Table A1.2 Technical Stakeholder Comments

Topic	Comment	RHDHV Response	Follow up required?
Workshop 1: Physical environment – coastal processes			
1.1	What is the plan for commencing the build of the Breakwater, are you going to start from the North East side or both ends of it and meet in the middle?	The design team will be working on that and the approach has not been finalised as yet.	No
1.2	Concerning the impacts and benefits of the preferred option – on the completed site itself – could there be potential benefits to offset the environmental impacts elsewhere? In this included in the EIA or later?	Each chapter will examine effects based on the spatial influence of the site within the defined study area – it will be different for each topic. For example, if scaly cricket habitat is affected at this site, consideration is given to how to improve its habitat elsewhere. This process is called 'no net loss' – first need to determine what may be 'lost' before it is possible to assess any mitigation required.	No
1.3	Guernsey Water has a coastal water quality model for the whole island, which may be useful to the project. Also there are two critical pieces of infrastructure near the site - the long and short sea outfalls in Belle Grave Bay. Reports produced by Intertek-Metoc mainly focus on dispersion from the outfalls and hydrographics that impact on that.	These form part of the baseline for the modelling. Obtain report to understand what was done in terms of modelling and how it might assist this project.	Reports provided to RHDHV to consider as part of the EIA work.

Topic	Comment	RHDHV Response	Follow up required?
1.4	Impact on tidal flows – there has been feedback from local marine pilots about the effect on tidal currents at Longue Hougue. A solution could be to provide the 2019 tidal current model results to the pilots to see if they match experience – Colin Le Ray can arrange this through Guernsey Harbours.	It was agreed this would be useful feedback.	Follow-up contact has been made – a telephone discussion will be arranged.
1.5	Regarding the modelling work that has been undertaken – what type has been undertaken for the dispersion model (on slide 9)? Nick Cutts, University of Hull	A hydrodynamic model was used for changes to tidal currents – the English Channel Regional model using MIKE21 – calibrated around the English Channel with appropriate mesh size reduction for Guernsey & Longue Hougue. Dr David Brew (RHDHV) is confident adjustments to the model provide sufficient detail. An appendix to the EIA will identify how the model was set up and calibrated (currently in draft form).	Appendix to the EIA to define model parameters and set-up
1.6	Slide 13 - what return frequency was used in modelled data for the 2012 study to determine direction and significant wave height? Did it include climate change sea level rise?	RHDHV will confirm and revert back.	RHDHV to provide N Cutts with the Coastal Modelling and Report once completed

Topic	Comment	RHDHV Response	Follow up required?
1.7	Guernsey Water Benthic surveys for the sea outfall development may be of use.	RHDHV welcome additional data that can assist in the EIA process.	Confirmed benthic surveys on the Long Sea Outfall (LSO) area are due every 4 years, but not yet carried out. Some video footage was taken and considered sufficient/little impact at time of the LSO work
1.8	What is meant by “intrinsic morphological value”?	This is subjective and based on professional opinion. Presents an interesting dilemma for interpretation of value – experts/stakeholders could have different values. Judgements will be made during the process of the EIA whether to use the stated impact and effect criteria/assessment or whether impact would be used throughout. This will be assessed at both local and regional scales.	No
1.9	Herm commissioned another Intertek-Metoc survey for the outfall between Herm & Jethou	It would be useful data.	David Parish (Property Services) will seek permission from Herm Island. Contacted on 7/3/19.

Topic	Comment	RHDHV Response	Follow up required?
1.10	Has Herm been affected by the development and operation of Longue Hougue? Could a new site present a knock-on effect. Attendee Jamie Hooper: *Herm has changed shape during the lifetime of Longue Hougue 1 – possible erosion has pushed the common Eastwards – perhaps caused by storms and the current Longue Hougue site. Could a new site accelerate that process – i.e. increase the rate of erosion?*	The existing site Longue Hougue site is part of the baseline of this EIA. RHDHV would not usually assess a previous effect, but it would be helpful to check the changes to the shape of Herm coastline over time (if data is available)? Dr Brew referenced a later slide showing no tidal current impacts on Herm. This indicates LHS is unlikely to influence Herm/Little Russel.	Aerial photos of Herm may indicate if the shape has changed over time. Whether developments around LH have had any influence is not possible to determine given the high number of variables.
1.11	You could model taking away the existing LH site to understand the effect of the current reclamation site on Herm erosion.	That is possible - but presently outside the scope of this EIA. There is some previous current modelling data, from around 2000. Graeme Falla also mentioned that in 2000 a wave buoy was installed for nine months at St Sampson Harbour. It would be useful for RHDHV to have this data	Note: The original Longue Hougue was constructed in 1990 / 91 so these studies do not look back before Longue Hougue
1.12	Has there been any changes at St Sampson's harbour? Potentially, to the northern tip	Noted - it was suggested that we talk to marine pilots re the entrance to the harbour.	Link to item 1.4

Topic	Comment	RHDHV Response	Follow up required?
1.13	Tidal speeds - more recognised units would assist the audience - e.g. knots/mph instead of ms^{-1}	Noted – will make it more meaningful to the relevant stakeholders and the public.	No
1.14	Some concern about dispersion impacts with regard to bacteria and bathing water due to effects on the dispersion from the long (LSO) and short (SSO) sea outfalls. LSO may not be influenced but SSO may be. Steve Langlois suggested engagement with Intertek-Metoc will clarify what has been done and ensure no duplicate modelling.	It will be useful to identify the LSO/SSO on the geomorphological model to understand if their location would be within an area of proposed change to tidal and wave action. Also may be useful for Brehon Tower to be added.	The key contact has left Inertek-Metoc. Guernsey Water can provide an alternative contact. Report provided to RHDHV. Outfall locations will be plotted on the model.
1.15	North East set of tides modelling. What about SW stream/low water? E.g. on lowest possible tide it could be out of water so may have low or no effect. Apart from corner coming off existing breakwater line.	Data can be presented at any state of the tide, but worst worst case shown – i.e. the difference between peak flood tide and spring tide/ ebb/ neap tide combinations.	No

Topic	Comment	RHDHV Response	Follow up required?
1.16	Rather than seeing impact of accelerated currents at Herm, what about if they change direction? May not see changes in speed but the location of the channel may shift eastwards?	RHDHV can report this data. Directional arrows were taken off the image of tidal current changes on the relevant slide but can be shown pre and post scheme to compare. David Brew's view is local coastal processes at Longue Hougue are predominantly driven by waves not tides - wave dominated environment even on a high tide.	No
1.17	Is the effect of both wave and tidal currents assessed?	Assessed separately - not a combination of wave and tidal currents.	No
1.18	N Cutts: Has potential climate change impact been factored in to understand sea-level rise and wave height etc?	Climate change has not been included for hydrodynamic modelling. RHDHV could rework the model with higher wave height, but this will need a review of the 2012 study.	RHDHV and the Project team to confirm if this will be included in the EIA.
1.19	N Cutts: Is info available for the existing LH -physical and benthic data?	No information available because at the time did not require planning permission as strategic development.	No. (Note: Bathymetry data of the existing site before development is available).

Topic	Comment	RHDHV Response	Follow up required?
1.20	Identification of assessment receptors - what do they relate to? Only biodiversity importance or general user importance as well? Will these be looked at?	RHDHV will look into this. The coastal processes chapter will look at impact on intrinsic geomorphological value and its subjectivity. The assessment will consider impacts to all relevant receptors rather than just the effects, for example value in biodiversity, flood defence, aesthetics etc.	RHDHV to clarify in their approach to EIA.
1.21	There is an oyster farming operation to the north. They extract sea water, and may be concerned about impacts. Specifically, suspended sediments at construction phase.	They are likely to be within the relevant study area for many of the topics for impact assessment. Not previously identified as an expert stakeholder, but can engage with them.	Project team and RHDHV to contact operators.
1.22	Termination of the proposed breakwater at the end of Spur Point – there is a WWII structure present. Is there any allowance to preserve that structure? Direct impacts to material assets have been scoped out of the Scoping Report - Paul Bourgaize, Festung Guernsey	Heritage impact assessment is to be carried out on all heritage material assets. This area /structure will be reconsidered (in light of the commitments in the Scoping Report) following this consultation process.	Further questions raised in the later workshop.

Topic	Comment	RHDHV Response	Follow up required?
Workshop 2: Human environment – traffic, noise and air quality			
2.1	Any considerations for other developments, e.g. Bulwer Avenue?	All will have cumulative impact assessments. Any cumulative development that is significant will also have to be applied, including the waste transfer station.	No
2.2	Power station operation – will it form part of the baseline?	RHDHV are liaising with Environmental Health. Continuous air quality monitoring is in place. Modelling will be against a worse case air quality as a baseline.	No
2.3	Is there existing information about noise and dust from construction phase of the current site?	Potentially. Previous developments, e.g. the waste transfer station, required EIAs. These may provide some historic data. Surveys are being carried out now (or later in the year – April) –over a 3 month window. Longue Hougue operational data may be very useful.	RHDHV have checked the data.

Topic	Comment	RHDHV Response	Follow up required?
2.4	Alan Dorey (La Societe) stated that the Gabbro Rock outcrop that would potentially be buried by infill is unique at that location and of national importance. It is a unique example of a layered gabbro, which has been studied by numerous universities. The whole lot would be covered.	Although covered/protected, future access would be impossible. If it only exists in that formation in this location, need to consider salvaging some before construction. Needs to be properly recorded by a Geologist. Some of the survey area will record it visually – benthic area – this information could be hosted in an appropriate location. Potentially could obtain a formal geological record for archiving and get a geologist in to do this.	A suggested option for mitigation would be to obtain and extract samples or provide other visuals for archive. RHDHV and the project team have identified mitigation.
2.5	The scoping report identifies 30% development underwater all the time. There may be underwater archaeology, but accepted not really practical/affordable, and the high energy environment reduces the probability of anything being present. 10% of the development is above high tide –archaeological interest in this area. The draft scoping report has insufficient detail of how the infill will be managed as it comes up the shingle bank and interfaces with the existing coastline. Infilling will use major machinery that might impact on this '10%' of the area. Near monitoring point 1 there's a coastal	It is known there is a fortification at Spur Point. Direct impacts on Heritage assets is scoped out in the draft scoping report, but could be re-assessed if the justification is insufficient. Rob Roussel stated that the detailed design levels have yet to be finalised so the transition from fill material to the existing coast line has yet to be considered. Things such as drainage would require further investigation. H&S implications around access to a construction site and an active infill site would be considered in the detailed design phase. Once completed a public right of way access may be reinstated but has yet been finalised – this could be considered through consultation processes. RR stated that based on planning conditions for the development of the existing land reclamation site,	Written comments from Phil De Jersey provided on 19/02/2019. RHDHV to cover response in the final Scoping Report

Topic	Comment	RHDHV Response	Follow up required?
	path, a granite wall, then rock armour/shingle – how is the site going to be finished off? What is the transition point? Suggested archaeology should be scoped in to address that problem, as the plans provided don't show sufficient level of detail.	there may be a requirement to provide a coastal footpath along the outer boundary of the site. SW confirmed this	
2.6	Where are the particulate monitoring locations?	The locations are identified on the presentation slides.	No
2.7	Will transport, air quality and dust monitoring be affected by half term etc.	It is a three month survey – low points and high points will be picked up	No
2.8	Will any rock armour be deposited from the sea side? The impact of idling vessels offloading rock represents other issues to be considered, including cost factors.	The design and construction approach is looking to bring material in from a landward side from the existing Longue Hougue facility. That is the currently the preferred route in.	No
2.9	Flooding issues – is this covered?	Yes, in the surface water assessment	No

Topic	Comment	RHDHV Response	Follow up required?
2.10	Noise monitoring points. Five mentioned in the text, but only four shown on the map.	RHDHV will identify location of the fifth site and include in the slides.	Update: there were initially 5 monitoring points, including a potential eco receptor located on the shore. However, after consultation with Environmental Health and the ecology team it was confirmed that there were no eco receptors at the 5th point. Point MP2 was also shifted to the location behind the reservoir as advised by Environmental Health.

Topic	Comment	RHDHV Response	Follow up required?
Workshop 3: Biodiversity – flora and fauna			
3.1	Are the Biodiversity Assessment methods considered appropriate?	Standard methodology to be employed – La Societe Guernesaise and the Biodiversity officer happy with this approach.	No
3.2	The map on slide 35 is high level. Is there a detailed version, with info on shingle/sand/ soft sediment and have any intertidal samples been taken?	To be clarified	RHDHV will investigate and confirm in the baseline assessment of the EIA.
3.3	N Cutts asked about taking soft sediment and hard inter-tidal samples	The question needs to be clarified	N Cutts to forward the rationale to RHDHV.
3.4	Mike Elliot: Terminology = Reclamation or land claim – given land is not being reclaimed, it is being claimed from the sea, the strict term to use is the latter.	Point noted. Reclamation is simply the term commonly used for this type of project.	No
3.5	Mike Elliot: Clarification regarding the 5km survey area. How does that relate to the Ormer, Oyster farm, Seagrass beds habitats? Need to ensure the EIA covers the 'far-field' effects as well as near field.	Surveys will cover the areas relevant to each topic. The oyster farm seawater intake is likely to be within the relevant survey area.	RHDHV to cover as appropriate in the relevant EIA topic chapter assessment.

Topic	Comment	RHDHV Response	Follow up required?
3.6	Mike Elliot: Cause/effect – does your modelling cover what currents are doing, once you start making changes, what happens? Knock on effect on hydrography, upstream or up-current of activities needs to be surveyed	Hydrodynamic modelling indicates changes to tidal currents are small and geographically restricted. Sediment suspension unlikely to be an issue due to the existing high energy levels (waves/high velocity tides) and predominance of coarse sediments (gravels, cobbles etc).	No
3.7	Are the benthic survey points fixed? Do they take account of the predicted changes to tidal current? If not, suggest additional benthic points to capture current changes.	Survey points shown on slides are indicative and selected prior to the results of the modelling being available. RHDHV agrees it would be useful to reassess the sampling points to be within the zone of changes to tidal currents. Map on slide 15 is not based on the results of the modelling - it would make sense to redistribute where there are changes to tidal currents. This would mean rescoping the sample points to be more aligned northeast to southwest and less far out into the channel	RHDHV to overlay the results of the modelling & define better where the sample points should be.
3.8	Once you have the modelling data – look at the effects along those tidal streams instead of putting more effort going offshore – put more effort longshore	The effects are reasonably localised around the facility. Slide 19 – shows effect of where those changes are	No

Topic	Comment	RHDHV Response	Follow up required?
3.9	The change to receptors in a known and local context is important– so the EIA needs to account for receptors in various contexts – Guernsey level through to European status. Habitat change should be covered as well as habitat loss	RHDHV will ensure importance of receptor in the context of local and Guernsey Island wide status is considered. This will accommodate how a particular area is designated and the reasons for designation. The assessment will also cover wider European / International significance.	No
3.10	Scaly cricket: There are UK populations considered globally important (other populations in Cherbourg peninsular, Portugal). Guernsey population considered to be globally important. La Societe is conducting a survey of local habitats. Has RHDHV caught scaly crickets recently? Dr Karim Vahed of the University of Derby is giving a talk in Guernsey on 24th April re breeding habits of the scaly cricket.	Scaly crickets are reasonably inactive at present. An initial survey was done in October, and another planned for April. Important to recognise there is a formal recognition process to determine whether an area or species is globally significant and as such receives a formal designation. The EIA is giving the scaly cricket specific consideration.	States of Guersney personnel attended the talk on the Scaly Cricket and fed back to RHDHV.

Topic	Comment	RHDHV Response	Follow up required?
3.11	Reporting on the Scaly Cricket is done on a separate basis. Are you aware of Societie Guernesaise' surveys of Scaly Crickets?	It would be useful to tie-up RHDHV surveys with any other surveys that are being carried out	Action: RHDHV to liaise with the on-island surveys to coordinate. J Hooper has offered to assist.
3.12	The rock armour within the bay is identified as an artificial habitat. There are cases where artificial habitats have become important in their own right. They attract their own biology and some have nature conservation designations. It should not be assumed that because it is artificial it doesn't have potential to support important species	RHDHV has expertise on this subject (e.g. the scour protection for foundations of offshore turbines). Experts will accommodate this in their assessments.	No
3.13	Does the timing of the works accommodate breeding species?	Yes. A Construction Environmental Management Plan (CEMP) will be put in place to identify when construction activities are restricted by breeding times etc.	An indicative CEMP will be provided with the final environmental statement.

Topic	Comment	RHDHV Response	Follow up required?
3.14	Will the EIA provide representative views on the rest of Belle Greve Bay? Or the RAMSAR site?	RHDHV can only identify the impact from this project. Julia Henney (Biodiversity Officer) - we can try and introduce mitigation measures but there is no legal or formal protection. SW stated there will be legal standing for mitigation measures included as planning conditions for any proposed development.	No
3.15	There are Internationally significant habitats within the 2km area	Point noted and will be accommodated as part of the assessment.	No
3.16	Will there be underwater noise?	There will be an aspect of marine noise. Based around the placement of the rock armour (most noise). However, the channel already has a lot of sources of marine noise.	No
3.17	Will the EIA consider marine mammals? Increase in bottle nose dolphins may be due to our waters being quieter – not based on evidence/fact, just an assumption	Marine mammals will be considered as a receptor in the relevant chapters. Spectral noise distribution – low frequency noise travels farthest and can be disruptive. RHDHV has experience on the assessment of this. Note underwater noise is proposed to be scoped out because of the baseline activity from vessels in the channel.	No

Topic	Comment	RHDHV Response	Follow up required?
3.18	Changes in coastal processes and impacts and how those are being measured, including potential for changes in the energy growth on shores. The draft scoping report identifies a Phase 1 intertidal survey, but what about covering the areas likely to be impacted from coastal processes? These could be impacted from reduction in current or energy? Would those areas be surveyed?	Yes, for coastal processes However, those present at the workshop cannot answer from a habitat perspective.	RHDHV will take that forward to identify whether we are covering a wider intertidal survey area than just at the site
3.19	Existing sediment will be disturbed – may be contaminated sediments – is that within scope? Consider known/unknown contaminated sediments.	Suspension of sediment during construction is scoped in. Unlikely to be contaminated within the infill material. Several things contaminated sediment could impact on. Considering contaminated sediment – but not for all chapters. Will find out more information from the benthic surveys to (potentially) revisit scoping out contaminated sediments.	No

Topic	Comment	RHDHV Response	Follow up required?
3.20	Will the bund be porous and release contaminated material? M Elliott referred to an infill facility in Scotland where seawater was stagnant within the bund then gradually filtered out – issues of low oxygen content, hydrogen sulphide and methane. Concern a facility could create plumes of poorly oxygenated water affecting water quality.	Current Longue Hougue facility has not caused a similar issue to the knowledge of RHDHV, nor other States' representatives. RHDHV not aware of any potential issues associated with the deposit of inert waste. The high tidal range and current velocity in the region is not likely to result in stagnating water.	It was suggested that ME provides RHDHV with a reference of that example. It was acknowledged that it was a SEPA report (may not be publicly available)
3.21	An EIA is only as good as action from it, otherwise a waste of time: • Long sea outfall - monitoring recommendation not followed. Transfer station construction overrun led to loss of a breeding season.	Noted. The ability of the Contractor to stick to the mitigation plans and Management Plans is a key issue – can make it contractually binding as part of the tendering process.	No
3.22	Potential biosecurity measures required from importing rock armour from overseas. Open harbours – no biosecurity protocols.	The States has set standards for shipping biosecurity by legislation. Would be dealt with via CEMP. Main focus is HGV movements of rock armour to site. Initial approach, rock offloaded and taken to the site by road.	No
3.23	Will there be any potential for Phase 2 surveys – for example bats? Records are based on observations	Noted. Our assessment is based on availability of data and what has been recorded on the Biodiversity List.	No (see 3.24)

A2 Public Comments

The comments made by the public following letter drops and during and after the public engagement event on the 1st and 2nd March 2019 are provided in **Table A2.1**.

Table A2.1 Public Drop In Event Comments

Date	Topic	Comment	RHDHV Response
12-12-18	Traffic and Transport	The survey area should include The Bridge area, and be included in the most northerly survey site.	The study area will be extended to the north (Les Monmains).
21-01-19	Landscape and Visual	It is recommended that three photomontages are initially prepared - including Beau Sejour, Hougue a la Perre, and from the sea along the ferry route.	Three photomontages were prepared as requested. Photomontages are presented in **Appendix 16.3** with methodology in **Appendix 16.4**.
14-02-19	Marine Ecology	Benthic surveys are usually done every 4 years at Belle Greve, but one hasn't been done as yet and is probably due. Video footage of the oyster farms was taken instead of benthic surveys at the time of EIA study for the LSO, which demonstrated little impact.	A benthic survey has been carried out as part of the data collection process for the project. It included grab samples and drop-drown video footage across the project site. The results of the survey have been used to inform the assessment of environmental impacts in **Chapter 12 Marine Ecology**.
15-02-19	Archaeology	The scoping opinion document lacks the necessary detail for an assessment of the impacts on the archaeology, particularly about key areas including the narrow strip of coastland above the high-water mark. List of data sources used to inform the baseline environment does not	Data from the Sites and Monuments Record (SMR) was obtained to inform the EIA which includes consideration of the direct impact of construction on archaeological sites (**Section 15.3**). In order to fully understand the impact of construction and operation on archaeology and cultural heritage, heritage

Date	Topic	Comment	RHDHV Response
		list the Sites and Monuments Record (SMR), although it was clearly used. 30% of the development area is sub-tidal, while 10% is above the highest tide level - it is accepted that although the 30% area below the tide may contain some archaeology, it is unlikely that much has survived in such a high-energy environment. However, the 10% area of land above the tide includes the vulnerable coastal strip with the German fortifications and any other buried archaeology. The direct impact of construction on archaeological sites has been scoped out of the EIA process, but whether this is fair depends on the precise details of construction, of which are not available in the scoping document. The impact of construction and operation on archaeology and heritage should be scoped into the EIA process. Mitigation measures should at least mention the possibility of archaeological evaluation, survey, or recording.	assets have been grouped into four key themes (**Section 15.6**, **Section 15.7**, and **Section 15.8**): Maritime and aviation archaeology below high water; Buried archaeology and cultural heritage assets above high water; World War II heritage assets; and Conservation areas and built heritage assets. Works within the coastal strip above high tide are limited to the installation of temporary haul roads, compounds and security fencing. The potential for interactions with German fortifications and any other buried archaeology are, therefore, low and measures such as archaeological evaluation are not anticipated to be required (**Section 15.6**). Further mitigation measures, however, are discussed including the implementation of a protocol for archaeological discoveries and specific measures to ensure the preservation and recording of gun emplacement MGU664 (**Section 15.6**).

Date	Topic	Comment	RHDHV Response
20-02-19	Landscape and Visual	Regarding the infilling stage infrastructure, in landscape and visibility terms, compound area B would be preferable as Area A has an established green pocket with the memorial bench, grassy area and Tamarisk hedge/ bushes around 2m in height… whereas the compound area B is landfill.	Compound A was dropped as a possible compound due to the concerns raised by a number of consultees and project specialists. **Section 4.4** and **Figure 4-3** present the final site compound location.
28-02-19	Coastal Processes	The proposed development may affect tidal flows with a relatively wide effect across the Little Russel, with impacts on Herm and the Ramsar site established there.	**Section 7.7** and **Section 7.8** examine and assess the potential effects on tidal flows and currents in the surrounding area based on the numerical modelling (**Appendix 7.1**). No change to tidal flows extended across the Little Russel to result in changes to the coastal processes on or adjacent to Herm and the Ramsar site.
28-02-19	Terrestrial Ecology, Marine Ecology	The report must take into account international conventions and obligations - The Bonn Convention, ASCOBANS, EUROBATS, AEWA, and Animal Welfare Law which covers all vertebrates and cephalopods (relating to marine development).	We do not ordinarily list conventions in the ES. We have referenced the AWO in the Ecology chapter in the Legislation and Policy Section and where relevant in the impact assessment.

Date	Topic	Comment	RHDHV Response
28-02-19	Coastal Processes	There is evidence that suggests that the development of the existing inert waste site has caused a change in coastal processes leading to erosion on the northern edge of Herm, resulting in a loss of nationally important habitat within a Ramsar site - which was not predicted in the original EIA. This should be modelled in the new EIA.	The assessment of coastal processes (waves and tidal currents) impacts at Herm are presented in **Section 7.8**. The results of hydrodynamic modelling and conceptual analysis of the wave regime show that there are no changes to the coastal processes at the northern edge of Herm, and hence no changes to the processes at the Ramsar site.
28-02-19	Marine sediment and Water Quality	Due to the historic use of St Sampsons Harbour and discharges into the sea, there may be concerns relating to buried contaminants. Data gathering should therefore include testing sediment samples for presence of contaminants. If possible, sediment samples should be taken to a depth that will likely be disturbed (not just surface sediment).	A benthic survey was carried out in May 2019 which collected sediment samples to be analysed for contaminants. The survey found mostly bedrock across the site and noted an absence of sediment in the grab samples. Only 5 of 9 samples had enough sediment for contaminants analyses. The results of the contaminant analyses have been used to inform the impact assessment in **Chapter 8 Marine Sediment and Water Quality**.

Date	Topic	Comment	RHDHV Response
28-02-19	Noise and Vibration	Additional noise receptor sites should be added on the west coast of Herm to monitor noise and vibration effects to sensitive ecological receptors within the 5km study area.	Noise contour isopleths were produced from SoundPLAN noise modelling for the construction (**Appendix 13.1 Figure A13.1** to **Figure A13.14**) and operational phases (**Appendix 13.1 Figure A13.15** to **Figure A13.18**), for interpretation by a qualified ecologist. The effect from noise and vibration on ecological receptors is therefore provided in **Section 13.6** and **Section 13.7**. The construction phase impacts were predicted to be negligible significance based on the realistic worst-case modelled scenario, including mitigation measures (**Section 13.6**). There will be the development of a construction phase management plan, which will outline Best Practice Measures (BPM) to ensure effects are minimised. The negligible impacts were determined at the closest sensitive receptors to the site. Due to the distance (~5Km) from proposed project construction, there were no impacts (elevated noise levels) at any human or ecological receptors at Herm (**Section 13.6**). For the operational phase, it should be noted there is currently an active site at Longue Hougue

Date	Topic	Comment	RHDHV Response
			undertaking the same processes as those detailed in the Environmental Statement (ES) for the proposed Longue Hougue South site with the exception that the Longue Hougue South operational activities are further away from Herm. Therefore, operational phase noise levels at the west coast of Herm are therefore expected to be lower than those from current operations (**Section 13.7**).
28-02-19	Marine Ecology	It is worth noting that eelgrass beds and maerl beds have been recorded within 5km of the proposed development. The effects of noise/vibrations on marine mammals should also be scoped in.	Maerl Beds were recorded in the drop-down video survey (**Appendix 17.1**) and potential effects on the habitat have been assessed in **Section 17.6** (construction) and **Section 17.7** (operation). Eelgrass beds were also recorded in a recent survey (**Appendix 17.2**) and impacts on this habitat have been assessed in **Section 17.6** (construction) and **Section 17.7** (operation). The effects of noise and vibrations on marine mammals has been scoped out of the assessment on the basis that the only potential for underwater noise is from the placement of rocks, which is highly unlikely to cause injury to marine mammal populations (see **Section 17.1**).

Date	Topic	Comment	RHDHV Response
28-02-19	Terrestrial Ecology	The scope for terrestrial ecology is poorly defined in this EIA. A lack of knowledge of the species present and the unique habitats as a combination of Mediterranean and Northern European flora and fauna requires further phase 2 surveys to be carried out. Bat surveys in particular, as bats are known to use the strand line vegetation for foraging and there is a potential impact due to loss of habitat and light pollution.	We have read and reviewed all of the habitat reports (2015 and 2018), undertaken a site visit and obtained the GBRC records data. We have reviewed the suitability of habitats on site for their likelihood to support protected species and where this is likely, undertaken the impact assessment on the worst -case assumption that these animals are present. With mitigation the impacts to bats, breeding birds, reptiles, small mammals and slow worm is negligible or no impact.
28-02-19	Climatic Factors	Climate resilience should be considered within the mitigation measures.	Climate resilience of use and operation of the site was considered during the design process, specifically with regard to coastal flood risk. Future development on the site will and should consider climate resilience for other elements as well including pluvial flood risk and site drainage. However, no other climatic factors associated with the or affecting the project were identified.
28-02-19	Natural Capital	Eel grass beds are very efficient at sequestering carbon. Damage to established eel grass beds releases carbon and contributes to climate change.	The eelgrass beds affected by the Project have been included and assessed within the Natural Capital chapter, see **Section 19.5**.

Date	Topic	Comment	RHDHV Response
05-03-19	Land Quality	Old desalination plant closer to La Hure Mare, so not impacting on the proposed site.	Noted.
05-03-19	Marine Sediment and Water Quality	Hydrographic modelling data may be used to predict the plume dispersion for the Long Sea Outfall.	Outfall pipe location and modelling to be mapped and included in assessment.
07-03-19	Traffic and Transport	Cumulative traffic impact associated with the continuation of traffic for inert waste management and new residential development - the Island Development Plan needs to be considered. Discussion with Simone about planned future development locations (GIS map), to inform Ryan's modelling - Noise and Air Quality must also be considered due to associated impacts with cumulative assessment modelling.	Cumulative impact assessment utilise spatial data to scope in/out local projects to be considered in noise, traffic and air quality chapters.
07-03-19	Coastal Processes	In terms of physical changes (predominantly to do with sea currents), the DDV survey extents should be reviewed as appropriate. Current change plots could be overlaid with marine benthic survey shapefiles.	The benthic survey sampling locations and DDV locations reflect the areas where the largest changes in tidal currents are predicted by the hydrodynamic model.

Date	Topic	Comment	RHDHV Response
07-03-19	Terrestrial Ecology	Scaly Crickets are of key ecological interest - La Societe Guernesiase intends to carry out beach surveys in the coming weeks.	RHDHV to collaborate with La Societe Guernesiase on Scaly Cricket surveys.
07-03-19	Landscape and Visual	The view from the sea may change significantly and this must be considered in future assessment.	A photomontage from the sea was prepared and is presented in **Appendix 16.3** and the assessment of views from the sea have been assessed in **Section 16.6** and **Section 16.7**. The assessment concluded a minor adverse impact on character, and moderate adverse visual impact.
07-03-19	Public Amenity	Users of the back of the beach and activities such as snorkelling should be considered.	The known users of the site are identified in **Section 14.3**, and the impacts on users has been assessed in **Section 14.6** (construction) and **Section 14.7** (operation).
07-03-19	Marine Ecology	Impact assessment with respect to water quality and benthic ecological impact should be made to cover ecological receptors such as oyster beds within the study area.	The potential for water quality impacts on benthic ecology, including oyster beds, have been assessed in **Section 17.6** (construction) and **Section 17.7** (operation).

Date	Topic	Comment	RHDHV Response
08-03-19	Marine Sediment and Water Quality	Concerns for Guernsey Sea Farms, an oyster and clam seed production business, as they rely on seawater drawn into their quarry. Suggestion that they be included as an expert stakeholder to provide input.	Guernsey Sea Farms is approximately 2.5km away from the project boundary by sea. **Chapter 7 Coastal and Marine Processes** does not predict any change to waves or suspended sediments any further than a few hundred kilometres away from the project boundary, therefore Guernsey Sea Farms has not been included as a sensitive receptor that could be impacted as a result of the project.
11-03-19	Traffic and Transport	Construction phase would likely have the greatest impact in terms of traffic, and therefore the inclusion of construction phase scoping in the asessment is supported. The scale of the impact will depend on the chosen method of breakwater/rock-armouring construction and material supply to the site - there are 5 sites listed for collection of background traffic flows, but this does not include Northside, The Bridge, or Southside. It is therefore important during the construction phase to consider whether this data would be important for assessment. The plan includes proposed traffic counter locations (including Northside and Southside), but they do not appear within the scoping document -	Engagement with the SoG Highways Department led to the agreement of extension of the study area to the north (Les Monmains), and the addition of two ATC sites to cover potential use of the Ronez block plant and RM Concrete sites to the north. If any imports were to come from St. Sampson's Harbour, these could be covered by our HGV distribution. Pedestrian (cycle) amenity is broadly defined as the pleasantness of a journey and is considered to be affected by traffic flow and composition, pavement width, and seperation from traffic, and takes into acount pedestrian fear and intimidation, and exposure to noise and pollution - for these reasons, and as part of the GEART assessment

Date	Topic	Comment	RHDHV Response
		consideration must be given to traffic data collection to assess impacts during the construction phase. Alternatively, outline for THS why St. Sampson's Harbour imports will not be significant during the project. Mention is made that most lanes in the area have a 25mph speed limit, when in fact most have a 35mph speed limit. Ruette Tranquille have recommended a speed limit of 15mph, not 10mph. There are a few designated cycle lanes, but one runs alongside the Inter Harbour Route. It may be incorrect to say that this development will have an impact on Ruette Tranquilles.	methodology, it is strongly recommended to include this as a consideration.
14-03-19	Marine Ecology/ Project Design	Initial BPEO did not mention the environmental sensitivity of the proposed area due to the presence of the endangered Scaly Cricket, nor the potential negative impact of Maerl beds in the area - if this is new information that would have impacted this initial assessment, it should be revisited in light of this information. It is essential that up-to-date figures on the quantum of waste are being used, with a view to quantify the scope for recycling, as to enable an accurate	The EIA developed a rapid understanding of the environmental (particularly ecological) receptors that are present within and adjacent to the Project site. The surveys carried out as a result of the Project and the EIA process have provided a significant additional source of data and information regarding species and habitats in Guernsey as well as the project site. Such information was not and is not credibly available at a high (island) level, and as such the BPEO for any sites could not rule out such

Date	Topic	Comment	RHDHV Response
		assessment of the needs and economic viability of the project.	receptors being present elsewhere, thus a data gap would be present for any of the sites previously considered in the high level BPEO work. It is further noted that whilst maerl is within 300m of the site, it is not affected by the Project (see **Section 17.6** and **Section 17.7)**. Island wide scaly cricket surveys have also found populations present across a large number of sites (see **Section 18.3**). The latest forecast volumes of inert waste generated on the island are detailed in **Section 4.5**, and these have been used to derive traffic volumes used in the various technical assessments. The economic need and viability of the project were developed and resulted in the site selection in the Inert Waste Management Strategy.
14-03-19	Population and Human Health	The current planned survey points do not include receptors on the most vulnerable and closest affected site, namely the Gorselea residential site. Modelling the likely outcome of noise and air quality on this site over baseline conditions, as well as other threats to resident health and rights, is essential. Assessments of noise and air quality impacts of the current operations should	Surveys (air quality and noise and vibration) were carried out at the nearest residential receptor as well as other locations (see **Section 12.3** and **Section 13.3** respectively), and modelling and impact assessment of the air quality impacts and the noise and vibration impacts are assessed for the nearest residential and other receptors (see

Date	Topic	Comment	RHDHV Response
		be included. Key data from professional monitoring must be made available from the prior site preparation works (current Longue Hougue land fill site). The EIA should demonstrate that it has cross validated the model with pre and post monitoring/modelling data from the ES and planning conditions of the current land claim site (a living example) to identify the 'actual' versus 'expected' impacts of the proposed development. In similar situations, the building works have been carried out from the sea - it is less environmentally-damaging to bring rocks for the bund by sea and use machinery at low water to put the material into place. This approach is less nuisance to those on land and should be considered as a more sustainable approach under BPEO.	**Section 12.6** and **Section 12.7** and **Section 13.6** and **Section 13.7**, respectively).
14-03-19	Landscape and Visual	The site is incorrectly being referred to as part of an industrial area. The IWP shows the foreshore in the area to be of importance for biodiversity and there is also residential land that was excluded from the development centre of St. Sampson. Therefore, it is essential that accurate	The baseline was amended in line with this comment, see **Section 16.3**. Detailed assessment of nearby and far viewpoints and views was undertaken, see **Section 16.6** (character) and **Section 16.7** (visual).

Date	Topic	Comment	RHDHV Response
		visual and landscape viewpoint impact assessments are made that look at properties and public areas adjoining to, and in clear sight of the development area. It is also important to known the use of the new land-claim after completion of the scheme, as it may not be suitable for certain uses while allowing industrial use may create further visual impacts.	Due to the long timescale of the site operation and given that island requirements in 15 years may be very different from today it is not considered suitable to provide a present day indication of use when this may not be relevant in the future. However, any development after completion of the site operation phase will have to comply with due planning process.
14-03-19	Marine sediment and Water Quality	No consideration of bund type and threat of pollutant creation - contained waste may be inert, but seawater forced into porous bund material may become anoxic, leading to creation of H2S and CH4 which give both toxic and aesthetically damaging effects. Also difficult to ensure no OM is included in the inert material held within bund. Assessment process should address this.	The material the bund would be constructed of is known as it based on the required design. We have calculated the seawater ingress and egress and it indicates that there would be a fairly rapid inflow and outflow of water which would therefore not become anoxic given that there would be rapid water exchange and thus no deterioration in the levels of oxygen present. If organic matter is present this could reduce the oxygen present in the water inflowing / outflowing, however, site operations and operational procedures are set to prevent organic matter being present in the material allowed within the site. Not only are loads checked once they are also scrutinised by a contractor to extract material that can be recycled. On that basis

Date	Topic	Comment	RHDHV Response
			there is a low risk of organic matter being deposited within the site and affecting water quality.
14-03-19	Population and Human Health	Formation of proposed land-claim may affect dispersion from sewage outlet point. The location of this outlet would have been placed to ensure adequate dispersion and dilution of effluent. It is likely that the new land-claim will change the hydrographical regime including water currents and effects of wind. This may result in insufficient dispersion/dilution and the effluent entrained closer to shore, closer to bathers. This is of importance from a health perspective as well as a realistic cost assessment should the pipe need to be repositioned.	**Section 8.6** of **Chapter 8 Marine Sediment and Water Quality** shows that there will be no interaction between the long or short sea outfalls and physical processes as a result of the proposed project. Therefore, there is no risk to human health as a result of the proposed scheme.
14-03-19	Coastal Processes	New landfill will create an abrupt change in the coastline - a new corner that could cause material to gather. Fine sediment may be deposited in a new 'quiet zone'. This could change the sediment from a coarse sand and shingle beach area to a more muddy, lower-energy area. This carries health risks, visual impact risks, and loss of amenity risks. This	The assessment of hydrodynamic impacts at the Project are presented in **Section 7.8**. The reductions in current velocity are small compared to the absolute baseline velocities and so the possibility of creating zones of fine-grained sedimentation is low. Also, although the tidal current regime may be reduced in its capacity to transport sediment, the wave regime will continue to

Date	Topic	Comment	RHDHV Response
		could also have consequences for the preferred habitat of the scaly cricket, reducing available habitat. It is therefore very important that modelling clearly addresses this risk - and that the modelling has regard to the more abrupt change in coastline than was the case with the previous land fill, and the greater anticipated impact on the Herm coastal region than was anticipated with the previous landfill. Impact assessment and monitoring must have regard for the speed of tidal flow (give the unique tidal strength of the area), and the increased likelihood of impacts on the oyster beds, ormer sites and harbour silting.	be relatively high energy and capable of re-suspending any deposited sediment. Hence, the sediment on the sea bed and in the nearshore zone would not change significantly in particle size from that currently existing.
14-03-19	Surface Water and Flooding	The height of the proposed landfill may impact on the dissipation of rainfall surface run-off from adjoining properties, leading to increased risk of flooding which has not been considered adequately. The abrupt changes in coastline could also have a material adverse effect on areas already at risk including Bulwer Avenue and the Banques.	The current and future flood risk has been considered in **Chapter 9 Surface Water and Flooding**. **Chapter 7 Coastal and Marine Processes** does not predict a significant change to coastal processes as a result of the proposed scheme.

Date	Topic	Comment	RHDHV Response
14-03-19	Public Amenity	The proposed area is currently used as a recreational site including walkers and ormerers, as well as sea-based users such as fishermen. Assessment of the current users is critical for a credible EIA.	The known recreational users of and activities within the site are identified in **Section 14.3**, and the impacts on users has been assessed in **Section 14.6** (construction) and **Section 14.7** (operation).
14-03-19	Project Design	Potential and likely use of the land, likely timescale of availability of useable land, as well as the core costs of construction and operation of the site must be considered. EIA should include a realistic assessment of likely future usage.	As for the adjacent existing site the future use of the land after operation has ceased will be subject to a separate Environmental Impact Assessment. Due to the long timescale of the site operation and given that island requirements in 15 years may be very different from today it is not considered suitable to provide a present day indication of use when this may not be relevant in the future. However, any development after completion of the site operation phase will have to comply with due planning process. The future use of the site has not therefore been considered in this ES.
26-03-19	Terrestrial Ecology	The current Phase 1 habitat surveys of the proposed site should be extended to include all habitats within the proposed site and also the intertidal and subtidal areas which are likely to be affected by the development. Selected Phase 2 surveys should be conducted on the habitats	It was assumed that Phase 1 was sufficient, albeit with need for additional scaly cricket survey, as we reviewed all habitat survey reports (2015 and 2018), undertook a site visit and obtained the GBRC records data. We have reviewed the suitability of habitats on site for their likelihood to support

Date	Topic	Comment	RHDHV Response
		identified during the Phase 1 surveys so to identify any vulnerable or protected species. Following the Phase 2 surveys. species specific surveys should be conducted on any vulnerable or protected species. It appears only scaly cricket and bird surveys are being conducted, but it is likely that more locally, nationally, and internationally important species (e.g. Bats) are likely to be using the site and further surveys will be required to understand the impact of the proposed development on their populations.	protected species and where this is likely, undertaken the impact assessment on the worst-case assumption that protected species could be present adjacent to or foraging within the site, and we have identified standard and straightforward mitigation to prevent impacts occurring to bats, breeding birds, reptiles, small mammals, and slow worm. It is noted that a Phase 2 intertidal habitat survey was undertaken (see **Appendix 17.2**).
27-03-19	Marine Ecology	It is a well established fact that cetaceans use sound as their primary sense for navigation, finding food, and communication, and there is growing evidence that noise pollution can have a severe negative impact on whale and dolphin populations. Whilst there is a level of baseline underwater noise from shipping within the English Channel, this differs from the noise that will result from this project in a number of ways, and I believe the effect of noise pollution on marine mammals should be considered in the EIA.	The only source of underwater noise from this project is from the placement of rock underwater and from the use of vessels, if required, for the construction of the breakwater in deeper waters. A review of the underwater noise associated with different man-made noise through construction activities concluded that rock placement activities cannot be heard over the noise associated with the vessel used to undertake that activity. While the underwater noise associated from the placement of rock underwater has been reported to have negative effects on marine mammal species up to a few

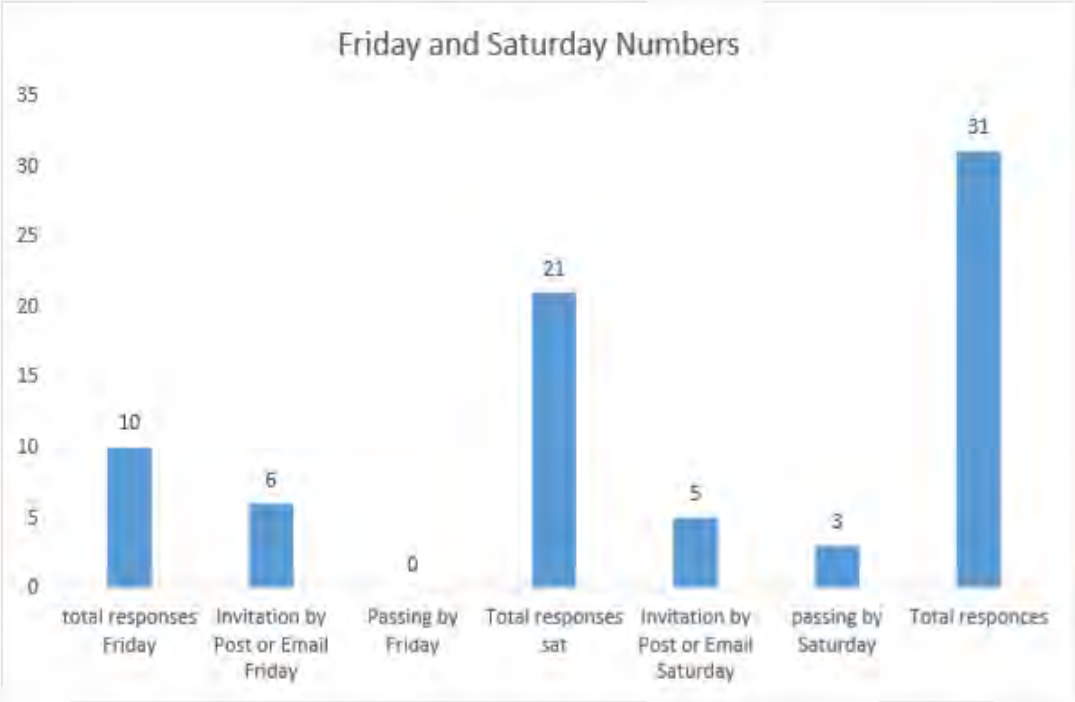
Date	Topic	Comment	RHDHV Response
			hundred metres, these effects are only found in much deeper waters which allows for much larger noise propagation ranges. It is considered extremely unlikely that any individual would remain in the vicinity of any such activity for that period of time, and would in reality travel away from the rock placement activities. There is no potential for effect on any marine mammal species if they are exposed to the sound of rock placement for a single occurrence. Taking the limited effect of rock placement activities on marine mammals, and that rock placement has only been found to have any, if limited, effect on marine mammals in much deeper waters where sound can propagate much further, it is considered unlikely the activities would have any effect on the marine mammal populations in the area, and it is therefore proposed that it is screened out of further assessment.
05-04-19	Project Design	The amount of Harbour space that could be taken up during a potential operational phase of an inert waste disposal facility if it were to be located East of the QEII is dependent on the design and purpose of the fill area. Considering	The Project proposed is the Longue Hougue South site which is detailed in **Chapter 4 Project Description**. The selection of the site is detailed in **Chapter 3 Site Selection and Consideration of Alternatives**.

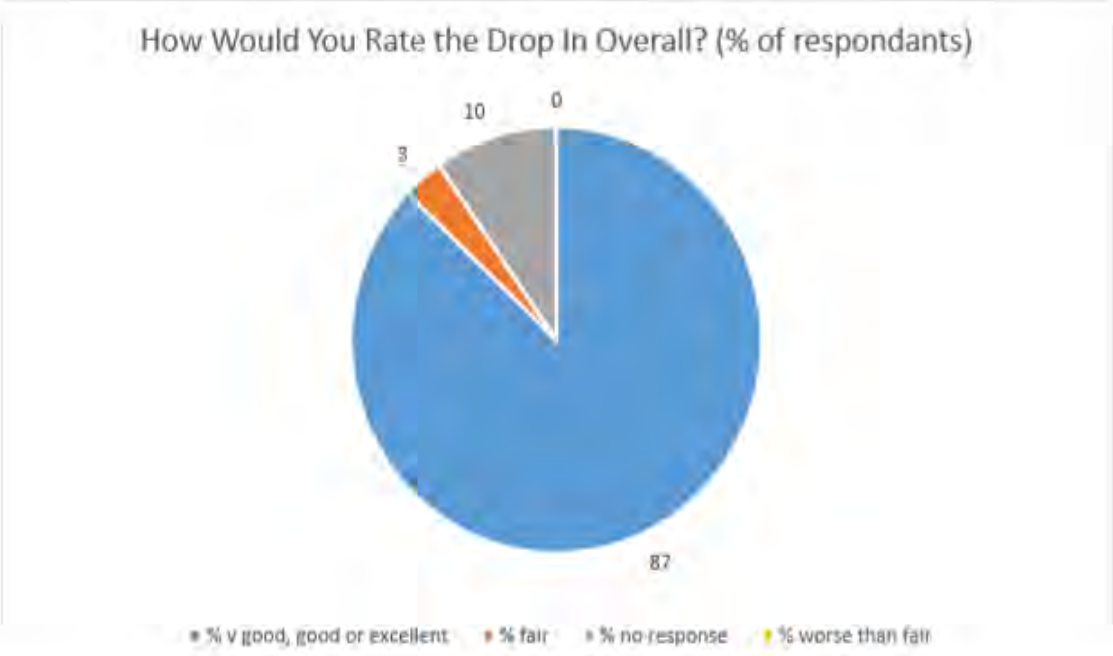
Date	Topic	Comment	RHDHV Response
		past experience with the existing site, there should not be too much impact, and that could potentially be mitigated. A bigger issue would be accessing the site for construction of the rock armour breakwater if this was done from the landward side rather than the sea – the logical starting point for this would appear to be from the northern most point of the QEII breakwater, with access along the breakwater. We would also need to consider operationally how the site would be filled initially – I think the logical method would be to cut through the raised breakwater at the end of the access road once the new breakwater is in place and fill from there. This would need a turning area for vehicles, but not a lot else if bulking continued at Longue Hougue.	The approach to construction of the breakwater at Longue Hougue South is described in **Section 4.4**, two options are possible and the worst-case scenario of either option was assessed throughout the technical chapters. Infilling operations are described in **Section 4.5** and shown on **Figure 4-4**. Access is through the same access as the Household Waste Recovery Centre with vehicles then travelling around the landward edge of Longue Hougue to access Longue Hougue South from the north-east corner. Infilling operations would then progress from east to west.
Commenced 06-04-19 and continued through to August 2019	Coastal Processes	Between April and August 2019, consultation with the Guernsey pilots took place regarding discrepancies between their experience and the baseline results of the hydrodynamic model. A dialogue was established and the main comments from the pilots are reflected below:	The discrepancy in the baseline model results was due to a lack of detailed bathymetry around the entrance to St Sampson Harbour and to the north of St Sampson Harbour. To rectify this Admiralty data (contours and other spot heights) was digitised to provide more detail in the area identified by the pilots. The model was then re-run on the spring ebb

Date	Topic	Comment	RHDHV Response
		"There seems to be an assumption that the strongest tides are only over the shallowest patches. This in fact is not the case, it is not as simplistic as that. The very variable depths and coastal topography throw in a complicated resultant behaviour in the tide. Vessels experience very strong tides west of Brehon. The whole of the deeper channel, between the present reclamation and Torode, and stretching up the Douit Sauvary, (the deeper narrow channel stretching up past Bordeaux and past the Bectondu) is a fast flowing rip of tide, and rates can and do exceed 5 knots. Rates of tide are affected by many variables. It is not always the biggest Spring Tide that causes the strongest flows, it is possible that a 8.5m tide may give stronger flows than a 10.0m tide. Atmospheric pressure, a wind that has blown fairly steadily from one direction for a lengthy period, even, bizarrely, high temperatures over a lengthy period can increase or decrease flows." The pilots experience of the approaches to St. Sampsons harbour is 5 knots (2.5m/s) northerly (flood) flow at spring tides when high water is in	tide, which is the tide that the model was not representing as identified by the pilots. The results show: About 100m away from the existing Longue Hougue shoreline and between Crabiere and Torode reefs, the model predicts peak flow velocities northwards of around 1.8m/s - 2.0 m/s (3.5 knots - 3.9 knots). The model is a 2D depth-averaged model, and the current speed at the sea surface would be usually 20% higher than the depth-averaged current speed. If 20% is applied to the depth-averaged velocities, this would lead to modelled surface current speeds of approximately 4.2 knots - 4.7 knots. This is close to the 5 knots off Longue Hougue seawall experienced by the pilots. Over Torode reef, the flows are predicted to accelerate to 2.2m/s - 2.4m/s (4.3 knots - 4.7 knots) and then decelerate on the north side to 1.2m/s - 1.4m/s (2.3 knots - 2.7 knots) in line with the reduction in velocity experienced by the pilots. Seaward of Torode, the model predicts velocities of 1.8m/s - 2.0m/s, like the predictions on the landward side of Torode and in line with the pilots'

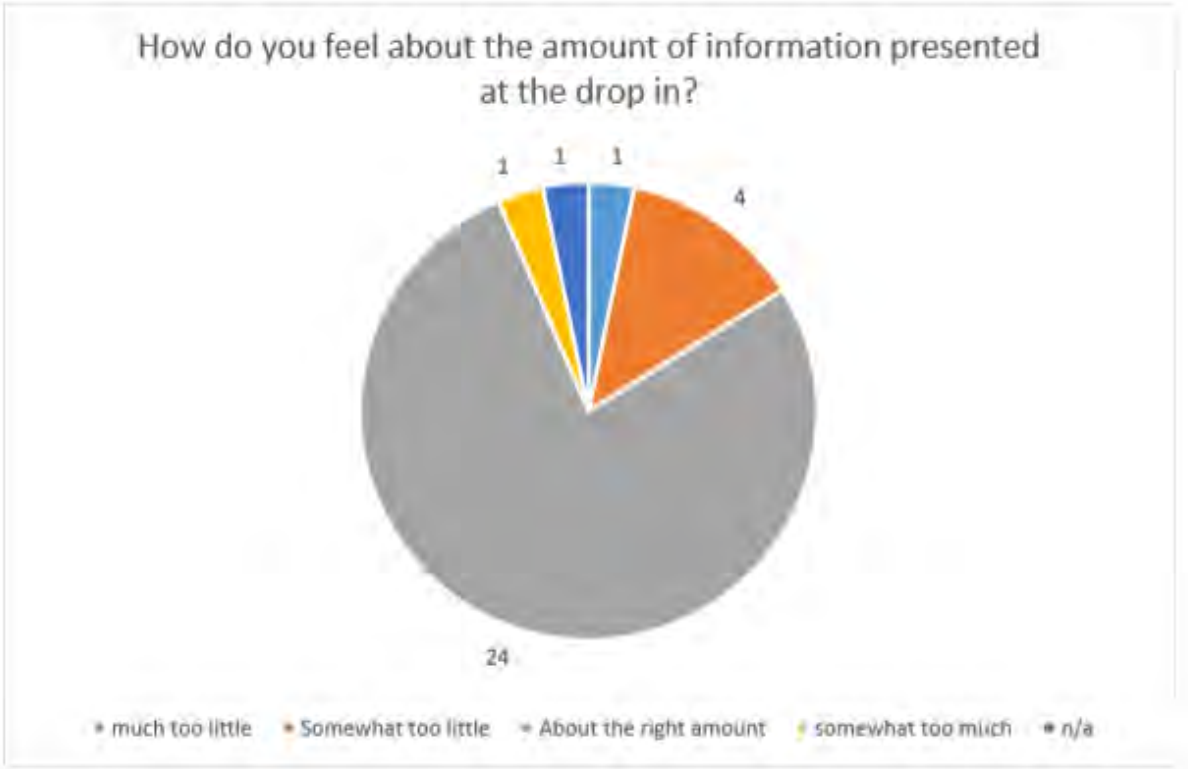
Date	Topic	Comment	RHDHV Response
		excess of 9.2m. This would be the surface current. This is in the intersection of the leading lights of St. Peter Port and St. Sampsons, running along the eastern wall of the present reclamation area, and across the access to St. Sampsons in the area of the Crabiere reef (the reef that is just north-northeast of Longue Hougue with a drying height of 2.1m above CD). A lesser rate is experienced when the vessel is north of Torode/Fosse Torode (the reef to the east of Longue Hougue, drying at 2.7m above CD at its shallowest point). Torode being a large area of rock and north of this area and the tidal flow is reduced but on either side, it is accelerated quite dramatically.	experience, if depth-averaging is taken into consideration. Agreement was reached with the pilots in August 2019 that the baseline hydrodynamic model results satisfactorily replicated their experience of entering and exiting St. Sampson Harbour. The baseline results are presented in **Section 7.4**.

Appendix A3 Inert Waste Drop-in Feedback Summary






Have the team been able to answer any questions you had?
1
1
29
Yes
No
Awaiting Responses


How do you feel about the amount of information presented at the drop in?
1
1
1
4
24
much too little
Somewhat too little
About the right amount
somewhat too much
n/a

Comments

- no cost reclaim. Use at st peter port extension
- Longue Hougue is a larger facility for inert waste but some of the waste could be diverted to a potential St Peter Port harbour extension which is vital to protect our existing harbour facilities.
- Was informative and has given me the information to decide how I feel about the proposal
- The presentation boards could have been larger to make it easier to view the information
- As plans/consultations proceed will there be more such 'dropins' to keep public informed? Invitation appreciated
- lack of joined up thinking with other committees
- Confusing. Need video. More of a sit down/relax table area
- I feel very reassured that the States are focussing on one site alone at this stage. The air quality is extremely poor in St Sampsons and the traffic and transport infastructure is inadequate to sustain additional burden. The waves tidal currents etc really really does need to be investigated deeply etc. etc. etc. I shall leave it here!!
- I feel there is no plan (effective) as there is little political support long term.
- Is this the start of filling in Belle Greve Bay by stealth?
- Let's get on with it
- Very helpful and informative
- The 'scaley cricket'. Sites impact and 'development creep'. The thin edge of the wedge in the 'infill' of Belle Greve Bay - against.
- All questions answered. Very good. Thank you
- I would strongly go in favour of harbour extension with a pier which could also be used by cruise liners as we get so many cancellations due to rough seas.
- Further detail in the information provided on how the site would look after the development
- Desperately need a big plan for harbours etc.

Appendix A4 Inert Waste FAQs

INERT WASTE – FREQUENTLY ASKED QUESTIONS	
Inert Waste and the Inert Waste Strategy	
What is inert waste	Inert waste is produced from excavation, construction and demolition activities, and mainly comprises rubble, hard-core, concrete, bricks, tiles and other ceramics, clean soil, and mixtures of these items.
Why do we need a Strategy solely for Inert waste	The Solid Waste Strategy is primarily focussed on the management of household and commercial waste. It states that "Future inert waste disposal will be reliant on further land reclamation projects", which is limited in outlook for inert waste, and does not provide a strategic or sustainable direction for the future management of inert waste. An Inert Waste Strategy is therefore required to formalise the States' position in relation to inert waste, which: complements and is consistent with the approved Solid Waste Strategy 2012; and will provide a framework for the future which can be taken into account by Islanders and businesses, to enable sound investment decisions to be made.
What is the focus of the Strategy	The Strategy does not solely seek to focus on one site as a solution for inert waste. Instead it provides a 20-year plan for improving the management of inert waste on Guernsey by providing phased implementation of a series of measures and solutions to implement an inert waste hierarchy. This includes measures for developers to plan for how their construction wastes will be managed in advance of construction to maximise waste minimisation opportunities. It will enable the provision of a new facility for the management of residual inert waste - that cannot be reused or recycled or recycled elsewhere. The Strategy will enable the capture of baseline data about how inert waste is managed to ensure that within approximately three years, realistic and relevant targets can be set for Guernsey on how inert waste should be managed.

INERT WASTE – FREQUENTLY ASKED QUESTIONS	
	The Strategy will be reviewed every five years to ensure that it remains relevant and keeps up to pace with innovation in the management of inert waste.
What is residual inert waste	Residual inert waste is inert waste that cannot be reused or recycled or recycled elsewhere for example by converting it into an aggregate product; or used on the island for construction purposes. This represents waste that is discarded by the construction industry or householders carrying out construction or demolition projects. It requires a facility to manage it appropriately.
How much inert waste is managed on the island	At the present time, we do not know the total amount that is produced, only the amount of residual inert waste that is sent to the current Longue Hougue facility. The amount being deposited in the current facility has reduced for the fifth consecutive year. However, historical data shows that there have been periods in the past where the amount has reduced, only for it to peak again due to major island development. So, we have to be cautious when using any declining trend or historical data to estimate how much will be produced in the future. The Inert Waste Strategy has an aim to implement measures to capture the baseline information required to quantify inert waste management on the island. We aim to use the Strategy to quantify this and develop knowledge about how much inert waste is being reused, recycled and recovered on the island.
What is the waste hierarchy for inert waste	The “waste hierarchy” ranks waste management options according to what is best for the environment. This is a process of prioritising how waste is managed according to the following order: Avoiding producing waste. Waste reduction. Reuse - this has a very limited definition and means cleaning or repairing something so it can be used for the same purpose it was originally put to (e.g. cleaning a waste brick of mortar, so it can be used as a brick again). Recycling - treatment applied to waste so it can be transformed into a usable product that meets market specification. This includes recycled aggregate.

INERT WASTE – FREQUENTLY ASKED QUESTIONS	
	Recovery - putting waste to beneficial use (for example creating a landscape or screening bund) - in the Strategy, reclamation is being promoted as recovery where it is in line with Policy and will generate land that can be put to beneficial use. Disposal - depositing inert waste in or on land where it is not being put to any beneficial use.
What is the difference between recovery and disposal	Recovery is where waste material is intentionally put to beneficial use by replacing virgin/raw materials that would otherwise be put to that same use. Disposal is where waste is discarded without being put to any beneficial use.
Does the Strategy focus on reclamation	No, reclamation is one of a number of options that are dictated by the inert waste hierarchy. In fact, Reclamation is lower down the hierarchy than reuse or recycling of inert waste.
How has the Strategy been developed	The Strategy has evolved over a long period based upon early research carried out by the States to look for potential options to replace the Longue Hougue facility; which has then been supplemented by the work of consultants in the past 12 months or so, to assess the management of inert waste on Guernsey; and independently assess the feasibility of over 50 potential options for the management of inert waste, including different waste management measures as well as new inert waste facilities. The proposed solutions have been developed by following a recognised approach by using the Best Practicable Environmental Option (BPEO) which required assessment of each of the options against environmental, social and economic factors that were relevant to Guernsey.
Why are there no targets in the Strategy for recycling	The Strategy recognises that there is insufficient data on the total quantities of inert waste being managed across the Island. Until this is known, it would be premature to put targets in place that are challenging but are relevant for Guernsey. Therefore, the Strategy is proposing a stepwise approach to implementing measures to encourage reuse, recycling and recovery, whilst at the same time, putting in measures to benchmark the amount of inert waste that is being managed according to each option.

INERT WASTE – FREQUENTLY ASKED QUESTIONS	
Management of Inert Waste	
Instead of using inert waste for reclamation, why not reuse, recycle or recover it.	This is exactly what the Strategy is promoting. Only residual inert waste that cannot be put to beneficial use elsewhere on the Island will be managed in a proposed facility. This is currently happening now on the island, but there is no strategic direction to this practice, which creates uncertainty for the construction industry - the Strategy will encourage the construction industry to look for more hierarchical options for managing inert waste.
Why can't all inert waste be recycled	Consultation has been held with the construction industry and they have identified that recycling of inert waste does happen. However, the inert waste has to be of the right quality to ensure that it can be recycled and there is a market for these recycled materials. Not all inert waste is of the right quality and it can be disproportionately expensive to treat small quantities of mixed inert waste to extract good quality aggregate, for example.
Why can't residual inert waste be processed further to turn it into a beneficial product or construction material	The Strategy encourages the processing of all inert waste, but the decision on the lengths that the construction industry will go to maximise the amount of reuse, recycling and recovery is driven by how cost-effective the treatment and processing will be.
Will all of the inert waste generated be disposed of	No. Only residual inert waste will require a specific facility to enable it to be safely managed when the Longue Hougue facility becomes full.

INERT WASTE – FREQUENTLY ASKED QUESTIONS	
How is residual inert waste being minimised	The States are introducing Site Waste Management Plans for developments, which will require developers to plan for all of their waste in advance of the development taking place. This will allow for waste minimisation or reuse or recovery of inert waste for beneficial use to be part of the design. Thereby minimising the amount of residual inert waste that cannot be reused within the development or recycled by the construction industry.
What are Site Waste Management Plans?	A Waste Management Plan is a framework which details the amount and type of waste that will be produced on a construction site and how it will be reduced, reused, recycled and disposed of, in order to encourage increased diversion of construction and demolition waste from landfill. There is a requirement for a Waste Management Plan to be prepared for certain proposals, as set out in the Island Development Plan, Policy GP9: Sustainable Development: The demolition and rebuilding of dwellings on a one for one basis, or the demolition and rebuild of redundant buildings or dwellings which have been subdivided or where development is for five or more dwellings or for any development of a minimum of 1,000 square metres of floor area. In order to fulfil the requirements set out in the Island Development Plan (IDP) a detailed breakdown of materials and estimated waste needs to be provided, along with details of how waste will be reduced at all stages of the project. This is set out at the start of designing the development and then a record must be kept of the actual management of all waste on the site during construction. This record is then sent to the States to inform their monitoring.

INERT WASTE – FREQUENTLY ASKED QUESTIONS	
What do other countries do with inert waste	Research carried out to support the Strategy identified that no other small island nation in Europe had a specific standalone Strategy for dealing with inert waste, so Guernsey will be leading in this regard. Some did not refer to inert waste in any Strategy, and some simply referred to the EU 2020 target of recycling >70%. Some nations had an avoidance of landfill target instead of a recycling target. In terms of large countries, the UK recovers almost 90% of its inert waste and the Netherlands >95% of inert waste, by reusing inert waste as low grade construction material (as infill material, landscaping material or for creating bunds); or recycling segregated inert waste into secondary aggregate. These are all practices that are supported by the Guernsey Inert Waste Strategy. It is noted that these figures do not include dredging spoils and the vast majority of soil. Uncontaminated soils are included as residual inert waste in Guernsey and make up a significant proportion of the overall quantities.
Residual inert waste site	
Why do we need another site	The Longue Hougue facility has a finite life and has limits on how much material can be placed there because it cannot be raised beyond the planned levels. The Strategy places an emphasis on ensuring as much inert waste is reused or recycled as possible. However, some inert waste cannot be reused or recycled and therefore a facility is required to manage this material in a safe way. No matter how much is recycled and reused there will be a requirement for managing residual inert waste on island. The States Trading Supervisory Board (STSB) as Waste Disposal Authority has an obligation to ensure provision for inert waste management including construction or demolition rubble that cannot be re-used or recycled because they have no commercial or beneficial value.

INERT WASTE – FREQUENTLY ASKED QUESTIONS	
Why do we need to think about a potential new site now - the current site has a few years left and inert waste quantities are reducing	There are legislative and planning decisions that must be followed before any site can be agreed. These take a long time to generate the necessary amount of information required to make the planning decision. There will be environmental surveys required and these can take a long time to ensure that all of the required evidence has been collected to be able to identify what measures will need to be put in place to ensure any site is safe and does not cause any significant adverse impacts.
What is the strategic reason for reclamation	Reclamation is currently being carried out at Longue Hougue. It is a better option than simply disposing of the residual inert waste because reclamation creates land that can be put to beneficial use e.g. for industrial development.
Site selection and options assessment process	
Was Longue Hougue South the only site considered for the management of residual inert waste	No, the proposed Longue Hougue extension was one of more than 50 options, which considered potential site alternatives or other waste management options. Other possible options have not been discounted. Of the options available within the timeframe, Longue Hougue South offers the greatest operational capacity, was not significantly adversely impacted in relation to environmental constraints and based on current estimates, offers the best value for money for sites available by 2022.

INERT WASTE – FREQUENTLY ASKED QUESTIONS	
What was the options assessment process?	A 'high level' Environmental Impact Assessment (EIA) assessing all options for the management of inert waste was developed to enable it to determine the Best Practicable Environmental Option (BPEO), and identify the optimal solution(s) for the management of Guernsey's inert waste stream over the next 20 years (as required under the Environmental Pollution (Guernsey) Law, 2004, and the Land Planning and Development (EIA) Ordinance, 2007). The long list of options for inert waste management were assessed and a number of sites were immediately ruled out as a consequence of specific constraints (capacity limitations, safeguarded/protected status, and policy or regulatory constraints) that would make a specific option unviable. The medium list of options was then assessed using BPEO criteria, which were developed following consultation, to consider economic, social and environmental implications of each option, using an appropriate assessment framework for Guernsey. Based on the environmental and cost and affordability criteria selected options were identified as 'leading options' by virtue of their BPEO score. The sites and options were further evaluated during a sensitivity assessment; and a consultation workshop staged with stakeholders in July 2017 to conclude a short-list of strategic options.
Have other options been considered	Yes, the assessment process considered over 50 potential options, each of which were assessed against the same criteria to determine the most appropriate options on environmental, economic and socials grounds. Other possible options have not been discounted.
Who has been consulted on the options assessment process	Three rounds of consultation have been held including Members of the STSB and Committee for the Environment * Infrastructure (CfE&I), States bodies, Non-Governmental Organisations, Construction Industry & other private sector representatives.

INERT WASTE – FREQUENTLY ASKED QUESTIONS	
If Longue Hougue South is a preferred option, why do we need to spend more money on consultants to assess it.	There is a need to carry out a detailed Environmental Impact Assessment (EIA) to ensure that the construction of the facility will not cause an unacceptable risk to human health and the environment; and also to ensure there would not be an unacceptable social risk associated with construction and operation. The site selection process was based upon available data but was not supported by significant detailed baseline information measured by site surveys, for example, so the EIA is a focus on identifying and mitigating the potentially significant impacts of the proposal. This is a legal requirement and needs to be carried out by consultants who have in-depth knowledge of carrying out EIA, to ensure that the process is robust and independent.
How will the environment be protected if such a facility is built	Extensive environmental studies are required to justify giving planning consent to any facility, this is in line with the law in terms of the planning consent process. These studies will identify whether any aspect of human health or the environment will be significantly impacted by the proposed development and will identify what mitigation measures will be required to minimise these significant risks. Any waste management facility will have to be run in accordance with the strict requirements of a waste management licence to ensure that proposed mitigation measures are effectively implemented; and the site is run in accordance with management systems to ensure it is safely and efficiently operated. There has been no evidence of any leachate/chemical pollution arising from the existing Longue Hougue Reclamation Site.
Why can't some of the disused quarries be filled?	Many of these quarries are in sensitive locations, or would require significant work to enable them to receive inert waste safely and efficiently. The site-selection and assessment work that has been carried out has identified that these sites do not provide medium to long-term strategic options because they are mostly too small and it would be disproportionately expensive to adapt them to receive inert material.

INERT WASTE – FREQUENTLY ASKED QUESTIONS	
Why can't the residual inert waste be disposed off-shore in the sea	The disposal of mixed residual inert waste to sea was eliminated as an option because regulatory and environmental considerations made this option unacceptable. It does not adhere to legal obligations and international best practice. The disposal of any waste to sea is highly regulated through the Food and Environmental Protection Act 1985 (extended to Guernsey in 1987) and by international convention; and only permitted after careful assessment of other disposal options and potential impacts.
Why can't we send the residual inert waste to another country	The export of inert waste as an option was eliminated because regulatory, financial and logistical considerations make it very unlikely to be viable. It would be difficult to make a case to ship inert waste for disposal to the EU on the basis that Guernsey does not have the technical capacity or necessary facilities on island in an environmentally sound manner, because the Longue Hougue facility already deals with this waste. This option would also be reliant on the receiving country having a shortfall of suitable material to justify importing it and this could only occur if there was sufficient beneficial use capacity for it. Even if such a solution could be found, export would require construction of a new export facility on the island, which would be disproportionately expensive considering the low value and relatively high volumes of the residual inert waste.
What measures will be put in place to ensure that any proposed reclamation option will not be preferential to reuse, recycling or recovery	The Strategy will raise awareness of the requirement on developers to implement site waste management plans prior to development taking place. This will focus developers to consider management of inert waste in accordance with the waste hierarchy to encourage reuse, recycling and recovery; and will also require that the management of residual inert waste is justified. Furthermore, the Gate fee for the facility would be set to provide a level of economic disincentive.

INERT WASTE – FREQUENTLY ASKED QUESTIONS	
Is Les Vardes an alternative option to Longue Hougue South?	Les Vardes quarry is an active site and will continue to be so for the short term. There are a number of significant risks associated with Les Vardes as a medium-term option, but this may become a future longer term solution. Furthermore, the site is currently safeguarded for water storage. However, work will continue on the potential future uses for Les Vardes particularly if its use for inert waste management could be demonstrated to be of greater value than safeguarding for water storage. This includes the consideration of a Drought Management Plan next year.
What about land reclamation North of Creve Coeur/Mont Cuet?	This is a possible option that hasn't been ruled out at this stage. However, the area North of Mont Cuet/Creve Coeur has a smaller capacity and would be more expensive to build than Longue Hougue South. This is partly due to the greater exposure of this area to greater wave heights. This means that the breakwater around the site would have to be bigger to withstand the tidal forces, which leads to significantly greater costs of the rock armour necessary to construct around the site, in comparison to Longue Hougue South.
Why can't the current Land Reclamation Site be used for longer – e.g.by stockpiling or further land raising?	This will happen. The proposed interim solution is to stockpile inert waste at the current site when it is full until the new site is ready. However, this can only be on a temporary basis, because it is expensive to double handle the material. It is not possible to permanently stockpile at the current site, nor raise the levels of the area according to the current permission. To make changes would require planning permission. Land raising would add significant time and cost to the existing site associated with the evaluation of the changes to the design level and any subsequent environmental and human impacts this would have, plus the impacts on any activities or developments that are proposed for the area of the current facility; and also the costs of rock armour required to ensure the raised area is protected from the sea, with little additional operational capacity benefit in comparison.

INERT WASTE – FREQUENTLY ASKED QUESTIONS	
Environmental impact Assessment of Longue Hougue South	
What is an Environmental Impact Assessment (EIA)?	EIA is the formal and logical process by which the human and natural environment are considered within a large-scale planning application. EIA is a step by step approach to identifying and assessing the impacts of a proposal and includes and incorporates consultation within this process. A wide range of human and environmental topics are considered within this process. The requirements and the approach have been implemented and carried out in line with Guernsey legislation and best practice from European.
Who is carrying out the Environmental Impact Assessment and what are their relevant credentials for to carry out this work?	Royal HaskoningDHV is carrying out the Environmental Impact Assessment (EIA). They are an engineering and environmental consultancy with marine engineering credentials, but they also have a well-established and experienced Waste Management specialist team based in Peterborough, UK. The Waste Management team is led by Gary Bower, who has over 20 years' experience in Waste Management including reviews of waste management options. Gary regularly provides Expert Witness support on Waste Regulatory issues. Gary Bower has been the lead consultant on this project for over two years. As environmental consultants, Royal HaskoningDHV has extensive experience of preparing EIAs for the coastal environment both in the UK and internationally. Members of the project team have over 20 years' experience in the preparation of EIAs for coastal projects, and the company has a wide range of technical specialists covering all of the technical topics relevant to the project.

INERT WASTE – FREQUENTLY ASKED QUESTIONS	
What are the risks to biodiversity from the option at Longue Hougue South?	Much of the foreshore in Guernsey has been designated as an area of biodiversity importance, to recognise a range of local flora and fauna interests around the island. More environmentally sensitive areas have higher level designations i.e. Sites of Special Significance. On a small island we have to find a site somewhere and whilst wishing to protect our environment, we need to identify the best practical environmental option (BPEO) that is sustainable and cost-effective for our waste management needs. The BPEO process undertaken with the assistance of consultants and consultees, is designed to achieve this balance. The high-level environmental impact assessment has helped to identify the options offering the least harm to the environment. Biodiversity is currently being assessed as part of the detailed EIA, which is a planning requirement as part of the preparation for a Local Planning Brief and Public Inquiry. However, the current key risks and impacts are those on scaly cricket, which is known at 4 or 5 other locations on the island. The local population on Guernsey has been suggested to be globally important. We are proposing an island wide survey of all potential scaly cricket habitat to gain an understanding of the context of the local (i.e. site) and regional (i.e. Island) population, and also to ascertain whether there are potential sites around the island where the habitat could be enhanced or increased (or made more resilient in relation to climate change). Surveys have been commissioned that will identify the potential impact upon tidal foreshore and the seabed. These are being carried out in April. They will inform us of what, if any, are the significant impacts associated with the site and if so, what is required to mitigate them.

INERT WASTE – FREQUENTLY ASKED QUESTIONS	
Will dust and emissions from construction and operation cause a deterioration in air quality	This will be assessed as part of the Environmental Impact Assessment. The baseline data is currently being determined from a combination of existing data sources and site survey information by monitoring the baseline air quality conditions. This is being performed using: Diffusion tubes to measure nitrogen dioxide (NO_2) along road network; and Frisbee dust gauges to monitor current depositional dust levels, and sticky pad adaptors to monitor the direction of windblown dust, both around the existing inert waste facility and at a location representative of the closest receptors to the site (off Bulwer Avenue). NO_2 concentrations and dust (direction and depositional) quantities are being monitored for 3 months (February – May 2019). Repeat spot measurements of particulate matter (PM) are being taken to provide an indication of baseline PM_{10} and $PM_{2.5}$ concentrations. Once the baseline is established, the predicted emissions for the construction activities and operational activities will be modelled to identify whether there will be any significant effects and will propose specific mitigation measures to reduce impacts.

INERT WASTE – FREQUENTLY ASKED QUESTIONS	
How noisy will the facility be in construction and operation	This will be assessed as part of the Environmental Impact Assessment. The baseline data is currently being determined from a combination of existing data sources and site survey information by monitoring the baseline noise conditions. A noise survey took place in January and will be followed by two more surveys. Noise surveys will be undertaken at the four closest noise sensitive receptors to the proposed site in accordance with the procedure described in the relevant British Standard (BS 7445 parts 1 and 2 and BS 4142:2014). The assessment will be informed by noise modelling for the construction phase (using SoundPLAN noise modelling software). For the operational phase, the assessment of noise from proposed fixed and mobile plant and activities associated with the operational elements of the project will be considered at the nearest receptors. An indicative list of plant equipment and activity noise levels will be developed and compiled based on the operational activities expected. Once the predicted noise levels are established, these will be compared to baseline levels to identify whether there will be any significant impacts. Mitigation measures to specifically reduce noise levels at impacted receptor locations will be identified to ensure that the effect is reduced.

INERT WASTE – FREQUENTLY ASKED QUESTIONS	
Will there be impacts from increased traffic	The States has commissioned baseline traffic surveys to develop a more detailed understanding of the current traffic conditions adjacent to the site. The surveys will be carried out in April 2019 across a week period and will comprise the installation of seven automatic traffic counters. The surveys will provide the Annual Average Daily Traffic (AADT) profile of traffic at each location (presented at hourly intervals). The data will also include the vehicle classification and speed data. Impacts will be considered on all transport routes within 1.2km to the south and 1.8km to the north of the site. The assessment will include the development of a proposed site access layout including details of critical junction geometry and visibility to inform the assessment of potential impacts on traffic and transport receptors. It is considered unlikely that there will be a significant increase in the number of vehicles visiting the site in the operational phase compared to the current Longue Hougue facility because it is anticipated that similar number of lorries will use the proposed facility compared to the current facility.
Will the proposed facility cause changes to waves, tidal and current flows or sediment deposits	Royal HaskoningDHV are assessing the impact on the coastal processes (tides, currents and sediment transport) that the proposed Longue Hougue facility could cause. The assessment will be based upon baseline data and surveys. A model of changes to the processes is being created that will identify the extent of any significant impacts. Indicative data suggests that any impacts will be localised around the development and will not cause any significant impact on a wider scale (e.g. will not impact Herm or any designated site)

INERT WASTE – FREQUENTLY ASKED QUESTIONS	
Next steps	
What are Members being asked to agree at this stage of the project?	Members are being asked to provide authority to the Policy and Resources Committee to allow funding of £1.1m to progress with the preferred way forward. This will enable further work to be carried out on the preferred option – Longue Hougue South - including a detailed EIA and public enquiry, with detailed design, market testing etc.
What could Longue Hougue South be used for after it is filled?	This is beyond the scope of the Environmental Impact Assessment. Any proposed use would be subject to planning permission based upon the merits of the proposed use. It is adjacent to a main centre and therefore (as it would be land adjacent to existing services and infrastructure) could be incorporated within the main centre and therefore open to be used for development. This might include housing and/or industrial use development. It has the benefit of being close to an industrial area and it mostly falls outside of the revised Major Hazards Public Safety Zone.

Appendix 7.1: Coastal Modelling Report

REPORT

Longue Hougue South – Numerical Modelling Report

Client: States of Guernsey

Reference: PB5312-RHD-ZZ-XX-RP-Z-0001

Status: Final/P01.02

Date: 8/30/2019

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Disclaimer

Royal HaskoningDHV

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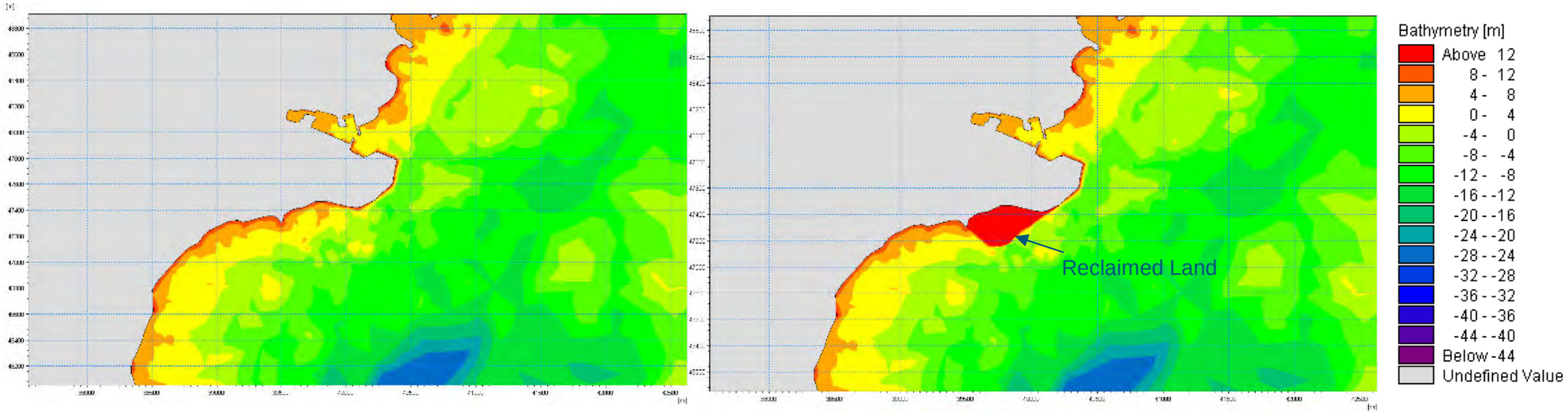
1 Introduction

This note describes the numerical modelling exercise undertaken to provide simulated hydrodynamic information around the study area to enable a comparison of tidal currents before and after scheme implementation. The numerical modelling work involved the construction of a regional 2D hydrodynamic model. The following model scenario were simulated:

- Baseline: This involves simulating the 'present day' hydrodynamic conditions.
- With Scheme: This involves simulating the hydrodynamic conditions with the proposed land reclamation area.

Figure 1 illustrates the before and after scheme implementation layout.

Figure 1: Before and after scheme implementation layout



2 Hydrodynamic Model Setup

2.1 Model Description

Royal HaskoningDHV has developed an English Channel Regional Model using MIKE21-FMHD software. The model can be used to simulate tidal movement within the English Channel as well as associated water quality and sediment transport. The MIKE-21/3-FMHD software was developed by the Danish Hydraulic Institute (DHI). The software has a proven track record and is widely used in many similar studies worldwide. The MIKE21/3-FMHD hydrodynamic module can be used to solve two-dimensional (2D) problems. The 2D model is based on the nonlinear shallow water equations using depth-averaged conditions. The main advantages of this model are:

- The flexible triangular mesh of MIKE21-FMHD provides accurate boundary fitting for an area with complicated geometry, for example around Guernsey and the Channel Islands.
- The flexible mesh enables the model to use a coarser grid in the offshore area and the areas further away from Holyhead but a finer mesh in the area of greatest interest. This approach enables higher computational efficiency whilst still maintaining sufficient accuracy of mesh coverage in areas of the most interest in the present study area.

The model is driven by tides in the North Sea in the north and the Atlantic Ocean in the south. The dominant tide enters the English Channel from the southern boundary whilst the less dominant tide approaches the English Channel from the northern boundary. The model is therefore driven by both a northern and a southern elevation boundary. The model is calibrated by both astronomical and actual tidal data at several locations on two sides of the English Channel.

The regional model was refined and updated around Guernsey and surrounding islands to simulate tidal movement with greater accuracy. Changes includes refining the coastline, updating the bathymetry with the latest bathymetric survey data and refining the model mesh around the study area.

2.2 2D Model Setup

The set-up of the 2D Regional Model is described in detail below.

2.2.1 Model Extent

The model extent covers the whole of the English Channel as described above and illustrated in **Figure 2**.

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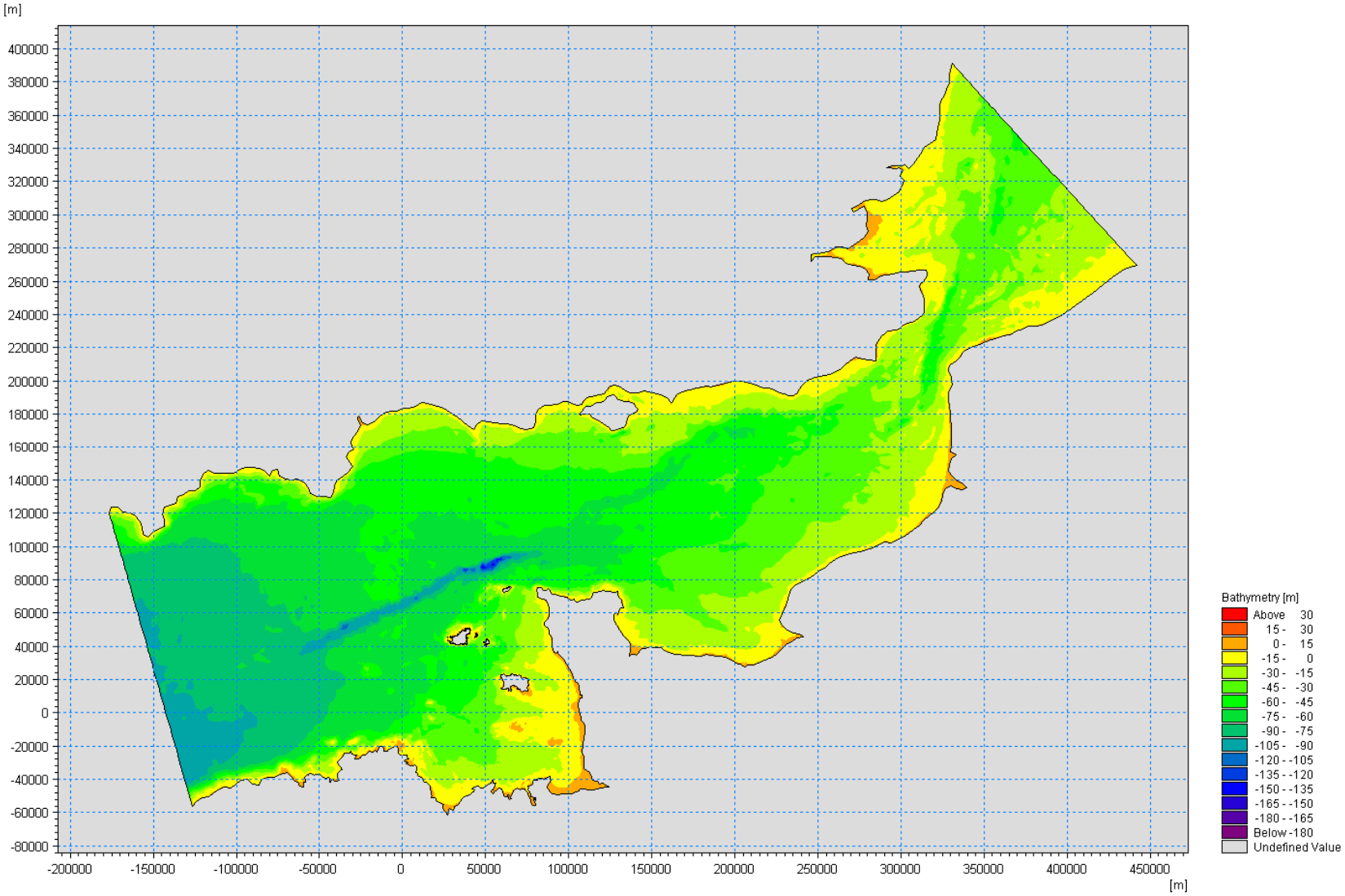
Figure 2: English Channel Regional Model Extent



2.2.2 Model Datasets

The bathymetry consists of several data sources that are listed below:

- CMap data covering offshore areas.
- LiDAR data covering nearshore coastal zone.
- Bathymetric survey covering study area extent.

Figure 3 illustrates the bathymetric survey data across the Regional Model and **Figure 4** illustrates the extent of the bathymetric survey data local to the study area.

Following initial model runs the bathymetry data was adjusted locally to achieve expected current speeds in the vicinity of approach channel to the Sampson Port. This was required due to a gap in available bathymetry data and its coarse resolution.

2.2.3 Triangular Mesh Resolution

A triangular mesh was generated, and the model domain divided into areas of different grid resolution as show in **Figure 5**. The grid is finest near the study area to give better definition as this area is of most interest in terms of assessing the changes in hydrodynamic outputs between the baseline and “with scheme” model run. The mesh becomes gradually coarser moving away from the study area to the most offshore areas being the coarsest resolution.

2.2.4 Model Boundaries

Open model boundaries are set to drive the flow conditions in the model. This model is driven by two sets of open boundary data as illustrated in **Figure 6**.

The northern and southern model boundaries are varying tidal elevation boundaries using predicted tidal data. The tides are predicted using a formula developed from the information contained in Tide Tables (tidal harmonics and phase lag information) for the required time periods. The northern boundary uses tide information from two stations, namely Westkapelle in the east and Lowestoft in the west. The water levels are interpolated along the model boundary between the two tidal stations. The southern model boundary is setup in the same way. It uses two stations, namely Penzance in England in the west and Portsall in France in the east.

Figure 3: Model bathymetry (Regional Model)

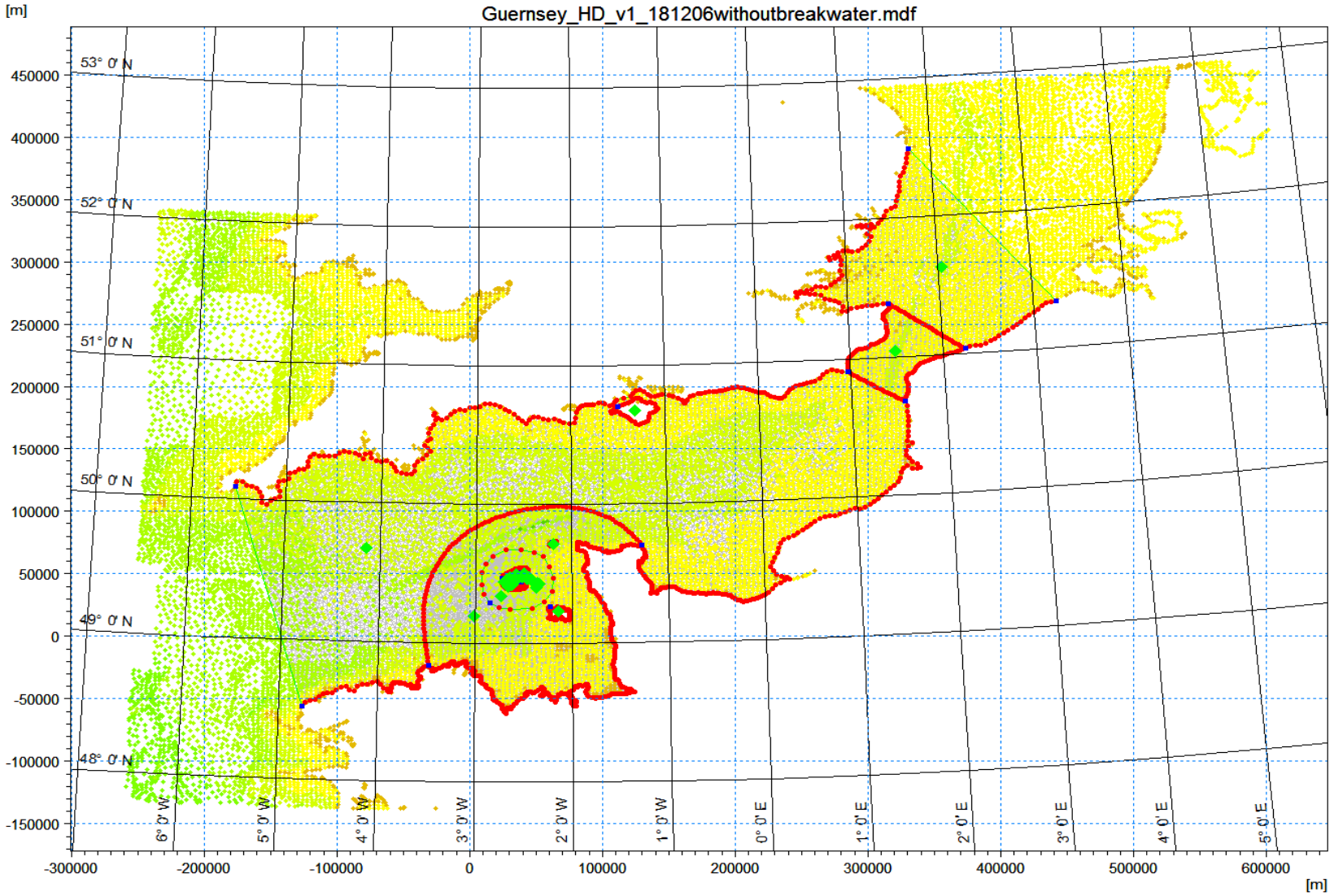


Figure 4: Model Bathymetry (Study Area)

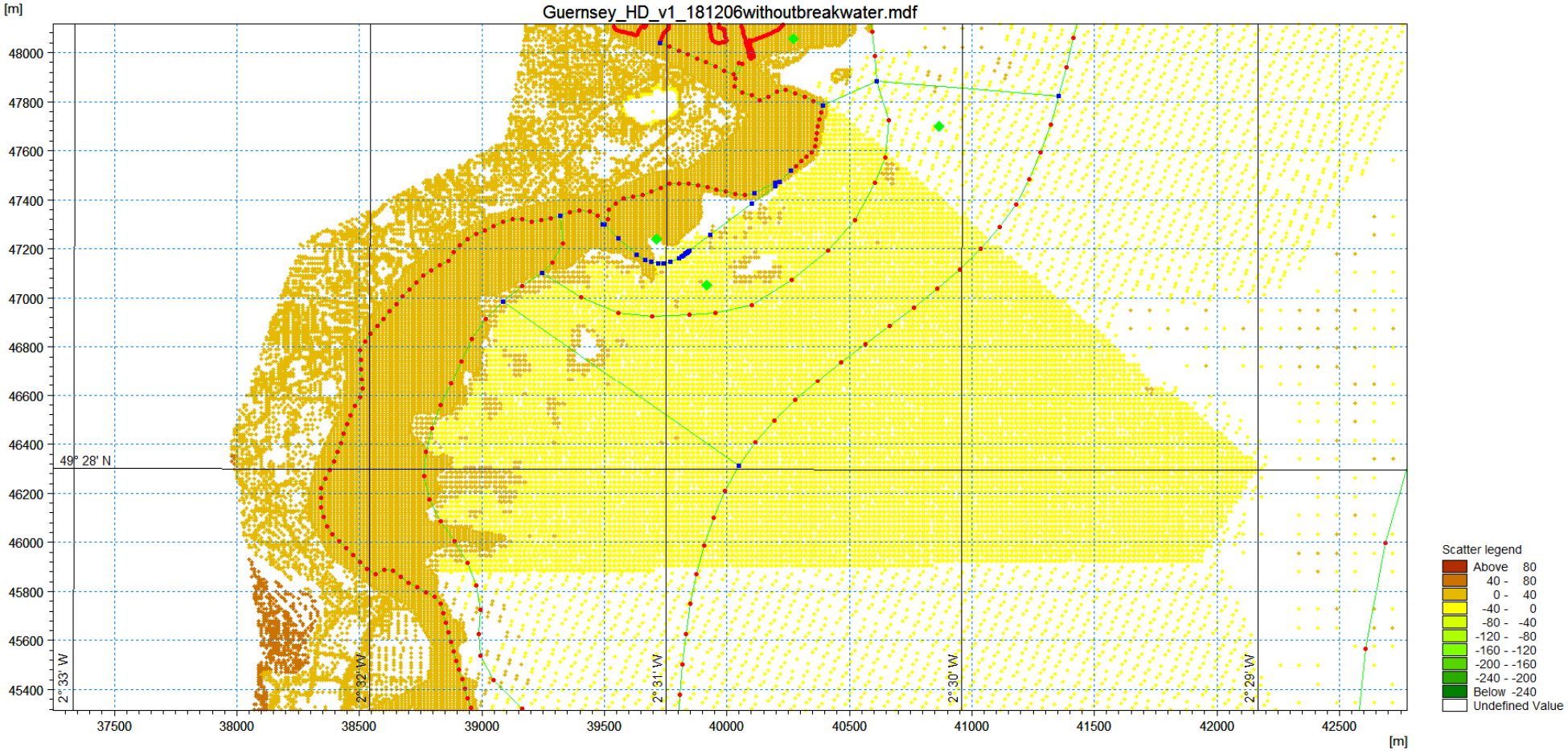


Figure 5: Triangular Mesh Resolution

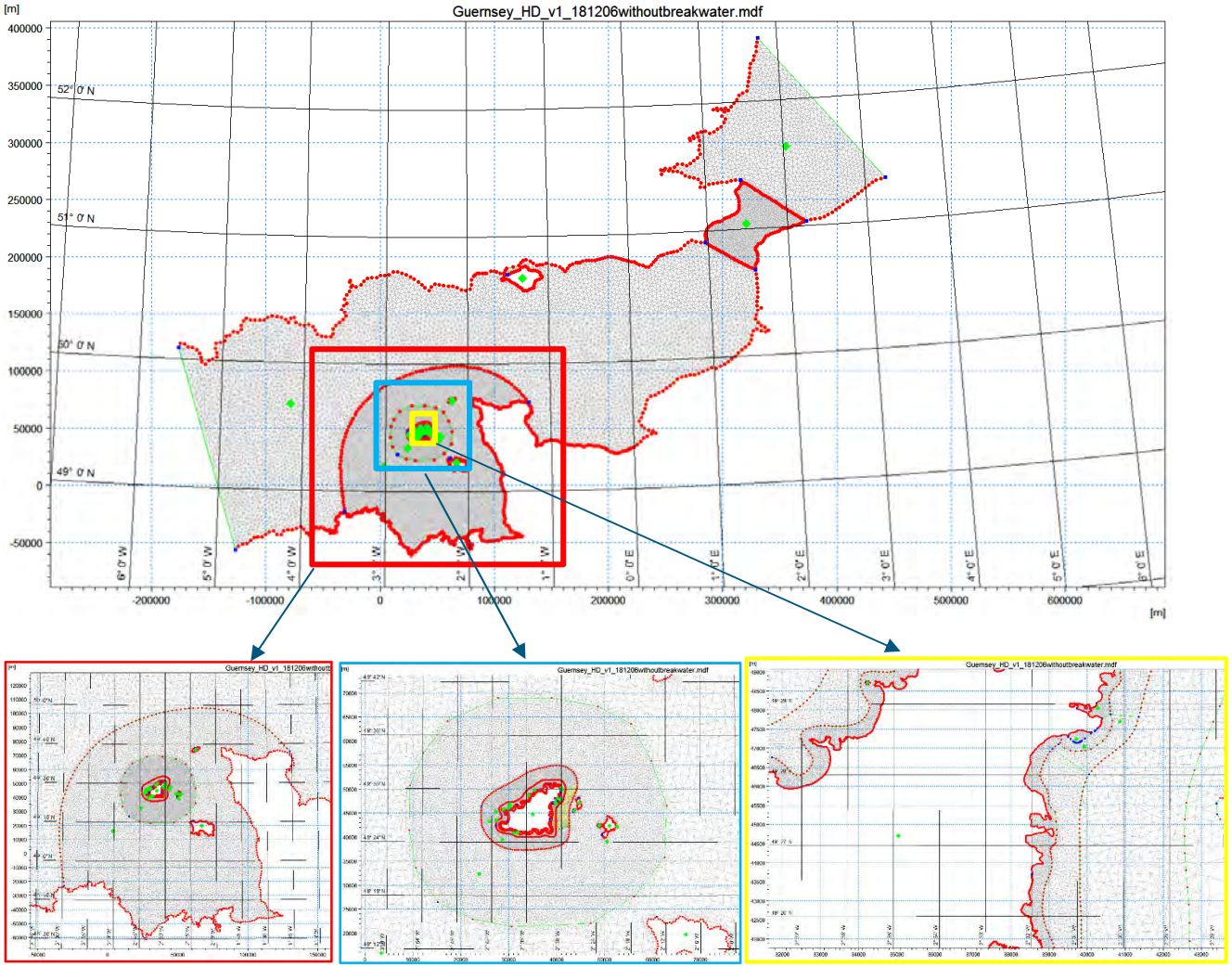
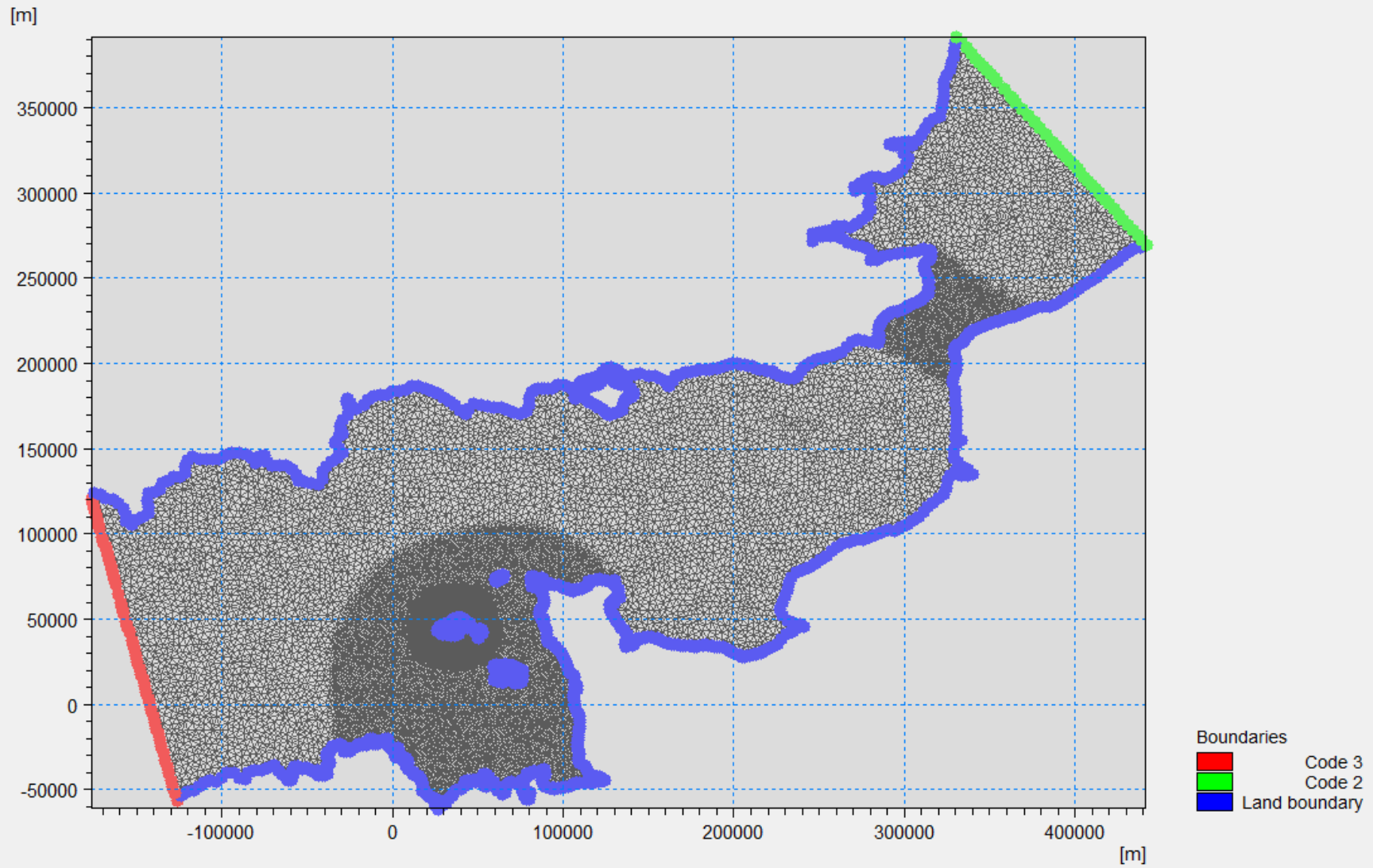


Figure 6: Model Boundaries

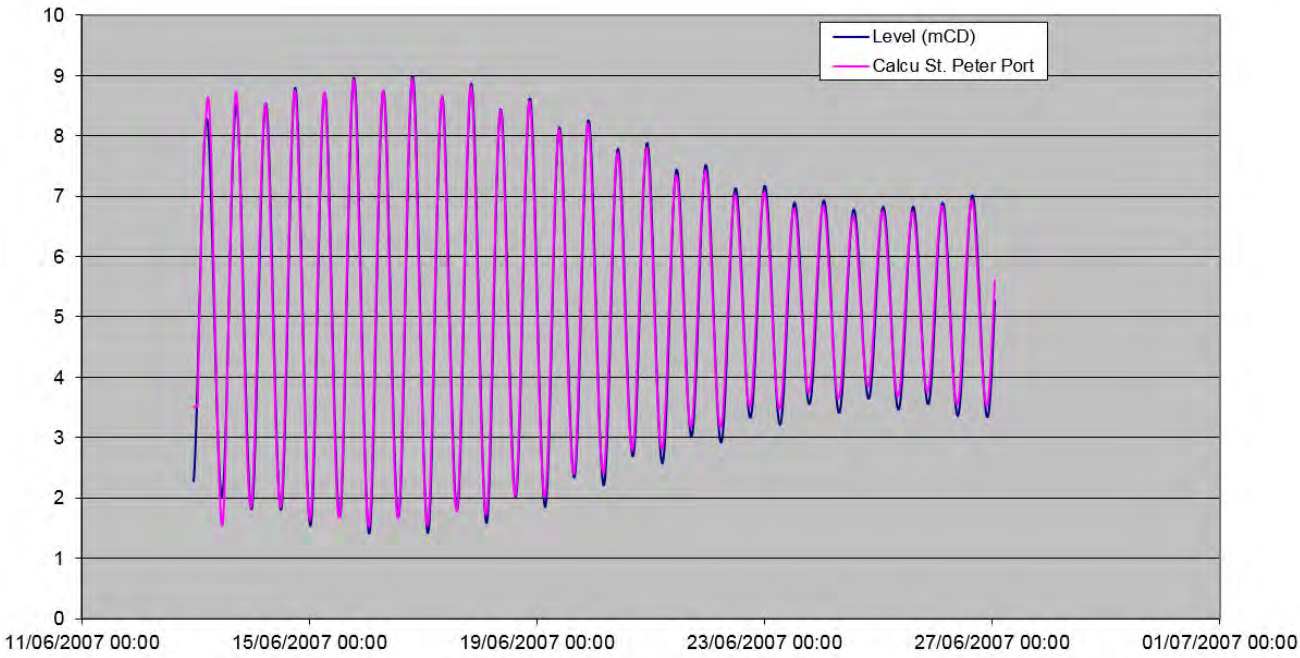


3 Model Calibration

3.1 Background

The Regional Model has already been calibrated by both astronomical and actual tidal data at several locations. Checks however were made to ensure that water levels were well represented within the study area. **Figure 7** shows a comparison between the predicted (using harmonic constituents) and modelled water level data at St. Peter's Port. There is good agreement between the modelled and the predicted water levels.

Figure 7: Water Level, Modelled Vs Predicted



4 Modelled Scenarios

4.1 Background

The hydrodynamic model has been run for the following two scenarios (**Figure 8**):

- Baseline: This involves simulating the 'present day' hydrodynamic conditions.
- With Scheme: This involves simulating the hydrodynamic conditions with the proposed land reclamation area.

4.2 Results

The hydrodynamic model was first run for the 'baseline' scenario using water levels and tidal current velocities over a typical spring-neap cycle. Currents for peak flood and peak ebb conditions near the study site are shown in **Figure 9** and **Figure 10** for Spring Tide and Neap Tide respectively.

The model was then re-run over the same time period under a 'with scheme' scenario. Currents for peak flood and peak ebb with the scheme in place are shown in **Figure 11** and **Figure 12** for Spring Tide and Neap Tide respectively. The differences between the two runs shows the location and magnitude of any potential changes in tidal current velocities directly from the scheme. They are shown in **Figure 13** and **Figure 14** respectively. The differences in current speed between the 'baseline' scenario and 'with scheme' scenario and small and localised.

Figure 8: Before and after scheme implementation layout

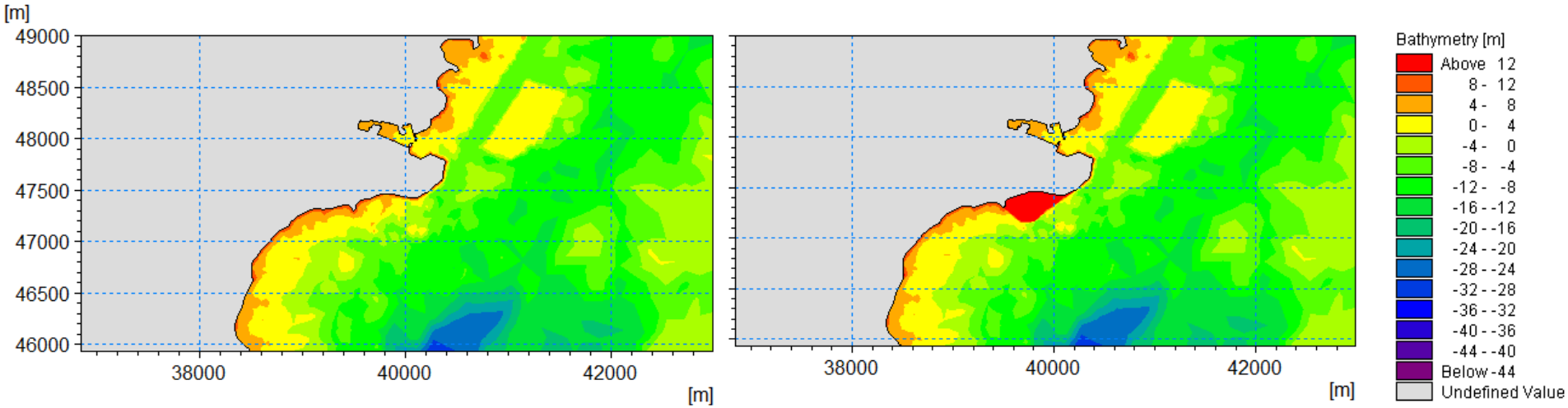


Figure 9: Baseline Current Speed during Spring Tide for Peak Flood

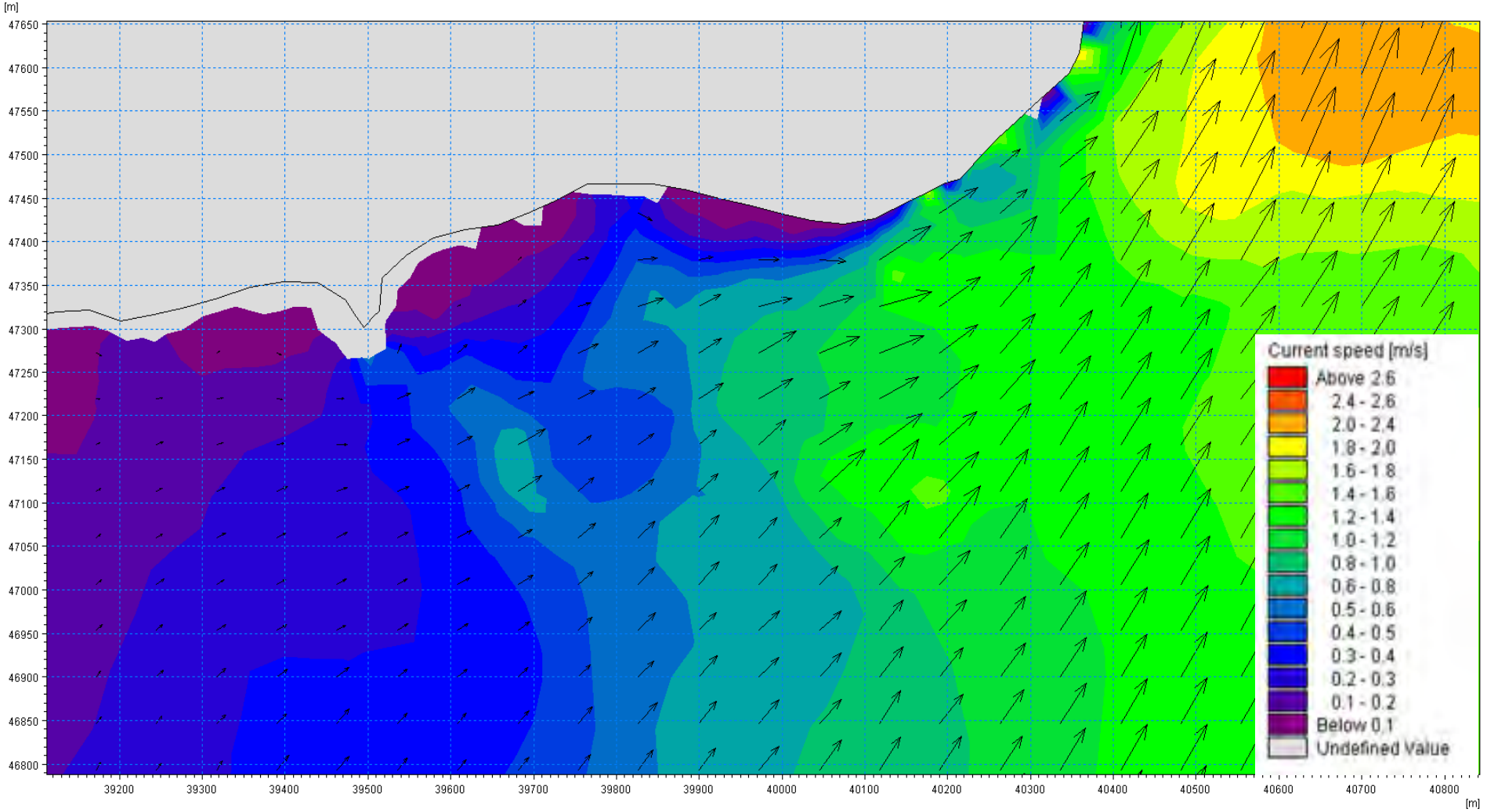


Figure 10: Baseline Current Speed during Neap Tide for Peak Flood

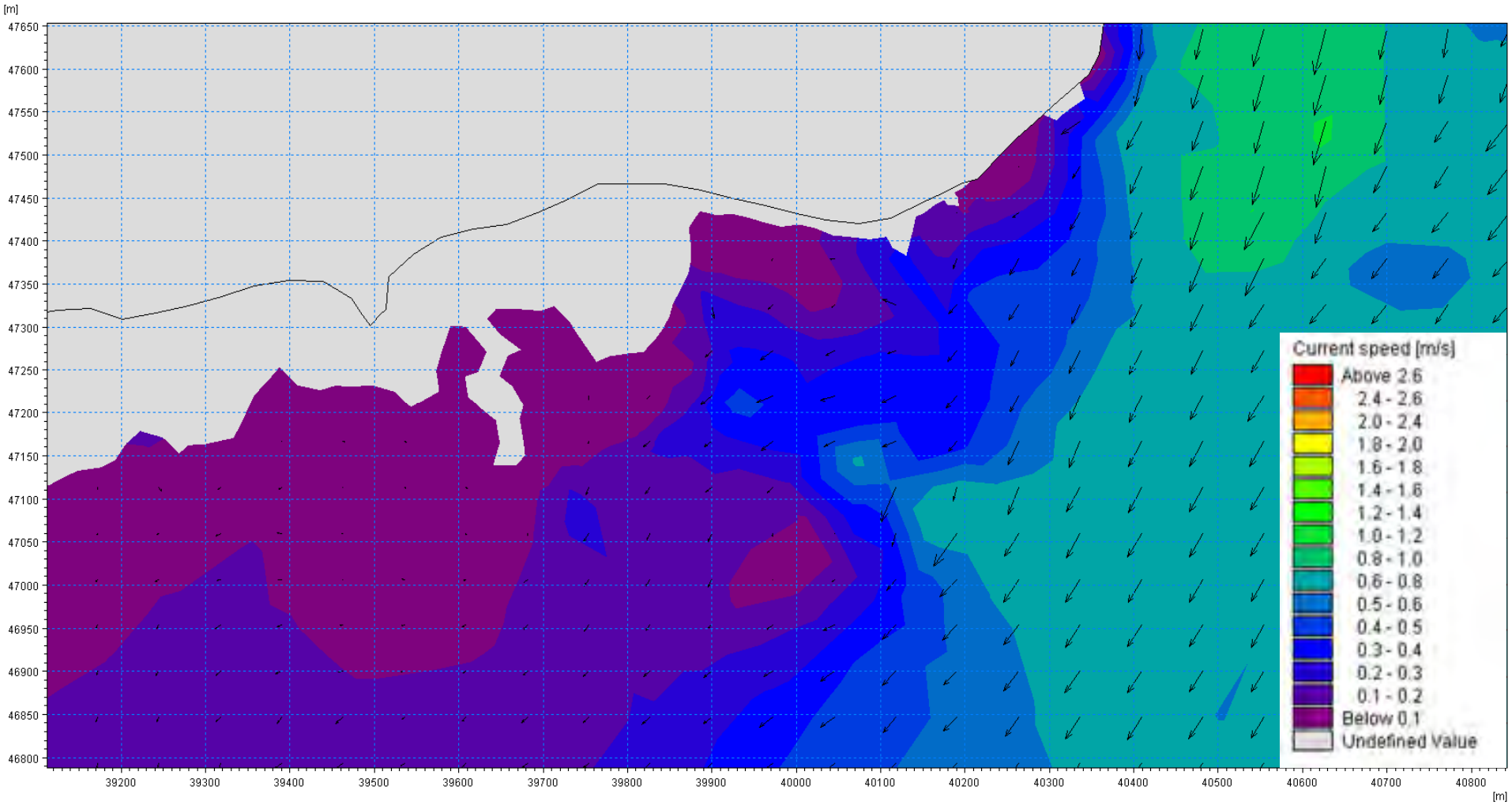


Figure 11: With Scheme Current Speed during Spring Tide for Peak Flood

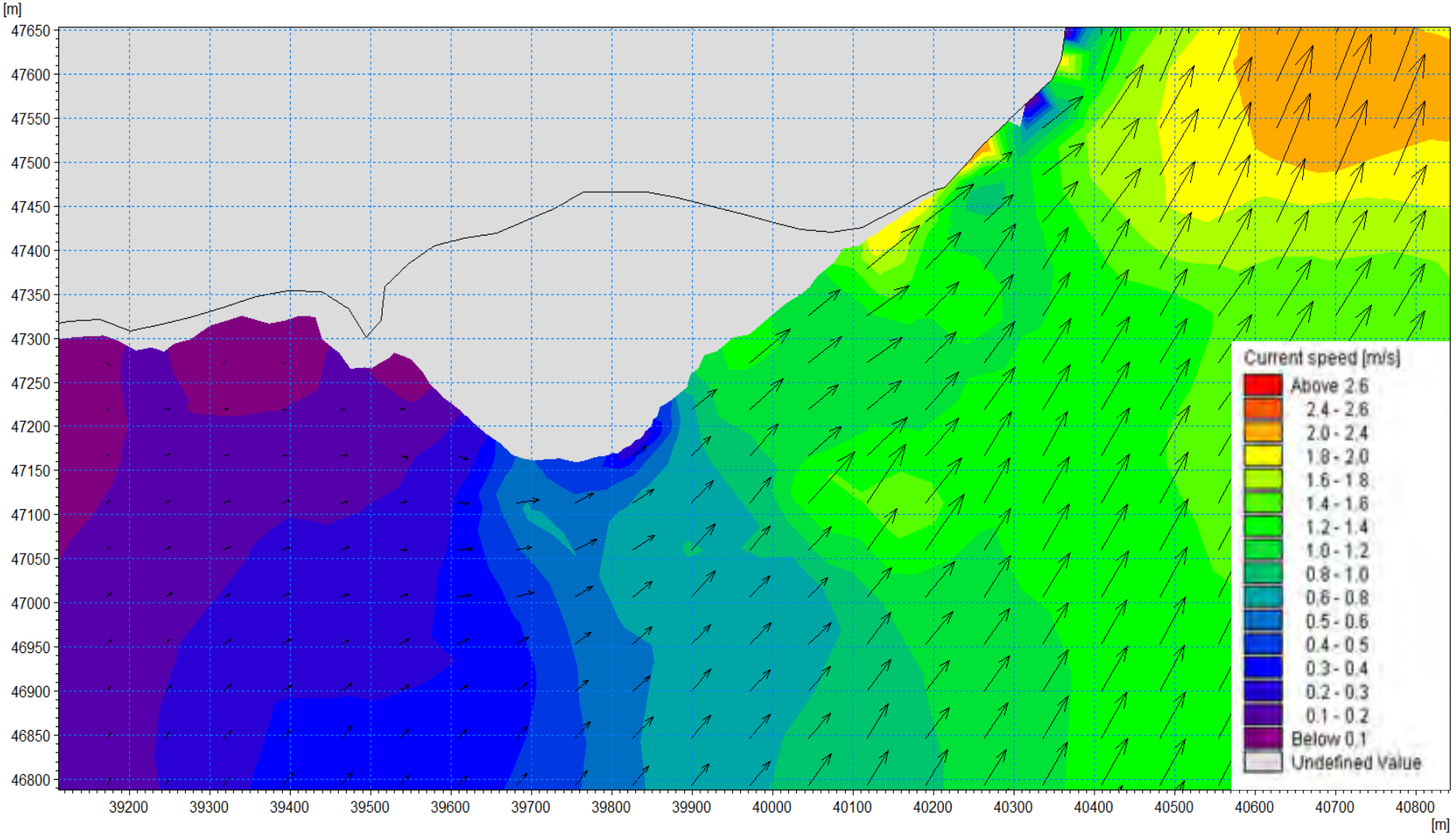


Figure 12: With Scheme Current Speed during Neap Tide for Peak Flood

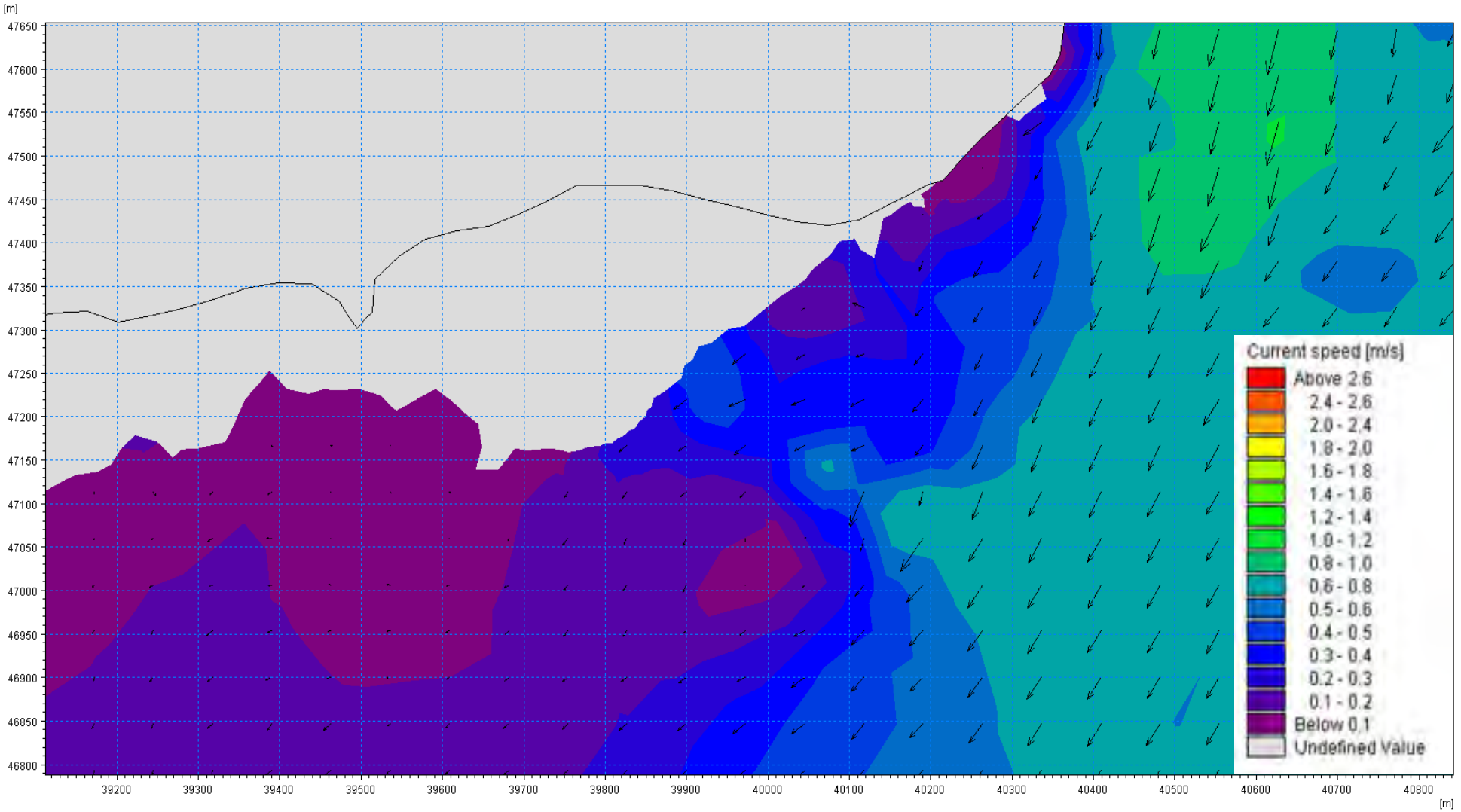


Figure 13: Spring Tide Difference Plot (the contours show different in current speed, positive mean increase)

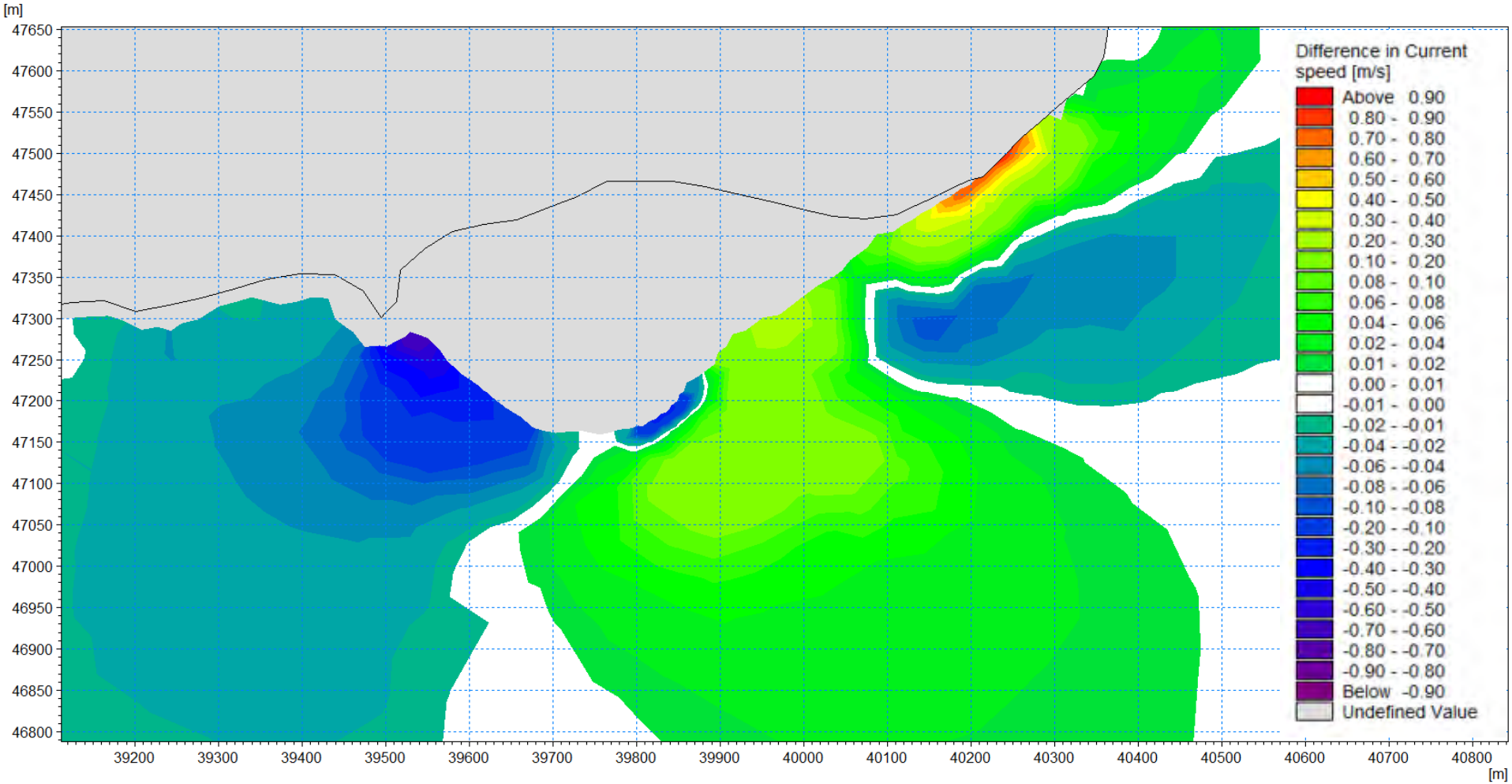
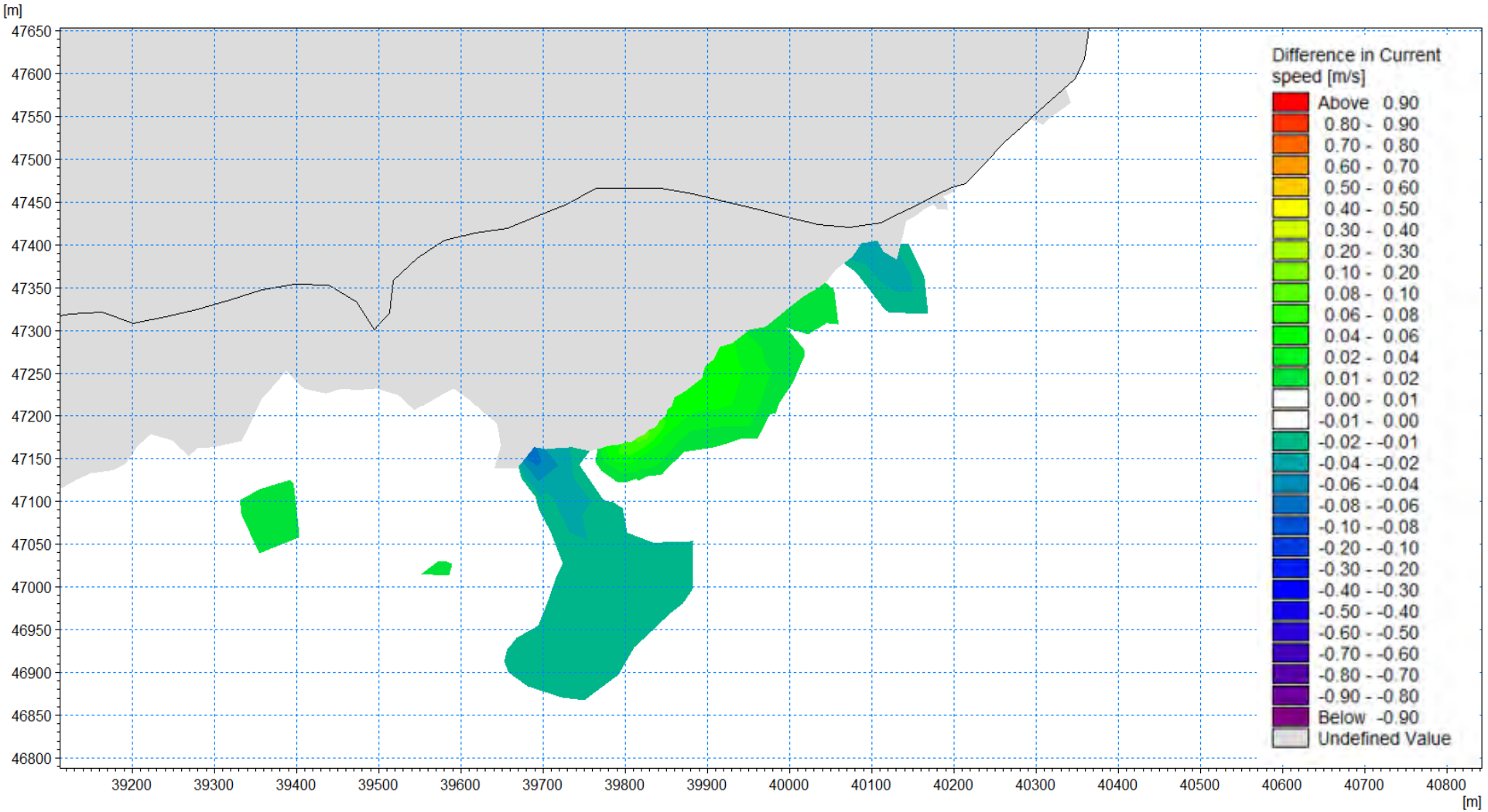


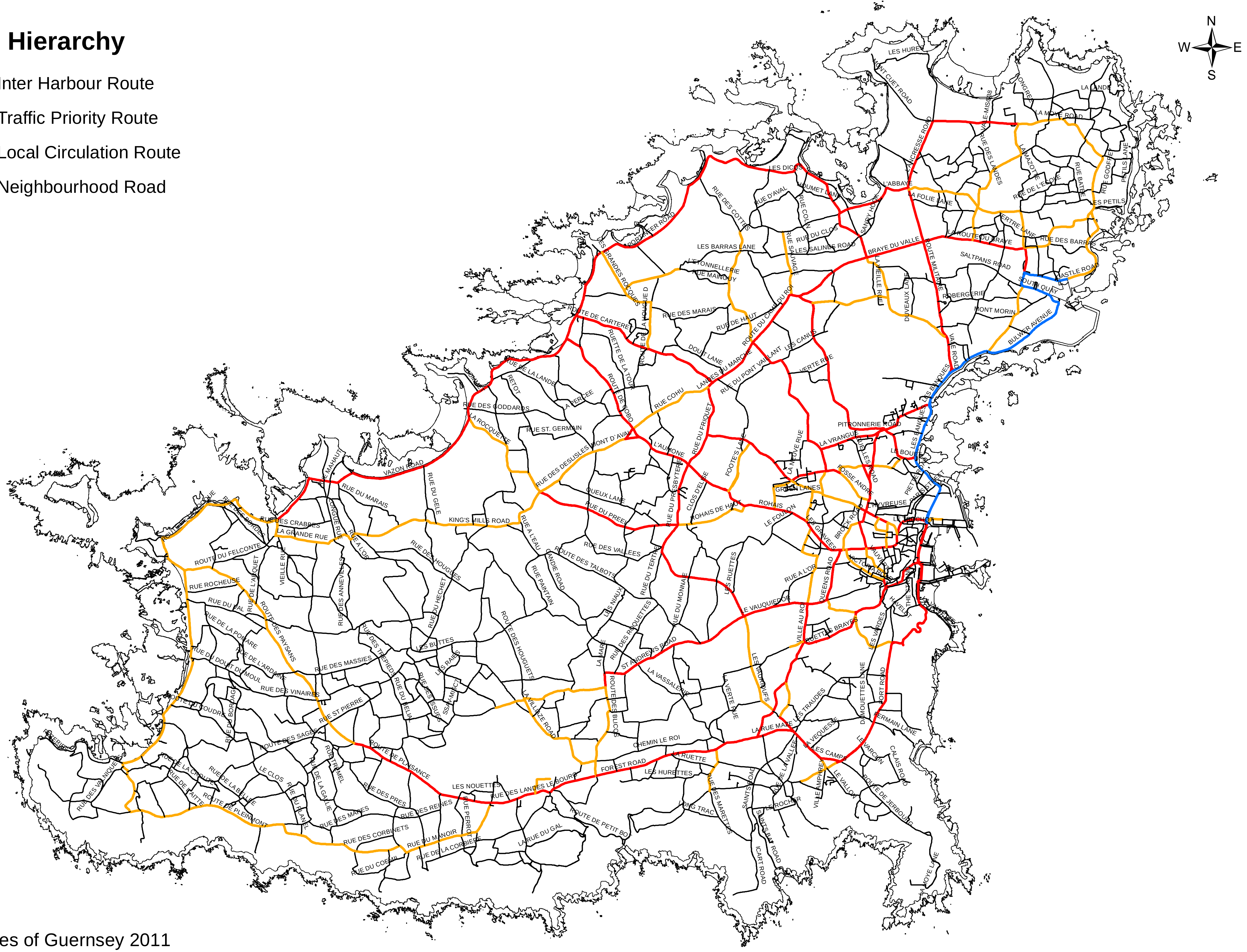
Figure 14: Neap Tide Difference Plot (the contours show different in current speed, positive mean increase)



Appendix 11.1: Guernsey Road Hierarchy

Road Hierarchy

- Inter Harbour Route
- Traffic Priority Route
- Local Circulation Route
- Neighbourhood Road



Appendix 11.2: Outline Construction Traffic Management Plan

REPORT

Longue Hougue South EIA

Outline Construction Traffic Management Plan

Client: States of Guernsey

Reference: PB6934-RHD-01-ZZ-RP-N-3019

Status: 0.1/Final

Date: 9/19/2019

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Checked by: _____

Date / initials: _____

Approved by: _____

Date / initials: _____

Classification
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1 Introduction

1. Royal HaskoningDHV have been commissioned by the States of Guernsey to produce an Outline Construction Traffic Management Plan (OCTMP) for the proposed Longue Hougue South Residual Inert Waste Facility ('the Project').

1.1 Background

2. The States of Guernsey is seeking to gain planning approval for an inert waste facility at Longue Hougue, on the north-east coast of Guernsey, effectively extending the current Longue Hougue Reclamation Site.

1.2 The Longue Hougue South Residual Inert Waste Facility

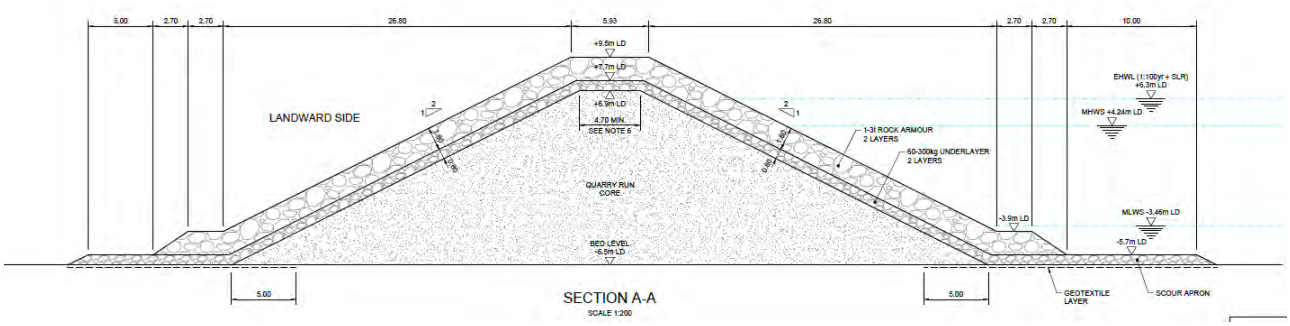
3. The first stage of the project would consist of the construction of a structure approximately 800m in length and extending between 210m and 300m from the shoreline (see **Appendix A**) to the crest of the structure. The area (approximately 9ha) within the structure would be used as a deposit site for Guernsey's residual inert waste, with a capacity of approximately 715,000m^3.

4. The predicted operational life is a minimum of 12 years. This estimate has been calculated based on predicted arisings of 1,213,000 tonnes in the 11 years between 2022 and 2032 inclusive and a volume of 1m^3 for every 1.75 tonnes of inert waste. Improvements in the reuse and recycling of inert waste were introduced at Longue Hougue Reclamation Site early in 2019. The full impact of this new initiative has yet to be fully understood, but has the potential to extend the life of the existing reclamation site by a number of years, and to extend the duration of infilling activities at Longue Hougue South, such that it could operate for a longer period.

5. The construction phase will involve building a rock breakwater that will form a perimeter wall inside which, will be the location for infilling of residual inert waste for the Longue Hougue South Facility. The top of the rock breakwater will be +9.5mAGD to take account of sea level rise and potential future after uses, as well as provide a greater capacity. The ground level behind the breakwater will be up to +8.5mAGD. The width of the crest of the breakwater will be approximately 4.7m. The design of the breakwater would allow the site to be operational throughout the year, and would protect against a 1:100 year storm event including for sea level rise for a design life of 50 years.

6. The breakwater is likely to consist of three layers: an armour layer, an underlayer, and core (**Figure 4.2**).

Figure 1-1 Indicative Breakwater Cross Section



7. During the construction of the Project, working hours are anticipated to be 07:00 to 19:00, Monday to Saturday. Relaxation of the above hours may be required for tidally affected activities, with construction activities possible throughout the day and night from Monday to Saturday.

1.3 OCTMP Scope

8. The construction of the Project is likely to result in increases in traffic on the highway network. During the operational phase of the Project, traffic movements would be broadly in line with the existing facility and thus are not part of the scope of this document.

9. The OCTMP provides an outline of the standards, procedures and mitigation measures that are promoted for the project to manage and mitigate against the impact of the Project's construction traffic in the area.

10. The OCTMP is intended to be a live document to be reviewed and updated as appropriate by the Project's appointed Principal Contractor in consultation with the SoG as construction is progressed.

2 Construction Vehicle Movements and Programme

2.1 Construction Traffic

11. Construction of the Project is anticipated to take up to 20 months (best case scenario), though this is highly dependent on contractor engagement and rock sourcing, as well as timings and seasonality. If the availability of rock and transhipment barges proves troublesome then construction programme may increase up to 36 months (worst-case scenario). The best and worst case programme is provided in **Table 2-1.**

2.2 Traffic Demand

12. The predicted increase in traffic volumes attributable to the construction phase has been derived by ways of a 'first principles' approach whereby vehicle movements are derived from an understanding of the likely requirement for material and resource profiled to an indicative construction programme.

13. Construction of the breakwater will be undertaken using predominantly land-based equipment and techniques. For deeper sections, if the reach of land-based equipment is not sufficient, floating equipment may be required. The crest of the breakwater's core will be used as a temporary construction road during the construction process; notably when the breakwater height is lower (and the access wider) vehicles will be able to pass each other. However, when the breakwater is higher (and narrower) only single lane access will be possible.

14. Prior to construction starting, a compound will be erected (see **Appendix A**) within the existing landscaped area of waste facilities. Access would be through the gates of the current Inert Waste Management Facility, across to its seaward perimeter and then down alongside the WTS area and through the perimeter bund of the current site (**Appendix A**).

15. The compound will comprise temporary cabins and facilities enclosed by fencing. The compound will also have marked areas for parking, plant, material laydown and other storage areas. Security fencing that matches the WTS (approximately 2.4m high) will be placed around the perimeter of the site and will include two sets of double gates.

Table 2-1 Worst and best case programme for construction

Activity	Month							
	1	2 to 3	4 to 5	6 to 12	13 to 18	19 to 20	21 to 30	31 to 36
Temporary haul roads constructed to site								
Delivery and stockpile of primary armour layer and underlayer								
Delivery of quarry run material to site								
Placement of geotextile along scour apron of breakwater footprint								
End tipping of quarry run or existing inert material to form core of the breakwater								
Placement of scour apron and rock toe								
Placement of underlayer and primary armour layer from breakwater crest (land-based techniques)								

Best Case
Worst Case

Peak HGV Construction Demand

16. **Table 2-2** presents the list of key significant volumes of materials predicted to be delivered to the project site and the indicative maximum HGV generation forecasts (note the schedule uses the term 'wagons' to describe HGVs).

Table 2-2 Volumes of material / movements of vehicles and vessels

	Whole Breakwater	Local Quarry Run Material
Amount of material required	800,000T (comprising: 250,000T Rock Armour 550,000T Quarry Run Core)	78,000T (15% of total quarry run core material)
Delivery method	20,000T barge (large barge) and 1,500T barge (small barge)	5 x 10T wagons
Number of movements per day	One large barge to remain anchored offshore in transhipment area 2 small barge movements to shore per day (1 per tidal cycle)	3 deliveries per wagon per day Total 15 deliveries per day
	Number of movements (on land) for Berthed Barge option: 150 x 10T wagons 30 trips for 5 wagons over 12 hours	
Movements per week	One shipment by large barge per week 14 deliveries by small barge per large barge (one a week)	180 movements per week (assuming a 6 day work week)
Total	40 large barge deliveries 560 small barge movements over whole project	15,600 movements over whole project

17. **Table 2-2** details that the peak daily HGV construction vehicles would not exceed 30 movements (15 deliveries).

18. It is assumed that the rock will also be delivered by boat from another country (most likely Norway or France), arriving on a large vessel (i.e. 20,000 tonne barge) and then transferred to shore using smaller 1,500 tonne barges in one of two ways:

- **Option 1: Shoreline deposition** - the smaller barge would arrive at the site at high tide to deliver the rock onto the shoreline within the Longue

Hougue South site (see **Appendix A** Error! Reference source not found.). The barge will either comprise a hopper barge whereby the hopper would open and the rock would be deposited underwater but in an area which will become exposed at low tide, or be deposited from the barge using an excavator. Once on the shore the rock will be transported to the storage area by excavators.

- **Option 2: Berth based deposition** – essentially the smaller barge would berth at the north end of Longue Hougue (where barges berthed for the Longue Hougue Construction and trucks would transfer the rock to a stockpile in the existing Longue Hougue site (see **Appendix A**) before being transported to Longue Hougue South for placement.

19. It is anticipated that delivery of material will take between 12 and 18 months, depending on the availability of barges and the proportion of material imported from local quarries.

20. Under the shoreline deposition material delivery option, the rock would be stockpiled within the area to be infilled during operation as close to the working area as possible, whilst allowing barges to safely access at high tide to deposit rock armour, or it will be stockpiled at the north-east end of Longue Hougue after being taken off by a barge berthed to the north of Longue Hougue.

21. Under the barge berth material delivery option, material will be stockpiled at the north-east end of Longue Hougue and would be transported to site for placement as necessary.

22. Neither option will require any shunting HGV movements to occur on the public highway.

Employee Traffic Demand

23. The project engineering consultants have provided details of the expected resourcing requirements during the construction programme. Based on this input, it is estimated that an average workforce of 25 employees will be required per day (including office based staff). This would result in a peak of 50 vehicle movements per day.

24. It is envisaged construction workers will predominately work during the hours of 7am to 7pm. However, as the construction of the Breakwater is likely carried out 24 hours per day due to the tidal nature of the site there will be potential requirement for workers to be present during night time hours.

2.3 Traffic Distribution

25. During construction, the majority of inner core breakwater materials will be comprised of imported rock, existing stockpiled inert waste and quarry run material from elsewhere on the island. At this stage, as a definitive source of materials sourced on the island are unknown, it has been assumed that the total peak HGV demand would be assigned to the west (Les Banques leading to St George's Esplanade), the north (Vale Road / Route Militaire (south)) and the east (North Quay / Castle Road / La Rue du Chateau (North side)).

3 Construction Traffic Management Measures

3.1 Introduction

26. The following measures will form a framework for the appointed contractor to develop and augment in consultation with the SoG prior to submitting the final CTMP for discharge.

Management of Deliveries

27. The core working hours are anticipated to be between 7am and 7pm, Monday to Friday. However, due to the tidally affected construction activities, working throughout the day and night is likely to be required.

28. Section 2 set out a maximum of 15 peak daily HGV deliveries (30 movements) to the site. The contractor will therefore be expected to manage the total daily HGV peak demand traffic at 30 movements between 7am and 7pm Monday to Friday.

29. The repetitive nature of the deliveries during the construction period (importing material) would inherently lead to an optimal fleet size resulting in an even distribution of HGV traffic on a day to day basis. This will prevent bunching of deliveries and reduce the impact of HGV traffic upon peak periods.

30. The contract would be required to introduce processes that maintain this even profile of HGV deliveries during the working hours.

Employee Travel

31. It is envisaged construction workers will predominately work during the hours of 7am to 7pm. However, as the construction of the Breakwater is likely carried out throughout the day and night due to the tidal nature of the site there will be potential requirement for workers to be present during night time hours.

32. The contractor would be required to provide advance notification to the SoG of the requirement for 24 hour working.

Driver Information Packs

33. An information pack will be distributed to all individuals involved in the transport of materials. The pack would be a convenient size so it can be stored in a truck cab.

34. The pack will include key information on delivery routes and times and procedures for dealing with emergencies and disciplinary measures for non-compliance.

Control of Dust and Dirt

35. To prevent dust and dirt being tracked on to the highway, the Project's construction site will include for a dry brush sweeper on standby and road sweeper on call. Wheel washing will be used where appropriate.

Parking and Loading

36. Appropriate loading / unloading areas for construction vehicles will be undertaken within the site compounds to avoid overspill parking or waiting on the highway. There is to be sufficient parking space within the Projects construction compound for the peak employee vehicle numbers.

Communication Strategy

37. The appointed Contractor will identify a single point of contact as Traffic Management Plan Co-Ordinator (TMPC) – it is likely that much of this role will be undertaken by the Public Liaison Officer (PLO). The TMPC details will be provided to the SoG to allow them to raise any immediate concerns directly with the Contractor.

38. The TMPC and project team will also attend regular meetings with the SoG. These meetings will allow the appointed Contractor to provide an update on progress and future activities as well as allowing the local communities to raise any concerns.

39. The TMPC will provide regular updates to the local community highlighting issues such as, peak periods where deliveries would be more intense. In addition, the TMPC will establish direct lines of communication with local businesses, etc. to ensure that deliveries are managed and co-ordinated.

4 Control Processes

4.1 Introduction

41. This section outlines the control processes that the appointed Contractor and their supply chain would be required to adhere to and contribute towards.

4.2 Employee Travel

42. The appointed Contractor will be required to keep an up to date record of the number of construction employees on site and how they travelled. This will take the form of daily sign in sheets at the site where each employee will be required to sign in and at the same time provide their vehicle registration number where applicable.

43. This information will provide an easily auditable record of the number of vehicle movements and allow for the derivation of achieved mode share. This information will be retained and provided to SoG upon request.

4.3 Delivery Log (HGVs)

44. The appointed Contractor will be responsible for managing the demand for deliveries for their own fleet and that of their supply chain partners to ensure they comply with agreed daily traffic profiles.

45. The appointed Contractor will be required to keep an up to date record of deliveries to the site, this will take the form of delivery receipts. This information will be retained to be provided to SoG upon request.

5 Monitoring and Control Processes

5.1 Introduction

46. This section outlines the monitoring and control processes that will be developed in collaboration with the appointed Contractor.

5.2 HGV Movements

47. The HGV movements associated with construction of the Project will be continuously monitored through the use of the Delivery Log. This will require the appointed Contractor to keep an up to date record of deliveries to the construction site. The information will be made available to SoG upon request.

5.3 Employee Movements

48. The vehicle movements associated with construction employees travelling to and from the site will be continuously monitored through the use of the signing in sheets. This would require the appointed Contractor to keep an up to date record of employee numbers and method of travel to work. This information will be made available to SoG upon request.

5.4 Stakeholder Input

49. Contact numbers will be on display and will be provided to SoG for the general public to raise any concerns with the appointed Contractor. All enquiries will be recorded and responded to within seven working days. The enquirer would receive a written response (copied to SoG) detailing what action has been taken, if necessary.

50. The appointed Contractor will be required to keep an up to date record of all enquiries and responses to be made available to SoG upon request.

6 Corrective Measures

6.1 Introduction

51. This section provides a summary of the mechanisms that will ensure that the control measures are effectively implemented.

6.2 Correction Process

52. To ensure that the aims of the OCTMP can be effectively enforced, it is important to define what would constitute a breach. The following actions would constitute a breach of the OCTMP, whereby corrective measures will be required:

- Construction personnel overspill parking on the public highway;
- Construction HGVs not adhering to the agreed times; or
- Construction traffic being driven inappropriately, e.g. speeding.

53. On receipt of a report of a potential breach, the TMPC will investigate the circumstances and compile a report for SoG. SoG would then review the information, request further clarifications (if required) and confirm to the TMPC if a material breach has occurred.

54. If the breach is found to be material the appointed Contractor will take appropriate action with the offenders and report back to the highway authority.

55. Individual employee breaches would be addressed through SoG employment law whereby the process outlined above would form the basis for disciplinary proceedings.

7 Summary

56. The OCTMP provides an outline of the standards, procedures and mitigation measures that are promoted for the construction of the Longue Hougue South Residual Inert Waste Reclamation Facility to manage and mitigate against the impact of construction traffic in the area.

57. The OCTMP is intended to be an evolving document and the appointed Contractor and their supply chain would be required to adhere to and contribute towards the OCTMP throughout the duration of the construction phase.

58. The OCTMP sets out a number of measures that have been developed to mitigate the construction traffic demand. The OCTMP then outlines how the measures within the plan would be subject to a series of control processes, a monitoring strategy and a corrective measure strategy. **Table 7-1** provides a summary of traffic demand, measures and controls.

Table 7-1: Summary of OCTMP Measures and Control

OCTMP Section	Summary	Details
OCTMP Demand and Profiles	HGVs	**Section 2** set out a maximum of 15 peak daily HGV deliveries (30 movements) to the site. The appointed contractor will therefore be expected to manage the total daily HGV peak demand traffic at 30 movements between 7am and 7pm Monday to Friday.
	Employee Vehicles	**Section 2** details that the construction of the Project would result in a daily peak of 50 vehicle movements Core hours are anticipated to be between 7am to 7pm (office staff) Monday to Friday, However, a requirement for 24 hour working will be required for the construction of the breakwater which is affected by the tidal activity.

OCTMP Section	Summary	Details
Overarching OCTMP measures	Vehicle movements	**Section 3** provides details of the measures to manage vehicle movements.
	Driver Information Packs	**Section 3** provides details of information packs that would be distributed to drivers to inform them of key delivery information such as routes, times, etc.
	Dust and dirt	**Section 3** details the measures that would be employed to control dirt being tracked on to the highway.
	Parking and Loading	**Section 3** details parking and loading requirements.
	Communication Strategy	**Section 3** details a strategy for liaising with the local community to discuss issues.
OCTMP Controls	Employee Travel	**Section 4** provides details of measures to monitor personnel vehicle movements.
	HGVs	**Section 4** provides details of measures to monitor HGV movements.
OCTMP Corrective Measures	**Section 6** details the mechanisms that would ensure that the control measures are effectively implemented.	

Appendix 11.3: Personal Injury Collision Data

RoadName	USRN	Junction_With	Road Speed (First Road Listed)	Road Heirachy	Incident Type	Nature	Incident No	Start	Location	Perry's Ref
LA ROUTE DU BRAYE, VALE	15131	ROUTE MILLITAIRE	35	LCR	Serious Injury	4 car rtc	G-190215-015-170	2/19/2015 14:00	Crossways Junction, Vale	C00843A000
LA ROUTE DU BRAYE, VALE	15131		35	LCR	Minor Injury	Wing mirror hits pedestrian	G-010915-014-147	9/1/2015 7:45	Braye Road, Vale	C00843A000
LA ROUTE DU BRAYE, VALE_ST. SAMPSON	15131		35	TPR	Minor Injury	Motorcylce vs Motorcar	G-280314-004-032	3/28/2014 8:30	Braye Road St. Sampsons	C00866A00
NORTH SIDE, VALE	15200		35	IHR	Minor Injury	Car v pedestrian	G-230113-003-133	1/23/2013 8:30	North Side, Vale	C02657000
NORTH SIDE, VALE	15200		35	IHR	Damage Only	LORRY COLLIDES WITH PARKED CAR	G-120713-007-109	7/12/2013 12:55	NORTHSIDE	C007690000
NORTH SIDE, VALE	15200		35	IHR	Minor Injury	Car V Car	G-201213-009-187	12/20/2013 13:50	Northside, St Sampsons	C007710000
NORTH SIDE, VALE	15200		35	IHR	Damage Only	CAR V CAR	G-031214-009-096	12/3/2014 9:10	NORTHSIDE, VALE	C006180000
NORTH SIDE, VALE	15200	VALE ROAD, ST SAMPSONS	35	IHR	Damage Only	DAMAGE ONLY	G-110215-014-129	2/11/2015 12:45	Northside Roundabout, St Sampsons	C007510000
NORTH SIDE, VALE	15200		35	IHR	Damage Only	RTC - Damage Only Car v Car	G-200515-006-114	5/20/2015 15:20	NORTHSIDE, VALE	C00652A000
NORTH SIDE, VALE	15200	UNKNOWN	35	IHR	Damage Only	Damage only	G-061115-015-026	11/6/2015 14:45	Northside, St Sampson	C006320000
VALE ROAD, ST. SAMPSON	10150		25	TPR	Damage Only	Car vs. Car	G-260113-005-065	1/26/2013 10:05	Vale Road, Near Halfway Filter, St. Sampsons	B000600000
VALE ROAD, ST. SAMPSON	10150		25	TPR	Minor Injury	car made a u turn and the m/c ran into the side of the vehicle	G-190313-001-187	3/18/2013 22:15	Vale road, St Sampsons	B00700000
VALE ROAD, ST. SAMPSON	10150		25	TPR	Damage Only	Car v Trailer	G-011213-017-095	12/2/2013 19:35	Vale Road, St Sampsons	BOO6610000
VALE ROAD, ST. SAMPSON	10150		25	TPR	Minor Injury	Car v M/C	G-201114-020-018	11/20/2014 19:00	Vale Road, St Sampsons	B00673A00
VALE ROAD, ST. SAMPSON	10150	LE MURIER, ST SAMPSONS	25	TPR	Damage Only	Car V Car	G-040115-006-064	1/4/2015 11:25		A20239000
VALE ROAD, ST. SAMPSON	10150		25	TPR	Minor Injury	Motorcyclist injured in fall	G-140315-014-133	3/15/2015 19:15	Vale Road, St Sampson	B00634000
VALE ROAD, ST. SAMPSON	10150		25	TPR	Minor Injury	MINOR INJURY, FAIL TO STOP	G-250915-009-129	9/25/2015 8:15	VALE ROAD, ST SAMPSONS	B006430003
THE BRIDGE, VALE	15319		25	IHR	Damage Only	Car v Car	G-030313-016-200	3/3/2013 17:00	The Bridge, Vale	C00755A000
THE BRIDGE, VALE	15319		25	IHR	Damage Only	Car vs Car	G-050914-011-195	9/5/2014 16:30	The Bridge, Vale	C00755A000
BRAYE DU VALLE, ST. SAMPSON	10103		35	TPR	Damage Only	Hit and Run RTC vehicle v wall	G-050613-003-165	6/3/2013 8:30	A Little Thought, Braye Road, St. Sampsons	B007360003
BRAYE DU VALLE, ST. SAMPSON	10103	ROUTE MILITAIRE, ST. SAMPSON	35	TPR	Damage Only	unknown vehicle v granite wall	G-071013-014-151	10/7/2013 13:00	Braye du Valle crossroads	B00699J000
BULWER AVENUE, ST. SAMPSON	10182		35	IHR	Damage Only	Car v Car - Minor Damage	G-260413-014-086	4/26/2013 16:10	Bulwer Avenue, St Sampson	B001720000
BULWER AVENUE, ST. SAMPSON	10182		35	IHR	Damage Only	Heavy Goods Vehicle (under 3 tonnes) vs Freight Shed Doors - fail to s	G-040913-003-171	9/4/2013 6:50	Bulwer Avenue, St Sampsons	B00171C000
BULWER AVENUE, ST. SAMPSON	10182		35	IHR	Damage Only	Damage Only Offences	G-260913-016-124	9/26/2013 14:00	Bulwer Avenue, St Sampson	B00135C000
BULWER AVENUE, ST. SAMPSON	10182		35	IHR	Damage Only	RTC - Damage only - Car (18893) v Car (76768)	G-201113-017-027	11/20/2013 15:40	Bulwer Avenue junction with Grandes Maison Road, St Sampsons	B001350000
BULWER AVENUE, ST. SAMPSON	10182		35	IHR	Damage Only	Damage Only	G-230214-015-204	2/23/2014 18:20	Bulwer Avenue, St Sampsons	B00135000
BULWER AVENUE, ST. SAMPSON	10182		35	IHR	No Data	Car v traffic light/pole	G-310314-025-174	3/31/2014 17:15	Bulwer Avenue, St Peter Port	B001710000
BULWER AVENUE, ST. SAMPSON	10182		35	IHR	Damage Only	DAMAGE ONLY RTC	G-030714-009-026	7/3/2014 11:15	BULWER AVENUE, ST SAMPSON	B00172A000
BULWER AVENUE, ST. SAMPSON	10182		35	IHR	Damage Only	Damage only	G-130714-015-076	7/13/2014 15:30	Bulwer Avenue	B 00137000
BULWER AVENUE, ST. SAMPSON	10182		35	IHR	Damage Only	DAMAGE ONLY	G-260814-005-026	8/26/2014 7:25	BULWER AVENUE	B00168C00
BULWER AVENUE, ST. SAMPSON	10182		35	IHR	Damage Only	nose to tail damage only	G-171214-034-076	12/17/2014 15:00	Bulwer avenue	B00172A000
BULWER AVENUE, ST. SAMPSON	10182	GRANDE MAISON ROAD ST SAMPSON	35	IHR	Damage Only	Van v Lorry	G-140115-005-151	1/14/2015 10:20	Juction of Bulwer Avenue and	B001720000
BULWER AVENUE, ST. SAMPSON	10182		35	IHR	Damage Only	CAR VS CAR - T JUNCTION	G-130215-018-135	2/13/2015 19:50	BULWER AVENUE, ST PETER PORT	B00135000
BULWER AVENUE, ST. SAMPSON	10182		35	IHR	Damage Only	CAR VS CAR	G-210415-016-195	4/21/2015 19:55	Bulwer Avenue, St Sampson	B001050000
BULWER AVENUE, ST. SAMPSON	10182		35	IHR	Serious Injury	Man falls off moving vehicle	G-100515-019-174	5/9/2015 17:20	Bulwer Avenue, St Sampson	B00354A000
BULWER AVENUE, ST. SAMPSON	10182		35	IHR	Damage Only	Single Vehicle	G-250515-006-098	5/25/2015 14:45	Bulwer Avenue, St Sampsons	B00171A000
BULWER AVENUE, ST. SAMPSON	10182	GRAND MAISON ROAD, ST SAMPSONS	35	IHR	Damage Only	Car v lorry	G-061215-005-174	12/5/2015 7:45	Bulwer Avenue	B001710001
BULWER AVENUE, ST. SAMPSON	10182		35	IHR	Damage Only	Car Vs Car	G-250216-006-191	2/25/2016 13:15	Bulwer Avenue	B002920000
LES BANQUES, ST. SAMPSON	10140		35	IHR	Damage Only	Car v Car	G-140113-003-174	1/14/2013 9:24	Half Way Filter, Les Banques, St Samspons	B000560030
LES BANQUES, ST. SAMPSON	10140	VALE ROAD, ST SAMPSONS	35	IHR	Damage Only	Cycle v lorry	G-080513-004-133	5/8/2013 6:50	Halfway Filter, St Sampson	B000570000
LES BANQUES, ST. SAMPSON	10140	VALE ROAD, ST SAMPSONS	35	IHR	Damage Only	TWO CAR RTC	G-190613-021-114	6/19/2013 17:30	HALFWAY FILTER, LES BANQUES	B000580000
LES BANQUES, ST. SAMPSON	10140	VALE ROAD, ST SAMPSONS	35	IHR	No Data	fail to give way at a filter - front of the offending M/V drove into t	G-271113-008-040	11/27/2013 11:22	Halfway Filter	B000650001
LES BANQUES, ST. SAMPSON	10140		35	IHR	Damage Only	Car v. Car	G-270214-022-065	2/27/2014 19:50	Halfway Filter, St. Sampson	B000580000
LES BANQUES, ST. SAMPSON	10140		35	IHR	Damage Only	Car Vs Car	G-240414-007-195	4/23/2014 13:00	Halfway, Les Banques, St Sampsons	B00105000
LES BANQUES, ST. SAMPSON	10140	VALE ROAD, ST SAMPSONS	35	IHR	Minor Injury	Minor Injury/Damage	G-260914-013-030	9/26/2014 20:10	Halfway filter junction	B000580000
LES BANQUES, ST. SAMPSON	10140	GRANDE MAISON ROAD, ST SAMPSONS	35	IHR	Damage Only	CAR v PEDESTRIAN	G-100415-016-103	4/10/2015 15:40	Les Banques, St Sampson	B000050008
LES BANQUES, ST. SAMPSON	10140		35	IHR	Damage Only	DAMAGE ONLY	G-291015-023-079	10/29/2015 18:30	LES BANQUES	B00056000
LES BAS COURTILS, ST. SAMPSON	10140	DELANCEY LANE, ST. SAMPSON	#N/A	IHR	Minor Injury	CYCLIST V CAR	G-021215-012-096	12/1/2015 17:30	LES BAS COURTILS/DELANCEY LANE	B000840000
LES BAS COURTILS ROAD, ST. SAMPSON	10160	GRANDE MAISON ROAD, ST SAMPSONS	35	IHR	Minor Injury	Car v Motorbike	G-100113-006-174	1/10/2013 8:30	Les Bas Cortils, St Sampsons	B000800001
LES BAS COURTILS ROAD, ST. SAMPSON	10160	DELANCY LANE, ST SAMPSONS	35	IHR	Damage Only	Car v Car	G-051213-003-174	12/5/2013 7:35	Les Bas Courtils Road	B000850000
LES BAS COURTILS ROAD, ST. SAMPSON	10160		35	IHR	Minor Injury	Minor Injury	G-020214-011-109	2/2/2014 16:15	Les Bas Courtils Road, St Sampsons	B00095000
LES BAS COURTILS ROAD, ST. SAMPSON	10160		35	IHR	No Data	DAMAGE ONLY	G-280214-005-129	3/28/2014 11:55	Entrance/Exit to Delancey Elim Church and Les Bas Courtils Road, St Sampsons	B000800001
LES BAS COURTILS ROAD, ST. SAMPSON	10160	GRANDE MAISON ROAD, ST PETER PORT	35	IHR	Damage Only	CAR VS CAR	G-070714-013-135	7/7/2014 11:20	LES BAS COURTILS ROAD, ST SAMPSONS	B00075A000

RoadName	USRN	Junction_With	Road Speed (First Road Listed)	Road Heirachy	Incident Type	Nature	Incident No	Start	Location	Perry's Ref
LES BAS COURTILS ROAD, ST. SAMPSON	10160		35	IHR	Minor Injury	Car vs Pedal Cycle	G-290515-007-197	5/29/2015 11:20	Les Bas Courtils Road	B000850000
LES BAS COURTILS ROAD, ST. SAMPSON	10160		35	IHR	No Data	Car reversed into m/c	G-080116-014-026	1/8/2016 18:30	La Bas Courtil	B00070B00
LES BAS COURTILS ROAD, ST. SAMPSON	10160		35	IHR	Minor Injury	MINOR INJURY, SIGNIFICANT DAMAGE TO CYCLE	G-090316-005-129	3/8/2016 7:50	LES BAS COURTIL RAD, ST SAMPSON	B00105A000
ROUTE MILITAIRE, ST. SAMPSON	10146		35	TPR	Damage Only	Amber Traffic Light	G-120613-018-172	6/12/2013 16:40	Cross Roads, Route Militaire / Route Du Braye	B01066C000
ROUTE MILITAIRE, ST. SAMPSON	10146		35	TPR	Damage Only	Car v wall	G-071013-002-102	10/7/2013 6:50	Route Militaire	B007300000
ROUTE MILITAIRE, ST. SAMPSON	10146		35	TPR	No Data	Lorry vs car	G-101013-008-187	10/10/2013 7:30	Route Militaire,	B00722B000
ROUTE MILITAIRE, ST. SAMPSON	10146		35	TPR	Damage Only	Car Vs Dog	G-200414-012-195	4/20/2014 16:15	Route Militaire, St Sampsons	B00713A000
ROUTE MILITAIRE, ST. SAMPSON	10146		35	TPR	No Data	Car v car	G-161214-023-104	12/16/2014 8:30	Route militaire junction with Braye Du Valle, St Sampsons	10c2
ROUTE MILITAIRE, ST. SAMPSON	10146	BRAYE ROAD, ST SAMPSONS	35	TPR	Damage Only	car vs mc	G-030315-005-208	3/3/2015 7:30	Route Militaire, St Sampson	B00699L000
ROUTE ST. CLAIR, ST. SAMPSON	10147		35	TPR	Damage Only	DAMAGE ONLY	G-101213-016-109	12/10/2013 16:25	ST CLAIR HILLS, ST SAMPSONS	B006880000
ROUTE ST. CLAIR, ST. SAMPSON	10147	VALE ROAD, ST SAMPSONS	35	TPR	Damage Only	car v car	G-080316-014-079	3/8/2016 15:00	st clair hill, st peter port	B007060000
SOUTH QUAY, ST. SAMPSON	10212		25	IHR	Minor Injury	m/v vs pedestrian	G-110113-017-109	1/11/2013 19:20	Southside, St Sampsons	B003080000
SOUTH QUAY, ST. SAMPSON	10212		25	IHR	Damage Only	Car Vs Van	G-040913-002-191	9/4/2013 4:50	Southside. St Sampson	B003060000
SOUTH QUAY, ST. SAMPSON	10212		25	IHR	Damage Only	Car v Car	G-090314-007-107	3/8/2014 11:30	Southside, St Sampsons	B00305D00
SOUTH QUAY, ST. SAMPSON	10212		25	IHR	Damage Only	Car vs Car	G-180714-005-116	7/18/2014 10:55	Southside, St Samspons	B003240000
SOUTH QUAY, ST. SAMPSON	10212		25	IHR	Damage Only	Car vs Traffic sign	G-260714-017-200	7/26/2014 18:50	South Side, St Sampson	B003160000
SOUTH QUAY, ST. SAMPSON	10212		25	IHR	Damage Only	MC v MV	G-250914-018-098	9/25/2014 21:00	Southside, St Sampsons	B00305D000
SOUTH QUAY, ST. SAMPSON	10212		25	IHR	No Data	Lorry V Car	G-061014-006-018	10/6/2014 8:50	Southside, St Sampsons	B00316000
SOUTH QUAY, ST. SAMPSON	10212		25	IHR	Minor Injury	Car v m/c	G-270615-013-174	6/27/2015 17:20	Southside, St Sampson	B003030000
SOUTH QUAY, ST. SAMPSON	10212		25	IHR	Minor Injury	Car v car	G-270615-013-174	6/28/2015 17:20	The Bridge, St Sampson	C007700000
SOUTH QUAY, ST. SAMPSON	10212		25	IHR	Damage Only	DAMAGE ONLY FAIL TO STOP	G-280815-006-199	8/27/2015 17:45	SOUTHSIDE	
THE BRIDGE, ST. SAMPSO+A+1573:1594	10213		#N/A	NR	Damage Only	Car v Building	G-240113-012-102	1/24/2013 9:35	The Bridge, Vale	C007560000
THE BRIDGE, ST. SAMPSON	10213		25	NR	Damage Only	Car v Car	G-040213-015-107	2/4/2013 13:00	Clock Tower, The Bridge, St. Sampsons	A411190002
THE BRIDGE, ST. SAMPSON	10213		25	NR	Minor Injury	Moped v Cyclist	G-070313-025-136	3/7/2013 17:55	The Bridge, St Sampsons	B00352A00
THE BRIDGE, ST. SAMPSON	10213		25	NR	Damage Only	car reversed into a mc and drove off without exchanging det	G-280313-013-Mr	3/28/2013 14:40	The Bridge, St Sampsons (closest building cadastre C00755A000)	C00755A00
THE BRIDGE, ST. SAMPSON	10213		25	NR	Damage Only	CAR V CAR	G-300313-009-141	3/30/2013 9:45	THE BRIDGE, ST SAMPSONS	B003290000
THE BRIDGE, ST. SAMPSON	10213		25	NR	Damage Only	Damage Only	G-210913-012-045	9/21/2013 15:25	TRAFFIC ISLAND ON ENTRANCE TO THE BRIDGE FROM SOUTHSIDE, ST SAMPSONS	B003440000
THE BRIDGE, ST. SAMPSON	10213		25	NR	No Data	M/C knocked over whiLst parked and unatended	G-140114-001-059	1/18/2014 18:00	The Bridge, St Sampsons	C007550000
THE BRIDGE, ST. SAMPSON	10213		25	NR	Damage Only	Car v Sign	G-190214-016-200	2/19/2014 15:10	The Bridge, St Peter Port	B003300000
THE BRIDGE, ST. SAMPSON	10213		25	NR	Damage Only	Car v railing	G-190414-003-174	4/18/2014 19:00	The Bridge	B003420000
THE BRIDGE, ST. SAMPSON	10213		25	NR	Damage Only	Car vs parked car, damage only	G-070514-009-197	5/7/2014 10:40	The Bridge, St Sampsons	B00340000
THE BRIDGE, ST. SAMPSON	10213		25	NR	Minor Injury	Bus V person	G-180614-009-064	6/18/2014 11:30	The Bridge, St Sampsons	B00329000
THE BRIDGE, ST. SAMPSON	10213		25	NR	Damage Only	Minor Damage Only	G-070814-011-193	8/7/2014 14:10	Bridge, St Sampsons	B00333000
THE BRIDGE, ST. SAMPSON	10213		25	NR	Damage Only	Fail to Stop	G-200215-004-124	2/20/2015 10:00	The Bridge, St Sampson	B003330000
THE BRIDGE, ST. SAMPSON	10213		25	NR	Damage Only	Damage and Fail to Stop	G-080415-015-052	3/19/2015 12:20	The Bridge, St Peter Port	B003290000
THE BRIDGE, ST. SAMPSON	10213		25	NR	Damage Only	Damage only - Fail to stop	G-140415-009-030	4/14/2015 9:10	Bridge, St Sampsons	C00755000
THE BRIDGE, ST. SAMPSON	10213		25	NR	Damage Only	Trailer & Jetski vs Car	G-280615-016-171	6/28/2015 16:25	The Bridge, St ~Sampsons	C007610000
THE BRIDGE, ST. SAMPSON	10213		25	NR	Damage Only	RTC FTS	G-010915-011-172	9/1/2015 13:05	Beekers, 7, The Bridge, St. Sampson,	B003340000
THE BRIDGE, ST. SAMPSON	10213		25	NR	No Data	car vs car	G-290915-016-196	9/28/2015 11:25	The Bridge, St Sampsons	C00755A000
THE BRIDGE, ST. SAMPSON	10213		25	NR	Minor Injury	Minor Injury	G-161115-011-109	11/16/2015 12:30	The Bridge, St Sampsons	B003290000
THE BRIDGE, ST. SAMPSON	10213		25	NR	Damage Only	Damage only	G-300116-007-104	1/30/2016 7:00	Tozers, The Bridge, St Sampson	
THE BRIDGE, VALE	15319		25	IHR	Damage Only	Car v Car	G-030313-016-200	3/3/2013 17:00	The Bridge, Vale	C00755A000
THE BRIDGE, VALE	15319		25	IHR	Damage Only	Car vs Car	G-050914-011-195	9/5/2014 16:30	The Bridge, Vale	C00755A000

Editted Location	Occ Number	Road Speed (First Road Listed)	Report Time	Person Ref	Casualty Class	Injury Severity	Car Passenger Position	Pedestrian Location
NORTH QUAY, VALE	OC1600001872	#N/A	6/19/2016 2:45		1. Driver or rider	3. Slight		
NORTHSIDE, VALE	OC1600004241	#N/A	10/18/2016 19:36	2		None		
NORTHSIDE, VALE	OC1700003670	#N/A	7/5/2017 8:00	2	1. Driver or rider	None	1. Front seat passenger	
NORTHSIDE, VALE	OC1700004351	#N/A	8/8/2017 4:00	1	1. Driver or rider	None	0. Not a car passenger	
THE BRIDGE, ST. SAMPSON	OC1600000396	25	4/18/2016 5:59	1	1. Driver or rider	None	0. Not a car passenger	
THE BRIDGE, ST SAMPSONS	OC1600003330	#N/A	8/30/2016 16:34	1	1. Driver or rider	None	0. Not a car passenger	
BRIDGE, ST SAMPSON	OC1700002031	#N/A	4/15/2017 13:59	1	1. Driver or rider	None	0. Not a car passenger	
BRIDGE, ST SAMPSON	OC1700004022	#N/A	7/25/2017 10:27	2	1. Driver or rider	None	0. Not a car passenger	
SOUTHSIDE, ST SAMPSONS	OC1600000127	#N/A	3/24/2016 17:12	1	1. Driver or rider	3. Slight	0. Not a car passenger	
SOUTHSIDE, ST SAMPSONS	OC1700000630	#N/A	2/6/2017 12:56	1	1. Driver or rider	None	1. Front seat passenger	
SOUTHSIDE, ST SAMPSONS	OC1700004436	#N/A	8/22/2017 21:09	2	1. Driver or rider	None	0. Not a car passenger	
BULWER AVENUE, ST SAMPSONS	OC1600005171	#N/A	12/3/2016 2:27	1	1. Driver or rider	None	1. Front seat passenger	
BULWER AVENUE, ST SAMPSONS	OC1700003144	#N/A	6/14/2017 9:56	2	1. Driver or rider	None	1. Front seat passenger	
BULWER AVENUE, ST SAMPSONS	OC1700005284	#N/A	9/22/2017 16:41	2	1. Driver or rider	3. Slight	0. Not a car passenger	
BULWER AVENUE, ST SAMPSONS	OC1700005563	#N/A	10/6/2017 17:15	1	1. Driver or rider	None	0. Not a car passenger	
LES BAS COURTILS ROAD, ST. SAMPSON, GY2 4BH	OC1700004021	#N/A	8/9/2017 7:34	2	3. Pedestrian	3. Slight	0. Not a car passenger	05. In c'way crossing elsewhere
LES BAS COURTILS ROAD, ST SAMPSONS	OC1700004620	#N/A	8/21/2017 22:22	2	1. Driver or rider	None	0. Not a car passenger	
LES BAS COURTILS ROAD, ST SAMPSONS	OC1700006216	#N/A	11/8/2017 23:10	2	1. Driver or rider	None	0. Not a car passenger	
VALE ROAD, ST SAMPSON, GY2 4DP	OC1700000351	#N/A	1/20/2017 16:49	2	1. Driver or rider	None	1. Front seat passenger	
VALE ROAD, ST SAMPSON, GY2 4DP	OC1700002870	#N/A	5/29/2017 6:46	1	1. Driver or rider	2. Serious	0. Not a car passenger	
VALE ROAD, ST SAMPSON, GY2 4DP	OC1700004018	#N/A	7/22/2017 15:55	1	1. Driver or rider	None	0. Not a car passenger	
ST CLAIR HILL, ST SAMPSONS	OC1700001740	#N/A	4/3/2017 11:26	1	1. Driver or rider	3. Slight	0. Not a car passenger	
ROUTE MILITAIRE, ST SAMPSONS	OC1600000671	#N/A	4/21/2016 11:16	1	1. Driver or rider	3. Slight	0. Not a car passenger	
ROUTE MILITAIRE, ST SAMPSONS	OC1600001877	#N/A	6/19/2016 14:13	1	1. Driver or rider	None	0. Not a car passenger	
ROUTE MILITAIRE, ST SAMPSONS	OC1600004239	#N/A	10/18/2016 17:24	1	1. Driver or rider	None	0. Not a car passenger	
LA ROUTE MILITAIRE, ST SAMPSONS	OC1700000905	#N/A	2/21/2017 16:15		1. Driver or rider	None	0. Not a car passenger	
LES BANQUES, ST SAMPSONS	OC1700003834	#N/A	7/12/2017 7:11	2	1. Driver or rider	None	1. Front seat passenger	Halfway filter junction

Appendix 11.4: Housing Allocation Growth Factor Results (2021, 2024)

Leale's Yard Full Development (300 dwellings)
Base 24HR AADT
Total Vehicles
0
0
0
0
822
822
193

Saltpans Full Development (119 dwellings)
Base 24HR AADT
Total Vehicles
0
0
49.6
0
0
73.7
4.5

Belgrave Vinery Full Development (222 dwellings)
Base 24HR AADT
Total Vehicles
0
259
136
441
0
0
0

France Fief Full Development (198 dwellings)
Base 24HR AADT
Total Vehicles
0
47
279
233
47
329
140

Pointues Rocques Full Development (100 dwellings)
Base 24HR AADT
Total Vehicles
0
52
260
208
52
0
0

Leale's Yard
24HR AADT 2021 Build Out (60 Dwellings) Total Vehicles
0
0
0
0
164
164
39

Salt Pans
24HR AADT 2021 Build Out (50 Dwellings) Total Vehicles
0
0
21
0
0
31
2

Belgrave Vinery
24HR AADT 2021 Build Out (0 Dwellings) Total Vehicles
Construction not yet begun

France Fief
24HR AADT 2021 Build Out (50 Dwellings) Total Vehicles
0
12
71
59
12
83
35

Pointues Rocques
24HR AADT 2021 Build Out (50 Dwellings) Total Vehicles
0
26
130
104
26
0
0

Leale's Yard
24HR AADT 2024 Build Out (240 Dwellings) Total Vehicles
0
0
0
658
658
154
0

Salt Pans
24HR AADT 2024 Build Out (119 Dwellings) Total Vehicles
0
0
50
0
0
74
5

Belgrave Vinery
24HR AADT 2024 Build Out (122 Dwellings) Total Vehicles
0
142
74
241
0
0
0

France Fief
24HR AADT 2024 Build Out (198 Dwellings) Total Vehicles
0
47
279
233
47
329
140

Pointues Rocques
24HR AADT 2024 Build Out (100 Dwellings) Total Vehicles
0
52
260
208
52
0
0

Link	Road	2019 Operational Assessment Year		
		Total HA Traffic Flows	2019 LHS Baseflows	Growth based on HA Site traffic flows
1	Site Access	0.0	1,285	0.0%
2	Bulwer Avenue/Les Bas Courtils	37.7	9,369	0.4%
3	Vale Road / Route Militaire	221.2	11,463	1.9%
4	Les Banques	162.7	24,377	0.7%
5	Bulwer Avenue	202.1	8,494	2.4%
6	The Bridge / South Quay	278.3	10,386	2.7%
7	North Side (North Quay / Castle Road)	75.8	5,280	1.4%

Link	Road	2024 Operational Assessment Year		
		Total HA Traffic Flows	2019 LHS Baseflows	Growth based on HA Site traffic flows
1	Site Access	0.0	1,285	0.0%
2	Bulwer Avenue/Les Bas Courtils	240.2	9,369	2.6%
3	Vale Road / Route Militaire	662.9	11,463	5.8%
4	Les Banques	1338.9	24,377	5.5%
5	Bulwer Avenue	756.1	8,494	8.9%
6	The Bridge / South Quay	556.6	10,386	5.4%
7	North Side (North Quay / Castle Road)	144.1	5,280	2.7%

Appendix 11.5: Construction Worker Distribution and Assignment

Construction Workers Distribution Gravity Model

Parish	Activity Centre	Factor	Population per Parish	Population % per Parish	Population % Per Parish Activity Centres (A x C)	Peak Construction Workers per Activity Centre (D x 25)	Entry Link to Study Area
		A	B	C	D	E	
Castel	A	0.7	8760	14.06%	9.84%	2.5	4
	B	0.3			4.22%	1.1	4
Forest	A	1	1522	2.44%	2.44%	0.6	4
St Andrew	A	1	2304	3.70%	3.70%	0.9	4
St Martin	A	1	6573	10.55%	10.55%	2.6	4
St Peter Port	A	0.4	18595	29.84%	11.94%	3.0	4
	B	0.3			8.95%	2.2	4
	C	0.3			8.95%	2.2	4
St Pierre Du Bois	A	0.5	2030	3.26%	1.63%	0.4	4
	B	0.5			1.63%	0.4	4
St Sampson	A	0.6	8942	14.35%	8.61%	2.2	3
	B	0.3			4.31%	1.1	3
	C	0.1			1.44%	0.4	3
St Saviour	A	0.5	2745	4.41%	2.20%	0.6	4
	B	0.5			2.20%	0.6	4
Torteval	A	0.5	1036	1.66%	0.83%	0.2	4
	B	0.5			0.83%	0.2	4
Vale	A	0.5	9531	15.30%	7.65%	1.9	6
	B	0.4			6.12%	1.5	3
	C	0.1			1.53%	0.4	7
Other	-	1	269	0.43%	0.43%	0.1	7
		Totals	62307	100%	100%	25	

Peak Construction employees = 25

Entry Link	Total construction workers per entry link
Link 3	5.1
Link 4	17.5
Link 6	1.9
Link 7	0.5
Totals	25.0

Construction Workers Assignment

			Links						
Origin Link	Peak daily construction workers per entry link	Peak daily construction worker vehicle movements	1	2	3	4	5	6	7
3	5.1	10.2	10.2	10.2	10.2				
4	17.5	35.0	35.0	35.0		35.0			
6	1.9	3.8	3.8				3.8	3.8	
7	0.5	1.0	1.0				1.0	1.0	1.0
Totals	25.0	50.0	50.0	45.2	10.2	35.0	4.8	4.8	1.0

Destination link (Longue Hougue South site location)

Appendix 11.6: Operational HGV Distribution and Assignment

Operational HGV Distribution Gravity Model

Parish	Activity Centre	Factor	Office Sqm	Industry Sqm	Storage & Dist Sqm	Total GFA (B+C+D)	Proportion per Parish	% Proportion Per Parish Activity Centres (A xF)	Peak HGVs per Activity Centre (G x 113.1)	Entry Link to Study Area
		A	B	C	D	E	F	G	H	
Castel	A	70%	0	6400	1900	8300	1.2%	0.8%	0.9	4
	B	30%						0.4%	0.4	4
Forest	A	100%	870	10700	15700	27270	4.1%	4.1%	4.6	4
St Andrew	A	100%	0	17000	3300	20300	3.0%	3.0%	3.4	4
St Martin	A	100%	6520	7800	3300	17620	2.6%	2.6%	2.9	4
St Peter Port	A	40%	241300	75000	51000	367300	54.6%	21.8%	24.7	4
	B	30%						16.4%	18.5	4
	C	30%						16.4%	18.5	4
St Pierre Du Bois	A	50%	0	1400	0	1400	0.2%	0.1%	0.1	4
	B	50%						0.1%	0.1	4
St Sampson	A	60%	15210	36000	59000	110210	16.4%	9.8%	11.1	3
	B	30%						4.9%	5.6	3
	C	10%						1.6%	1.9	3
St Saviour	A	50%	2170	6400	500	9070	1.3%	0.7%	0.7	4
	B	50%						0.7%	0.7	4
Torteval	A	50%	0	450	0	450	0.1%	0.1%	0.1	4
	B	50%						0.1%	0.1	4
Vale	A	30%	4350	58000	49000	11350	16.5%	5.0%	5.6	6
	B	30%						5.0%	5.6	3
	C	40%						6.6%	7.5	7
Totals			270420	219150	183700	573270	100.0%	100.0%	113.1	

Entry Link	Total HGVs per entry link
Link 3	24.1
Link 4	75.9
Link 6	5.6
Link 7	7.5
Totals	113.1

2019 Reference Year (HGV daily movements) 276
2024 Operational Peak Year (HGV daily movements) 389

Net HGV Increase for Assesment 113

Operation Employees 4 Applied to all routes

HGV Operational Assignment

		Links						
Origin Link	Peak HGV Movements	1	2	3	4	5	6	7
3	24.1	24.1	24.1	24.1				
4	75.9	75.9	75.9		75.9			
6	5.6	5.6				5.6	5.6	
7	7.5	7.5				7.5	7.5	7.5
Totals	113.1	113.1	100.0	24.1	75.9	13.1	13.1	7.5

Destination link (Longue Hougue South site location)

Appendix 12.1: Construction Phase Dust Assessment Methodology

REPORT

Longue Hougue South

Appendix 12.1: Construction Phase Dust Assessment Methodology

Client: States of Guernsey

Reference: PB5312-RHD-ZZ-XX-RP-Z-0001

Status: Final/01

Date: 8/28/2019

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Document title: Longue Hougue South

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Date / initials: CG 22/08/2019

Approved by: Gary Bower

Date / initials: GB 28/08/2019

Classification

Open

Appendix 12.1: Construction Phase Dust Assessment Methodology

The following section outlines criteria developed by the Institute of Air Quality Management (IAQM, 2016) for the assessment of air quality impacts arising from construction activities. The assessment procedure is divided into four steps and is summarised below.

Step 1: Screen the Need for a Detailed Assessment

An assessment will normally be required where there are human receptors within 350m of the site boundary and / or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s), or designated ecological sites within 50m of the site boundary or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s), are also identified at this stage. A designated ecological site refers to any sensitive habitat affected by dust soiling. For locations with a statutory designation, such as Ramsar sites, Site of Specific Scientific (SSS) or Areas of Biodiversity Importance (ABI), consideration should be given as to whether the particular site is sensitive to dust. Some non-statutory sites may also be considered if appropriate.

Where the need for a more detailed assessment is screened out, it can be concluded that the level of risk is '**negligible**'.

As there were several human receptors within 350m of the site boundary and the site boundary includes a small area of the nationally designated Bulwer Avenue and Spur Point Area of Biodiversity Importance (ABI), a Detailed Assessment was therefore required.

Step 2: Assess the Risk of Dust Impacts

A site is allocated to a risk category based on the scale and nature of the works (Step 2A) and the sensitivity of the area to dust impacts (Step 2B). These two factors are combined (Step 2C) to determine the risk of dust impacts before the implementation of mitigation measures. The assigned risk categories may be different for each of the construction activities outlined by the IAQM (demolition, construction, earthworks and trackout).

Step 2A: Define the Potential Dust Emission Magnitude

The IAQM guidance recommends that the dust emission magnitude is determined for demolition, earthworks, construction and trackout. The dust emission magnitude is based on the scale of the anticipated works. There are no buildings anticipated to be demolished during the construction of the breakwater, therefore demolition was scoped out of the assessment. The IAQM guidance states that 'earthworks' encompasses haulage, tipping and stockpiling. Therefore, the construction of the breakwater was defined as earthworks

in the context of this assessment. Construction is defined in IAQM guidance in relation to construction of buildings, which is not proposed in this development, so is not considered. Therefore, construction was scoped out of the assessment. Trackout is defined as the transport of dust and dirt from construction sites onto the public road network and was scoped into the assessment. **Table A12.1.1** describes the potential dust emission class criteria for each outlined construction activity.

Table A12.1.1: Criteria Used in the Determination of Dust Emission Class

Activity	Criteria used to Determine Dust Emission Class		
	Small	Medium	Large
Earthworks	Total site area <2,500m^2; <5 heavy moving earth vehicles active at any one time.	Total site area 2,500 – 10,000m^2; 5 – 10 heavy moving earth moving vehicles active at any one time.	Total site area >10,000m^2, >10 heavy earth moving vehicles active at any one time.
Trackout	<10 outward HGV trips in any one day; Unpaved road length <50m.	10 – 50 outward HGV trips in any one day. Unpaved road length 50 – 100m.	>50 outward HGV trips in any one day; Unpaved road length >100m.

Step 2B: Define the Sensitivity of the Area

The sensitivity of the area takes into account the following factors:

- the specific sensitivities of receptors in the area;
- the proximity and number of receptors;
- the local background PM_{10} concentration; and
- site-specific factors, such as the presence of natural shelters, such as trees, to reduce the risk of windblown dust.

Table A12.1.2: Criteria for Determining Sensitivity of Receptors

Activity	Criteria for Determining Sensitivity (Human Receptors)	
	Human Dust Soiling Effects	Health Effects of PM_{10}
High	Dwellings, museums and other culturally important collections, medium and long-term car parks and car showrooms.	Residential properties, hospitals, schools and residential care homes.

Activity	Criteria for Determining Sensitivity (Human Receptors)	
	Human Dust Soiling Effects	Health Effects of PM_{10}
Medium	Parks, places of work.	Office and shop workers not occupationally exposed to PM10.
Low	Playing fields, farmland, footpaths, short-term car parks and roads.	Public footpaths, playing fields, parks and shopping streets.

The criteria detailed in **Table A12.1.2** to **Table A12.1.5** were used to determine the sensitivity of the area to human and ecological dust soiling effects and human health impacts. **Figure 12-3** details the distance bands, as detailed in **Table A12.1.2** to **Table A12.1.5**, from the site boundary for use in the construction phase assessment.

Table A12.1.3: Sensitivity of the Area to Dust Soiling Effects on People and Properties

Receptor Sensitivity	Number of Receptors	Distance from Source (m)			
		<20	<50	<100	<350
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Table A12.1.4: Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM_{10} Concentration ($\mu g.m^3$)	Number of Receptors	Distance from the Source (m)				
			<20	<50	<100	<200	<350
High	>32	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	>28 -32	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	>24 -28	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	-	>10	High	Medium	Low	Low	Low
	-	1-10	Medium	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

Table A12.1.5: Sensitivity of Area to Ecological Impacts

Receptor Sensitivity	Distance from Source (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

Step 2C: Define the Risk of Impacts

The dust emission magnitude and sensitivity of the area are combined and the risk of impacts from each activity (earthworks and trackout) before mitigation is applied should be determined using the criteria detailed in **Table A12.1.6** and **Table A12.1.7**.

Table A12.1.6: Risk of Dust Impacts – Earthworks

Potential Impact	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table A12.1.7: Risk of Dust Impacts – Trackout

Potential Impact	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

Step 3: Site-Specific Mitigation

Step three of the IAQM guidance identifies appropriate site-specific mitigation. These measures are related to whether the site is a low, medium or high-risk site. The highly recommended mitigation measures for the Project are detailed in **Section 12.6** of **Section 12: Air Quality**.

Step 4: Determine Significant Effects

With the implementation of the above mitigation measures, the residual impacts from the construction are considered to be **not significant**, in accordance with IAQM guidance.

References

Institute of Air Quality Management (IAQM) (2016). Guidance on the assessment of dust from demolition and construction. London: IAQM.

Appendix 12.2: Alternative Approach Model Verification and Results

REPORT

Longue Hougue South

Appendix 12.2: Alternative Approach Model Verification and Results

Client: States of Guernsey

Reference: PB5312-RHD-ZZ-XX-RP-Z-0001

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Date: 8/28/2019

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Approved by: Gary Bower

Date / initials: GB 28/08/2019

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Appendix 12.2: Alternative Approach Model Verification and Results

States of Guernsey was consulted on the assessment methodology, including the approach to the conversion of NOx to NO_2 because there are no specific assessment tools provided by States of Guernsey or Defra for this purpose which relate to Guernsey. It was agreed to present the assessment results using both the Defra NOx to NO_2 Calculator (set to Cornwall as a proxy for Guernsey), and using the Environment Agency's stack assessment approach[1] for converting NO_X to NO_2, using a conversion factor of 0.7.

Generally, the use of the NOx to NO_2 Calculator produced higher results; therefore, these were presented in **Section 12: Air Quality**. This appendix details the model verification and results of the air quality assessment using the Environment Agency's stack assessment approach[2] for converting NO_X to NO_2 (the "Alternative Approach"), for comparison purposes.

Model Verification

Roadside diffusion tubes DT1, DT2 and DT4 to DT7 were used in the derivation of the adjustment factor utilised in the assessment, in accordance with Defra Technical Guidance (TG(16)) (Defra, 2018). 2018 annualised background concentrations measured at DT3 were used at all locations in the assessment. The model verification using the Alternative Approach is detailed in **Table A12.2.1**.

Table A12.2.1: Model Verification (using the Alternative Approach)

Verification Factor	NO_2 Diffusion Tube Monitoring Location					
	DT1	DT2	DT4	DT5	DT6	DT7
2018 Annualised Monitored Total NO_2 ($\mu g.m^{-3}$)	22.9	23.9	22.7	17.8	16.2	18.9
2018 Annualised Background NO_2 (from DT3) Concentration ($\mu g.m^{-3}$)	9.9	9.9	9.9	9.9	9.9	9.9

[1] https://webarchive.nationalarchives.gov.uk/20140328232919/http:/www.environment-agency.gov.uk/static/documents/Conversion_ratios_for__NOx_and_NO2_.pdf
[2] https://webarchive.nationalarchives.gov.uk/20140328232919/http:/www.environment-agency.gov.uk/static/documents/Conversion_ratios_for__NOx_and_NO2_.pdf

Verification Factor	NO_2 Diffusion Tube Monitoring Location					
	DT1	DT2	DT4	DT5	DT6	DT7
Monitored Road Contribution NO_X (total - background) ($\mu g.m^{-3}$)	18.6	20.0	18.2	11.2	9.0	12.9
Modelled Road Contribution NO_X (excludes background) ($\mu g.m^{-3}$)	5.3	11.9	5.9	9.8	3.7	5.2
Adjustment Factor for Modelled Road Contribution	**1.918**					
Adjusted Modelled Road Contribution NOx ($\mu g.m^{-3}$)	10.1	22.9	11.2	18.8	7.1	9.9
Modelled Total NO_2 (based on empirical NO_X / NO_2 relationship) ($\mu g.m^{-3}$)	17.0	25.9	17.8	23.0	14.9	16.9
Monitored Total NO_2 ($\mu g.m^{-3}$)	22.9	23.9	22.7	17.8	16.2	18.9
% Difference [(modelled - monitored) / monitored] x 100	-26%	8%	-22%	30%	-8%	-11%

The Root Mean Square Error (RMSE) of the model was 4$\mu g.m^{-3}$ which is within the ideal value of 4$\mu g.m^{-3}$ (10% of the Objective) as specified in Defra technical guidance (Defra, 2018). Model performance was therefore considered to be suitable.

Construction Phase Road Traffic Emissions Assessment Results

The NO_2 results detailed in the following section were verified using the adjustment factor in **Table A12.2.1**.

Human Receptors

The predicted NO_2 concentrations for the 'with Project construction' (2021) scenario (Scenario 3) are detailed in **Table A12.2.2**, which include the contribution from the modelled road network and background pollutant concentrations. Concentrations for the 2021 'without Project construction' scenario (Scenario 2) and the predicted change in NO_2 concentrations, as a result of the construction phase, are also shown for comparison purposes.

Table A12.2.2: Predicted Annual Mean NO_2 Concentrations and Impact of Project during Peak Construction (2021) at Sensitive Receptor Locations using the Alternative Apprach

Receptor	Alternative Approach Predicted Concentrations 2021 – Construction Phase				
	Without Project construction ($\mu g.m^{-3}$)	With Project construction ($\mu g.m^{-3}$)	Change ($\mu g.m^{-3}$)	Change as % of Objective	Impact Descriptor
Nitrogen Dioxide (NO_2) – Air Quality Objective of 40$\mu g.m^{-3}$					
R1	21.9	22.3	0.4	1%	Negligible
R2	16.0	16.2	0.2	0%	Negligible
R3	13.1	13.2	0.1	0%	Negligible
R4	14.3	14.4	0.1	0%	Negligible
R5	16.0	16.1	0.1	0%	Negligible
R6	16.9	17.0	0.1	0%	Negligible
R7	25.0	25.3	0.3	1%	Negligible
R8	35.8	36.0	0.2	1%	Negligible
R9	23.1	23.4	0.3	1%	Negligible
R10	14.1	14.2	0.1	0%	Negligible
R11	13.3	13.4	0.1	0%	Negligible

As detailed in **Table A12.2.2**, the results of the impact assessment showed that there were no exceedances of the annual mean NO_2 Objective. The highest annual total concentration during peak construction (2021) was 36.0$\mu g.m^{-3}$ at R8 and this is below the NO_2 Objective of 40$\mu g.m^{-3}$. The impact was described as negligible at all receptors for NO_2 in accordance with IAQM and EPUK guidance (IAQM & EPUK, 2017).

Ecological Receptors

The Alternative Approach predicted NO_X concentrations from construction phase vehicle emissions along the transects modelled in each of the ABIs are detailed in **Table A12.2.3**Error! Reference source not found.. The predicted vehicle emissions were added to the background pollutant concentrations to provide total concentrations at each transect location. Background NO_X concentrations were calculated from NO_2 measurements taken at DT3. The NO_X background concentration calculated using the Alternative Approach was 14.14µg.m^{-3} and was added to predicted vehicle emissions to give total predicted concentrations during construction.

The results from using the NO_X to NO_2 Calculator approach are provided within the brackets in the Table, these are inclusive of a NO_X background concentration of 15.744µg.m^{-3} which was calculated using the NO_X to NO_2 Calculator.

Table A12.2.3: Construction Phase Critical Level Assessment (using the Alternative Approach)

Site	Alternative Approach 2021 Annual Mean NO_X Concentrations (µg.m^{-3})			
	Transect ID	NO_X Concentration without Project construction (µg.m^{-3})	NO_X Concentration with Project construction (µg.m^{-3})	NO_X Concentration with Project construction as % of Critical Level
NO_X Annual Mean Critical Level Assessment – Critical Level 30µg.m^{-3}				
Bulwer Avenue (b) and Spur Point (a) ABI	T1(a)-1	24.1 (25.7)	24.3 (25.9)	81% (86%)
	T1(a)-2	16.0 (17.6)	16.0 (17.6)	53% (59%)
	T1(a)-3	15.2 (16.8)	15.2 (16.9)	51% (56%)
	T1(a)-4	15.0 (16.6)	15.0 (16.6)	50% (55%)
	T1(b)-1	21.6 (23.2)	21.7 (23.3)	72% (78%)
	T1(b)-2	17.5 (19.1)	17.5 (19.1)	58% (64%)

Site	Alternative Approach 2021 Annual Mean NO_X Concentrations ($\mu g.m^{-3}$)			
	Transect ID	NO_X Concentration without Project construction ($\mu g.m^{-3}$)	NO_X Concentration with Project construction ($\mu g.m^{-3}$)	NO_X Concentration with Project construction as % of Critical Level
NO_X Annual Mean Critical Level Assessment – Critical Level 30$\mu g.m^{-3}$				
Longue Hougue Quarry ABI	T2-1	15.7 (17.3)	15.8 (17.4)	53% (58%)
	T2-2	15.2 (16.8)	15.2 (16.8)	51% (56%)
	T2-3	15.1 (16.7)	15.1 (16.7)	50% (56%)
	T2-4	15.1 (16.7)	15.1 (16.7)	50% (56%)
	T2-5	15.1 (16.7)	15.2 (16.8)	51% (56%)
Mont Crevelt ABI	T3-1	20.0 (21.6)	20.1 (21.7)	67% (72%)
	T3-2	15.5 (17.1)	15.6 (17.2)	52% (57%)
	T3-3	15.0 (16.6)	15.1 (16.7)	50% (56%)
	T3-4	14.9 (16.5)	14.9 (16.5)	50% (55%)
Vale Castle/Rue des Barras ABI	T4-1	19.3 (20.9)	19.5 (21.1)	65% (70%)
	T4-2	15.2 (16.8)	15.2 (16.8)	51% (56%)
	T4-3	14.8 (16.4)	14.8 (16.4)	49% (55%)
	T4-4	14.7 (16.3)	14.8 (16.4)	49% (55%)

Site	Alternative Approach 2021 Annual Mean NO_X Concentrations ($\mu g.m^{-3}$)			
	Transect ID	NO_X Concentration without Project construction ($\mu g.m^{-3}$)	NO_X Concentration with Project construction ($\mu g.m^{-3}$)	NO_X Concentration with Project construction as % of Critical Level
NO_X Annual Mean Critical Level Assessment – Critical Level 30$\mu g.m^{-3}$				
Delancey to St Clair and Robergerie ABI	T5-1	15.0 (16.6)	15.0 (16.6)	50% (55%)
	T5-2	14.8 (16.4)	14.8 (16.4)	49% (55%)
	T5-3	14.7 (16.3)	14.7 (16.3)	49% (54%)
	T5-4	14.6 (16.2)	14.6 (16.2)	49% (54%)
Delancey Lane ABI	T6-1	14.9 (16.5)	14.9 (16.5)	50% (55%)
	T6-2	14.9 (16.5)	14.9 (16.5)	50% (55%)
Les Banques ABI	T7-1	23.3 (24.9)	23.4 (25.0)	78% (83%)
	T7-2	20.2 (21.8)	20.2 (21.8)	67% (73%)
Ivy Castel Lane ABI	T8-1	15.7 (17.3)	15.7 (17.3)	52% (58%)
	T8-2	15.0 (16.6)	15.0 (16.6)	50% (55%)
	T8-3	14.8 (16.4)	14.8 (16.5)	49% (55%)

As can be seen from **Table A12.2.3**, the Alternative Approach provided a less conservative assessment. The predicted NO_X concentrations at ABI transect locations during the construction phase were all below the Critical Level of 30$\mu g.m^{-3}$.

Operational Phase Road Traffic Emissions Assessment Results

The NO_2 results detailed in the following section were verified using the adjustment factor in **Table A12.2.1**.

Human Receptors

The predicted NO_2 concentrations for the 'with operational activities' (2024) scenario (Scenario 5) are detailed in **Table A12.2.4**, which include the contribution from the modelled road network and background pollutant concentrations. Concentrations for the 2024 'without operational activities' scenario (Scenario 4) and the predicted change in NO_2 concentrations, as a result of the construction phase, are also shown for comparison purposes.

Table A12.2.4: Predicted Annual Mean NO_2 Concentrations and Impact of Project during Operation (2024) at Sensitive Receptor Locations using the Alternative Approach

Receptor	Alternative Approach Predicted Concentrations 2024 – Operational Phase				
	Without Operational Activities ($\mu g.m^{-3}$)	With Operational Activities ($\mu g.m^{-3}$)	Change ($\mu g.m^{-3}$)	Change as % of Objective	Impact Descriptor
Nitrogen Dioxide (NO_2) – Air Quality Objective of 40$\mu g.m^{-3}$					
R1	22.3	23.1	0.8	2%	Negligible
R2	16.2	16.5	0.3	1%	Negligible
R3	13.2	13.4	0.2	0%	Negligible
R4	14.4	14.6	0.2	1%	Negligible
R5	16.1	16.4	0.3	1%	Negligible
R6	17.1	17.4	0.3	1%	Negligible
R7	25.6	26.0	0.4	1%	Negligible
R8	37.0	37.5	0.5	1%	Negligible
R9	23.5	23.6	0.1	0%	Negligible
R10	14.2	14.3	0.1	0%	Negligible

Receptor	Alternative Approach Predicted Concentrations 2024 – Operational Phase				
	Without Operational Activities ($\mu g.m^{-3}$)	With Operational Activities ($\mu g.m^{-3}$)	Change ($\mu g.m^{-3}$)	Change as % of Objective	Impact Descriptor
Nitrogen Dioxide (NO_2) – Air Quality Objective of 40$\mu g.m^{-3}$					
R11	13.4	13.4	0.0	0%	Negligible

As detailed in **Table A12.2.4**, the results of the impact assessment showed that there were no exceedances of the annual mean NO_2 Objective. The highest annual total concentration during operation (2024) was 37.5$\mu g.m^{-3}$ at R8 and this is below the NO_2 Objective of 40$\mu g.m^{-3}$. The impact was described as negligible at all receptors for NO_2 in accordance with IAQM and EPUK guidance (IAQM & EPUK, 2017).

Ecological Receptors

The Alternative Approach predicted NO_X concentrations from operational phase vehicle emissions along the transects modelled in each of the ABIs are detailed in **Table A12.2.3**Error! Reference source not found.. The predicted vehicle emissions were added to the background pollutant concentrations to provide total concentrations at each transect location. Background NO_X concentrations were calculated from NO_2 measurements taken at DT3. The NO_X background concentration calculated using the Alternative Approach was 14.14$\mu g.m^{-3}$ and was added to predicted vehicle emissions to give total predicted concentrations during operation.

The results from using the NO_X to NO_2 Calculator approach are provided within the brackets in the Table, these are inclusive of a NO_X background concentration of 15.744$\mu g.m^{-3}$ which was also calculated using the NO_X to NO_2 Calculator.

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Table A12.2.5: Operational Phase Critical Level Assessment (using the Alternative Approach)

Site	Alternative Approach 2024 Annual Mean NO_X concentrations ($\mu g.m^{-3}$)			
	Transect ID	NO_X Concentration without operational activities ($\mu g.m^{-3}$)	NO_X Concentration with operational activities($\mu g.m^{-3}$)	NO_X Concentration with operational activities as % of Critical Level
NO_X Annual Mean Critical Level Assessment – Critical Level 30$\mu g.m^{-3}$				
Bulwer Avenue (b) and Spur Point (a) ABI	T1(a)-1	24.4 (26.0)	24.8 (26.4)	83% (88%)
	T1(a)-2	16.0 (17.6)	16.1 (17.7)	54% (59%)
	T1(a)-3	15.2 (16.8)	15.3 (16.9)	51% (56%)
	T1(a)-4	15.0 (16.6)	15.1 (16.7)	50% (56%)
	T1(b)-1	21.7 (23.3)	22.0 (23.6)	73% (79%)
	T1(b)-2	17.5 (19.1)	17.7 (19.3)	59% (64%)
Longue Hougue Quarry ABI	T2-1	15.8 (17.4)	15.8 (17.4)	53% (58%)
	T2-2	15.2 (16.8)	15.2 (16.9)	51% (56%)
	T2-3	15.1 (16.7)	15.1 (16.7)	50% (56%)
	T2-4	15.1 (16.7)	15.2 (16.8)	51% (56%)
	T2-5	15.1 (16.8)	15.2 (16.8)	51% (56%)

Site	Alternative Approach 2024 Annual Mean NO_X concentrations ($\mu g.m^{-3}$)			
	Transect ID	NO_X Concentration without operational activities ($\mu g.m^{-3}$)	NO_X Concentration with operational activities($\mu g.m^{-3}$)	NO_X Concentration with operational activities as % of Critical Level
NO_X Annual Mean Critical Level Assessment – Critical Level 30$\mu g.m^{-3}$				
Mont Crevelt ABI	T3-1	20.3 (21.9)	20.4 (22.0)	68% (73%)
	T3-2	15.6 (17.2)	15.7 (17.3)	52% (58%)
	T3-3	15.0 (16.6)	15.1 (16.7)	50% (56%)
	T3-4	14.9 (16.5)	14.9 (16.5)	50% (55%)
Vale Castle/Rue des Barras ABI	T4-1	19.4 (21.0)	19.4 (21.0)	65% (70%)
	T4-2	15.2 (16.8)	15.2 (16.8)	51% (56%)
	T4-3	14.8 (16.4)	14.8 (16.4)	49% (55%)
	T4-4	14.8 (16.4)	14.8 (16.4)	49% (55%)
Delancey to St Clair and Robergerie ABI	T5-1	15.0 (16.6)	15.0 (16.6)	50% (55%)
	T5-2	14.8 (16.4)	14.8 (16.4)	49% (55%)
	T5-3	14.7 (16.3)	14.7 (16.3)	49% (54%)
	T5-4	14.6 (16.2)	14.7 (16.3)	49% (54%)

Site	Alternative Approach 2024 Annual Mean NO_X concentrations ($\mu g.m^{-3}$)			
	Transect ID	NO_X Concentration without operational activities ($\mu g.m^{-3}$)	NO_X Concentration with operational activities($\mu g.m^{-3}$)	NO_X Concentration with operational activities as % of Critical Level
NO_X Annual Mean Critical Level Assessment – Critical Level 30$\mu g.m^{-3}$				
Delancey Lane ABI	T6-1	14.9 (16.5)	15.0 (16.6)	50% (55%)
	T6-2	14.9 (16.5)	14.9 (16.5)	50% (55%)
Les Banques ABI	T7-1	23.6 (25.2)	23.9 (25.5)	80% (85%)
	T7-2	20.4 (22.0)	20.6 (22.2)	69% (74%)
Ivy Castel Lane ABI	T8-1	15.7 (17.3)	15.8 (17.4)	53% (58%)
	T8-2	15.0 (16.6)	15.1 (16.7)	50% (56%)
	T8-3	14.9 (16.5)	14.9 (16.5)	50% (55%)

As can be seen from **Table A12.2.5**, the Alternative Approach provided a less conservative assessment. The predicted NO_X concentrations at ABI transect locations during the operational phase were all below the Critical Level of 30$\mu g.m^{-3}$.

References

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