

Appendix B:

Rivers Parrett and Tone Dredge –
Bank Profile Restoration EIA
Addendum Scoping Study



Rivers Parrett and Tone Dredge – Bank Profile Restoration

Environmental Impact Assessment Addendum Scoping Study



July 2014

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Quality Assurance

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<i>Name</i>	<i>Signature</i>	<i>Title [complete using 497-10 as guidance]</i>	<i>Date</i>	<i>Version</i>

EIA Quality Mark



This Environmental Statement, and the Environmental Impact Assessment (EIA) carried out to identify the significant environmental effects of the proposed development, was undertaken in line with the EIA Quality Mark Commitments.

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1. Introduction

The Environment Agency is considering restoring the bank levels of the rivers Parrett and Tone through a combination of hard and soft engineering techniques. The sections of bank to be raised include the River Tone between Hook Bridge and its confluence with the River Parrett, and the River Parrett between its confluence with the River Tone and Moorland Court Farm. This constitutes the same stretch of the rivers as currently being dredged following the winter flood of 2013/14.

NEAS have undertaken a screening of these works and have determined that the minor civil works for the hard defences do not require an Environmental Impact Assessment (EIA). Therefore, this study is confined to the proposal to raise the existing defences typically between 200-600mm along the majority of the scheme length, in order to return the rivers back to their 1960s profile (i.e. when they were last dredged). Dredged material will be used as construction material. The dredged material will be temporarily stockpiled behind the existing banks and then re-formed to their designed height. Where there is insufficient space to stockpile behind the existing flood banks, adjacent fields will be temporarily used for storage.

The main compound area will be within the yard at Creeds' Farm, located adjacent to the River Tone approximately 400m upstream of its confluence with the Parrett. The existing Environment Agency compound area at Northmoor pumping station may also be used as a satellite compound. Access routes to the sites will be the same as previously highlighted for the main dredging work.

Two distinct construction methods will be used dependent on whether minor bank raising or an engineered re-build is required:

- Minor bank raising will involve transporting material to the flood bank in agricultural trailers, tipping (if space available) or unloading material using an excavator onto the bank and then carrying out informal compaction of the bank by tracking over with the excavator.
- Engineered rebuilding of the embankment will require stripping/ cutting back the embankment, cutting a bench into the embankment, placing material and compacting/re-forming with formal compaction plant.

Works are programmed to commence in mid-August and be complete by October 2014. If there is found to be excess dredged material then this may be spread over local fields into November. If there are any delays in re-use or spreading then the stockpiles may remain for up to one year. It is envisaged that there will be four bank raising gangs on site at any time.

2. Assessment Methodology

An Environmental Statement (ES) has already been produced for the Parrett and Tone dredge (Environment Agency, 2014a). An addendum to the Environmental Statement was also produced in April 2014 for the strategic stockpiling of dredged material in three fields close to the rivers (Environment Agency, 2014b) to accompany the planning applications.

Another ES addendum will be produced to consider the environmental risks associated with the bank raising works. The construction of hard defences are not considered as part of the main assessment as they are considered to be minor civil engineering works, however they will be discussed in the assessment of cumulative effects.

The environmental baseline for this addendum was established using the detailed provided within the original ES and stockpile addendum, except where it has significantly changed as a result of recent dredging activity or recent re-colonisation; this is the case for Flora and Fauna. The same Study Area will be used to undertake the assessment, encompassing the dredged rivers, locations where dredged material will be placed (including stockpile locations), proposed access routes, compound areas and the places that may be affected by resultant changes in water levels.

The Study Area is predominantly rural in nature with a mixture of mainly livestock grazing with some arable land, populated with small villages. The town of Bridgwater and the M5 are found in the northern extent of the Study Area and the A361 crosses the proposed dredging works at Burrowbridge. The River Parrett Trail long distance footpath runs along the River Parrett south of the M5 to Stathe. There is also a main railway line crossing the River Tone and Curry Moor within the Study Area.

Table 3.1 sets out the environmental receptors that have been scoped in and out of the original ES and stockpile addendum and those that have been scoped in and out of the new EIA Addendum for the bank raising works. Cumulative impacts will be assessed within the ES Addendum.

Where a receptor or sub-receptor has been **scoped in** for further environmental assessment this has been recorded using a ✓, where a receptor or sub-receptor has been **scoped out** of requiring further environmental assessment this has been recorded using a ✗.

Table 3.1 Scoping of the environmental effects within the original EIA and the EIA Addendum for bank raising

Resource/ Environmental Receptor	Description of Potential Effect	Original EIA Scoping Justification	Original EIA Scoping Outcome ✓: Scoped in X: Scoped out	EIA Addendum Screening for potentially significant changes	EIA Addendum Scoping Outcome ✓: Scoped in X: Scoped out
POPULATION					
Human Beings	<i>Operational effect:</i> Changed flood risk to people, land and property.	Significant positive effect and main objective of the scheme. A Flood Risk Assessment was prepared to support the planning application associated with stockpile creation.	✓	Modelling is currently being undertaken to confirm the impacts of also restoring the bank profiles in addition to the dredge. Whilst it is thought that there will be an overall increase in protection from tidal flooding, a small number of properties may be subject to an increased tidal flood risk.	✓
	<i>Construction effect:</i> Health and safety risks to public.	Previous high river flows and flood conditions will already have presented a health & safety risk to the public. Risks to the public can be managed by good site practice e.g. use of banksmen and warning notices on site to restrict public access to site for the duration of the works. Risk to bank stability through previous flooding and proposed dredging will be assessed and mitigated as part of detailed design.	X	Health and safety risks unchanged from original EIA. Working areas will be secured and risks to the public managed (including traffic management).	X
	<i>Construction effect:</i> Potential for disturbance to adjacent residents as a result of vehicle movements and bank raising close to residential properties.	Stockpiles located within arable fields close to residential properties. Potential significant effects were identified as a result of stockpile creation, storage and decommissioning (vehicle movements, noise, odour, vibration etc.)	✓	River banks will be raised close to some residential properties resulting in potential significant negative effects as a result of vehicle movements, noise, vibration and odour. However, the scale of the impacts will be similar to those already assessed. Dredging and bank raising will not occur simultaneously at any section of bank but bank raising will mean that the period of disturbance will extend. However, bank raising will be a relatively quick activity; approximately half a day per 50m is considered the worst case scenario. Therefore, this is not considered to result in a significant change.	X
Economy	<i>Operational effect:</i> Changed flood risk to businesses benefitting the local economy including the agricultural community.	Potential significant positive effect.	✓	There will remain a significant positive effect.	X
	<i>Construction effect:</i> Potential for dredging to result in increased sediment load and release of contaminants (over and above those experienced in the baseline conditions). The indirect result of this could be changes to turbidity, dissolved oxygen levels and damage to eels/elver and other fish in the commercial fishery.	There is considered to be a risk of the dredging works mobilising sediment and releasing contaminants at levels over and above those within the baseline water column. Mitigation for these impacts is being developed.	✓	Risk unaltered from the original assessment.	X
	<i>Construction/operational effect:</i> Loss of use of agricultural fields for up to 1 year during stockpiling	Stockpile locations were agreed with landowners and appropriate compensation agreed. Areas to be used for stockpiling are a small proportion of the total farm area	X	Where there is limited space to stockpile temporarily on the landward side of the existing embankments, adjacent fields may be used. Instead of stockpiles being used prior	X

Resource/ Environmental Receptor	Description of Potential Effect	Original EIA Scoping Justification	Original EIA Scoping Outcome ✓: Scoped in X: Scoped out	EIA Addendum Screening for potentially significant changes	EIA Addendum Scoping Outcome ✓: Scoped in X: Scoped out
		and the dominant land use in the study area is graded 3 and 4 on the Agricultural Land Classification (moderate to poor quality)		to spreading, they will now be used to store material prior to re-use on banks. Therefore, overall there will be no net change in land take. The same constraints will be used as previously identified to determine appropriate stockpile locations.	
	<i>Operational effect:</i> Potential loss of use of agricultural fields.	Stockpiles were originally planned to be an average of 2m in height. Topsoil condition will be restored following stockpiling by ploughing in an amount of stockpiled material.	X	The works involve returning the embankment back to the 1960's profile. This will require no more landtake than had been required for dredging to the bank (D1 exemption) and therefore the effect is considered to remain unaltered from the original assessment.	X
Recreation	<i>Operational effect:</i> Reduced flood risk to local recreation activities.	Although there will be potential for minor improvements to recreational activities during the summer due to reduced flood risk this is not considered likely to be a significant improvement and is therefore scoped-out.	X	The change in flood risk will not be significantly different to that stated within the original assessment.	X
	<i>Construction effect:</i> Restricted access to the River Parrett Trail, East Deane Way and Macmillan Way West Long Distance Paths and other PRowWs whilst dredging is undertaken.	<p>It was anticipated that the works will affect access to the paths along the River banks (the River Parrett Trail, East Deane Way and Macmillan Way West Long Distance Paths) where dredging is being undertaken. Machinery/vehicle movements may also affect other PRowWs where these intersect with site access routes.</p> <p>Banksmen will be used to safely restrict public access to site when required during the works. Where practicable, warning notices will also be put in place on site to warn the public.</p> <p>Whilst temporary diversion/closure of footpaths may be required to undertake the works, such local PRowW closures/ diversions will be temporary in nature and will be publicised where possible. They are therefore not considered to be significant and are scoped-out.</p> <p>Due to their sensitivity, only the long-distance footpaths (the River Parrett Trail, East Deane Way and Macmillan Way West Long Distance Paths) are scoped-in for consideration of potentially significant impacts.</p>	✓	<p>Bank raising works have the potential to affect PRowWs that run adjacent to the river, and temporary closures may be required.</p> <p>The initial assessment stated that wherever possible long distance paths would not be closed or diverted rather banksmen would be used to protect users of the site and that any requirement for temporary closure/diversion would be agreed with Somerset County Council Rights of Way Team. Given that the same mitigation will be implemented during the works to raise the embankment and the construction programme remains the same, it is not anticipated that the effects will be any more significant than already identified.</p>	X
Tourism	<i>Construction effect:</i> Potential for dredging to result in release of contaminants (over and above those in the baseline water column) reducing quality of the bathing waters downstream at Burnham-on-Sea.	<p>Following the considerable extent and duration of the flooding, sediment load (which may also contain contaminants) is anticipated to be raised at the commencement of the works. However, sediments are likely to settle and it can be anticipated that there will be reducing sediment load in the water column as the works progress.</p> <p>Mitigation measures to reduce and monitor the amount of sediment loading have been developed.</p>	✓	Effects unaltered from the original assessment.	X

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		The majority of contaminants within the sediments are thought to be marine driven and therefore are unlikely to impact bathing water quality at Burnham-on-Sea. Further information has been gathered on the types and level of contamination and testing of dredged material has been carried out to understand how this may affect bathing water quality. Additional sampling will be undertaken if required.			
LAND USE					
Agricultural land - grazing	<i>Operational effect:</i> Reduced flood risk to agricultural land and associated agricultural infrastructure will enable more continual grazing and reduce risk of death/loss of livestock.	Likely significant positive effect.	✓	The change in flood risk will not be significantly different from the original assessment.	X
	<i>Construction effect:</i> Deposit and spreading of dredged arisings on neighbouring agricultural land may affect its suitability as grazing land depending on the type/level of contamination and salinity.	Sediments will be tested prior to dredging in order to demonstrate that they are non-hazardous prior to depositing or spreading on river banks or adjacent agricultural land. If sediments are found to be contaminated they will be disposed of as hazardous waste and not deposited/spread in surrounding areas. Therefore, potential for contamination to affect agricultural land has been scoped out. Spreading of saline dredgings on land not normally flooded could result in adverse effects on agricultural land. However, salinity testing will also be carried out as part of the permitting and if above thresholds will not be used. Land subject to High Level Stewardship will not be used.	✓	Negligible to moderate beneficial effects were identified within the original Environmental Statement as a result of soil enrichment/conditioning of agricultural land through the spreading of uncontaminated dredged material. Whilst some of this material will be used to raise flood banks and thus less material overall may be spread on land, this will not result in significant changes to the beneficial effects previously identified. Effect unaltered from the original assessment.	X
A-roads and local roads	<i>Operational effect:</i> Reduced flood risk to A-roads and local roads.	Likely significant positive effect.	✓	The change in flood risk will be unaltered from the original assessment.	X
M5 Motorway	<i>Construction effect:</i> Potential effects on traffic as a result of machinery/vehicle movements associated with the dredging activities are considered under 'Traffic & Transport'.				
Railway line	<i>Construction effect:</i> Potential effects on the railway line from dredging activity or movement of plant and vehicles.	It is not anticipated that the dredging works (including vehicle movements) will affect the railway line in any way.	X	Unaltered from the original assessment.	X

Resource/ Environmental Receptor	Description of Potential Effect	Original EIA Scoping Justification	Original EIA Scoping Outcome ✓: Scoped in ✗: Scoped out	EIA Addendum Screening for potentially significant changes	EIA Addendum Scoping Outcome ✓: Scoped in ✗: Scoped out
FLORA AND FAUNA					
<i>Statutorily designated sites</i>					
Natura 2000 Sites (SAC, SPA & Ramsar sites)	<i>Construction and operational effects:</i> No dredging or material disposal will take place within a Natura 2000 site. Potential for indirect impacts from disturbance; temporary short-term changes in water quality affecting mobile species; temporary medium-term changes to river habitat used by mobile species; and, changes to water levels on moors.	<p>Scoped-in to assessment. Outcomes of Habitats Regulations Assessment (HRA) informed the original EIA, which confirmed no permanent significant impacts on the designated sites after the implementation of mitigation.</p> <p>The Somerset Levels and Moors SPA and Ramsar site is designated for its overwintering bird population and the presence of 17 species of British Red Data Book invertebrates (associated with the moorlands and network of small rhynes and ditches). A test of likely significant effects was undertaken for the original proposals (including the requirement for stockpiles); this concluded:</p> <ul style="list-style-type: none"> ▪ The majority of stockpiling work will take place between April and October 2014; this will avoid disturbance to overwintering birds. ▪ There is potential for dredging works (and therefore stockpiling works) to extend beyond October into winter 2014. The programme will be organised so that all areas within 250m of a Natura site boundary will be dredged before November to avoid disturbing overwintering birds. <p>An Appropriate Assessment was undertaken for the original proposals to assess whether the proposals would adversely affect the integrity of the Somerset Levels and Moors SPA and Ramsar site and the Red Data Book invertebrates it supports. This resulted in the requirement for a monitoring programme after dredging is completed.</p>	✓	<p>Some short sections of bank raising may take place within designated sites, including a section of the right bank of the River Parrett near its confluence with the River Tone and the left bank of the River Tone (within the Somerset Levels and Moors Natura 2000 site).</p> <p>The mitigation previously stated within the HRA will be adhered to for the bank raising works. Disturbance to overwintering birds in the Somerset Levels and Moors SPA and Ramsar site is therefore scoped out of further assessment.</p> <p>A revised Appropriate Assessment will be undertaken to assess whether the proposals would adversely affect the integrity of the Somerset Levels and Moors SPA and Ramsar site and the Red Data Book invertebrates it supports, including temporary and permanent land take and any changes to the flooding/ water level management regime. The commitment to a monitoring programme after the dredging has been completed is unchanged.</p>	✓
Nationally protected sites (SSSI & NNR)	<i>Construction and operational effects:</i> Potential for direct impacts such as habitat loss or degradation; or, indirect impacts such as changes to habitats as a result of altered water or sediment regimes.	<p>Scoped-in to the original assessment due to legal requirement to consider impacts upon nationally protected sites.</p> <p>The designated sites were not considered to be directly affected by the creation of strategic stockpiles. Sensitive programming prevented disturbance impacts to overwintering species present at the sites. Designated sites were considered far enough away to avoid disturbance to breeding bird populations, which are likely to be habituated to vehicle movements associated with farming activities.</p>	✓	A section of river bank adjacent to the River Tone is part of the Curry and Hay Moors SSSI. If bank raising works are to take place in this area, the potential impacts on this site will be scoped into the EIA Addendum.	✓

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		Risk of indirect effects to habitats through potential for runoff from stockpiles to be managed through good site practice and pollution control methods. Impacts on nationally protected sites are therefore scoped out of further assessment in the EIA addendum.			
Local Nature Reserves (Screech Owl LNR)	<i>Construction and operational effects:</i> Habitat loss or degradation (depending on the temporary works access and storage arrangements for the works). Potential for indirect impacts due to changes in water regime.	It is considered highly unlikely that there will be any effects on the only nearby LNR (Screech Owl LNR) as a result of the dredging works. The proposed area of dredging is 2km from the LNR and this receptor is scoped-out of further assessment. However, potential for indirect impacts through changes to water regime will be included if found to occur.	✓	The proposed works are approximately 2km from the LNR. No direct effects. If modelling identifies any significant changes to the water regime then this will be scoped back into the ES addendum.	X
<i>Non-statutorily designated sites and other habitats</i>					
Non-statutory sites and other conservation areas	<i>Construction and operational effects:</i> Potential for direct impacts such as habitat loss or degradation; or, indirect impacts such as changes to habitats as a result of altered water or sediment regimes.	There are a number of non-statutory designated sites which could be directly or indirectly impacted by the works.	✓	The Somerset Levels and Moors Important Bird Area (IBA) is located adjacent to the proposed bank raising works. Bank raising will occur along the River Parrett Local Wildlife Site (LWS). Mitigation to prevent indirect disturbance impacts on breeding birds and overwintering birds will be undertaken as stated in the original assessment. Direct impacts will be similar to that assessed for the dredging works which included the potential to dredge to bank (under D1 exemption). Therefore there are not significant changes to the original assessment. Risk of indirect effects to habitats through potential for runoff will be managed through good site practice and pollution control methods.	X
NERC Habitats of Principal Importance	<i>Construction and operational effects:</i> Potential for direct impacts such as habitat loss or degradation; or, indirect impacts such as changes to habitats as a result of altered water or sediment regimes.	There are a number of habitats of principal importance habitats which could be directly or indirectly impacted by the works. The habitats of principal importance that are present in the study area and most likely to be affected by the works are 'Coastal/ floodplain grazing marsh' and 'Rivers and streams'. Two stockpile locations were planned to be sited on undesignated land and one on coastal floodplain grazing marsh. Permanent habitat degradation will be avoided by good working practice and ground protection methods.	✓	The effects will remain unaltered from the original assessment.	X
<i>Protected and Notable species</i>					
Water vole	<i>Construction and operational effects:</i> Potential for damage to water vole habitat and any re-established burrows within the dredging areas.	Despite the considerable likely impact on the presence of protected species as a result of the duration and extent of the preceding flooding, it is anticipated that species will quickly begin to recolonise the study area and that there is a risk of protected species being present at the time of the works. For the reasons given, the protected species listed are scoped-in to future	✓	Since the commencement of dredging, badgers and water voles have confirmed to be present along the river banks and therefore the additional impact of bank raising will be assessed in the ES addendum	✓
Otter	<i>Construction effect:</i> Potential for damage to resting places or any re-established holts within the dredging areas.		✓	Impacts to otters and reptiles remain unchanged to that assessed within the original ES and have therefore been	X

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Reptiles	<i>Construction effect:</i> Potential for killing or injury of reptiles (especially grass snakes) through destruction of hibernation and/or foraging and basking areas.	assessment. Further surveys were undertaken to confirm protected and notable species presence/absence.	✓	scoped out.	X
Badgers	<i>Construction effect:</i> Potential for destruction of setts or disturbance to badgers as a result of plant and vehicle movements and location of spreading areas and site compounds.		✓		✓
Dormouse	<i>Construction effect:</i> Potential for killing or injury of dormice and/ or damage to dormouse habitat as a result of vegetation clearance (in particular hedgerows).	Although dormouse could be present, as hedgerows will not be removed for the works or for this species has been scoped-out of future assessment.	X	It is not anticipated that hedgerows will require removal for the works.	X
Ground-nesting birds	<i>Construction and operational effects:</i> Potential for killing or injury of ground-nesting birds (such as mallard and coot) and/or destruction of nests or eggs through clearance of ground vegetation and location of spreading and compound areas.	Potential for significant impacts due to vegetation clearance, machinery tracking, spreading of material and changes in water levels after the dredging activity is complete. Scoped-in to future assessment.	✓	Works are to be undertaken, in part, during the nesting bird season. However, the risk of disturbance to ground-nesting birds is unaltered from the original assessment. No additional vegetation clearance is anticipated, however, pre-construction and pre-demobilisation checks will be undertaken.	X
Great crested newt (GCN)	<i>Construction effect:</i> Potential for killing or injury of GCN or impairment to their ability to breed; either through destruction of hibernation and/or foraging and commuting areas (including through rough grassland connecting breeding ponds).	EA Technical Specialists have advised of potential for ponds to support GCN. While likely to be impacted by recent flooding populations could be present and therefore have been scoped into the assessment. Given temporary impacts to any habitat only impacts within 250m of ponds will be assessed.	✓	Effects unaltered from the original assessment.	X
Bats	<i>Construction effect:</i> Potential for loss of roosting habitat if trees with bat roost potential are removed.	Bat roosting sites are legally protected. However, no mature trees will be removed for the works and bats have therefore been scoped-out of future assessment.	X	No additional vegetation clearance is thought to be required above and beyond that being undertaken for the dredging.	X
Breeding birds (other than ground-nesting species)	<i>Construction effect:</i> Loss of nesting habitat (such as habitats used by sedge warblers, reed warblers and blackbirds) and/ or damage to nests caused by land clearance for site access, storage areas or other clearance of vegetation associated with the Works.	Breeding birds (with very few exceptions), their nests and eggs are legally protected. There is a risk of nesting habitat being affected by the works (for example around the dredging locations, storage areas and access routes).	✓	No additional vegetation clearance is thought to be required above and beyond that being undertaken for the dredging.	X
Overwintering birds	<i>Construction effect:</i> Disturbance to overwintering birds.	The works will be undertaken outside of the overwintering period; therefore overwintering birds are currently scoped-out. Should the works over-run into the winter period then no works within 250m of a site designated for wintering bird interest will occur; this mitigation has been included within the Habitats Regulations Assessment. This receptor is therefore scoped-out.	X	The same restrictions will be implemented for the bank raising and therefore effects are unaltered from the original assessment.	X
'Important' Hedgerows	<i>Construction effect:</i> There is the potential for hedgerow removal to be required to facilitate site access and storage areas.	'Important Hedgerows' are legally protected. However, the works will not remove any hedgerows; therefore this receptor is scoped-out of further assessment.	X	No hedgerow removal expected.	X

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Fish (including eels)	<i>Construction effect:</i> Potential for killing of fish as a direct result of the dredging activity (i.e. fish being caught up in the dredging activity). Also potential for dredging to result in increased sediment load and release of contaminants (over and above those experienced in the baseline conditions). The indirect result of this could be changes to turbidity, dissolved oxygen levels and damage to fish's gills, impacts on fish habitats, spawning grounds, feeding grounds and effects on migration.	Potentially significant impacts from these effects, particularly if undertaken outside of winter. Mitigation is being developed.	✓	No direct impact to watercourses from bank raising beyond original assessment.	X
Notable/ nationally rare or scarce invertebrates	<i>Construction effect:</i> Direct loss of invertebrates (including the locally resident and nationally notable Hairy Click Beetle) as a result of removal with the dredged sediment.	Although there are many species of notable/rare invertebrates within the nearby protected areas, information from Natural England is that the designated invertebrate assemblages are associated with the small rynes and ditches in the moors, not the main river channels. Information from Environment Agency technical specialists show that there is only likely to be one nationally notable invertebrate species present in the study area: the Hairy Click Beetle. There are approximately six colonies of this nationally notable species on the River Parrett, two of which are within the study area for the works, one directly impacted. Options for avoiding or translocating habitat will be considered. The potential for a direct impact is scoped-in to future assessment.	✓	River banks have potential to support significant invertebrate interest but bank raising will have no additional impact to the dredge. Fauna of the rynes and ditch system will be protected through pollution control measures. No significant change to original assessment.	X
Notable/ nationally rare or scarce aquatic plants.	<i>Construction effect:</i> Potential for direct loss or degradation of conditions for notable species of plants as a result of dredging activity or vehicle movements.	Information from Environment Agency technical specialists shows that there are no notable plant species within the works area; therefore this is scoped-out of future assessment.	X	No additional impact.	X
Non-native invasive species and pathogens	<i>Construction effect:</i> Spreading of invasive species (including Himalayan balsam and Japanese knotweed) and pathogens (e.g. Ash die-back) within the working area (and potentially beyond).	The dredging works, including the removal and spreading/ transport of the dredging arisings and stockpiling of material have the potential to spread non-native invasive species and pathogens which may be present within the working area. This risk is present not only due to the movement of vehicles within the working area but also to other sites.	✓	No additional impact.	X
WATER (WATER FRAMEWORK DIRECTIVE COMPLIANCE)					
Water Framework Directive Compliance: [Parrett Transitional, Parrett River,	<i>Construction effect:</i> WFD Compliance is based on 3 key issues: 1 - Ensuring 'no deterioration' in WFD status of the biological quality elements (BQEs) (fish, aquatic flora, benthic invertebrates, included in the 'Flora and Fauna' receptors indicated above). As well	Statement of WFD compliance for relevant WFD water bodies (directly affected and up or downstream where relevant) was made with reference to specific assessments reported on other EIA receptors (including flora and fauna and designated sites, hydrogeology and contamination/ tourism/bathing waters) where relevant. Assessment of contribution to or conflict with RBMP	✓	The bank raising works will not require any additional in-channel works and will therefore not affect the project's compliance with the WFD. Impacts to designated sites through any changes in flood regime will be assessed through the HRA. All mitigation and monitoring previously agreed will continue, therefore no update to WFD is required.	X

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<i>and Tone d/s Taunton River WFD water bodies]</i>	as the direct effects of damage/removal on BQEs, potential changes in hydromorphological and physico-chemical (water quality) conditions during and after dredging may have indirect effects on the BQEs. 2 – Ensure that meeting WFD objectives is not compromised, as dredging may affect the implementation of WFD ‘mitigation measures’ for heavily modified water bodies as stated in the River Basin Management Plan. 3 – Related legislation for protected areas and species needs to be met, in addition to other Directives such as Bathing Waters.	mitigation measures was also required along with the need for Article 4.7 assessment (derogation for new modifications if not compliant based on a number of stated conditions). It was concluded that the works will not have any permanent negative effects on WFD quality elements which could lead to deterioration of any WFD water bodies so long as mitigation was implemented and that the works would not prevent any water bodies from meeting their objective under Article 4.1 of the WFD,			
SOIL, GEOLOGY & HYDRO-GEOLOGY					
Soil resource	<i>Construction effect:</i> Vehicle movements over saturated soils can cause long-term degradation to the structure of the soil. Soil erosion is much more likely under waterlogged conditions especially where vegetative matter has been removed from the surface. <i>Note that contamination issues associated with dredging arisings are considered under Waste.</i>	Ground cover removal to facilitate the works (including storage and site compounds) and vehicle movements could result in compaction and erosion, leading to changes to the soil structure and fertility and functionality of the soil resource. However, soils can be protected through standard, good working practice and ground protection methods which will be included in the EAP (such as the use of ground protection matting).	X	Effect unaltered from the original assessment.	X
Geology	<i>Construction and operational effects:</i> Potential for dredging activity to result in damage or degradation of underlying geology.	There are not anticipated to be any impacts on the geology of the surrounding area.	X	No impacts anticipated.	X
Hydro-geology	<i>Operational effect:</i> Changes to the hydro-geological regime; including changes to groundwater recharge and groundwater levels within surrounding sensitive moor land. <i>Note that issues associated with potential changes to groundwater bodies are considered in the Water (WFD) section.</i>	There are likely to be localised impacts on hydro-geology as a result of the changes to the flooding regime brought about by the dredging activity and the nature of the changes to the water level management put in place.	✓	Proposals will have no effect on hydro-geology.	X
LANDSCAPE AND VISUAL AMENITY					
Landscape character and visual amenity	<i>Construction effect:</i> Visual change and effects on local landscape character. Visible changes in channel morphology. Loss of vegetation on banks / temporary scarring until re-vegetates. Possible	Channel will become wider, but not more so than it has previously been following past widening and dredging works. No change to landscape character fundamentals anticipated and any changes to be at a localised level. De-vegetation to be temporary. To a lesser extent the	X	Scoping justification remains unaltered from the original assessment. No additional vegetation clearance required.	X

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	secondary effects such as undercutting of banks.	deposition of silts which can be expected to result from the current flooding will create a temporary de-vegetated appearance to the area.			
	<i>Construction effect:</i> Temporary effects on local landscape character and visual intrusion. Potential ground compaction, temporary haul roads if material has to be removed off site. Erosion of surfacing and verges by wide and heavy plant, machinery and lorries.	Temporary effects, not considered significant as they can be mitigated by good construction practice that will be included in the EAP/ Contractors' method statements. Construction vehicle movements more concentrated near the three stockpile locations, in closer proximity to residential properties.	X	The scoping justification remains fundamentally unaltered from the original assessment.	X
	<i>Construction effect:</i> Potential visual change and effect on local landscape character from deposit and spreading of dredging arisings.	The overall increase in ground levels from deposit and spreading of the dredging arisings is expected to be visually negligible.	✓	There is the potential for temporary construction effects on local character and/or visual amenity from the stockpiling of dredging arisings at back of bank This stockpiling will be in the form of 'windrows', using the same form, scale and principles of stockpiling as was assessed within the original ES. In the original ES, the assessment of landscape and visual impacts from this method of stockpiling looked at likely effects in relation to the 'worst case' scenarios of the most sensitive receptors (ie private households) in close proximity (ie within 250m) of the stockpiles, and concluded that effects would be minor adverse at worst, ie not significant, temporary and short lived. The effects of the stockpiling in relation to the proposed bank raising are, with consideration of the proposed locations and proximity of potential receptors, not expected to be any more significant, and there is therefore no requirement to re-assess within the EIA addendum.	X
	<i>Construction effect:</i> Visual intrusion and effect on local landscape character from compound areas and construction materials and plant.	There may be some temporary visual intrusion resulting from the site compound, however this will be temporary and is not expected to be significant.	X	The construction working area remains similar to that for the original dredge, and the access routes are the same. The plant is limited to excavators, tractors and trailers for most areas (ie the 'minor works' sections), plus some additional compaction plant in the 'engineered re-build' sections. The overall construction period remains the same. Estimates are that the construction will proceed at a rate of at least 100m in a day, so it is not considered that there will be significantly prolonged construction activity in any one section. Overall, the likely effects resulting are not considered to be a significant change from the original dredge.	X

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	<i>Operational effect:</i> Permanent effects on visual amenity from reduction / loss of views from key receptors, due to increased height of defences.	Effect not previously identified.		The extent of change is relatively small, at 200-600mm increases in height of existing embankments. The likelihood that this will result in significant visual effects is small, but cannot be excluded at this point, without further analysis of views in relation to the specific receptors which may be affected.	✓
	<i>Operational effect:</i> Permanent effects on local character and/or visual amenity due to appearance of modified defences, i.e increased height / footprint; changes in hard defences.	Effect not previously identified.		The overall increase in height / permanent change in appearance of defences is considered to be very minor. It will be noticeable only at short range distances and even here, in the context of the existing landscape will not constitute a change of character, and is expected to be of little interest or concern to visual receptors. There is also a historical precedent as, although representing a change to the current baseline, much of the works will restore defence levels to those previously created in the 1960s.	X
	<i>Operational effect:</i> permanent effects on local character and/or visual amenity due to loss of trees / vegetation.	Effect scoped out of original EIA as no trees, hedges or other significant vegetation losses considered likely.		No additional trees or hedges or other significant vegetation losses are considered likely.	X
CULTURAL HERITAGE					
Sites of cultural heritage value	<i>Construction effect:</i> Potential for degradation of historic landscape through inappropriate spreading of dredging arisings; tracking of machinery and in-channel impacts of dredging activity.	There are Scheduled Monuments and a large number of listed buildings in close proximity to the works area. It is known that dredging in the Somerset levels has in the past helped to uncover additional sites of heritage value. Tracking of plant and machinery over sensitive heritage sites could degrade them. For this reason further information gathering and assessment of risks to cultural heritage is needed in order to mitigate for any potential adverse effects; hence the receptors are scoped-in.	✓	There are a number of sites of historic interest that are listed on the Somerset Historic Environmental Record (HER) that are located on, or close to, areas of bank raising. These include: - Lake wall near Moorland House farm on the Parrett. - Sites of post medieval buildings - Former brickworks sites - Canalised sections of both the Rivers Parrett and Tone. It is not anticipated that works will have any significant impacts above those already assessed as works will be confined to the banks.	X
	<i>Operational effect:</i> Protection of Listed Buildings and cultural heritage sites from the impacts of unplanned flooding.	The works will have positive benefit on flood risk to the large number of Listed Buildings in the vicinity. As an impact (beneficial) is anticipated, this is receptor scoped-in.	✓	Flood risk is thought to be unaltered from the original assessment. If further modeling predicts an increase in flood risk to Listed Buildings this will be brought into the scope of the ES addendum for further assessment.	X
Known archaeological sites	<i>Construction and operational effect:</i> Potential for degradation of archaeological sites through inappropriate spreading of dredging arisings; tracking of machinery; in-channel impacts of dredging activity and visual impact of raised banks.	Tracking of plant and machinery, and/ or inappropriate material spreading and compound siting could damage or degrade archaeological sites. For this reason, further information gathering and assessment of risks to cultural heritage is needed in order to mitigate for any potential adverse effects; hence the receptors are scoped-in.	✓	The bank raising works are in close proximity to a Scheduled Monument (Burrow Mump) and a number of Grade II Listed Buildings, including Burrow Bridge. There is potential for degradation of the historic landscape as a result of the raised banks altering the setting of these features. There are also a number of sites that are listed on the Somerset Historic Environmental Record (HER); these include sites that were initially recommended should be	✓

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				avoided for the spreading of dredged material (e.g. former brickworks sites). NEAS Archaeology has flagged the potential for some of the banks to medieval. None are shown on the HER but further discussion will be held with County Archaeologist to confirm any significant impact/required mitigation.	
Previously undiscovered archaeology or heritage sites	<i>Construction effect:</i> Potential for damage to previously unknown archaeology or heritage sites by tracking of machinery and siting of compounds and material spreading areas.	The area has been previously dredged (in the 1960s). Although the project does not generally intend to widen or deepen the channel beyond the widths and depths originally dredged in the 1960s, there is still a risk that this may occur in some localised sections; and there is also a risk posed by the tracking of machinery and siting of material spreading and site compounds. This aspect therefore requires further assessment and mitigation and is scoped-in for future assessment.	✓	Additional topsoil stripping will not be carried out, the risk of uncovering unknown archaeology as a result of these activities is therefore considered to be negligible. Scoped out of further assessment.	X
TRAFFIC AND TRANSPORT					
A-roads and local roads	<i>Construction effect:</i> Possible temporary disruption to local traffic flow and tracking of debris onto roads.	It is currently anticipated that, due to the high volumes (circa 235,000m ³) of dredging arisings there is the potential for significant traffic movements; either to take off-site for disposal or to farmland not immediately adjacent to the works. Best practice measures will be used to ensure that debris is not tracked onto roads or that this is cleaned if debris is tracked onto them and therefore will not be assessed further but included in the EAP. The original ES addendum highlighted HGV movements for the transportation of dredged material to stockpile sites as being have the largest potential impact.	✓	It is assumed that the proposed bank raising works will result in a doubling of light traffic (car and van) assessed in the original ES between mid-August and the end of October, however these journeys will be dissipated across the 8km dredge reach. There is also anticipated to be 10-12 additional HGV deliveries per day. Most construction plant will remain on site for the duration of the works. Agricultural tractor/trailer movements will remain similar to the original assessment. Dredging and bank raising teams will not be working at the same locations although some of the minor roads will be shared throughout construction. There will be a reduction in HGV movements as less material is likely to be transported to stockpile sites. The impact of construction traffic and transport was originally assessed as being of moderate significance after the implementation of mitigation. This is not anticipated to change.	X
M5 Motorway	<i>Construction effect:</i> Possible temporary disruption to motorway traffic flow and tracking of debris onto motorway.	Plant may be brought to the area using the motorway, however it is not anticipated that this will significantly increase vehicle movements/traffic on the motorway.	X	Significance of effect unaltered from the original assessment.	X
Railway line	<i>Construction effect:</i> Potential effects on the railway line from dredging activity or movement of plant and vehicles.	It is not anticipated that the dredging works will affect the railway line.	X	Significance of effect unaltered from the original assessment.	X
WASTE					

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Waste	<i>Construction effect:</i> Generation of arisings from dredging, and waste from vegetation clearance removal.	The impact of waste in terms of dredging arisings will be assessed under relevant receptor headings. Waste generated from vegetation clearance/tree removal could be chipped/composted and spread on site. Alternatively, it could be disposed of as waste but there are not anticipated to be significant quantities arising, therefore is scoped-out. A Site Waste Management Plan will be produced. Waste will be defined and quantified under the 'Scheme Details' section in the Environmental Statement.	✓ Effects of waste disposal will be assessed under other receptors (e.g. traffic related effects will be considered under 'Traffic & Transport') as opposed to having a chapter of the ES dedicated to 'Waste')	Significance of effect unaltered from the original assessment. The dredged material will be used for bank raising.	X
AIR QUALITY					
Air quality	<i>Construction effect:</i> Emissions to air from machinery and vehicles required for the dredging activity (including vehicle movements associated with transporting the dredging arisings).	Any temporary decrease in air quality during the works arising due to vehicle movements and site works is not anticipated to be significant. Air quality emissions (such as dust and particulate matter) can be managed through good construction practice; and for this reason, air quality impacts are also scoped-out.	X	Significance of effect unaltered from the original assessment.	X
Climatic factors	<i>Construction effect:</i> Benefit of improved resilience to the anticipated impacts of climate change (increased rainfall and associated flooding).	The long-term impacts of climate change the dredged channels will be discussed under the 'scheme details' section of the Environmental Statement. The works themselves are not considered likely to have a significant effect on climate change and this element is scoped-out of further assessment.	X	Effect unaltered from the original assessment.	X
NOISE & VIBRATION					
Local residents/businesses	<i>Construction effect:</i> Machinery/vehicle movements associated with the works, as well as the location of the site compound/s could result in temporarily increased levels of noise and vibration.	The study area is rural in nature and therefore receptors to increased levels of noise and vibration are few. Any increase in noise and vibration will be temporary, and the works will be undertaken within considerate working hours using best construction practice.	X	The bank raising works will slightly increase the period that each reach is subject to disturbance. However, bank raising is relatively quick; approximately half a day per 50m is considered a worst case scenario. Therefore, this will not significantly change the potential impacts.	X Disturbance effects from machinery/vehicle movements will be assessed and reported within 'Population' chapter.
Fauna	Potential effects on fauna as a result of temporarily increased noise and vibration are considered under 'Flora & Fauna'.				

REFERENCES

Environment Agency, 2014a. Rivers Parrett and Tone Dredge, Environmental Statement. February 2014.

Environment Agency, 2014b Rivers Parrett and Tone Dredge, Environmental Statement Addendum, April 2014

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