimal potential damage to property;*
- *minimal impact of the proposed development on flood risk generally; and,*
- *minimal disruption to natural heritage."*

Table 7 assesses the Proposed Development against each acceptability criteria as laid out in Appendix 1, A1.12 – A1.15 of TAN15.

Table 7 shows that the Proposed Development is compliant with criteria A1.12 – A1.15. The consequences of flooding can be acceptably managed for the lifetime of the Proposed Development.

The Proposed Development should therefore be considered by Newport City Council to satisfy the Acceptability Criteria as set out in TAN15.

Table 7 TAN15 Acceptability of Consequences Criteria

Acceptability Criteria	Description	Justification	Criteria Met
A1.12	Flood defences must be shown by the developer to be structurally adequate particularly under extreme overtopping conditions (i.e. that flood with a probability of occurrence of 0.1%).	The existing defences at Newport Docks consist of solid concrete walls and the lock gates. The lock gates have recently been upgraded as part of a major package of works by ABP. The concrete defences are maintained by ABP.	✓
A1.12	The cost of future maintenance for all new/approved flood mitigation measures, including defences must be accepted by the developer and agreed with Natural Resources Wales.	No new flood defences are proposed. Maintenance of all existing defences at Newport Docks is the responsibility of ABP, as owners and operators of Newport Docks.	✓
A1.12	The developer must ensure that future occupiers of the development are aware of the flooding risks and consequences.	The end users of the development will be advised to sign up to NRW's Flood Warning Service i.e. Floodline, to ensure they receive the relevant warnings. It is a recommendation of the FCA that a Flood Evacuation Plan is developed and adopted. This will ensure awareness of flood risk and appropriate actions are taken in the event of a flood warning being issued.	✓
A1.12	Effective flood warnings are provided at the site.	The Site lies within an NRW Flood Warning Area. The occupier will sign up to the NRW's Flood Warning Service (Floodline).	✓
A1.12	Escape/evacuation routes are shown by the developer to be operational under all conditions.	A site-specific Flood Evacuation Plan will be drawn up for the Proposed Development and will be integrated into the existing ABP Newport Docks Flood Evacuation Plan. This will ensure awareness of flood risk and appropriate actions are taken in the event of a flood warning being issued to ensure safety of personnel on-site. All personnel working on the Site will be trained in the evacuation plan. Due to the layout of Newport Docks and presence of tidal lock gates, the only means of accessing and egressing the Site is via East Way Road; there are no other routes available outside of the tidal flood zone for people or vehicles to evacuate the Site. The elevation of East Way Road cannot be raised as it would impact on access to other adjacent existing development. Therefore, a robust emergency protocol, based on egress eastwards on East Way Road, will be employed. This is appropriate as the expected tidal rate of rise of 4.5 hours (see Section 6.4), would provide adequate time	✓

Acceptability Criteria	Description	Justification	Criteria Met
		to evacuate personnel from the Site in the event of an extreme flood event. In the unlikely event of an unsuccessful evacuation, the upper storey of the Mill Building (offices) would provide a safe refuge area as the floor level is above the 1 in 1,000 year plus climate change tidal flood level.	
A1.12	Flood emergency plans and procedures by the developer must be in place.	A site-specific Flood Evacuation Plan will be drawn up for the Proposed Development and will be integrated into the existing ABP Newport Docks wide Flood Evacuation Plan. This will ensure awareness of flood risk and appropriate actions are taken in the event of a flood warning/alert being issued to ensure safety of personnel on-site.	✓
A1.12	The development is designed by the developer to allow the occupier the facility of rapid movement of goods/possessions to areas away from the floodwaters.	Materials will be stored within hoppers positioned within buildings (anchored down) and external silos that are elevated above ground level (above the 1:1,000 year climate change tidal flood level) on steel supports with concrete foundations.	✓
A1.12	Development is designed to minimise structural damage during a flooding event and is flood proofed to enable it to be returned to its prime use quickly in the aftermath of a flood.	All silos will be positioned on steel supports and will all lie above the 1 in 1,000 year climate change tidal flood level. The FFL of the Mill Building will be raised above the 1 in 200 year plus climate change tidal flood level and will be flood free for the development lifetime. The Clinker Storage Building and Stockroom Building will be used to store materials in hoppers which will be anchored down and can accept inundation.	✓
A1.12	No flooding elsewhere.	Ground level raising associated with the Mill Building and erection of the Clinker Storage Building and Stockroom Building will remove a volume of tidal floodwater storage from the floodplain The calculated volume of storage lost is estimated to 10,044 m^3. The area of undefended floodplain shown on the Flood Map for Planning (Tidal) extending along the River Usk and into the Severn Estuary is approximately 29,000,000 m^2. Therefore, the loss of floodwater storage equates to a 0.3 mm increase in flood depth which is very small within the context of the whole tidal floodplain. Due to the close proximity to the estuary, this increase will be displaced into the sea. This level of change will not impact on nearby tidal flood	✓

Acceptability Criteria	Description	Justification	Criteria Met
		defences or increase the risk of flooding to other existing development.	
A1.14	Developer is required to demonstrate that the development is designed to be flood-free for the lifetime of the development for a 1 in 100 (1% AEP) chance (fluvial) and 1 in 200 (0.5% AEP) chance (tidal) flood event, including an allowance for climate change.	The FFL of the lower storey of the Mill Building will be raised to a level of at least 9.35 m AOD, equivalent to the 1 in 200 year climate change tidal flood level. The upper storey (offices) where personnel will be stationed will be above the 1 in 1,000 year plus climate change flood level. This level of mitigation covers the 75 year development lifetime as required in accordance with the latest climate change guidance for industrial development (Welsh Government, 2021). The Clinker Storage Building and Stockroom Building will have very intermittent use and can accept inundation without impacting on the Site or elsewhere.	✓
A1.15	In respect of the residual risk to Industrial development it should be designed so that in an extreme (1 in 1,000 year) [0.1% AEP] event there would be less than 1,000 mm of water on the access roads and within the property and the velocity of any water flowing across the development would be less than 0.45 m/s. The maximum rate of rise of floodwaters should be no more than 0.3 m/hr and the speed of floodwater inundation of 2 hours. ***TAN15 note: The above figures are indicative and reflect conditions in which, given the presence of adequate warnings and preparation, appropriately equipped personnel could undertake emergency activities. However, they are not definitive. Each site must therefore be considered individually and a judgement taken in the context of the particular circumstances which could prevail at that site.***	The average depth of flooding within the Site (property) during the 1 in 1,000 year climate change tidal event will be 1 m or less (see Appendix D). Limited areas at risk of a greater depth, such as in the east of the Site will contain silos raised on steel supports above the 1 in 1,000 year climate change tidal flood level and therefore will not be impacted. The depth of flooding at and around the Mill Building will be a maximum of 0.4 m because the ground level will be raised to achieve a FFL above the 1 in 200 year climate change flood level (see Section 6.2.1). The depth of flooding on access roads will be 1 m or less (see Appendix D) during a 1 in 1,000 year climate change event. Floodwater velocities during the 1 in 1,000 year climate change event are predominately less than 0.4 m/s within the Site boundary (see Appendix E). Small pockets of flood velocities equal to or greater than 0.45 m/s) are predicted in the far eastern edge of the Site and along the existing rail siding, away from buildings and raised structures such as silos. The maximum rate of rise of floodwaters and speed of inundation are acceptable and provide adequate time to evacuate personnel from the Site (see Section 6.4 for details). The residual risk to the Proposed	✓

Acceptability Criteria	Description	Justification	Criteria Met
		Development is therefore considered acceptable.	

9 CONCLUSIONS

The following points can be concluded from this FCA:

- Envireau Water was commissioned to prepare a Flood Consequences Assessment (FCA) to support a planning application for the construction and operation of an industrial plant for the manufacture of cement substitute from recycled waste products on land at South Dock in Newport Docks.
- The Proposed Development (buildings and infrastructure) lie in Zone C2 of the Development Advice Map (DAM) which supplements Planning Policy Wales and Technical Advice Note (TAN) 15: Development and Flood Risk (2004).
- The Proposed Development is classified as 'Less Vulnerable Development' in line with Section 5.2 of TAN15 and is an acceptable development type in Zone C2.
- The Proposed Development is predicted to be at High risk of tidal flooding in the future due to predicted sea level rise. To mitigate the risk of flooding for its anticipated lifetime (75 years), the Finished Floor Level of the Mill Building (where personnel will be based) will be raised to least the 1 in 200 year plus climate change tidal flood level of 9.35 m AOD.
- A site-specific Flood Evacuation Plan will be drawn up for the Proposed Development and will be integrated into the existing ABP Newport Docks Flood Evacuation Plan. This will ensure awareness of flood risk and appropriate actions are taken in the event of a flood warning being issued to ensure safety of personnel on-site. All personnel working on the Site will be trained in the evacuation plan.
- Evacuation from the Site will be via East Way Road and out of the docks to the north. This is appropriate as the expected tidal rate of rise of 4.5 hours would provide adequate time to evacuate personnel from the Site in the event of an extreme flood event. However, in the unlikely event of an unsuccessful evacuation, the upper storey of the Mill Building (offices) would provide a safe refuge area as the floor level is above the 1 in 1,000 year plus climate change tidal flood level.
- All other areas of the development will remain at risk of flooding during an extreme event but residual flood depths and velocities are acceptable in line with the acceptability of consequences criteria set out in TAN15.
- The Proposed Development is at Very Low risk of flooding from fluvial sources and all other potential sources including groundwater, surface water, sewers and artificial waterbodies.

This FCA has demonstrated that all aspects of the Justification Test and Acceptability of Flood Consequences criteria set out in TAN15 have been satisfied.

Consequently, we conclude that on the grounds of flood risk, the Proposed Development meets the requirement set out in TAN15 and the aims of Planning Policy Wales and the risks of flooding to the development are mitigated to an acceptable level for its lifetime.

REFERENCES

Associated British Ports. (2018). *£2.7 MILLION LOCK GATE PROJECT SECURES FUTURE OF NEWPORT DOCKS*. Retrieved from Abports: https://www.abports.co.uk/news-and-media/latest-news/2018/2-7-million-lock-gate-project-secures-future-of-newport-docks/

British Geological Survey. (2024). *GeoIndex (Onshore)*. Retrieved from https://www.bgs.ac.uk/map-viewers/geoindex-onshore/

Cranfield Soil and Agrifood Institute. (2024). *Soilscapes*. Retrieved from http://www.landis.org.uk/soilscapes/

JBA Consulting. (2016). *Caldicot and Wentlooge Coastal Modelling - Summary Report.*

JBA Consulting. (2022). *Newport Strategic Flood Consequences Assessment (SFCA) Level 1.*

Natural Resources Wales. (2024a). *Main Rivers*. Retrieved from Natural Resources.Wales: https://naturalresources.wales/flooding/managing-flood-risk/flood-risk-map-guidance/main-rivers/?lang=en

Natural Resources Wales. (2024b). *Flood Map for Planning / Development Advice Map*. Retrieved from Naturalresources.wales: https://naturalresources.wales/flooding/flood-map-for-planning-development-advice-map/?lang=en

Natural Resources Wales. (2024c). *Recorded Flood Extents*. Retrieved from DataMapWales: https://datamap.gov.wales/layers/inspire-nrw:NRW_HISTORIC_FLOODMAP

Natural Resources Wales. (2024d). *The Flood Risk Assessment Wales map*. Retrieved from naturalresources.wales: https://naturalresources.wales/flooding/check-your-flood-risk-on-a-map-flood-risk-assessment-wales-map/?lang=en

Natural Resources Wales. (2024e). *Newport tide gauge*. Retrieved from River levels, rainfall and sea data: https://rivers-and-seas.naturalresources.wales/Station/72839

Natural Resources Wales. (2024f, March 06). *Flood Warning Areas*. Retrieved from https://datamap.gov.wales/layers/inspire-nrw:NRW_FLOOD_WARNING

Newport City Council. (2015). *Newport Local Development Plan 2011 - 2026.* Newport City Council.

Welsh Government. (2004). *Technical Advice Note 15: Development and Flood Risk.*

Welsh Government. (2021). *Flood Consequences Assessments: Climate change allowances.*

Welsh Government. (2024). *Planning Policy Wales - Edition 12.*

APPENDICES

Appendix A Topographical Survey

Scale 1:200

2 0 2 4 6 8 10 20

Distances in metres

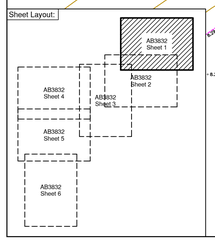
N

National Grid

3319500E 3320000E 3320500E 3321000E

184550N 184500N 184450N

Sheet Layout:



Abbreviations:

BrWall	brick retaining wall
BS	bollard (Illuminated)
BU	bollard (Illuminated)
CI	bollard
CB	brick on inspection cover
ConWall	concrete retaining wall
CSTV	cable television cover
CVR	cable valve cover
Cr	corrugated metal
CPCov	concrete post & barbed wire
CPCVL	concrete post & chain link
CPCVR	concrete post & panel
CPWire	concrete post & wire
CPVL	concrete posting plate
DO	down pipe shoulder
DP	down pipe
EP	electricity pole
EPO	electricity pole/telephone
FA	earthing rod
FB	flower bed
FFL	finished floor level
FP	flagpost
GPO	gallon well
GV	gas valve
GO	gas valve
HO	handrail
IC	inspection cover
IP	inspection pipe
IW	interception well
IWC	interception wood slat
KO	kerb outlet
KS	kerb system
LP	lamp post
MH	manhole
MR	marker
MP	metal mesh
NB	name board
NB	name board
NS	name stone
OB	open boarded
OPO	overhead cable/wire
PA	parking area
PO	post
RE	rodding eye
RP	road post
SG	sand trap
SP	signal post
SPG	stone pitching slabs
SPW	stone pitching wall
TC	traffic control
TL	traffic light
TP	traffic post
TR	traffic rail
VP	vent pipe
WC	water course
WCV	water course valve
WPCW	wood post & barbed wire
WPCWL	wood post & net
WPCWR	wood post & wire

H	height (of feature)
	arrow indicates up slope (unless otherwise stated)
A3002	survey control point

Drainage features:

CI	cover level
IL	invert level
IL	invert level
FWC	four winter cover
FWL	four winter level
CWL	combined water level
SWL	soakaway (no cover)
UNK	unable to identify
TBM	temporary benchmark (new)
~~	stream
~~	arrow indicates direction of flow

THE SURVEY ASSOCIATION

AZIMUTH GEO DATA-AZIMUTH LAND SURVEYS

Ordnance Survey Licensed Partner

Ordnance Survey

Survey Plan Plus+ Aerial Imagery Data Plus+ Aerial Images Historical Mapping Land Ranger Historical Mapping Land Ranger Historical Mapping Data Plus+

www.azimuthgeodata.co.uk

Notes:

Revisions:

AZIMUTH LAND SURVEYS LIMITED
28 CARDIFF ROAD NEWPORT S.WALES NP20 2ED UK
e-mail: enquiries@azimuthgroup.co.uk Web: www.azimuthlandsurveys.co.uk
Tel: 01633 262675 Fax: 01633 213767

- ❑ Topographical Surveys
- ❑ Engineering Surveys
- ❑ Measured Building Surveys
- ❑ Boundary Surveys
- ❑ OS Mapping and Data Centre
- ❑ Underground Utility Surveys

Coal terminal, Newport docks
Newport

Topographical Survey - Sheet 1 of 6

Client	ABP				
Coord Grid	Plane Grid based on National Grid		Level Datum	Level Datum via Active GPS Network	
Scale	1:200@A0	Date	Oct 2020	Status	Final	Job No.	AB3832
Surveyed	A. Jolliffe	Drawn	L. Rajnohova	Checked	R. Williams	Dwg. No.	AB3832-02

Scale 1:200

2 0 2 4 6 8 10 20

Distances in metres

National Grid

335000E

335100E

335200E

184450N

184400N

184350N

Sheet Layout:

AB3832 Sheet 1
AB3832 Sheet 2
AB3832 Sheet 3
AB3832 Sheet 4
AB3832 Sheet 5
AB3832 Sheet 6

Abbreviations:

B/WALL	brick retaining wall	FFL	finished floor level	RE	reading eye
BB	barbed boundary	G	gulley	RG	road gully
BH	borehole (geotechnical)	G/R	gulley and grating	RP	reflector post
BL	bollard	GP	gate post	RS	rail sleeper
CH	chamber inspection cover	HR	hand rail	RSJ	rolled steel joist
Cm	kerb and concrete	I	inspection cover (general)	RWP	rain water pipe
C/Wall	concrete retaining wall	IR	invert ratings	S/WALL	stone retaining wall
CL/BD	close boarded fence	J	junction box	SBP	sentry
CL	close boarded	JB	junction box	SD	stop end
CM	corrugated metal	KO	kerb outlet	SP	earth spot
CP	concrete post	LP	lamp post	SPR	sprinkler
CP/CW	concrete post & barbed wire	M	manhole	SV	stop valve
CP/M	concrete post & mesh	MH	manhole	TBL	turnbuckle bolt
CP/SW	concrete post & spiral	MK	metal mark	TEL	threaded rod
CP/W	concrete post & wire mesh	NB	new benchmark	TP	telephone pole
CP/WW	concrete post & wire	NB	note board	TR	cable tie
DC	drainage channel	OH	overhead	TW	tree wrap
DI	drain inlet	OHL	overhead cable/wire	WB	water board
EL	electricity pole	P/C	post & chain fence	WP/BW	wood post & barbed wire
EP	electricity pole	P/R	post & rail	WP/M	wood post & mesh
FB	flower bed	PO	post	WP/W	wood post & wire

H	height (of feature)
‡	arrow indicates up
‡	unless otherwise stated
A3032	survey control point

Ordnage features:

CL	cover level
IL	invert level
FWO	foul water open
FWM	foul water manhole
CBO	combined water sewer
UCO	unable to determine
UM	unknown manhole
ø	pipe diameter (mm)
↓	public sewer
→	arrow indicates direction of flow

THE SURVEY ASSOCIATION

AZIMUTH GEO DATA-AZIMUTH LAND SURVEYS

Ordnance Survey Licensed Partner

www.azimuthgeodata.co.uk

Notes:

Revisions:

AZIMUTH LAND SURVEYS LIMITED
28 CARDIFF ROAD NEWPORT S.WALES NP20 2ED UK
e-mail: enquiries@azimuthgroup.co.uk Web: www.azimuthlandsurveys.co.uk
Tel: 01633 263575 Fax: 01633 213767

❑ Topographical Surveys ❑ Boundary Surveys
❑ Engineering Surveys ❑ OS Mapping and Data Centre
❑ Measured Building Surveys ❑ Underground Utility Surveys

Coal terminal, Newport docks
Newport

Topographical Survey - Sheet 2 of 6

Client	ABP						
Coord Grid	Plane Grid based on National Grid			Level Datum	Level Datum via Active GPS Network		
Scale	1:200@A0	Date	Oct 2020	Status	Final	Job No.	AB3832
Surveyed	A. Jolliffe	Drawn	L. Rajnohova	Checked	R. Williams	Dwg. No.	AB3832-02

Scale 1:200

2 0 2 4 6 8 10 20

Distances in metres

331800E 331850E 331900E 331950E

184400N 184350N 184300N 184250N

National Grid

Sheet Layout:

AB3832 Sheet 1
AB3832 Sheet 2
AB3832 Sheet 3
AB3832 Sheet 4
AB3832 Sheet 5
AB3832 Sheet 6

THE SURVEY ASSOCIATION

AZIMUTH GEO DATA-AZIMUTH LAND SURVEYS

Ordnance Survey © Ordnance Survey Licensed Partner

Planning Maps - Vector Mapping - Raster Mapping
Aerial Imagery - Historical Mapping
Environmental Data - Land Registry Title Plans

www.azimuthgeodata.co.uk

Abbreviations:

B/RW	brick retaining wall
BB	Bellaba beacon
BL	bollard (illuminated)
BS	bus stop
BT	telecom inspection cover
BW	brick wall
C/RW	concrete retaining wall
CATV	cable television cover
CB	close boarded
CM	corrugated metal
CONC.	concrete
CP/BW	concrete post & barbed wire
CP/CL	concrete post & chain link
CP/CP	concrete post & panel
CP/W	concrete post & wire mesh
CPS	concrete paving slabs
DC	drainage channel
DW	double kerb
DR	drain
EP	electricity pole
ER	earthing rod
FB	flower bed
FFL	finished floor level
FS	flagstaff
G/W	gabion wall
GP	gate post
GV	gas valve
HH	hand hole
HY	fire hydrant
IC	inspection cover (general)
IR	metal railings
Ien	interwoven wood slat
JB	junction box
KO	kerb outlet
LP	lamp post
MH	manhole
MK	marker
MM	metal mesh
MP	mile post
NB	name board
O/H	overhead
OB	open boarded
OHC	overhead cable/wire
P/C	post & chain fence
PA	paling
PO	post
RE	rodding eye
RG	road gully
RP	reflector post
RS	road sign
RSJ	rolled steel joist
RWP	rain water pipe
S/RW	stone retaining wall
Sap.	sapling
SIG	signal
SPS	stone paving slabs
stay	stay wire
STN	survey control station
SV	water stop valve
SVP	soil vent pipe
tact.	tactile paving
TBL	traffic light head
TC	traffic-light post
TP	telephone pole
TV	cable tv
VP	vent pipe
Wsp	wood lop
WM	water meter
WP/BW	wood post & barbed wire
WP/N	wood post & rail
WP/W	wood post & wire
ht	height (of feature)
	arrow indicates up (unless otherwise stated)
▲9002	survey control point

Drainage features:

CL	cover level
ID	invert depth
IL	invert level
FWS	foul water sewer
SWS	storm water sewer
CWS	combined water sewer
UTD	unable to determine
UNK	unknown
Ø	pipe diameter (mm)
SL	soffit level
<0.00>	arrow indicates direction of flow

Notes:

Revisions:

ALS

- ❑ Topographical Surveys
- ❑ Engineering Surveys
- ❑ Measured Building Surveys
- ❑ Boundary Surveys
- ❑ OS Mapping and Data Centre
- ❑ Underground Utility Surveys

AZIMUTH LAND SURVEYS LIMITED
28 CARDIFF ROAD NEWPORT S.WALES NP20 2ED UK
e-mail: enquiries@azimuthgroup.co.uk Web: www.azimuthlandsurveys.co.uk
Tel: 01633 263575 Fax: 01633 213767

Coal terminal, Newport docks
Newport

Topographical Survey - Sheet 3 of 6

Client	ABP						
Coord Grid	Plane Grid based on National Grid			Level Datum	Level Datum via Active GPS Network		
Scale	1:200@A0	Date	Oct 2020	Status	Final	Job No.	AB3832
Surveyed	A. Jolliffe	Drawn	L. Rajnohova	Checked	R. Williams	Dwg. No.	AB3832-02

Scale 1:200

2 0 2 4 6 8 10 20

Distances in metres

National Grid

N

533650E 533700E 533750E 533800E

184400N 184350N 184300N

Sheet Layout:

AB3832 Sheet 1 | AB3832 Sheet 2 | AB3832 Sheet 3 | AB3832 Sheet 4 | AB3832 Sheet 5 | AB3832 Sheet 6

Abbreviations:

BWall	brick retaining wall	FFL	finished floor level	RE	rodding eye
BS	battery beacon	EP	footpath	RSJ	rolled steel joist
BH	bollard (illuminated)	GP	gate post	SP	soil pipe
BL	bollard	GV	gas valve	SWall	stone retaining wall
CI	telecom inspection cover	HT	high tension	Spg	sapling
CP	concrete post	HTC	fire hydrant cover (general)	SL	sign post
CRW	concrete retaining wall	IR	metal railings	SP	single post
CS	concrete surface cover	IM	inspection cover slot	SVA	stone valve
CB	crane boundary	JB	junction box	TSO	telecom service station
CM	corrugated metal	KO	kerb outlet	UV	water stop valve
CH	cut hedge	LP	lamp post	WV	water valve
CPJW	concrete post & barbed wire	MH	manhole	WTank	water tank
CPCL	concrete post & chain link	MK	marker	WTrough	water trough
CPPW	concrete post & panel	MP	mile post	WP	wood post
CPVW	concrete post & wire mesh	MS	mile stone	WPW	wood post & barbed wire
CPWR	concrete post & wooden rails	NP	notice post	WPC	wood post & chain link
DC	drainage channel	OH	overhead	WPR	wood post & rails
DI	drain inlet	OHC	overhead cable	WPVW	wood post & vertical wire
DP	drain pipe	PC	overhead cable/wire	WPCW	wood post & wire
EP	electricity pole	PJC	post & chain fence	WPVW	wood post & wire
FB	flower bed	PO	post	WPW	wood post & wires
FO	flower box	PT	point		

H	height (of feature)
↕	arrow indicates up (unless otherwise stated)
A.002	survey control point

Drainage features

CL	cover level
IL	invert level
Type	trap, inspection
150	foul water sewer
300	storm water sewer
UNK	unable to determine
225	dimension (mm)
1.1	size diameter (mm)
BL	depth level
→	indicates direction of flow

Notes:

Revisions:

THE SURVEY ASSOCIATION

AZIMUTH GEO DATA-AZIMUTH LAND SURVEYS

Ordnance Survey Licensed Partner

Ordnance Survey

Mining Maps - Mono Mapping - Raster Mapping

Environmental Data - Land Registry Title Plans

www.azimuthgeodata.co.uk

Topographical Surveys
Engineering Surveys
Measured Building Surveys
Boundary Surveys
OS Mapping and Data Centre
Underground Utility Surveys

ALS

AZIMUTH LAND SURVEYS LIMITED

28 CARDIFF ROAD NEWPORT S.WALES NP20 2ED UK

e-mail: enquiries@azimuthgroup.co.uk Web: www.azimuthlandsurveys.co.uk

Tel: 01633 263575 Fax: 01633 213767

Coal terminal, Newport docks
Newport

Topographical Survey - Sheet 4 of 6

Client	ABP				
Coord Grid	Plane Grid based on National Grid		Level Datum	Level Datum via Active GPS Network	
Scale	1:200@A0	Date	Oct 2020	Status	Final	Job No.	AB3832
Surveyed	A. Jolliffe	Drawn	L. Raynshaw	Checked	R. Williams	Dwg. No.	AB3832-02

Scale 1:200

2 0 2 4 6 8 10 20

Distances in metres

N

National Grid

537400E 537500E 537600E 537700E 537800E

184250N 184200N 184150N

Sheet Layout:

AB3832 Sheet 1
AB3832 Sheet 2
AB3832 Sheet 3
AB3832 Sheet 4
AB3832 Sheet 5 (This Sheet)
AB3832 Sheet 6

Abbreviations:

BrWall	brick retaining wall	FFL	finished floor level
BS	bollard (illuminated)	FG	flagpoint
BT	bollard (illuminated)	GW	gabion wall
BT	telecom inspection cover	GV	gas valve
CB	concrete retaining wall	HY	fire hydrant
CBTV	cable television cover	HP	high pressure (general)
CC	concrete	HV	high voltage
CCTV	concrete	IC	interwoven wood slat
CH	concrete	KO	kerb outlet
CM	corrugated metal	KS	kerb sunken
ConWall	concrete	LP	lamp post
CP/CG	concrete post & barbed wire	LP	lighting
CP/CL	concrete post & chain link	MH	manhole
CP/CP	concrete post & close mesh	MP	metal mesh
CP/W	concrete post & wire	NB	name board
CR	concrete railing slats	OG	open grate
CS	concrete	OB	open bollard
DS	drop kerb	PP/BW	post & barbed wire
EB	electricity pole	PP/CL	post & chain fence
EP	existing rail	PP/R	paling
EB	flower bed	PO	post

RE	retaining eye	SP	spot level
RG	road gully	SL	street light
RS	road sign	TP	telegraph pole
SL	sodium light	TW	traffic light
SW	soil vent pipe	TS	traffic signal box
SW	soil waste pipe	TW	traffic signal pole
SP	spot level	TP	traffic signal post
STL	stone pitching slabs	TL	traffic signal tube
STW	stone retaining wall	TW	traffic signal wall
SW	surface water gully	TR	traffic signal wall (rear)
TW	tank wall	TL	traffic signal wall (side)
TL	telegraph pole	TS	transformer box
TW	telegraph wire	TB	tree base
TB	traffic light	TW	tree stump
TS	traffic signal box	TW	tree with single stem
TW	traffic signal pole	TW	trees
TP	traffic signal post	TW	wall
TL	traffic signal tube	WV	water valve
TW	traffic signal wall	WM	water meter
TR	traffic signal wall (rear)	WP/BW	wood post & barbed wire
TL	traffic signal wall (side)	WP/CL	wood post & chain link
TS	transformer box	WP/R	wood post & rail
TB	tree base	WP/W	wood post & wire

N height (of feature)
arrow indicates up (unless otherwise stated)
A9002 survey control point

Drainage features:

CI	cover level
IL	invert level
S	invert level
FW/CW	foul water sewer
SW/CW	surface water sewer
CW/CW	combined water sewer
UNK	unknown sewer
UNK	unable to lift
SW	surface water (main)
SW	soffit level
→	arrow indicates direction of flow

Notes:

Revisions:

THE SURVEY ASSOCIATION

AZIMUTH GEO DATA-AZIMUTH LAND SURVEYS

Ordnance Survey Licensed Partner

Training Topic: Land Registry, Mobile Mapping, Ordnance Survey, Environmental Data - Land Registry Title Plans

www.azimuthgeodata.co.uk

AZIMUTH LAND SURVEYS LIMITED

28 CARDIFF ROAD NEWPORT S.WALES NP20 2ED UK

e-mail: enquiries@azimuthgroup.co.uk Web: www.azimuthlandsurveys.co.uk

Tel: 01633 262575 Fax: 01633 213767

- Topographical Surveys
- Engineering Surveys
- Measured Building Surveys
- Boundary Surveys
- OS Mapping and Data Centre
- Underground Utility Surveys

Coal terminal, Newport docks
Newport

Topographical Survey - Sheet 5 of 6

Client	ABP						
Coord Grid	Plane Grid based on National Grid			Level Datum	Level Datum via Active GPS Network		
Scale	1:200@A0	Date	Oct 2020	Status	Final	Job No.	AB3832
Surveyed	A. Jolliffe	Drawn	L. Rajnohova	Checked	R. Williams	Dwg. No.	AB3832-02

Scale 1:200

2 0 2 4 6 8 10 20

Distances in metres

N

National Grid

331650E

331700E

331750E

184150N

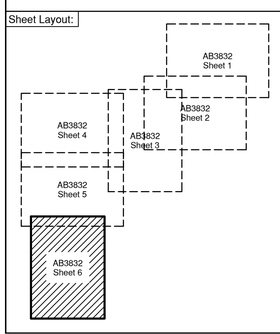
184100N

184050N

184000N

183950N

Sheet Layout:



THE SURVEY ASSOCIATION

AZIMUTH GEO DATA-AZIMUTH LAND SURVEYS

Ordnance Survey Licensed Partner

Planning Maps - Vector Mapping - Raster Mapping
Aerial Imagery - Historical Mapping
Environmental Data - Land Registry Title Plans

www.azimuthgeodata.co.uk

Abbreviations:

B/RW	brick retaining wall	FFL	finished floor level	RE	rodding eye	ht	height (of feature)
BB	Bellaho beacon	FG	flagstaff	RG	road gully		arrow indicates up (unless otherwise stated)
BI	Bellaho (illuminated)	G/W	gabion wall	RP	reflector post		
BL	bollard	GP	gate post	RS	road sign	▲9002	survey control point
BT	telecom inspection cover	GV	gas valve	RSJ	rolled steel joist		
BW	brick wall	HR	handrail	RWP	rain water pipe	Drainage features:	
C/RW	concrete retaining wall	HY	fire hydrant	S/RW	stone retaining wall	CL	cover level
CATV	cable television cover	IC	inspection cover (general)	SP	sign post	ID	invert depth
CB	close boarded	IR	metal railings	SPT	sign post	IL	invert level
CH	chain linked metal			SPS	stone paving slabs	FWS	foul water sewer
conc.	concrete	lm	interwoven wood slot	stay	stay wire	SWS	storm water sewer
CP/BW	concrete post & barbed wire	JB	junction box	STN	survey control station	CWS	combined water sewer
CP/CL	concrete post & chain link	LP	lamp post	SV	water stop valve	UNKS	unknown to determine
CP/CP	concrete post & panel	MH	manhole	SVP	soil vent pipe	UTL	unable to trace
CP/W	concrete post & wire mesh	MK	marker	TBM	temporary bench mark	#	pipe diameter (mm)
CPS	concrete paving slabs	MM	metal mesh	TL	traffic light	SL	soffit level
CU	cable duct channel	MP	mile post	TP	telephone pole	⇒	arrow indicates direction of flow
DK	drop kerb	NB	name board	TV	cable tv		
DR	drain	OB	open boarded	VP	vent pipe		
EP	electricity pole	OH	overhead cable/wire	Wbox	wood box		
ER	earthing rod	P/C	post & chain fence	WC	wood cover		
FB	flower bed	PA	paling	WP/BW	wood post & barbed wire		
		PO	post	WP/R	wood post & rail		
				WP/W	wood post & wire		

Notes:

Revisions:

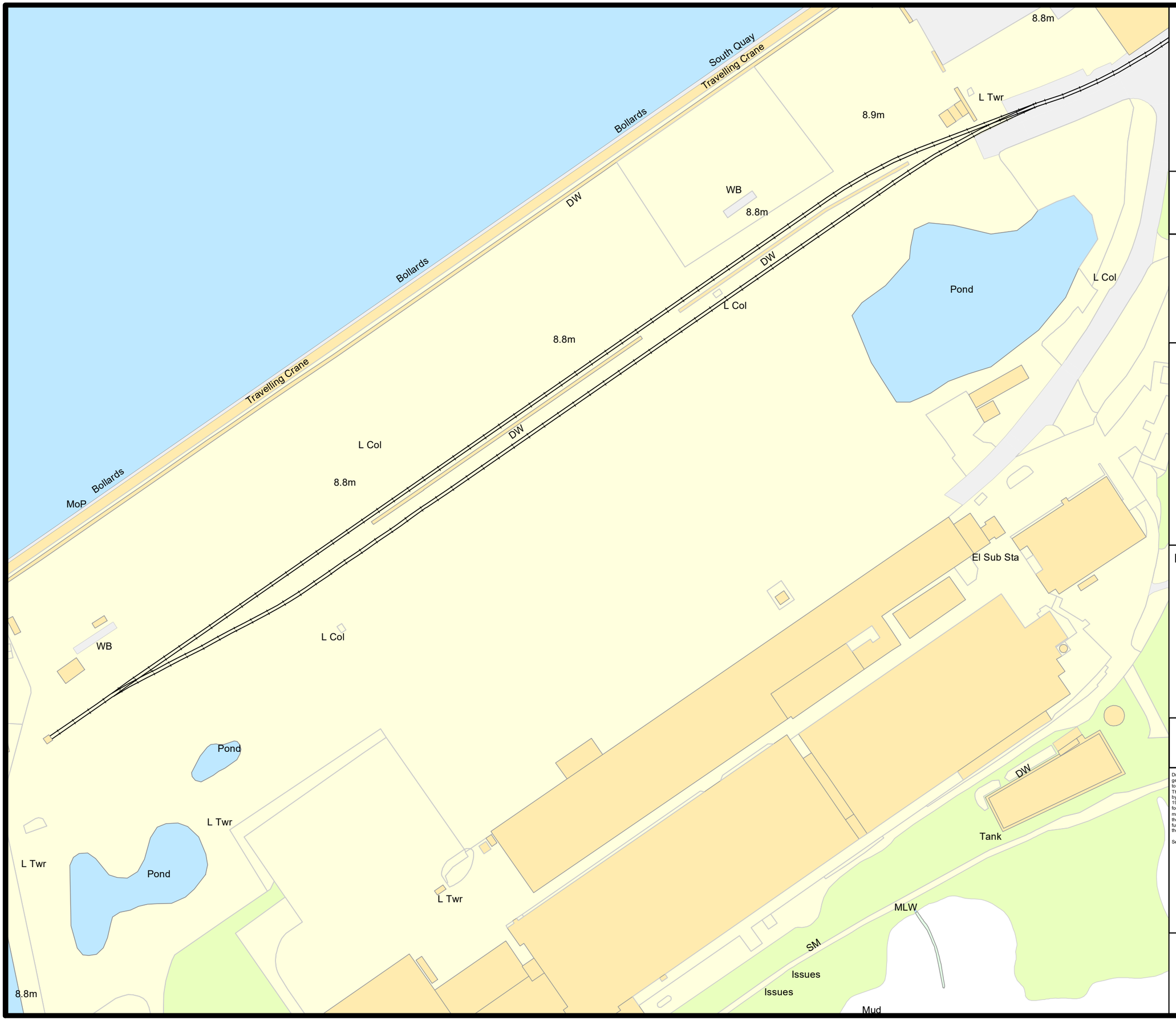
AZIMUTH LAND SURVEYS LIMITED
28 CARDIFF ROAD NEWPORT S.WALES NP20 2ED UK
e-mail: enquiries@azimuthgroup.co.uk Web: www.azimuthlandsurveys.co.uk
Tel: 01633 263575 Fax: 01633 213767

Coal terminal, Newport docks Newport

Topographical Survey - Sheet 6 of 6

Client	ABP						
Coord Grid	Plane Grid based on National Grid		Level Datum	Level Datum via Active GPS Network			
Scale	1:200@A0	Date	Oct 2020	Status	Final	Job No.	AB3832
Surveyed	A. Jolliffe	Drawn	L. Rajnohova	Checked	R. Williams	Dwg. No.	AB3832-02

Appendix B Welsh Water/Dŵr Cymru Sewer Asset Plan



Dŵr Cymru
Welsh Water

Newport Docks, Newport, NP20 2WF

N
W E
S

LEGEND(Representative of most common features)

Waste network:

	Foul chamber		Outfall
	Surface water chamber	LH	Lamphole
	Combined chamber		Storm Overflow
C O	Combined sewer overflow		Rising main
SPC	Special purpose chamber		Gravity sewer
	Treatment works	P	Private sewer
	Pumping station	S 104 P	Private sewer subject to Sect. 104 adoption agreement

NB: Sewer symbol colour indicates the type.

RED - Combined
GREEN - Surface Water
BROWN - Foul
Purple - Former S24 sewers (for indicative purposes only)

T — Private Sewer Transfer
L — Lateral Drain
Inspection Chamber

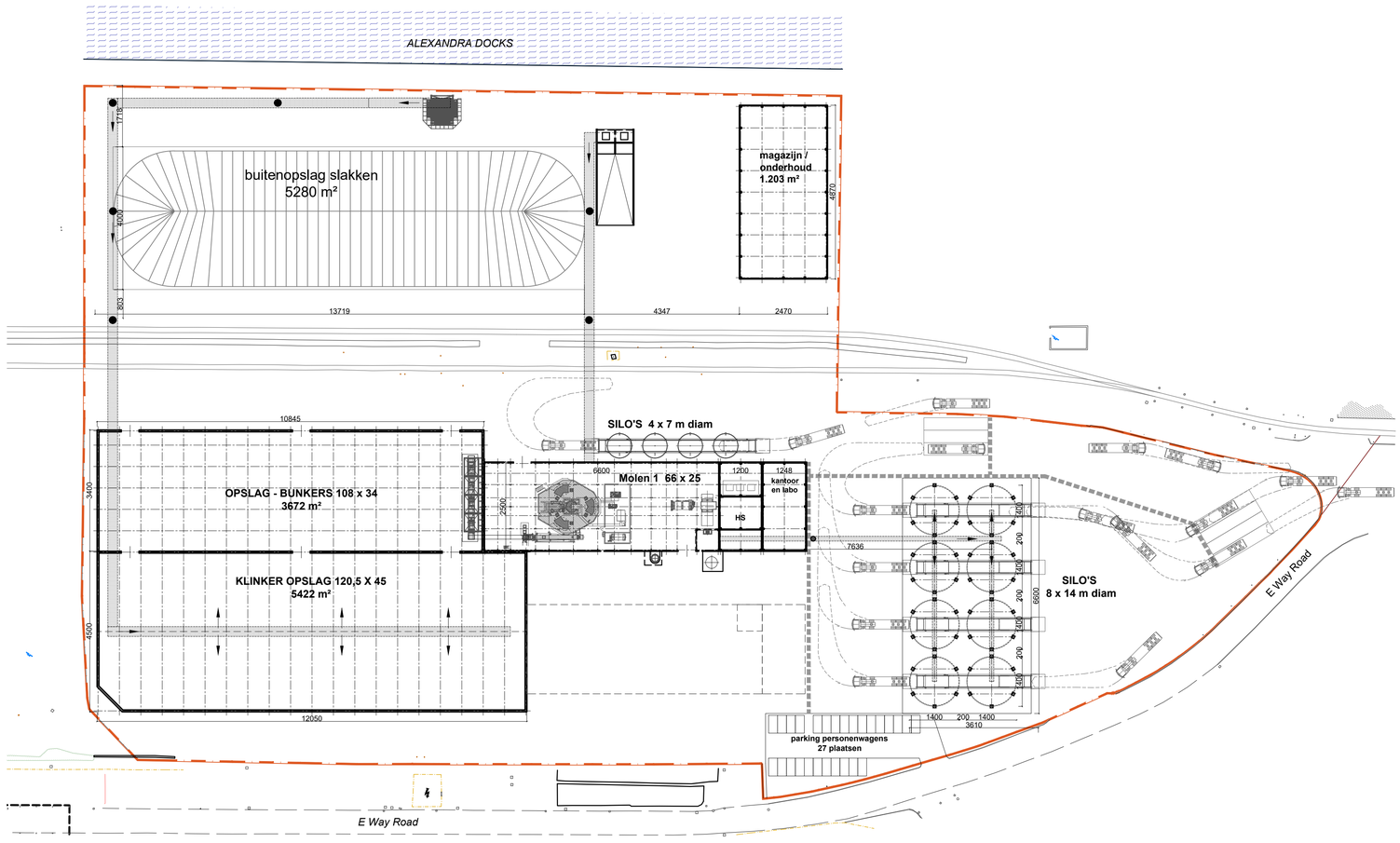
Notes:

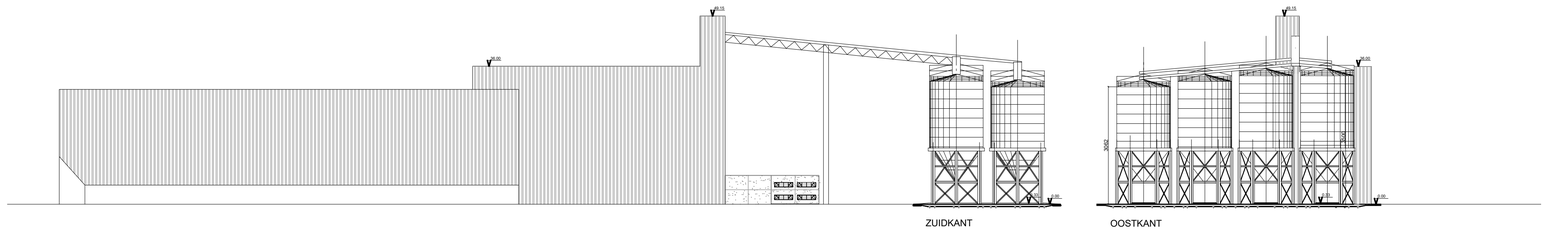
Whilst every reasonable effort has been taken to correctly record the pipe material of DCWW assets, there is a possibility that in some cases pipe material (other than Asbestos Cement or Pitch Fibre) may be found to be asbestos cement (AC) or Pitch Fibre (PF) . It is therefore advisable that the possible presence of AC or PF pipes be anticipated and considered as part of any risk assessment prior to excavation

EXACT LOCATIONS OF ALL APPARATUS TO BE DETERMINED ON SITE.

Map Ref:	331869,184355
Map scale:	1:1500
Printed by:	Tyrieque Golding
Printed on:	30 Apr 2024

Appendix C Proposed Development Plans





ARCADE
engineering matters

Groeningenlei 132 - 2550 Kontich - Belgium
T:03 239 58 75 - F:03 239 35 60
info@arcade-eng.com
www.arcade-eng.com

CEMMINERALS
DEVELOPMENT SOUTHDOCK - NEWPORT

- CONSTRUCTION SITE
Alexandra Docks - New Port - Wales

CLIENT -
Cemminerals N.V.
Christoffel Columbusstraat 37 - 9042 Gent

ARCHITECT -

INDEX	DATE	DRAWN BY	CHANGE
A	03-11-2023	EW	aanpassing
B	22-11-2023	EW	aanpassing
C	01-12-2023	EW	aanpassing
D	16-02-2024	EW	aanpassing
E	26-02-2024	EW	aanpassing
F	07-03-2024	EW	aanpassing

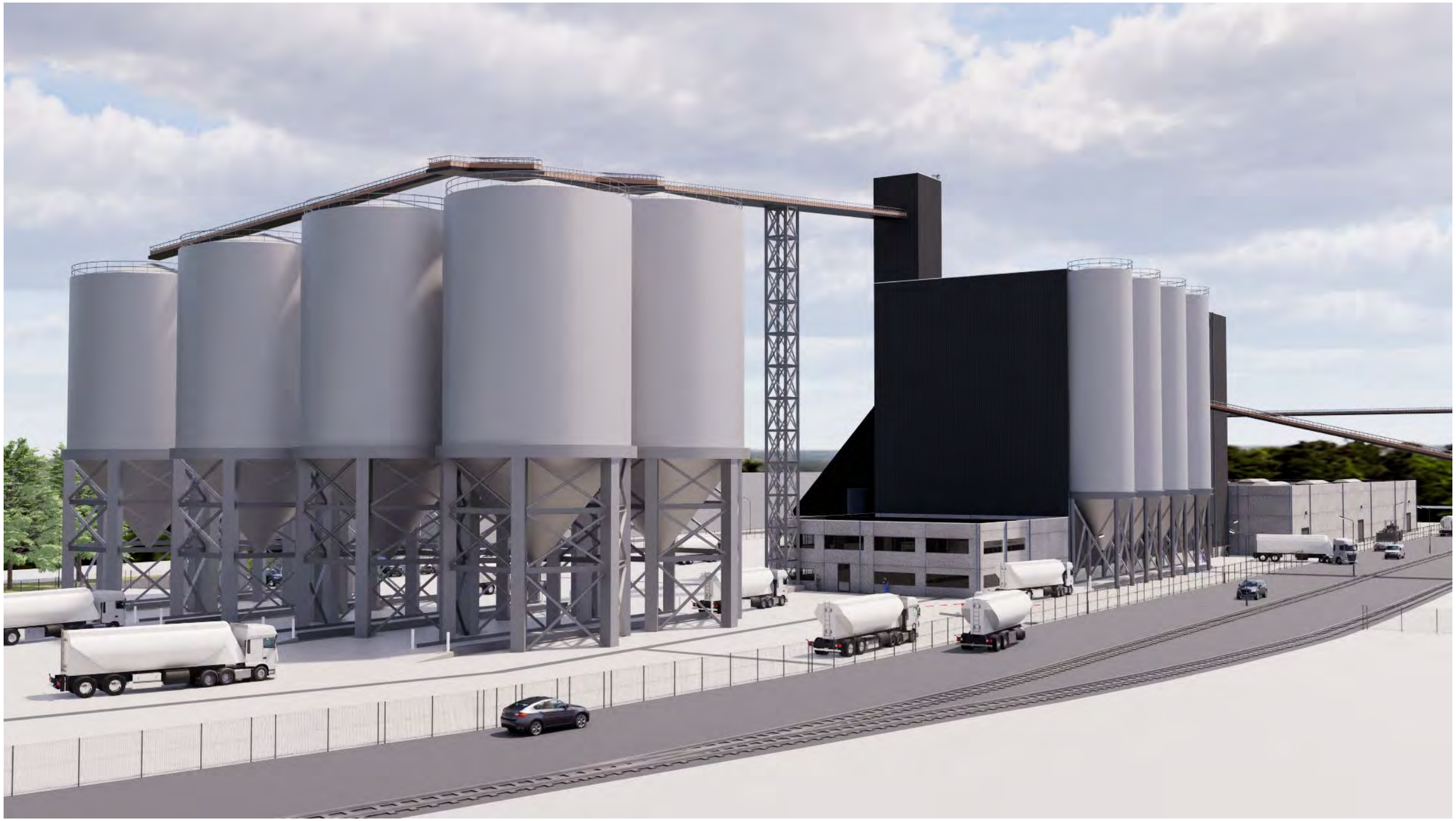
SITE PLAN

DATE		
04-10-2023	Architecture - Preliminary Draft	6023UK - AR - 1001 - F
1/1000		

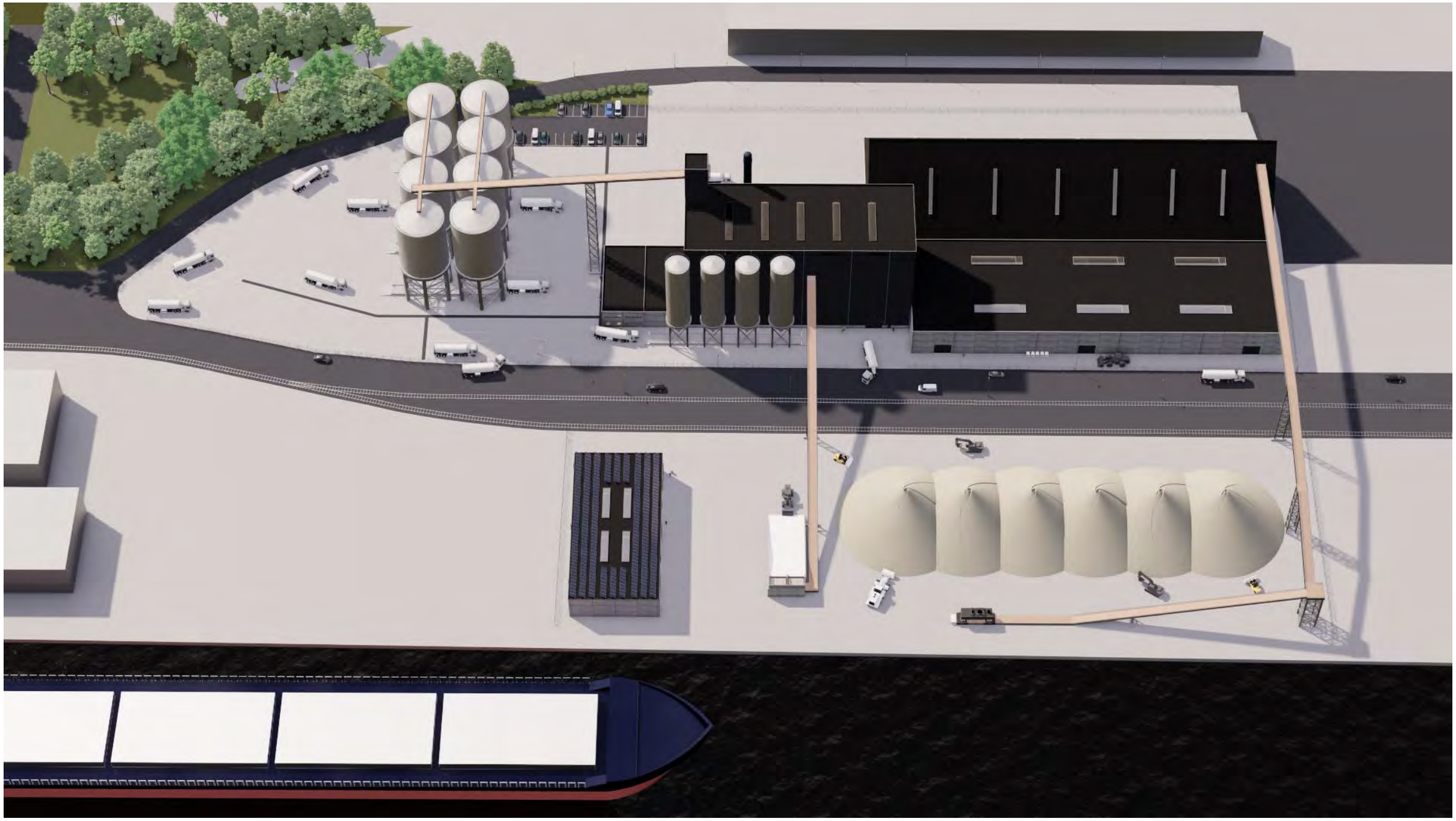
- Visualisatie totaal voorstel

- Visualisatie totaal voorstel

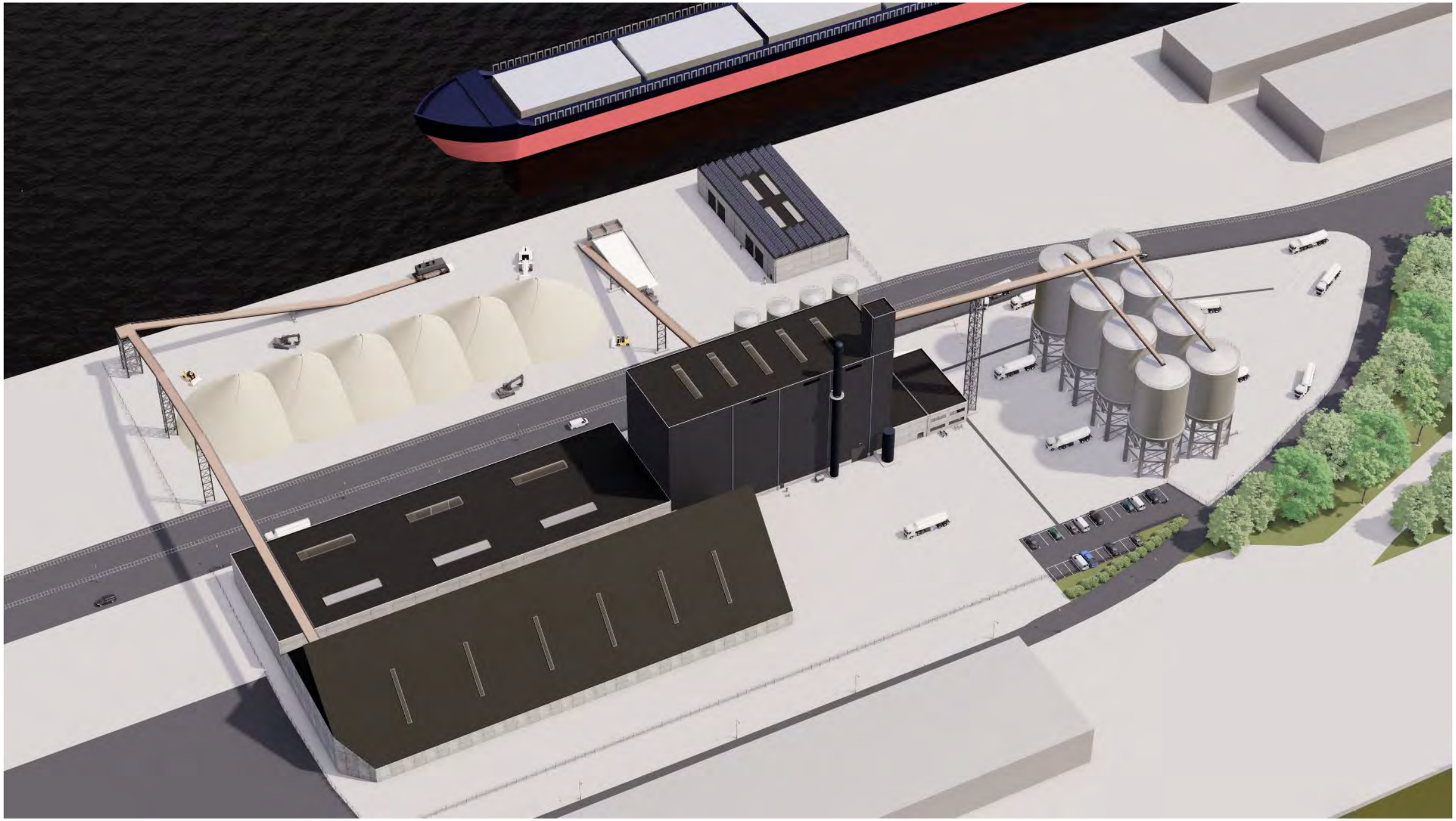
- Visualisatie totaal voorstel



- Visualisatie totaal voorstel



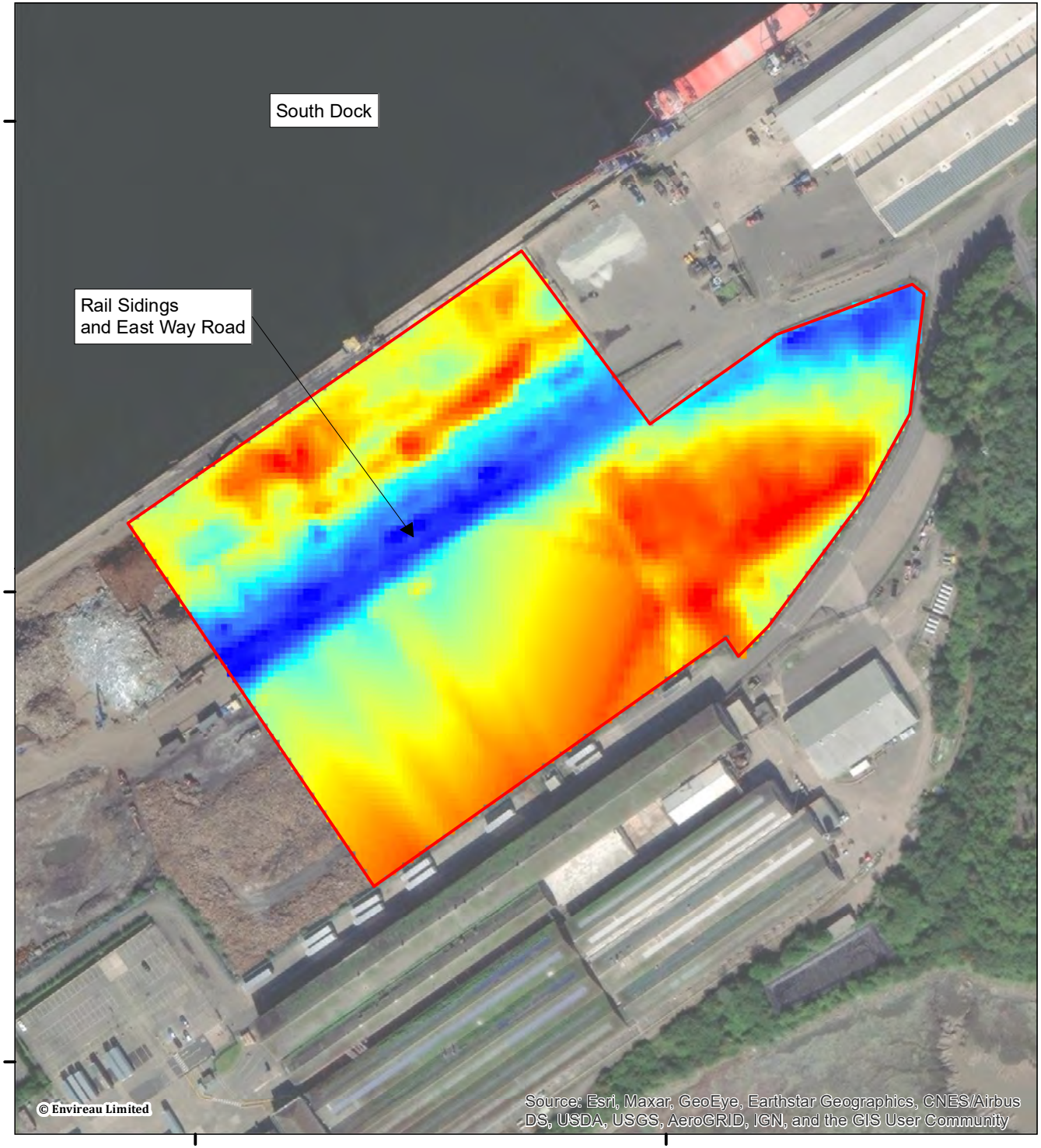
- Visualisatie totaal voorstel



Appendix D Depth Grids for 0.5% AEP (1 in 200) and 0.1% AEP (1 in 1,000) year events – Defended 2100

Appendix D: Depth Grid for 0.5% AEP 2100

Newport Docks, Newport



Application Site Boundary

Flood Depth

Metres (m)

High : 1.11

Low : 0.20

Notes:

0 25 50 75 100 Meters

Scale: 1:2,500 at A4

25 April 2024

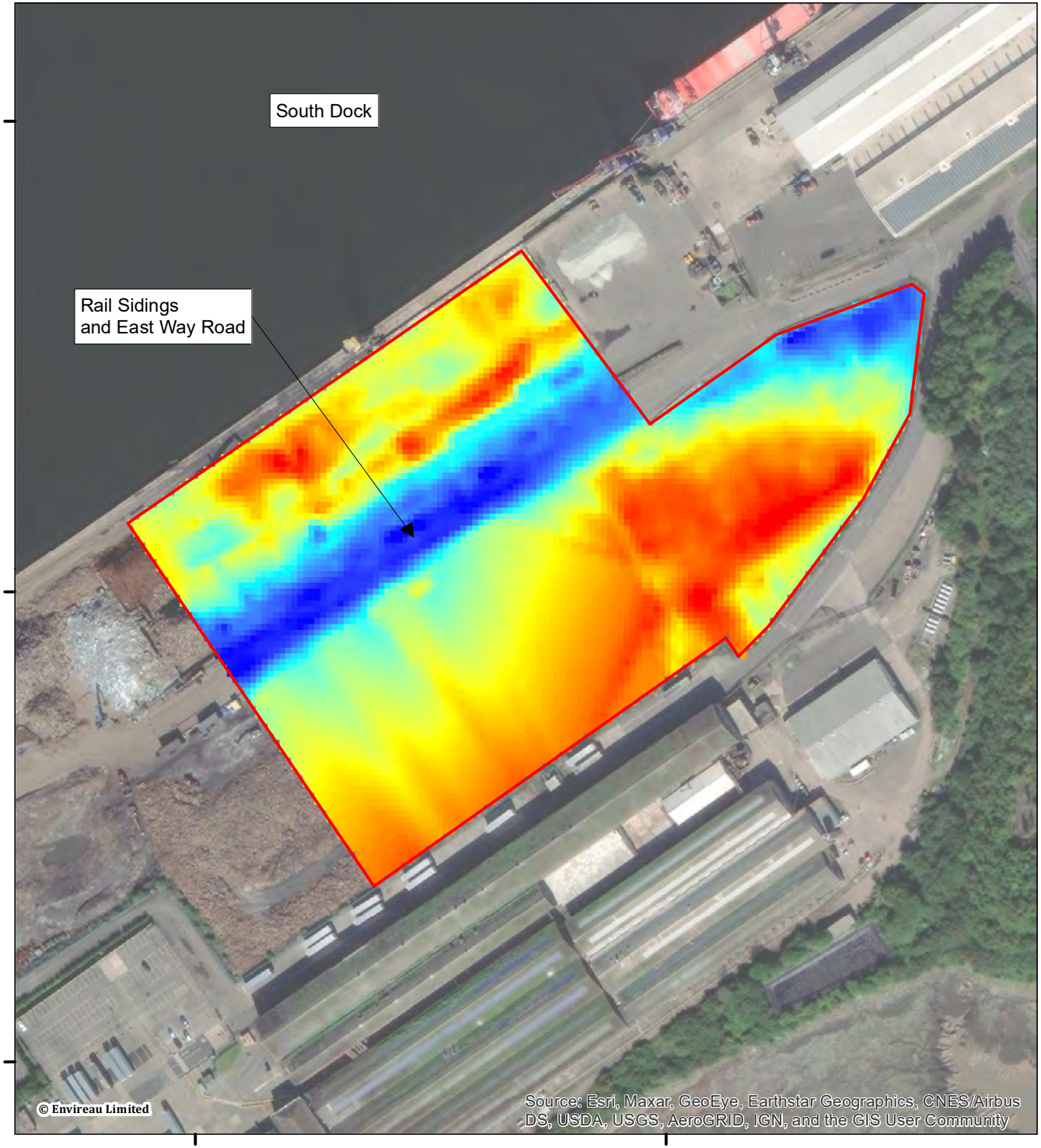
NGR: 331,940 E / 184,410 N

Project No.	3490703
Client:	Cemminerals NV
Drawn by:	MU
Ref:	Depth Grid 200 CC

envireau WATER

Appendix D: Depth Grid for 0.1% AEP 2100

Newport Docks, Newport



Application Site Boundary

Flood Depth

Metres (m)

High : 1.45

Low : 0.55

Notes:

0 25 50 75 100 Meters

Scale: 1:2,500 at A4

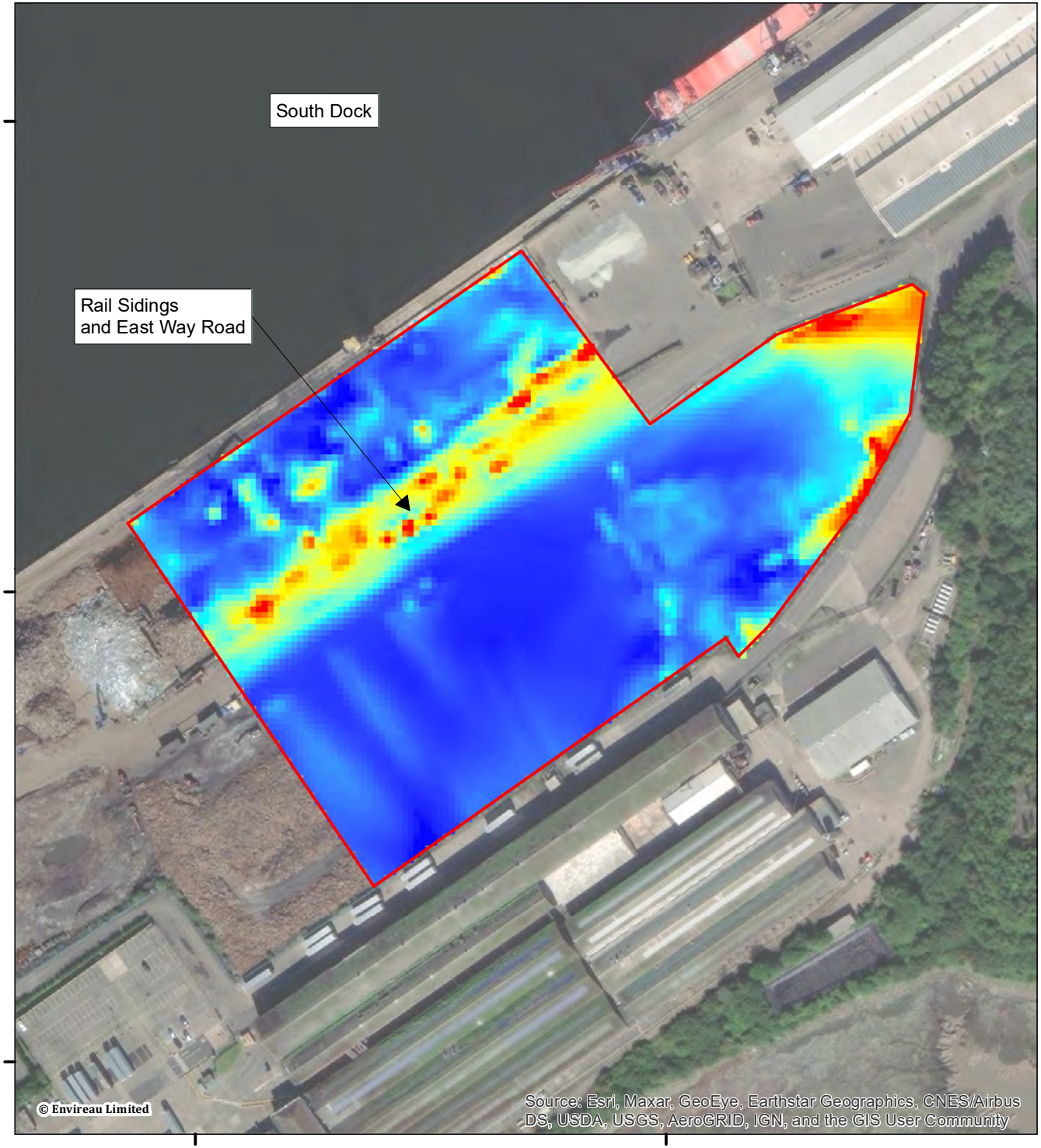
25 April 2024

NGR: 331,940 E / 184,410 N

Project No.	3490703
Client:	Cemminerals NV
Drawn by:	MU
Ref:	Depth Grid 1000 CC

envireau WATER

Appendix E Velocity Grids for 0.5% AEP (1 in 200) and 0.1% AEP (1 in 1,000) year event – Defended 2115



Appendix E: Velocity Grid for 0.5% AEP 2115

Newport Docks, Newport

Application Site Boundary

Floodwater Velocity

Metres per Second (m/s)

High : 1.33

Low : 0.12

Notes:

0 25 50 75 100 Meters

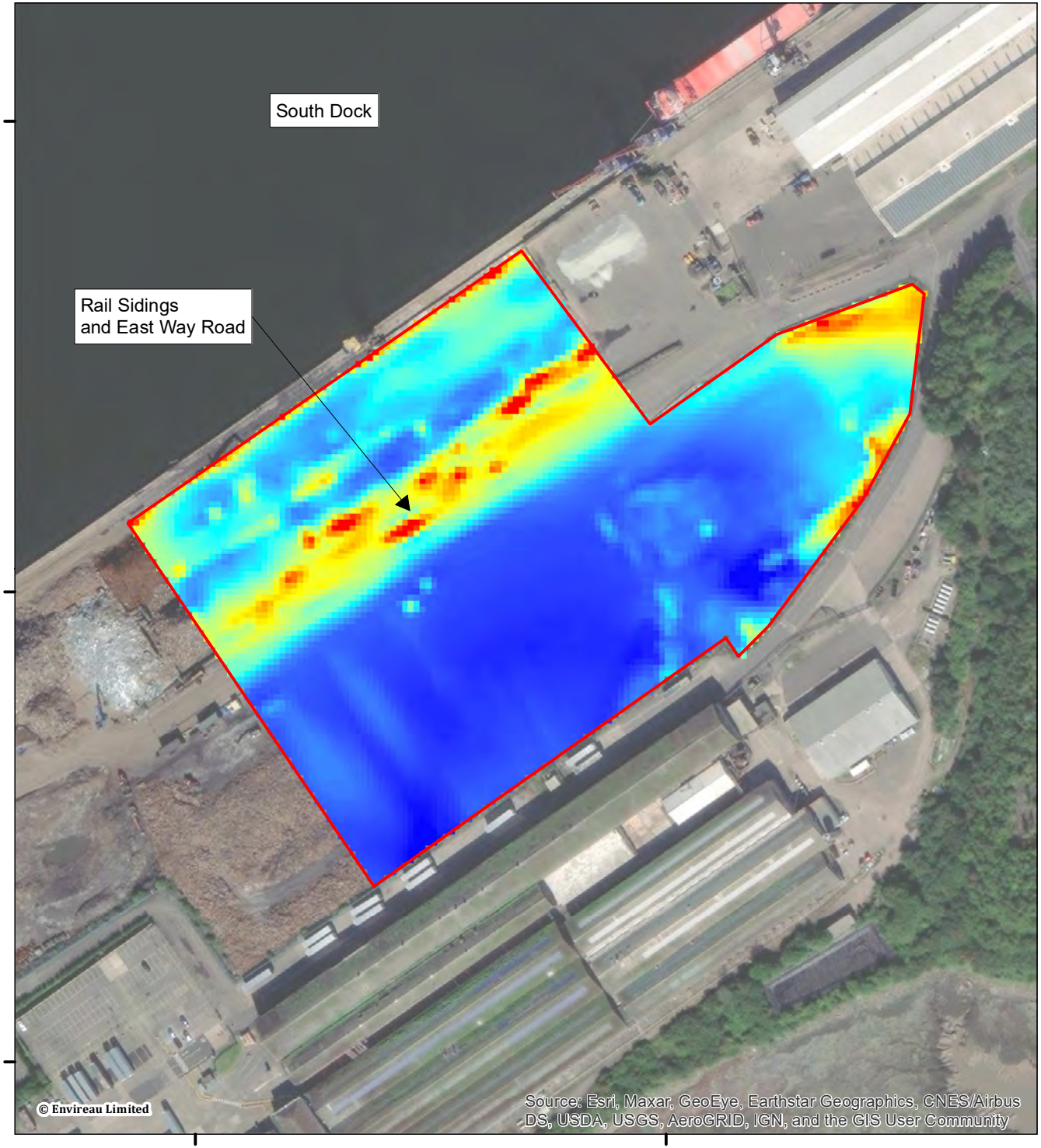
Scale: 1:2,500 at A4

25 April 2024

NGR: 331,940 E / 184,410 N

Project No.	3490703
Client:	Cemminerals NV
Drawn by:	MU
Ref:	Velocity Grid 200 CC

envireau WATER



Appendix E: Velocity Grid for 0.1% AEP 2115

Newport Docks, Newport

Application Site Boundary

Floodwater Velocity

Metres per Second (m/s)

High : 1.75

Low : 0.16

Notes:

0 25 50 75 100 Meters

Scale: 1:2,500 at A4

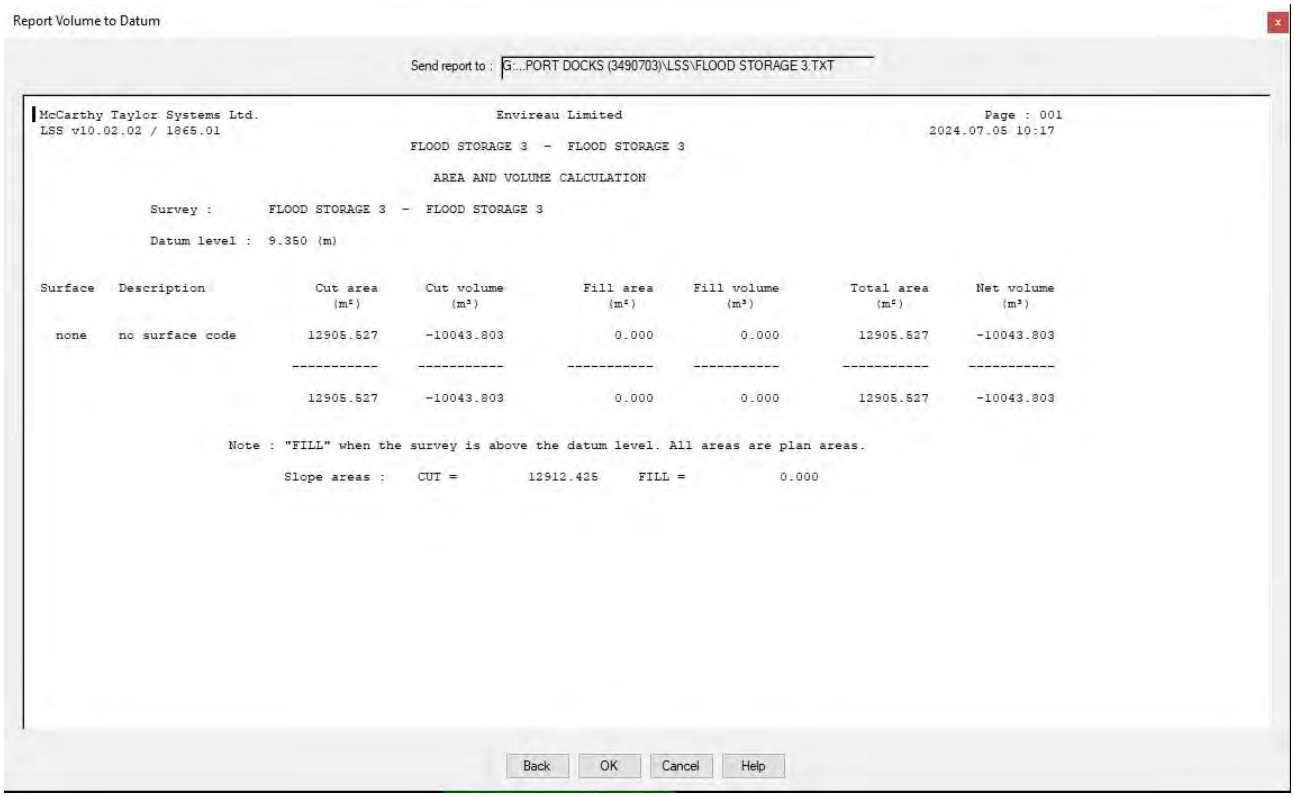
25 April 2024

NGR: 331,940 E / 184,410 N

Project No.	3490703
Client:	Cemminerals NV
Drawn by:	MU
Ref:	Velocity Grid 1000 CC

envireau WATER

Appendix F Tidal Floodwater Storage Loss Estimation



Report Volume to Datum

Send report to : G:...PORT DOCKS (3490703)\LSS\FLOOD STORAGE 3.TXT

McCarthy Taylor Systems Ltd.
LSS v10.02.02 / 1865.01

Envireau Limited

Page : 001
2024.07.05 10:17

FLOOD STORAGE 3 - FLOOD STORAGE 3

AREA AND VOLUME CALCULATION

Survey : FLOOD STORAGE 3 - FLOOD STORAGE 3

Datum level : 9.350 (m)

Surface	Description	Cut area (m^2)	Cut volume (m^3)	Fill area (m^2)	Fill volume (m^3)	Total area (m^2)	Net volume (m^3)
none	no surface code	12905.527	-10043.803	0.000	0.000	12905.527	-10043.803
		12905.527	-10043.803	0.000	0.000	12905.527	-10043.803

Note : "FILL" when the survey is above the datum level. All areas are plan areas.

Slope areas : CUT = 12912.425 FILL = 0.000

Back OK Cancel Help