

12. Noise & Vibration

Introduction

- 12.1 This Chapter reports the outcome of the assessment of likely significant environmental effects arising from the Proposed Scheme in relation to noise and vibration.
- 12.2 The Chapter describes the technical consultation that has been undertaken during the EIA, the scope of the assessment and assessment methodology, and a summary of the baseline information that has informed the assessment.
- 12.3 In line with **Chapter 2: Approach to EIA**, the assessment reports on the likely significant environmental effects, the further mitigation measures required to prevent, reduce or offset any significant adverse effects, or further enhance beneficial effects. The conclusions are provided both in terms of the residual effects and whether these are considered significant. The assessment of effects takes into consideration both primary and tertiary mitigation (see **Chapter 2: Approach to EIA** for further details) and is informed by the EIA Scoping process (**Appendix 2.1**) and iterative scoping process where applicable.
- 12.4 This Chapter, and its associated **Figures 12.1** and **Appendices 12.1 – 12.3**, is intended to be read as part of the wider ES with particular reference to the introductory Chapters of this ES (**Chapters 1 – 5**), as well as **Chapters 7: Terrestrial Ecology**.
- 12.5 In addition, this Chapter should be read in conjunction with **Chapter 14: Assessment of Cumulative Effects**.

Summary of Consultation

- 12.6 **Table 12.1** provides an overview of the consultation that has been undertaken to inform the Proposed Scheme and EIA, including the consideration of likely significant effects and the methodology for assessment.

Table 12.1: Summary of Consultation

Body / Organisation	Contact	Date and Form of Consultation	Summary
NPT/Red Twin	Council acoustician	Hunter Acoustics (HA) Letter, 14 th June 2022 Red Twin (RT) Technical Note, 8 th July 2022 HA letter, 22 nd July 2022	HA note on assessment methodology and receptor locations RT response to methodology. Broadly agreed however additional receptor locations including ‘quiet areas’ identified in the LDP highlighted as well as request for assessment to Mumbles to be scoped, as well baseline survey to be conducted at different times of the year.

Body / Organisation	Contact	Date and Form of Consultation	Summary
			Assessment to Mumbles was addressed through the EIA Scoping Report (Appendix 2.1) and scoped out of further assessment.
NPT/Red Twin/NRW	Council acoustician (RT), NRW, NPT Planning	Teams Meeting, 25 th May 2023	<p>Methodology of assessment and scenarios to be modelled discussed. HA and LanzaTech explained change to enclosed ground flare, demonstrating good acoustic design. Red Twin confirmed they had not received Scoping Report at this stage.</p> <p>Request for feedback on review of scoping report from RT, email from HA on 2nd June 2023</p> <p>Subsequent email from NRW received 7th June 2023 stating no further comments on noise.</p>

Scope of the Assessment

- 12.7 As set out in **Chapter 2: Approach to EIA**, the scoping of the EIA and ES has utilised a combination of informal consultation with NPTCBC, culminating in a formal request for an EIA Scoping Opinion in June 2023, supported by an EIA Scoping Report (**Appendix 2.1**). At the point of submission of PAC, an EIA Scoping Opinion from NPTCBC was pending.
- 12.8 Although the EIA Scoping Report looked to establish the overall framework of the EIA and ES, an iterative scoping process has been adopted in order to respond to the evolving engineering design of the Proposed Scheme. In a similar manner, a number of changes have occurred to the Proposed Scheme since the preparation and submission of the EIA Scoping Report, as set out within **Chapter 1: Introduction** and **Chapter 2: Approach to EIA**. As a result, it has been necessary to review the scope of assessment proposed.
- 12.9 This section provides a review, validation and update, where necessary, on the scope of the assessment presented within this Chapter.

Effects Not Considered to be Significant

- 12.10 The following effects were not considered significant as part of the EIA Scoping Report (**Appendix 2.1**) and, taking account of the changes occurring to the Proposed Scheme, are considered to remain unchanged and therefore not considered further in this Chapter (with detailed justification provided within the EIA Scoping Report):
- Operational noise [Mumbles – 13km];
 - Operational road traffic noise [surrounding residential receptors]; and
 - Vibration from construction activities [surrounding residential receptors].

12.11 There are no additional effects that have been identified as part of the iterative review process, that would be considered unlikely to be significant.

Effects Considered Likely to be Significant

12.12 The following effects (**Table 12.2**) were considered likely to be significant at the EIA Scoping stage, remaining unaffected by the changes to the Proposed Scheme since submission of the EIA Scoping Report, and therefore these have been assessed and reported within this Chapter:

Table 12.2: Effects Considered Likely to be Significant

Likely Significant Effect	Receptors	Applicable Development Stage
Generation of noise from construction activities (including construction traffic on site)	Human – Surrounding residential and commercial premises	Construction
Generation of noise from construction traffic off-site	Human – Surrounding residential and commercial premises	Construction
Generation of noise from plant ^a during operation	Human – Surrounding residential and commercial premises	Operation

12.13 Due to different assessment methodologies required for each, the generation of noise from construction activities (including construction traffic on the site) and generation of noise from construction traffic off site have been assessed separately and the conclusion of effect provided separately.

Assessment Methodology

Legislative Framework, Policy and Guidance

12.14 The following legislation and policy have informed the assessment of effects within this Chapter:

- Environmental Protection Act 1990¹;
- Control of Pollution Act 1974²;
- Environmental Permitting Regulations 2016 (as amended)³; and
- Neath Port Talbot County Borough Council Local Development Plan (2011-2026)⁴.

12.15 The following guidance has informed the assessment of effects within this Chapter:

- Environment Agency Guidance ‘Noise and vibration management: environmental permits’⁵;

^a The term plant here captures all types of plant, equipment and activities occurring on site including the process and ancillary uses associated with the operation of the Proposed Scheme (e.g. ship movements and pumping).

- British Standard 4142:2014+A1:2019⁶;
- British Standard 5228-1:2009+A1:2014⁷;
- Calculation of Road Traffic Noise (CRTN)⁸; and
- Design Manual for Roads and Bridges (DMRB)⁹.

Defining the Study Area

12.16 A technical study area for noise of 1.3km radius from the Site was determined as part of the EIA Scoping Report (**Appendix 2.1**) and encompasses nearest residential receptors in each direction, as shown in **Figure 12.1**. The closest residential receptors in each direction from the PDZ (due to the general focus of noise sources within the PDZ), as shown in **Figure 12.1**, are indicated as dwellings on Mariners Point to the west (SSR1, Position A), dwellings on Green Park Street to the north (SS4, Position B) and dwellings on Lower West End to the east (SSR8, Position C). This is in line with the study area used at the EIA Scoping stage.

12.17 **Table 12.3** below details sound sensitive receptor locations (SSRs) used in the assessment.

Table 12.3: Sound Sensitive Receptor Locations

ID No.	Description	Approx. Distance to Nearest Operational Site Boundary (m) ^b
SSR1	Dwellings at Mariners Point	890
SSR2	Dwellings at Darwin Rd / Newbridge Rd	900
SSR3	Dwellings on Isaac's Place / Borough St	1090
SSR4	Dwellings on Green Park St	1050
SSR5	Dwellings on Water St / Blanco's Hotel	1150
SSR6	Flats above shops on Station Rd	990
SSR7	Dwellings on Talbot Rd	745
SSR8	Dwellings on Lower West End	575
SSR9	Dwellings on St Alban's Terrace	810
SSR10	Dwellings on Duke St	1000
SSR11	Port Talbot Magistrates' Court	790

12.18 In addition to the above, NPTCBC / Red Twin Limited also highlighted the following quiet areas defined in the Neath Port Talbot LDP Policy EN10 as Vivian Park (1.6km north-west of the Site) and Talbot Memorial Park (830m north-east of the Site).

^b Approximate distance quoted from receptor to PDZ.

Background Studies to Inform the ES / Establishing the Baseline

12.19 **Table 12.4** summarises all surveys and modelling undertaken to inform the assessment presented within this Chapter.

Table 12.4: Surveys and Modelling

Study / Survey / Analysis / Evaluation	Overview	Date of Completion
Baseline Noise Survey (Appendix 12.1)	Baseline noise survey at receptors completed in September 2022 following agreement with NPTCBC/ Red Twin on monitoring locations	August – September, 2022
Operational Noise Impact Assessment (Appendix 12.2)	Operational noise impact assessment report completed in July 2023 following liaison with project engineering team (Technip Energies). This assessment presents operational noise modelling undertaken, the results of which informs the conclusions of likely significant effects presented within this chapter.	July 2023
Construction Noise Impact Assessment (Appendix 12.3)	Construction noise impact assessment report completed in July 2023 following liaison with project engineering team (Technip Energies) This assessment presents construction noise modelling undertaken, the results of which informs the conclusions of likely significant effects presented within this chapter.	July 2023

Assessment Process

Construction Noise

12.20 Full methodology of the assessment is set out in Construction Noise Impact Assessment report in **Appendix 12.3** and is summarised below.

12.21 British Standard 5228-1:2009+A1:2014 “Code of practice for noise and vibration control on construction and open sites – Part 1: Noise” gives guidance and recommendations for the control of noise from construction sites.

12.22 Based on the measured baseline levels detailed in **Appendix 12.1**, and guidance in BS 5228-1, the following construction noise limits are indicated at the three main monitoring locations:

Table 12.5: Proposed Construction Noise Limits at SSRs

Position	Weekday Daytime (0700-1900hrs)	Sat (0700-1300hrs)	Evenings (1900-2300) and weekends (other than Sat 0700-1300hrs)	Night-time (2300-0700hrs)
Pos A (east, dwellings at Mariners Point)	65	65	55	50
Pos B (north, dwellings at Water St/Green Park St)	65	65	55	50
Pos C (west, dwellings at Lower West End)	65	65	60	55

12.23 With exception of SSR8 (dwellings on Lower West End, for which it is proposed to use limits set at Position C), it is proposed to use the construction noise limits at Position A/B for all remaining SSRs.

12.24 Construction hours are indicated to be 0700-1900hrs across all days.

12.25 Construction noise prediction has been undertaken using Softnoise *Predictor* environmental noise mapping software package, which in turn uses calculation methods of British Standard 5228-1.

12.26 Predicted levels are worst-case $L_{Aeq,1hr}$ predictions with plant in open-air locations (i.e., no buildings / tanks erected on the site which could provide local screening to construction activities). The bulk of activities are modelled on the PDZ area however pre-fabrication works and HGV deliveries are modelled to the north of each Temporary Construction Area (TCA) and staff car parking has been included to the north of TCA 1 in close proximity to the nearest residential receptors.

12.27 The Project Design Engineers, Technip Energies (TE), have provided information relating to plant type/number for each month of the build program. Source noise data used in the model for the various items of construction plant and activities is detailed in **Appendix 12.3**, taken from the Predictor software database, which is largely based on data from Appendices of BS 5228-1.

12.28 For noise prediction, the construction of the Proposed Scheme has been broken down into six scenarios based on assumptions on the potential construction program informed by TE.

- **Scenario 1a** (Enabling works, plant at northern boundary of PDZ, including sheet piling for construction wharf)

- **Scenario 1b** (Enabling works, plant at southern boundary of PDZ, including sheet piling for construction wharf)
- **Scenario 2** (Months 1-6 of construction, including steel tube impact piling for operational jetty)
- **Scenario 3** (Months 7-12 of construction)
- **Scenario 4** (Months 13-18 of construction)
- **Scenario 5** (Months 19-24 of construction)

12.29 Construction activities/plant has generally been distributed around the perimeter of the PDZ in the modelling for worst-case assessment (reducing distance from source to receiver). Scenario 1 has been broken down into two scenarios (1a and 1b) for enabling works where there is less plant on Site to form a robust assessment.

12.30 To form a robust assessment for a worst-case one-hour period, for pre-fabrication activities on the TCAs, 2no angle grinders, 2no hammers and 2no welders have been included at the north of each TCA in all scenarios. 2no two-way HGVs to each of the three TCAs and 153no construction staff vehicles to the north of TCA 1 are also included.

12.31 46no two-way HGV movements have been modelled to the main PDZ area. This aligns with the total worst-case peak AM construction HGV flow of 52no AM arrivals and 52no AM departures set out in the Transport Assessment.

12.32 Traffic movements (HGV/LGVs/cars) have been included in the construction noise modelling from the point of passing the West Gate Site Security Access.

12.33 Construction traffic on public roads is assessed using Calculation of Road Traffic Noise and Design Manual for Roads and Bridges discussed below (see *Construction Traffic Noise (Off-Site)*).

12.34 Results of construction noise modelling are shown in **Table 12.15**.

Construction Traffic Noise (Off-Site)

12.35 Estimated construction traffic flow data set out in the EIA Scoping Report provides percentage increase over baseline for key Reference Points.

12.36 Calculation of Road Traffic Noise (CRTN) has been used to determine change in noise levels based on flow data which has then been assessed against criteria set out in Design Manual for Roads and Bridges. Change in noise levels is included in the final columns of **Table 12.16**.

12.37 With exception of Reference Point 19 (West Gate Site Access), all changes in noise levels are indicated to fall at or below 0.2dB.

12.38 It should be noted that West Gate Site Entrance (which is located away from SSRs) is at the point where construction traffic movements have been incorporated into the construction noise modelling discussed above.

Operational Noise

- 12.39 Operational noise has been assessed in accordance with British Standard 4142:2014+A1:2019. Full details of the operational noise impact assessment are included in the 'Operational Noise Impact Assessment' report included in **Appendix 12.2**.
- 12.40 Details of noise generating plant have been provided by TE for use in a prediction model and are summarised below (**Table 12.6**).

Table 12.6: Summary of Fixed Plant Items Modelled and Noise Data

Plant Item / Activity	Height (m)	Sound Power Level L_{wA} (dB)
Heat Exchanger HE-1351	10.5	91
Heat Exchanger HE-1451	6.5	91
Heat Exchanger HE-1511	10.5	91
Heat Exchanger HE-2401	7.5	91
Heat Exchanger HE-2605	6.5	91
Heat Exchanger HE-2200	18.5	96
Heat Exchanger HE-2403	18.5	96
Heat Exchanger HE-2650	18.5	96
Heat Exchanger HE-2750	6.5	91
Heat Exchanger HE-2760	6.5	91
Heat Exchanger HE-4011	8	91
Heat Exchangers HE-5451, HE-5452	8	91
Heat Exchangers HE-7301, HE-7310, HE-7311	8	91
Pump P-1112A/B	27.5	94
Pump P-1120A/B	2.5	89
Pump P-1132A/B	2.5	94
Pump P-1362A/B	16	89
Pump P-1453A/B	3	94
Pump P-1462A/B	12	89
Pump P-1522/A/B	25	89
Pump P-1532A/B	12	94
Pump P-1540A/B	4	89
Pump P-1612/A/B	25	89
Pump P-1652/A/B	0.5	89

Plant Item / Activity	Height (m)	Sound Power Level L_{WA} (dB)
Pump P-1811A/B	2.5	89
Pump P-1821A/B	2.5	94
Pump P-2120A/B	1	94
Pumps P-2211A/B	1	94
Pumps P-2302A/B	1	94
Pumps P-2340A/B	1	94
Pump P-2402A/B	1	94
Pump P-2421A/B	4	89
Pump P-2453A/B	1	94
Pump P-2481A/B	1	94
Pump P-2490A/B	1	89
Pump P-2602A/B	1	94
Pump P-2603	1	89
Pump P-2662A/B	4	89
Pump P-2672A/B	1	94
Pump P-2711A/B	8	89
Pump P-4251A/B	3	89
Pump P-4530A/B	3	94
Pump P-4540A/B/C	3	94
Pump P-4601A/B/C	3	94
Pump P-4610A/B	3	94
Pump P-4710A/B*	3	97
Pump P-4740A/B	3	94
Pump P-5011A/B	3	94
Pump P-5030A/B	3	94
Pump P-5030A/B	3	94
Pump P-5401	3	94
Pump P-5460A/B	3	94
Pump P-5500	3	89
Pump P-5510A/B	3	94
Pump P-5671A/B	3	94

Plant Item / Activity	Height (m)	Sound Power Level L_{WA} (dB)
Pump P-5800	3	89
Pump P-5810A/B	3	89
Pump P-6020A/B	3	94
Pump P-6110A/B	3	94
Pump P-6170A/B	3	89
Pump P-6420A/B	3	94
Pump P-6480A/B	3	94
Pump P-6450A/B	3	94
Pump P-6601A/B	3	94
Pump P-6911A/B	3	94
Pump P-6912A/B	3	94
Pump P-7001A/B	3	94
Heavies Drain Pump (P2603)	1	94
Lights Transfer Pump (P-2662A/B)	4	94
Fractionator Reflux Pump (P2672-A/B)	1	94
Fractionator Side Draw Pump (P2711-A/B)	8	94
Vacuum Pump Package (Z-2680)	12	94
Air Compressor Package (Z-3500)	4	94
Liquid N Storage & Vape Package (Z-3750)	12	94
Hydrogen Generation Package	20	89
Treatment Package Z-4510	4	94
Cooling Tower Z-4700 - Outlet	6.9	99
Cooling Tower Z-4700 – Casing	6.9	91
Cooling Tower Z-4700 – Inlet	2	107
Package Z-4760	3	81.3
Package Z-5000, Z-5020	8	89
Dosing System Z-5050	6	89
Boiler Package Z-5100	4.4	93
Boiler Package Z-5100 Stack	40	93
Boiler Package Z-5200	4.4	89
Package Z-7450	4	94

Plant Item / Activity	Height (m)	Sound Power Level L_{WA} (dB)
Ground Package Z-7460		
Flare Burners 238m2 area (emergency)	2	120
Flare Top 238m2 area (emergency)	20	115
Package Z-7910		
Emergency Diesel Gen1 (A15)	4	108
Emergency Diesel Gen2 (A17)	4	108
Emergency Diesel Gen2 (A18)	4	108
Compressor House 1 Louvre Area	10	99
Compressor House 2 Louvre Area	10	99
Ship pumps (x6, levels per pump)	5	104

- 12.41 Quantitative analysis has used the proprietary Predictor (v2023) computer modelling software, in conjunction with procedures of ISO 9613¹⁰.
- 12.42 LIDAR contour data has been used for terrain modelling, along with site observations and Google Earth for buildings.
- 12.43 The analysis predicts resultant noise levels at the SSRs.
- 12.44 Source noise data used in the model for the various items of plant is detailed in **Appendix 12.2** taken from initial information provided by TE and in-house database figures.
- 12.45 The following scenarios (**Table 12.7** and **12.8**) have been modelled to cover the range of operating states as noise levels can vary depending on the nature of activities

Table 12.7: Daytime Modelled Operational Scenarios (Worst Case 1hr period)

Scenario No	Details	All General Plant	Ground Flare	Diesel Generators	Ship Movement	HGVs	LGVs / Cars
1	Normal Operation (no ship movement)	On 100%	Off	Off	No	4no, 20km/h on site	52no, 20km/h on site
1a	Normal Operation (with ship movement)	On 100%	Off	Off	1no, 7km/h	4no, 20km/h on site	52no, 20km/h on site
2	Normal Operation (ship)	On 100%	Off	Off	No, but 6no pumps on ship	4no, 20km/h on site	52no, 20km/h on site

Scenario No	Details	All General Plant	Ground Flare	Diesel Generators	Ship Movement	HGVs	LGVs / Cars
	off-loading to site)				running at jetty		
3	Start-up Flaring	On 100%	Start-up Duty	Off	No	4no, 20km/h on site	52no, 20km/h on site
4	Emergency	On 100%	Emergency Duty	Off	No	4no, 20km/h on site	52no, 20km/h on site
5	Back-up Generator Testing	On 100%	Off	On 50% (30min test)	No	4no, 20km/h on site	52no, 20km/h on site

Table 12.8: Night-time Modelled Operational Scenarios (Worst Case 15min period)

Scenario No	Details	All General Plant	Ground Flare	Diesel Generators	Ship Movements	HGVs	LGVs / Cars
1	Normal Operation (no ship movement)	On 100%	Off	Off	No	1no, 20km/h on site	13no, 20km/h on site
1b	Normal Operation (with ship movement)	On 100%	Off	Off	1no, 7km/h	1no, 20km/h on site	13no, 20km/h on site
2	Normal Operation (ship off-loading to site)	On 100%	Off	Off	No, but 6no pumps on ship running at jetty	1no, 20km/h on site	13no, 20km/h on site
3	Start-up Flaring	On 100%	Start-up Duty	Off	No	1no, 20km/h on site	13no, 20km/h on site
4	Emergency	On 100%	Emergency Duty	Off	No	1no, 20km/h on site	13no, 20km/h on site

- 12.46 Scenarios 1, 2, 3 & 4 are effectively the same for daytime and night-time as plant runs continuously and the expected vehicle movements over the daytime one-hour assessment period are divided by 4 for the night-time 15minute assessment period which is considered reasonable.
- 12.47 As the modelling software references a one-hour assessment period, the model input includes for 4no ship movements over an hour to equate to the 1no potential ship movement in a 15minute period shown in the scenario table above. For reference and context, only 2no two-way ship movements are anticipated per week.
- 12.48 Results of operational noise modelling are shown in **Table 12.17**.
- 12.49 To determine the rating level, BS 4142 states that a sliding scale of penalties can be added to industrial/commercial sound levels which have acoustically distinguishing characteristics, including tonality, impulsivity and intermittency.
- **Tonality** – A penalty of 2dB for a tone which is just perceptible at the noise receptor, 4dB where it is clearly perceptible, and 6dB where it is highly perceptible.
 - **Impulsivity** – A penalty of 3dB for impulsivity which is just perceptible at the noise receptor, 6dB where it clearly perceptible, and 9dB where it is highly perceptible.

- **Other sound characteristics** – Where the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3dB can be applied
- **Intermittency** – If intermittency is readily distinctive against the residual acoustic environment, a penalty of 3dB can be applied.

12.50 Given the distance between the site and residential receptors (minimum approx. 500m from ship offloading to SSR8, Lower West End) and the predicted absolute sound levels in relation to the existing sound climate, it is likely that tonality may be just perceptible from the site which would warrant a 2dB character correction under BS 4142:2014+A1:2019.

12.51 For robustness at this stage however, a 3dB penalty has been included for sound characteristics that are readily distinctive against the residual acoustic environment, as specified in BS 4142:2104+A1:2019.

12.52 For the ship off-loading scenario however, as discussed in **Appendix 12.2**, a 4dB correction has been included for tonality being clearly perceptible at receptors around 600m or less from the ship (SSR 7 and SSR8),

12.53 As identified in **Appendix 12.2**, BS 4142 recognises the importance of context. Context is set out in **Appendix 12.2** and is repeated below.

Absolute Sound Levels

12.54 Absolute sound levels from the operations are indicated to fall at or below 45dB L_{Aeq} externally for the majority of scenarios at all receptors, with exception of scenarios/receptors outlined below.

12.55 Through a partially open window, this would equate to 30dB (assuming a 15dB loss) which is in line with desirable level inside bedrooms at night quoted in BS 8233:201411, quoted in Section 2.6 of **Appendix 12.2**.

12.56 During the emergency flaring and ship off-loading scenarios, levels of up to 46dB L_{Aeq} are indicated at SSR7 and SSR8. At these levels, through a partially open window, this marginally exceeds the 30dB level however falls in the range between desirable and reasonable inside bedrooms (30-35dB L_{Aeq}) in line with BS 8233:2014.

12.57 For the ship pass-by at night, an $L_{Aeq,15min}$ of up to 50dB is predicted at SSR1 (Mariners Point) however these are infrequent (up to 2no two-way trips per week).

12.58 Outcome: No modification of impact due to absolute noise sound levels.

Character of Specific Sound Level

12.59 BS4142 advises: *“Consider whether it would be beneficial to compare the frequency spectrum and temporal variation of the specific sound with that of the ambient or residual sound to assess the degree to which the specific sound source is likely to be distinguishable and will represent an incongruous sound by comparison to the acoustic environment that would occur in the absence of the specific sound.”*

- 12.60 At this stage, it is envisaged that a tonal component to the sound could be just perceptible at the receptors in the existing sound climate (+2dB, however +3dB used in assessments).
- 12.61 Based on sample measurements of the ship off-loading, tonality could be clearly perceptible at receptors around < 600m away (+4dB).
- 12.62 This has been accounted for in the character correction in the initial numerical assessment.
- 12.63 Outcome: No modification of impact due to character.

Character of a Particular Neighbourhood

- 12.64 The proposed site is located on the Port Talbot Docks adjacent to Tata Steel and Hanson Cement, both of which operate 24/7.
- 12.65 Receptors are therefore located near to a well-established industrial area and have an industrial noise component in their existing sound climate.
- 12.66 Outcome: No modification of impact due to character of neighbourhood.

Emergency Flaring

- 12.67 It is not uncommon for higher limits to be permissible during emergency scenarios. The emergency flaring is not a typical part of the operations. It is estimated this event could potentially happen 1 in 10 years.
- 12.68 It is also understood that during this state of emergency, the flare noise levels would likely fall to those in line with the start-up flaring after around 30mins.
- 12.69 Outcome: Modification of impact due to likely occurrence to adverse impact less likely at SSR3.

Ship Movement

- 12.70 As set out in **Chapter 4: Development Specification** only 2no two-way ship movements are indicated to occur per week.
- 12.71 Outcome: Modification of impact at SSR1 due to likely occurrence to adverse impact less likely.

Ship Off-loading

- 12.72 It is understood the ship off-load process can take up to 18hrs.
- 12.73 Ship pumps off-loading during the night have the potential to cause an adverse impact at SSR3 and SSR7. It is understood this would occur once every 7-14 days.
- 12.74 It should be noted that the ship pumps are not in control of the Applicant and an element of ship activity around a well-established port is to be expected.
- 12.75 Outcome: No modification of impact due – remains an adverse impact at SSR3 and SSR7.

Reporting of the Environmental Effect and Significance Criteria

12.76 The assessment of likely significant environmental effects as a result of the Proposed Scheme has taken into account the construction stage and operational stage. The following sections define the approach adopted within the assessment for the determination of sensitivity (or value/importance), magnitude of change (or impact), the level of effect and significance.

Determining Sensitivity of Receptor

12.77 The sensitivity of affected receptors has been considered on a scale of **high, medium, low** or **negligible**.

12.78 Residential receptors are considered medium sensitivity, reserving the high sensitivity for receptors of particular sensitivity. The Magistrates Court (SSR11) is also considered medium sensitivity.

12.79 Designated 'Quiet Areas' (i.e. Talbot Memorial Park and Vivian Park) are considered high sensitivity.

Determining the Magnitude of Change / Impact

12.80 Noise assessment guidance utilised often utilises the terms 'magnitude of impact' over 'magnitude of change'. As such, for the purpose of this Chapter the terms are considered interchangeable, or where necessary magnitude of impact has been assigned a corresponding 'magnitude of change' criteria. In doing so this ensure that across the ES common terms are being used when deriving environmental effects, whilst ensuring technical specific guidance is adhered to, as established within **Chapter 2: Approach to EIA**. Therefore, magnitude of change/impact has been considered as the change experienced from the current baseline conditions at the sensitive receptor and has been considered on a scale of **large, medium, small** or **negligible**.

Construction Noise

12.81 The magnitude of change/impact for construction noise is set in relation to any exceedance of the proposed construction noise limits set out in **Table 12.5**, rather than a specific baseline level, albeit the baseline noise levels are factored into establishing the identified noise limits.

12.82 The categorisation of exceedance against the established construction levels has been rated as follows and are based on professional judgement:

- Negligible (≤ 1dB);
- Small (1<3dB);
- Medium (3<5dB); and
- Large (>5dB).

Construction Traffic Noise

12.83 The magnitude of change / impact for construction traffic noise is derived from DMRB classification, which specifies the impact ranges for changes in road traffic noise set out within **Table 12.9**. These classifications have been considered against the language adopted across the rest of the ES, as stated within **Table 12.9**.

Table 12.9: DMRB Classification of Magnitude of Change/Impacts

Short Term		
Noise Change, $L_{A10,18h}$	Magnitude of Impact	Magnitude of Change
0	No change	-
0.9	Negligible	Negligible
1 – 2.9	Minor	Small
3 – 4.9	Moderate	Medium
5+	Major	Large

Operational Noise

12.84 BS 4142:2014+A1:2019 advises that a difference (industrial noise - background) of:

- +10dB or higher, likely to be an indication of a “*significant adverse impact*” (as defined by BS 4142, depending on the context;
- A difference of + 5dB, likely to be an indication of an “*adverse impact*”, depending on the context; and
- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an “*adverse impact*” or “*a significant adverse impact*”. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

12.85 A sliding scale of penalties can be added under a subjective assessment to industrial/commercial sound levels which have acoustically distinguishing characteristics, including tonality, impulsivity and intermittency which have been applied accordingly.

- Tonality - A penalty of 2dB for a tone which is just perceptible at the noise receptor, 4dB where it is clearly perceptible, and 6dB where it is highly perceptible;
- Impulsivity - A penalty of 3dB for impulsivity, which is just perceptible at the noise receptor, 6dB where it clearly perceptible, and 9dB where it is highly perceptible;
- Other sound characteristics - Where the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3dB can be applied; and
- Intermittency - If intermittency is readily distinctive against the residual acoustic environment, a penalty of 3dB can be applied.

12.86 **Table 12.10** below shows the adopted magnitude of change/impact scale used in this assessment based upon the difference between rating level and background. It should be noted however that the context assessment (including absolute level, residual level, hours of operation etc.) can vary the overall classification of effects/impacts.

Table 12.10: Magnitude of Change/Impact for Industrial Operational Noise

Rating Level (L_{Ar}) minus Background (L_{A90})	Magnitude of Change/Impact
≤ 0	Negligible
1-4	Small
5-9	Medium
≥ 10	Large

Determining the Level of Effect

12.87 The level of effect has been informed by the magnitude of change/impact due to the Proposed Scheme and the evaluation of the sensitivity of the affected receptor. The level of effect has been determined using professional judgement and **Table 12.11** has been a tool which has assisted with this process.

12.88 Whilst **Table 12.11** provides ranges, the level of effect is confirmed as a single level and not a range, informed by professional judgement. For each effect, it has been concluded whether the effect is ‘beneficial’ or ‘adverse’.

Table 12.11: Matrix to Support Determining the Level of Effect

		Sensitivity (or value / importance)			
		High	Medium	Low	Negligible
Magnitude of Change	Large	Major	Moderate to Major	Minor to Moderate	Negligible
	Medium	Moderate to Major	Moderate	Minor	Negligible
	Small	Minor to Moderate	Minor	Negligible to Minor	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

12.89 The following terms have been used to define the level of the effects identified and these can be ‘beneficial’ or ‘adverse’:

- **Major effect:** where the Proposed Scheme is likely to cause a considerable change from the baseline conditions and the receptor has limited adaptability, tolerance or recoverability or is of the highest sensitivity;
- **Moderate effect:** where the Proposed Scheme is likely to cause either a considerable change from the baseline conditions at a receptor which has a degree of adaptability, tolerance or recoverability or a less than considerable change at a receptor that has limited adaptability, tolerance or recoverability;
- **Minor effect:** where the Proposed Scheme is likely to cause a small, but noticeable change from the baseline conditions on a receptor which has limited adaptability, tolerance or recoverability or is of the highest sensitivity; or where the Proposed

Scheme is likely to cause a considerable change from the baseline conditions at a receptor which can adapt, is tolerant of the change or/and can recover from the change; and

- **Negligible:** where the Proposed Scheme is unlikely to cause a noticeable change at a receptor, despite its level of sensitivity or there is a considerable change at a receptor which is not considered sensitive to a change.

12.90 The duration of the effect has been assessed as either 'short-term', 'medium-term' or 'long-term'. Short-term is considered to be up to 1 year, medium-term is considered to be between 1 and 10 years and long-term is considered to be greater than 10 years.

Determining Significance

12.91 For each effect, a statement has been made as to whether the level of effect is '**Significant**' or '**Not Significant**'. This determination has been based on professional judgement and/or relevant guidance/legislation where applicable.

12.92 Significance has only been concluded for residual effects (i.e. following the identification of secondary mitigation).

Baseline Conditions

12.93 Baseline noise conditions have been determined with week-long unattended monitoring at Positions A-C identified in **Figure 12.1**, as well as a number of manned measurements during both daytime and night-time periods near sensitive receptor locations. The baseline conditions are set out in full within **Appendix 12.1**, but are summarised below:

- Baseline noise monitoring has been undertaken in accordance with British Standard 7445-1:2003¹² and British Standard 4142:2014+A1:2019;
- Parameters including L_{Aeq} , $L_{Amax,F}$ and background L_{A90} were logged with 100ms data and continuous audio, which allows for detailed post-analysis of data;
- Meteorological conditions (wind direction, wind speed, temperature, rainfall etc.) were logged continuously at 5 minute intervals using a weather station at a secure location at Port Talbot docks;
- Baseline daytime $L_{A90,1hr}$ and night-time $L_{A90,15mins}$ background sound levels have been determined from the data in line with guidance in BS 4142 for use in the operational impact assessment; and
- Baseline ambient $L_{Aeq,1hr}$ levels have been determined for use in the construction noise impact assessment.

12.94 A summary of background L_{A90} baseline monitoring results for long term positions (**Figure 12.1**) are provided below along with a summary baseline ambient noise levels measured:

Table 12.12: Minimum Consistent Daytime and Night-time Background L_{A90} Results

Period	Position		
	A	B	C
Daytime (0700-2300hrs) $L_{A90,1hr}$ (dB)	45	49	54
Night-time (2300-0700hrs) $L_{A90,15min}$ (dB)	45	40	52

- 12.95 Existing noise levels around the Proposed Scheme are judged to be controlled by road traffic and existing industrial sources.

Table 12.13: Summary of Baseline Ambient Noise Levels

Period	Range of Baseline Ambient Noise		
	Position A	Position B	Position C
Daytime (07.00–19.00) and Saturdays (07.00–13.00)	50-52	54-55	58-61
Evenings (19.00-23.00) and weekends	49-52	51-56	56-60
Night-time (23.00–07.00)	47-51	47-52	56-60

- 12.96 Baseline traffic flows used in the construction traffic noise assessment are taken from transport information in the EIA Scoping Report (**Appendix 2.1**), as shown in **Table 12.14**.

Table 12.14: Baseline Traffic Flows

Reference Point	Road Name	2022 AADT	2022 HGV	2026 AADT	2026 HGV
1	A48 Pentyla-Baglan Road	17954	698	18499	719
2	B4286 Heilbronn Way	17187	462	17712	476
3	Car Park Access (North)	15	0	15	0
4	A48 Heilbronn Way (North)	16991	698	17519	719
5	Car Park Access (South)	1155	354	1189	364
6	A48 Heilbronn Way (East)	10002	403	10305	415
7	Water Street	14420	585	14852	602

Reference Point	Road Name	2022 AADT	2022 HGV	2026 AADT	2026 HGV
8	A4241 (North 1)	5490	231	5685	238
9	Industrial Unit Access (East)	438	74	452	76
10	Industrial Unit Access (West)	21	0	21	0
11	Harbourside Road	634	0	653	0
12	A4241 (North 2)	5362	251	5554	258
13	A4241 (West)	7775	310	8152	319
14	North Bank Road	732	113	754	116
15	A4241 Harbour Way (West)	12273	467	12815	481
16	Oakwood Road	762	20	785	20
17	Llewellyn's Road	949	88	977	91
18	A4241 Harbour Way (North)	11609	487	12131	501
19	West Gate Site Access	3072	260	3163	268
20	Access Road 1	49	10	51	10
21	A4241 Harbour Way (South 1)	10641	570	11134	587
22	Access Road 2	152	0	157	0
23	Main Gate Site Access	4286	334	4414	344
24	A4241 Harbour Way (South 2)	9152	600	9601	618
25	Access Road 3	197	88	1584	111
26	A48 Margam Road (North)	7299	305	7989	347
27	A48 Margam Road (South)	14470	890	15759	1036
28	M4 Southbound Off-slip	3495	147	3947	185
29	A48 (East)	9230	378	9505	390
30	M4 Southbound On-slip	3406	334	3781	390
31	M4 Northbound Off-slip	4345	378	4711	430
32	Heolcae'r-Bont	772	103	795	106

Future Baseline

12.97 With existing baseline noise levels at receptors controlled by road traffic and existing industrial sources, it is not envisaged that any significant change to future baseline would occur.

12.98 The predicted gradual increase in traffic on the localised road network is perceived to have a negligible impact on the existing noise environment (no change), given the generally perceived limited background growth set out within the traffic data.

Primary and Tertiary Mitigation

Construction Stage

12.99 The following tertiary mitigation which has been evaluated as part of the construction stage assessment is outlined below.

- The impact of construction activities is to be controlled by the use of a Construction Environmental Management Plan (CEMP), which will incorporate mitigation measures for construction noise that follow best practicable means (BPM) outlined in BS 5228-1:2009+A1:2014.
 - All access roads should be kept clean and maintained in a good state of repair to avoid unwanted rattle and “body slap” from vehicles.
 - Minimise drop heights of materials.
 - Any reversing beepers fitted to vehicles should be minimised as far as is reasonably practicable and subject to maintaining site safety.
 - Alternatively, mute / switch off reversing beepers and using a banksman; low beeper volume settings (if possible set to site ambient noise levels); and / or manoeuvring vehicles in a circular manner to avoid the use of reversing alarms.
 - Site layout should locate the noisiest stationary plant as far as is practicable from residential receivers.
 - The operatives of the site should be made aware of noise control requirements.
 - Switch plant off when not required.

Operational Stage

12.100 No primary mitigation has been considered.

Assessment of Effects, Secondary Mitigation and Residual Effects

Construction Stage

Generation of noise from construction activities

12.101 Results of construction noise modelling are detailed in full in **Appendix 12.3** and summarised in **Table 12.15**.

Table 12.15: Predicted L_{Aeq} Construction Noise Levels for Worst Case Hour

Sound Sensitive Receptor (SSR)	Height (m)	$L_{Aeq, 1hr}$ (dB) for Scenarios					
		1a	1b	2	3	4	5
		Enabling Works North Boundary	Enabling Works South Boundary	M1-6	M7-12	M13-18	M19-24
SSR1 - 27 Mariners Point	1.5	48	50	51	50	49	48
SSR1 - 27 Mariners Point	4.5	49	51	52	51	51	49
SSR2 - 1 Darwin Road	1.5	48	50	52	51	50	48
SSR2 - 1 Darwin Road	4.5	49	51	53	52	52	48
SSR3 - 4 Isaac's Place	1.5	48	47	49	48	48	43
SSR3 - 4 Isaac's Place	4.5	53	52	54	53	53	48
SSR4 - 5 Green Park Street	1.5	42	45	47	44	44	39
SSR4 - 5 Green Park Street	4.5	46	47	49	48	47	42
SSR5 - Blanco's Hotel	1.5	39	39	42	41	40	36
SSR5 - Blanco's Hotel	4.5	45	44	47	46	45	41
SSR5 - Blanco's Hotel	7.5	49	49	51	51	50	45
SSR6 - 21 Station Road	1.5	36	35	39	38	38	33
SSR6 - 21 Station Road	4.5	43	42	46	45	44	40
SSR7 - 105 Talbot Road	1.5	46	46	48	46	45	44
SSR7 - 105 Talbot Road	4.5	58	57	60	59	58	54

Sound Sensitive Receptor (SSR)	Height (m)	$L_{Aeq, 1hr}$ (dB) for Scenarios					
		1a	1b	2	3	4	5
		Enabling Works North Boundary	Enabling Works South Boundary	M1-6	M7-12	M13-18	M19-24
SSR8 - 10 Lower West End	1.5	53	52	54	53	53	52
SSR8 - 10 Lower West End	4.5	60	60	61	60	60	59
SSR9 - 19 St Albans Terrace	1.5	45	45	48	45	44	42
SSR9 - 19 St Albans Terrace	4.5	57	56	59	58	58	54
SSR10 - 21 Duke Street	1.5	33	31	36	33	33	30
SSR10 - 21 Duke Street	4.5	37	35	39	37	36	34
SSR11 - Magistrates Court	1.5	47	46	50	51	51	46
SSR11 - Magistrates Court	4.5	50	49	52	53	52	47
Talbot Memorial Park	1.5	39	40	41	40	40	38
Vivian Park	1.5	37	37	40	37	37	34

12.102 Noise levels are not indicated to exceed proposed limits set in accordance with BS 5228-1 at all SSRs for daytime (0700-1900hrs) and Saturday 0700-1300hrs.

12.103 Limits for evenings and weekends are also met at SSRs1-6, SSR8 (marginal 1dB) and SSRs10-11. At SSR7 and SSR9, up to a 5dB excess is indicated based on the worst-case 1hour assessments. It is likely however that evening/weekend works would be at a reduced rate to the main daytime and Saturday periods and therefore lower levels may be expected.

12.104 Noise levels at Talbot Memorial Park and Vivian Park are indicated to fall well below existing daytime ambient noise climate and are therefore negligible.

SSR1-11

12.105 Residential receptors are considered medium sensitivity, reserving the high sensitivity for receptors of particular sensitivity. The Magistrates Court (SSR11) is also considered medium sensitivity. The magnitude of change is considered to be negligible for daytime scenarios with BS 5228-1 limits not exceeded. Therefore, there is likely to be a direct, temporary, medium-term, adverse effect which is considered to be negligible.

12.106 The sensitivity of designated quiet areas is considered to be high. The magnitude of change is considered to be negligible. Therefore, there is likely to be a direct, temporary, medium-term, adverse effect which is considered to be negligible.

12.107 For evening/weekend works, the magnitude of change is considered to be medium at SSR7 and SSR9 for BS 5228-1 limits exceeded up to 5dB. Therefore, there is likely to be a direct, temporary, medium-term, adverse effect which is considered to be moderate.

Secondary Mitigation or Enhancement

12.108 Any proposed evening (after 1900 – 2300hrs) and weekend construction works (outside of 0700 – 1300hrs Sat) would therefore need to be confirmed against limits set out in this report.

Residual Effect

12.109 In the absence of secondary mitigation the residual effects for SSR1-11 and the designated quiet areas are that same as that reported in the pre-mitigation scenario

Significance

12.110 This effect is considered to be **Not Significant**.

Generation of noise from construction traffic off-site

SSR1-11

12.111 Calculation of Road Traffic Noise has been used to determine the potential increase in noise levels from off-site construction traffic based on traffic flow data and is shown in **Table 12.16**.

Table 12.16: Construction Traffic Flow Data

Ref Point	Road Name	LGV	HGV	Total	% Increase over 2026 baseline	dB Increase over 2026 baseline	% Increase over 2022 baseline	dB Increase over 2022 baseline
1	A48 Pentyla-Baglan Road	167	0	167	0.9%	0.0	0.9%	0.0
2	B4286 Heilbronn Way	34	0	34	0.2%	0.0	0.2%	0.0
3	Car Park Access (North)	0	0	0	0.0%	0.0	0.0%	0.0
4	A48 Heilbronn Way (North)	202	0	202	1.2%	0.0	1.2%	0.1
5	Car Park Access (South)	0	0	0	0.0%	0.0	0.0%	0.0
6	A48 Heilbronn Way (East)	27	0	27	0.3%	0.0	0.3%	0.0
7	Water Street	0	0	0	0.0%	0.0	0.0%	0.0
8	A4241 (North 1)	229	0	229	4.0%	0.2	4.2%	0.2
9	Industrial Unit Access (East)	0	0	0	0.0%	0.0	0.0%	0.0
10	Industrial Unit Access (West)	0	0	0	0.0%	0.0	0.0%	0.0
11	Harbourside Road	0	0	0	0.0%	0.0	0.0%	0.0
12	A4241 (North 2)	229	0	229	4.1%	0.2	4.3%	0.2
13	A4241 (West)	109	0	109	1.3%	0.1	1.4%	0.1
14	North Bank Road	0	0	0	0.0%	0.0	0.0%	0.0
15	A4241 Harbour Way (West)	338	0	338	2.6%	0.1	2.8%	0.1
16	Oakwood Road	0	0	0	0.0%	0.0	0.0%	0.0
17	Llewellyn's Road	0	0	0	0.0%	0.0	0.0%	0.0
18	A4241 Harbour Way (North)	338	0	338	2.8%	0.1	2.9%	0.1
19	West Gate Site Access	564	240	804	25.4%	1.0	26.2%	1.0
20	Access Road 1	0	0	0	0.0%	0.0	0.0%	0.0
21	A4241 Harbour Way (South 1)	226	240	466	4.2%	0.2	4.4%	0.2
22	Access Road 2	0	0	0	0.0%	0.0	0.0%	0.0
23	Main Gate Site Access	0	0	0	0.0%	0.0	0.0%	0.0

Ref Point	Road Name	LGV	HG V	Tot al	% Increase over 2026 baseline	dB Increase over 2026 baseline	% Increase over 2022 baseline	dB Increase over 2022 baseline
24	A4241 Harbour Way (South 2)	226	240	466	4.9%	0.2	5.1%	0.2
25	Access Road 3	0	0	0	0.0%	0.0	0.0%	0.0
26	A48 Margam Road (North)	21	37	58	0.7%	0.0	0.8%	0.0
27	A48 Margam Road (South)	205	203	408	2.6%	0.1	2.8%	0.1
28	M4 Southbound Off-slip	0	35	35	0.9%	0.0	1.0%	0.0
29	A48 (East)	28	0	28	0.3%	0.0	0.3%	0.0
30	M4 Southbound On-slip	89	83	172	4.6%	0.2	5.0%	0.2
31	M4 Northbound Off-slip	89	85	174	3.7%	0.2	4.0%	0.2
32	Heolcae'r-Bont	0	0	0	0.0%	0.0	0.0%	0.0

12.112 Note that West Gate Site Access point is not assessed here as vehicle movements from this point are incorporated into the main construction modelling discussed above.

12.113 As is evident from **Table 12.9**, the magnitude of impact, in line with DMRB would be classified as 'no change'. However, in line with **Table 12.9** this corresponds to a magnitude of change/impact of negligible as part of the ES.

12.114 Residential receptors are considered medium sensitivity, reserving the high sensitivity for receptors of particular sensitivity. The Magistrates Court (SSR11) is also considered medium sensitivity. The magnitude of change is considered to be no change. Therefore, there is likely to be a direct, temporary, medium-term, adverse effect which is considered to be negligible.

Secondary Mitigation or Enhancement

12.115 No secondary mitigation or enhancement is required.

Residual Effect

12.116 In the absence of secondary mitigation, the residual effects for SSR1-11 is that same as that reported in the pre-mitigation scenario.

Significance

12.117 This effect is considered to be **Not Significant**.

Talbot Memorial Park

12.118 Calculation of Road Traffic Noise has been used to determine the potential increase in noise levels from off-site construction traffic based on traffic flow data and is shown in **Table 12.7**. Reference Point 4 (A48 Heilbronn Way, North) runs past Talbot Memorial Park and is therefore relevant.

12.119 There are no changes to traffic anticipated in the vicinity of Vivian Park.

12.120 The sensitivity of designated quiet areas is considered to be high. The magnitude of change is considered to be no change. Therefore, there is likely to be a direct, temporary, medium-term, adverse effect which is considered to be negligible.

Secondary Mitigation or Enhancement

12.121 No secondary mitigation or enhancement is required.

Residual Effect

12.122 In the absence of secondary mitigation, the residual effects for Talbot Memorial Park is that same as that reported in the pre-mitigation scenario.

Significance

12.123 This effect is considered to be **Not Significant**.

Operational Stage

12.124 Results of operational noise modelling are detailed in full in **Appendix 12.2** and summarised in **Table 12.17** and **Table 12.18**.

Table 12.17: Operational Noise Model Predictions

Sound Sensitive Receptor (SSR)	Height (m)	Scenario						
		1 Normal Operation	1a Normal Operations with Ship Movement (Day $L_{Aeq,1hr}$)	1b Normal Operations with Ship Movement (Night $L_{Aeq,15mins}$)	2 Ship Off-loading	3 Start-up Flare	4 Emergency Flare	5 Generator Testing
SSR1 - 27 Mariners Point	1.5	39	44	49	40	39	43	40
SSR1 - 27 Mariners Point	4.5	39	45	50	40	39	43	41
SSR2 - 1 Darwin Road	1.5	38	39	42	40	39	42	40
SSR2 - 1 Darwin Road	4.5	38	40	43	40	39	42	40
SSR3 - 4 Isaac's Place	1.5	37	37	39	39	38	41	39
SSR3 - 4 Isaac's Place	4.5	39	39	40	42	39	42	40
SSR4 - 5 Green Park Street	1.5	37	38	39	39	38	41	39
SSR4 - 5 Green Park Street	4.5	37	38	40	40	38	41	39
SSR5 - Blanco's Hotel	1.5	36	36	38	39	36	38	37
SSR5 - Blanco's Hotel	4.5	36	37	38	39	36	38	38
SSR5 - Blanco's Hotel	7.5	37	37	38	39	37	40	38
SSR6 - 21 Station Road	1.5	36	36	37	37	36	38	38
SSR6 - 21 Station Road	4.5	37	37	38	40	37	39	39
SSR7 - 105 Talbot Road	1.5	38	39	39	42	39	41	40

Sound Sensitive Receptor (SSR)	Height (m)	Scenario						
		1 Normal Operation	1a Normal Operations with Ship Movement (Day $L_{Aeq,1hr}$)	1b Normal Operations with Ship Movement (Night $L_{Aeq,15mins}$)	2 Ship Off-loading	3 Start-up Flare	4 Emergency Flare	5 Generator Testing
SSR7 - 105 Talbot Road	4.5	41	41	41	46	41	46	42
SSR8 - 10 Lower West End	1.5	40	40	41	46	40	42	41
SSR8 - 10 Lower West End	4.5	43	43	43	46	43	46	43
SSR9 - 19 St Albans Terrace	1.5	38	38	39	42	38	39	38
SSR9 - 19 St Albans Terrace	4.5	40	40	41	45	40	41	41
SSR10 - 21 Duke Street	1.5	34	34	35	38	34	36	34
SSR10 - 21 Duke Street	4.5	35	35	36	39	35	36	35
SSR11 - Magistrates Court	1.5	42	42	43	44	42	44	43
SSR11 - Magistrates Court	4.5	42	42	43	44	42	44	43
Talbot Memorial Park	1.5	38	38	39	42	38	40	38
Vivian Park	1.5	31	32	34	33	31	33	32

12.125 Impact assessments are presented for SSRs1-10 in **Appendix 12.2** and are summarised below for the worst-case scenarios at each SSR.

Table 12.18: Operational Noise Model Predictions

SSR	Worst-case Excess Rating over Background for Scenario	Scenario
1	8dB,	1b (Normal with ship night)
2	1dB,	1b (Normal with ship night)
3	5dB	2/4 (Ship Off-loading / Emergency Flare)
4	4dB	4 (Emergency Flare)
5	3dB	4 (Emergency Flare)
6	3dB	2 (Ship Off-loading)
7	8dB	2 (Ship Off-loading)
8	-2dB,	2 (Ship Off-loading)
9	3dB	2 (Ship Off-loading)
10	-4dB	2 (Ship Off-loading)

12.126 At SSR11 (Magistrates Court) and the designated quiet areas (Talbot Memorial Park and Vivian Park), levels are indicated to fall below the daytime background sound levels.

Generation of Noise from Plant during Operation

SSR 1

12.127 The sensitivity of SSR 1 is considered to be medium (residential receptors are considered medium sensitivity, reserving the high sensitivity for receptors of particular sensitivity).

12.128 Considering context as set out in the methodology section of this chapter, as the ship pass-by at night has resulted in the worst-case excess over background sound levels at SSR1 and there are only 2no two-way ship movements proposed per week, it is proposed to modify the BS 4142 assessment for context to an adverse impact being less likely.

12.129 The magnitude of change is therefore considered to be small. Therefore, there is likely to be a direct, permanent, long-term, adverse effect which is considered to be minor.

Secondary Mitigation or Enhancement

12.130 The assessment of effects has been informed by the sound power levels for the proposed equipment and plant within the Proposed Scheme, as set out within **Table 12.6**, which in turn have been informed by the project design engineers and suppliers. As such, upon completion of the final design and at the point procurement of plant / equipment is undertaken, it will be necessary to ensure the final plant and equipment aligns with the assessed sound power levels or can utilise appropriate plant / equipment specific mitigation to achieve these levels. Therefore, a further level of evaluation and validation of equipment and plant against **Table 12.6** is necessary.

Residual Effect

12.131 The identified secondary mitigation ensures the pre-mitigation assessment remains the same and therefore the residual effect is the same as that reported in the pre-mitigation scenario.

Significance

12.132 This effect is considered to be **Not Significant**.

SSRs 3 & 7

12.133 The sensitivity of SSRs 3 & 7 are considered to be medium (residential receptors are considered medium sensitivity, reserving the high sensitivity for receptors of particular sensitivity).

12.134 Considering context as set out in the methodology section of this chapter, as the ship off-loading at night has resulted in the worst-case excess over background sound levels at SSRs 3 & 7, it is not proposed to modify the BS 4142 assessment for context and an adverse impact is likely to remain.

12.135 The magnitude of change is therefore considered to be medium. Therefore, there is likely to be a direct, permanent, long-term, adverse effect which is considered to be moderate.

Secondary Mitigation or Enhancement

12.136 As set out within **Paragraph 12.131**.

12.137 It should be noted that the ship pumps are not in control of the applicant and an element of ship activity around a well-established port is to be expected.

Residual Effect

12.138 The identified secondary mitigation ensures the pre-mitigation assessment remains the same and therefore the residual effect is the same as that reported in the pre-mitigation scenario.

Significance

12.139 This effect is considered to be **Not Significant**.

SSRs 2, 4, 5, 6 & 9

12.140 The sensitivity of SSRs 2, 4, 5, 6 & 9 are considered to be medium (residential receptors are considered medium sensitivity, reserving the high sensitivity for receptors of particular sensitivity).

12.141 The magnitude of change is considered to be small. Therefore, there is likely to be a direct, permanent, long-term, adverse effect which is considered to be minor.

Secondary Mitigation or Enhancement

12.142 As set out within **Paragraph 12.131**.

Residual Effect

12.143 The identified secondary mitigation ensures the pre-mitigation assessment remains the same and therefore the residual effect is the same as that reported in the pre-mitigation scenario.

Significance

12.144 This effect is considered to be **Not Significant**.

SSRs 8, 10 & 11

12.145 The sensitivity of SSRs 8, 10 & 11 are considered to be medium (residential receptors are considered medium sensitivity, reserving the high sensitivity for receptors of particular sensitivity).

12.146 The magnitude of change is considered to be negligible. Therefore, there is likely to be a direct, permanent, long-term, adverse effect which is considered to be negligible.

Secondary Mitigation or Enhancement

12.147 As set out within **Paragraph 12.131**.

Residual Effect

12.148 The identified secondary mitigation ensures the pre-mitigation assessment remains the same and therefore the residual effect is the same as that reported in the pre-mitigation scenario. .

Significance

12.149 This effect is considered to be **Not Significant**.

Vivian Park and Talbot Memorial Park

12.150 The sensitivity of designated quiet areas are considered to be high (designated 'Quiet Areas' protected within the LDP). The magnitude of change is considered to be negligible. Therefore, there is likely to be a direct, permanent, long-term, adverse effect which is considered to be negligible.

Secondary Mitigation or Enhancement

12.151 As set out within **Paragraph 12.131**.

Residual Effect

12.152 The identified secondary mitigation ensures the pre-mitigation assessment remains the same and therefore the residual effect is the same as that reported in the pre-mitigation scenario.

Significance

12.153 This effect is considered to be **Not Significant**.

Limitations and Assumptions

12.154 To ensure transparency within the EIA process, the following limitations and assumptions have been identified.

- There is a degree of uncertainty in construction noise modelling, as the full construction methods are to be determined.

The following steps have therefore been taken to minimise the uncertainty insofar as is possible:

- Noise model scenarios are based on worst-case activity areas at the north and south;
- Source plant noise levels with spectra shapes taken from BS 5228-1:2009+A1:2014 the Predictor database; and

- Noise model follows the procedures of BS 5228-1:2009+A1:2014.
- There is a degree of uncertainty in the source noise data used in the operational noise modelling as the scheme is not yet fully designed, and the full plant noise data is not currently available.

The following steps have therefore been taken to minimise the uncertainty insofar as is possible:

- Significant sources – Flare, Cooling Towers – noise levels have been confirmed by the project engineering team, Technip Energies (TE);
- Noise limits for other plant are based on single-figure limits provided by TE, with spectra shapes taken from the Predictor database;
- Noise model follows the procedures of ISO 9613; and
- Noise sources have been calibrated to near-field positions in the model to validate the far-field receivers.

The source data input in the model effectively becomes limits for plant for suppliers to quote against at the detailed design stage of the Proposed Scheme.

Summary

12.155 **Table 12.19** provides a summary of the effects, receptors, residual effects and conclusions of significance considered within the Chapter.

12.156 The table only provides a summary of the residual effects identified within the assessment and details of all primary, secondary and tertiary mitigation that has been taken into account is set out in detail within the Chapter and summarised within the Environmental Management Plan included within **Volume 3: Environmental Management Plan**.

Table 12.19: Summary of Residual and Significant Effects

Effect	Receptor	Residual Effect	Is the Effect Significant?
Construction Stage			
Generation of noise from construction activities and on-site construction traffic (daytime and Saturday)	SSRs 1-11 and Talbot Memorial Park and Vivian Park	Negligible Adverse	NO
Generation of noise from construction activities and on-site	SSRs1-6, 8, 10 & 11	Negligible Adverse	NO

Effect	Receptor	Residual Effect	Is the Effect Significant?
construction traffic Evenings and weekends (excl. Sat 0700-1300hrs)	SSRs7 & 9	Moderate Adverse	NO
Generation of noise from construction traffic off-site	SSRs 1-11 and Talbot Memorial Park	Negligible Adverse	NO
Operational Stage			
Generation of Noise from Plant during Operation	SSRs 1, 2, 4, 5, 6 & 9	Minor Adverse	NO
	SSRs 3 & 7	Moderate Adverse	NO
	SSRs 8, 10&11 and Talbot Memorial Park and Vivian Park	Negligible Adverse	NO

References

- ¹ UK Government, Environmental Protection Act 1990. Available at <https://www.legislation.gov.uk/ukpga/1990/43/contents> 1990
- ² UK Government, Control of Pollution Act 1974. Available at <https://www.legislation.gov.uk/ukpga/1974/40>
- ³ UK Government, Environmental Permitting Regulations 2016 (as amended). Available at <https://www.legislation.gov.uk/uksi/2016/1154/contents/made>
- ⁴ Neath Port Talbot County Borough Council Local Development Plan (2011-2026), Adopted January 2016, Policy EN 8 and Policy EN 10. Available at https://www.npt.gov.uk/media/7321/ldp_written_statement_jan16.pdf?v=20170727124344
- ⁵ Environment Agency, Guidance 'Noise and vibration management: environmental permits'. Available at <https://www.gov.uk/government/publications/noise-and-vibration-management-environmental-permits/noise-and-vibration-management-environmental-permits>
- ⁶ British Standards Institute, British Standard 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'
- ⁷ British Standards Institute, British Standard 5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites'
- ⁸ Department of Transport Welsh Office, Calculation of Road Traffic Noise (CRTN), 1988
- ⁹ Highways England, Design Manual for Roads and Bridges – LA111 Noise & Vibration, Revision 2, 2020
- ¹⁰ International Organization for Standardization (1996) ISO 9613-2:1996 – Acoustics; Attenuation of sound during propagation outdoors – Part 2: General method of calculation
- ¹¹ British Standards Institute (2014) BS 8233:2014 'Guidance on sound insulation and noise reduction for buildings'
- ¹² British Standards Institute (2013) BS 7445-1:2003 'Description and measurement of environmental noise — Part 1: Guide to quantities and procedures'