

High Speed Rail (West Midlands - Crewe)

Environmental Statement

Volume 5: Technical appendices

Water resources

Route-wide Water Framework Directive compliance assessment (WR-001-000) – Part 2



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High Speed Two (HS2) Limited has been tasked by the Department for Transport (DfT) with managing the delivery of a new national high speed rail network. It is a non-departmental public body wholly owned by the DfT.

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A report prepared for High Speed Two (HS2) Limited:





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,	nt (trib of Trent) (GB104028047250) detai	led impact assessment - effects on current status		Detailed Imp	act Assessment				Detailed Impact Assessme	nt Results			
Water body ID: Hydromorphological designation:	GB104028047250 Not A/HMWB	Watercourse Scheme componen	WFD-PYR-W-01-01	Pyfor	d Brook WFD-PYB-W-01-02 Access road culvert				Overall offerts are also and		Additional mitigation		
Overall Status:	Bad	Description of scheme componen	Puford Brook Viaduct: Approx. viaduct width: 15m: Approx		Approx. culvert length: 10m; Approx. culvert diameter: 0.9n	n			Overall effects on element		requirements		
Status Objective:	Good by 2027	Summary of embedded mitigation	Clear span viaduct. Viaducts designed to cross perpendicular to river channel wherever possible to reduce shading impact.	maintain natural substrate. Culvert sized to minimise impa	cticable. Invert of culvert to be buried 300mm below the exist ct on flow continuity. Detailed design to be developed in gene ocities for fish passage. Hydromorphological improvements to downstream of the culvert to compensate for footprint loss	eral accordance with CIRIA and Environment Agency guidance o be undertaken to river channel immediately upstream and	Cumulative effects - effects on element from scheme component(s) located in other WFD water bodies	Summary of scheme components proposed on			ıction	Residual effect on element	WFD compliance outcome - potential for deterioration of current status
WFD Classification Eleme	nts	Current Status Status Objective	Shading	Footprint	Shading	Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream		watercourses within water body catchment wit the potential to effect element status	Summary of effects on elements	Overall effect on element	Constru		
	Macrophytes and Phytobenthos - combined	Moderate Good by 2027	Some minor, localised and periodic shading of river channel. However negligible effect on macrophytes and phytobenthos anticipated. No measureable change in quality element	Localised but permanent loss of open river habitat. Localised adverse effects on macrophytes and phytobenthos anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent shading of section of river channel. Localised adverse effect on macrophytes and phytobenthos anticipated (due to a reduction in photosynthetic activity), but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and macrophytes and phytobenthos habitat upstream and downstream of culvert. No measureable change in quality element.		Viaducts Pyford Brook: - viaduct (WFD-PYB-W-01-01) Culverts Pyford Brook: - culvert (WFD-PYB-W-01-02) - 10m Total length of new culverted river channel =	Viaducts The viaduct will cause some minor, localised and periodic shading of river channel. This will have a negligible effect on macrophytes and phytobenthos, macroinvertebrates and fish. Culverts The 10m length of new culverting will cause a localised but permanent loss of existing river	Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.		N/A	
Biological Quality Elements	Macroinvertebrates	Bad Good by 2027	Some minor, localised and periodic shading of river channel. However negligible effect on macroinvertebrates anticipated. No measureable change in quality element	Localised adverse effects on macroinvertebrates	Localised but permanent shading of section of river channel. Localised adverse effects on macroinvertebrates anticipated (including due to a reduction in/loss of riparian and aquatic vegetation), but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and macroinvertebrate habitat upstream and downstream of culvert. No measureable change in quality element.	None. Water body downstream (Trent from Moreton Brook to River Tame) affected by Proposed Scheme but no widespread adverse impacts identified with the potential to propagate upstream and affect water body	10m Resultant net loss of open river channel = 10m	habitat and shading. This will have a minor, localised adverse effect on macrophytes and phytobenthos, macroinvertebrates and fish.	Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.	None required. None required.	N/A	Compliant - no change in biological status of water body
	Fish	-	Some minor, localised and periodic shading of river channel. However negligible effect on fish anticipated. No measureable change in quality element	Localised but permanent loss of open river habitat. Localised adverse effects axon fish anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent shading of culverted section of channel. Localised adverse effects on fish anticipated (including due to a reduction in/loss of riparian and aquatic vegetation), but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and fish habitat upstream and downstream of culvert. No measureable change in quality element.	(e.g. restrictive structures significantly affecting biological continuity). Also Proposed Scheme effects to downstream water body all occur upstream of confluence with this water body.		Viaducts	Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.		N/A	
	Dissolved oxygen	Bad Good by 2021	Some minor, localised and periodic shading of river channel (with potential associated reduction in photosynthetic activity by aquatic flora). However negligible effect on dissolved oxygen concentrations anticipated. No measureable change in quality element.	Element is insensitive to impact	Localised but permanent shading of culverted section of channel. Potential to lead to minor and localised impact on dissolved oxygen concentrations (due to reduced photosynthetic activity by aquatic flora). Localised adverse effects anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and dissolved oxygen upstream and downstream			The viaduct will cause some minor, localised and periodic shading of river channel. This will have a negligible effect on dissolved oxygen and water temperature. Culverts The 10m length of new culverting will cause localised but permanent shading of river channel. This will have a minor, localised adverse effect on	Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.		N/A	
ıts	рН	High Good by 2015	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	None		dissolved oxygen and water temperature	Element is insensitive to impact. No measureable change to quality element		N/A	
emical Quality Eleme	Phosphate	Bad Good by 2021	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact				Element is insensitive to impact. No measureable change to quality element	None required. None required.	N/A	Compliant - no change in physicochemical status of water body
Physicoch	Ammonia (phys-chem)	Bad Good by 2021	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact				Element is insensitive to impact. No measureable change to quality element		N/A	
	Temperature	High Good by 2015	Some minor, localised and periodic shading of river channel. However negligible effect on water temperature anticipated. No measureable change in quality element.	Element is insensitive to impact	Localised but permanent shading of culverted section of channel. Potential to lead to minor and localised impact on water temperature. Localised adverse effects anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	None. Water body downstream (Trent from Moreton Brook to River Tame) affected by Proposed Scheme but no widespread adverse impacts identified with the potential to propagate upstream and affect water body. Also Proposed Scheme effects to downstream water body all occur upstream of confluence with this water body.			Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.		N/A	
Specific Pollutants	Ammonia, Copper, Triclosan, Zinc	High by 2015	N/A - Specific pollutants effects screened out for scheme design component	N/A -	Specific pollutants effects screened out for scheme design co	mponent							
	Quantity and dynamics of water flow			Localised but permanent changes to hydromorphology regime. Localised adverse effects on flow dynamics (including potential localised increases in flow velocity) anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and quantity and dynamics of flow upstream and downstream. No measureable change in quality element			Culverts The 10m length of new culverting will cause a localised but permanent change in hydromorphological regime. This will have a minor, localised adverse effect on flow dynamics, river continuity, river widths and depth, structure of substrate, and structure of riparian zone.	change in disality element when halanced against		N/A	
	Connection to groundwater bodies			Localised but permanent loss of connection to surrounding shallow groundwater within superficial deposits. However no likely effect anticipated on connection to groundwater bodies. No measureable change in quality element.	Element is inconsitive to impost	Element is insensitive to impact	None			Negligible effect anticipated when scheme component effects considered in combination. No measureable change in quality element.		N/A	
cal Quality Elements	River continuity	Supports Good Supports Good by 2015	N/A - Hydromorphology effects screened out for scheme	Localised but permanent changes to hydromorphology regime. Localised adverse effects on river continuity anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Element is insensitive to impact				Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.		N/A	Compliant - no change in hydromorphological status of
Hydromorphologi	River depth and width variation		design component	Localised but permanent changes to hydromorphology regime. Localised adverse effects on river depth and width anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and river depth and variation upstream and downstream. No measureable change in quality element	None. Water body downstream (Trent from Moreton Brook to River Tame) affected by Proposed Scheme but no widespread adverse impacts identified with the potential to propagate upstream and affect water body.			Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.	Residual efform elements Residual efform elements Residual efform elements NA NA Residual efform elements NA NA NA NA NA NA NA NA NA N		water body
	Structure and substrate of the river bed			Localised but permanent changes to hydromorphology regime. Localised adverse effects on structure of river bed anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and structure and substrate of river bed upstream and downstream. No measureable change in quality element	identified with the potential to propagate upstream and affect water body. Also Proposed Scheme effects to downstream water body all occur upstream of confluence with this water body.			Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.		N/A	
	Structure of the riparian zone			Localised but permanent loss of riparian zone. Localised adverse effects on structure of riparian zone anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Flament is insensitive to impact	Element is insensitive to impact				Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.		N/A	

Table 49: Bourne-Bilson Brook Catchment (trib of Trent) (GB104028047270) detailed impact assessment Surface water body: Bourne-Bilson Brook Catchment (trib of Trent)	- effects on current status												Detailed Impa	ct Assessment														Detailed Impact Assessment Results			
Water body (D: GB104028047270 Watercourse Hydromorphological Not A/HMWB Scheme component: designation:	WFD-BRN-W-01-01 Viaduct		WFD-BP02 Borrow pit - Kings Bromley North, located adjacent to the			Bourne Brook WFD-BRN-W-01-02 Daylighting (of existing highway cu			WFD-BRN-W-01-03 Highway realignment culvert			WFD-BRN-T-02-01 Highway realignment culvert		WFD-BRN-T-02-02 Viaduct		WFD-BRN-T-02-03 Realignment		Borrow pit - Kings Ba	Crawley Brook WFD-BP02 omley North, located adjacent to the realign			WFD-BP03 s Bromley North, located adjacent to the realigned Shaw Lan			WFD-BRN-T-02-04 ghway realignment culvert			Overall effects on element		Additional mitigation requirements	
Status Objective: Good by 2027 Summary of embedded mitigation:	Kings Bromley Vladuct; Approx. viaduct width: 15 viaduct length: 980m; Approx. viaduct heigh Clear span viaduct. Viaducts designed to cross perg- river channel wherever possible to reduce shadii	A 50m buffer zone is incorporated betwe borrow pit excavation, there is the pi	Imi [*] , Assumed average excavation depth: 3.3 m; Makinum excavation depth: 3.8 m; Assumed average (at nearest point): 158m; Total calciformate area of wat nearby watercourses and borrow pits. Excavation will not take place in this son ential for dewatering and excavation activities to affect watercourse flow regime central for dewatering and excavation activities to affect watercourse flow regime central for dewatering and excavation activities to affect watercourse. The extension activities to affect watercourse, for his extension activities and the control groundwater levels and to Drainage measures will be designed to control groundwater levels and to	recourse: 37.54km ² Depending on the permeability of the underlying strata between a war Therefore, site investigation and monitoring before during and after deted as borrow pit will be restored to the existing levels and land use in reation plan are assumed to consist of a lower permeability than the units of the control of the rest of the control of the restored to t	tercourse and the watering and	Approx. existing culvert length: 9m; Approx. existing culvert dimensions into the control of the			Approx. culvert length: 10m; Approx. culvert diameter: 0.9m ticable, invert of culvert to be buried 300mm below the existing by w continuity. Detailed design to be developed in general accordan ssage. Hydromorphological improvements to be undertaken to riv to compensate for footprint loss.			Approx. culvent length: 10m; Approx. culvent diameter 0.9m able. Invert of culvent to be buried 300mm below the existing be- continuity, Detailed design to be developed in general accordance age. Hydromorphological improvements to be undertaken to rive- to compensate for flootprint loss.		Kings Bromiey Vaduct. Approx. valadut vidith: 15m; Approx. viaduct length: 980m; Approx. viaduct height: 6m Clear span viaduct. Viaducts designed to cross perpendicular to river channel wherever possible to reduce shading impact.	The length of watercourse realignments has been reduced as a appropriate features equivalent to those lost along the existin condition where reasonably practicable (provided this is com	vrealigned channel: 60m; Approx. total length of existing chann far as reasonably practicable. Design of the new channel will all channel footprint. Where natural watercourse, the design will sable with the watercourse; flood risk and land drainage funct buffer zone for the implementation of marginal/riparian impr	o ensure the equivalent hydraulic capacity and incorporation of aim to enhance hydromorphological condition over the existing ions). In addition, the design of the new channel will allow for a	A Som buffer zone is incorporated between stably supported by the water of the stable	baseflow to the watercourse .	watercourse. 4:37mi ⁻ The Depending on the permeability of the underlying strata ext watercourse flow regime. Therefore, this investigation and watercourse. Editioning construction, the trace excavated as variation Strategy. The materials used to backfull the borrow pit as will be designed to control groundwater levels and to sustain	watercourse A 50m buffer zone is incorporated between nearby watercourses and and the borrow pit excavation, there is the potential for dewateri dewatering and excavation activities will be required to protect the in use in accordance with the Phase 2 a Borrow Pis Agricultural Restorate		the underlying strata between a watercourse n and monitoring before during and after fill be restored to the existing levels and land e assumed to consist of a lower permeability water depths and	as been reduced as far as reasonably practicable. Invert of culve	rt length: 10m; Approx. culvert diameter: 0.9m rt to be buried 300mm below the existing bed level to reduce disruption to sediment transfer and se developed in general accordance with CRIA and Environment Agency guidance and to ensure a ob be undertaken to river channel immediately upstream and downstream of the culvert to comp loss.	maintain natural propriete low flow component(s) located in other WFD water bodies	Summary of scheme components proposed on watercour within water body catchment with the potential to effectment status	rses ect Summary of effects on elements	Overall effect on element	Construction Operation	WFD compliance outcome - Residual effect on element potential for deterioration of current status
WFD Classification Elements Current Status Objective	Shading	Footprint	Changes in flow velocity and volume due to dewater	ng Changes to water body hydromorphology leading to ch processes and habitats upstream and downstr	anges in river Footprint / creation of new	habitats Shading	changes in river processes and habitats upstream a downstream	d Footprint	Shading	changes in river processes and habitats upstream and downstream	Footprint		Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream	Shading	Footprint	Changes to water body hydromorphology leading to change in river processes and habitats upstream and downstream	Creation of new habitats	Footprint	Changes in flow velocity and volume due to dewatering	changes in river processes and habitats upstream and downstream	Footprint	Changes in flow velocity and volume due to dewatering in river proces	body hydromorphology leading to changes es and habitats upstream and downstream	Footprint	Changes to water body hydromorphology in river processes and habitats upstream	ading to changes and downstream	Viaducts	Viaduts			
Macrophytes and Phytobenthos - Good by 2027 combined	Some minor, localised and periodic shading of riv However negligible effect on macrophytes and phy anticipated. No measureable change in quality	Localised and temporary excavation of Jagoros. DAK of catchment area of wat physical impact on river channel or rigards effects anticipated on ancopylise and po- tern of the company of the No measureable change in quali	urea of floodplain course). No direct an zone. No Bleby robbethos habitat element. Localised and temporary excavation of area of floodplain average excavation depth: 3.3m; maximum excavation dep Potential for minor and temporary reduction in floor a flootenthos habitat element. Localised and temporary excavation of a proposary reduction in floor a floored to the proposary reduction in the potential for minor and temporary reduction. There is cleaned in status could occur. Requires additional mitig	No direct physical impact on river channel leading to che processes and habitat upstream and downstream. No doverse risk that at too.		lised but permanent red improvement in anticipated, but no reduction in shading of section of river channet. I improvement in marcipylare and phytocenthos anticipated, but no change in quality element.		ology to a called but permanent loss of open river habitat. Localis at the called but permanent loss of open river habitat. Localis at the called the call	Localised but permanent shading of section of river channel act. and channel shading of section of river channel act. and channel shading of section in photosynthetic activity), by no change in quality element when balanced against mitigation embedded in the scheme.	et. Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and macrophyte and phytoberthos habitat upstream and downtream of cut-riv. No measureable change in quality element.	Localized but permanent loss of open river habitat. Localized advence effects on macrophysis and phytobenthos sancipates but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent thading of section of river channel. Localised alwerse effect on macrophytes and phytoberthos anticipated (size to a reduction in photosynthetic activity), but no change in quality element when ablanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and macrophytes and phytobenthos habitat upstream and downstream of culvert. No measureable change in quality element.	Some minor, localised and periodic shading of river channel. However negligible effect on macrophytes and phytobenthos anticipated. No measureable change in quality element.	Creation of 320m of new realigned channel, with incorporated hydromorphological and rigarian/marginal habitat improvements resulting in 20m net gain of river channel). Localised improvement in macrophyles and phyloberhols habitat, but no change in quality element.	Localised but permanent change to hydromorphological regin However negligible effect anticipated on river processes an macrophylese and phylobenthos habitat upstream and downstream. No measureable change in quality element.	Creation of 320m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements (resulting in 20m net gain of river channel). Localized improvement in marcophytes and phytoberithos habitat, but no change in quality element.	nal (approx. 3.2% of catchment area of watercourse). No direct	Localized and temporary excavation of area of floodplain (assumed average excavation depth: 3.1m, maximum excavation depth: 5.1m, Potential for minor and temporary reduction in flow regime downstream as a result of devastering activities. Potential adverse effects on macrophytes and phytobentions habitat. There is a risk that change in status code occur. Regimes additional milligation.	No direct physical impact on river channel leading to changes in river processes and hisbitat upstream and downstream. No Backy effects antiques do managorphes and physiobenthos. No measureable change in quality element.	Localised and temporary excavation of area of floodpilain (approx. 4.8% of catchment area of watercourse), No direct physical impact on river channel or riparian zone. No likely effects anticipated on macrophyte and phytobenthos habitat. No measureable change in quality element.	Localised and temporary excavation of area of floodylain (assumed average excavation depth: 2.5m; maximum excavation depth: 2.8m). No direct physic process in the control of the control	impact on river channel leading to changes in Localised but per d habitat upstream and downstream. No likely effects on macropit sets on macrophysic and physiotemitos. No reable change in quality element.	nament loss of open river habitat. Localized adverse consideration of the consideration of the substance and the substan	but permanent shading of section of river channet. Adverse effect on microphytes and phytobenthos (I due to a reduction in photosynthetic activity), but mitigation embedded in the scheme. Localized but permanent changes to hydrobenthos to shad the strength of the scheme for the scheme against mitigation embedded in the scheme.	orphology regime. The processes and upstream and quality.	source stroke: Vaduct (WVD-BRN-W-01-01) Crawley Brook: Cuberts & Daylighting Bourne Brook: Highway realignment cubert (WFD-BRN-W-01-03) - 10m Highway realignment cubert (WFD-BRN-W-01-03) - 10m Highway realignment cubert (WFD-BRN-W-01-03) - 10m Cawley Brook: Highway realignment cubert (WFD-BRN-W-01-03) - 10m Cawley Brook: Highway realignment cubert (WFD-BRN-T-02-04) - 10m	The two viadacts will cause some minor, localised and periodic shading of river channel. This will have a negligible effect on macrophyta and phytobenthos, macroinvertebrates and fish. Gulverst The 21m net length of new culverting will cause a localised but permanent loss of existing open river habitat and shading. This will have minor, localised adverse effect on macrophytes and phytobenthos, macroinvertebrates and fish. Realignments The creation of 60m of new realigned channel (resulting in a net gain of 5m of river channel), with incorporated hydromorphological a riparairain/mappinal improvements, will cause a localised but permanent improvement in river habitat. This will have a minor, localised beneficial effect on macrophytes and phytobenthos, macroinvertebrates and fish.	Adverse effect anticipated when scheme component effects considered in combination. When balanced against mitigation embedded in the scheme, there remains a risk that there could be change in the status of the quality element.	nal mitigation measures for the memory of production of the memory of th	ied adverse effect anticipated when me component effects considered in halton. No change in quality sement shen balanced against miligation added in the scheme and additional miligation measures.
Macroinvertebrates High Good by 2015	Some minor, localised and periodic shading of riv However negligible effect on macroinvertebrates ar measureable change in quality element	tocalised and temporary excivation of (approx. 0.8% of actiment area of wat anticipated. No int. Localized and temporary excivation of (approx. 0.8% of actiment area of int. 0.8% of actiment area of effects anticipated on macroinvered measureable change in quality	rea of floodplain course). No direct in a course, No direct in a course, No direct in a core. No labely direct in a core. No labely direct in a core. No labely defended in the hobitat. No dement. Seement.	No direct physical impact on river channel or riparian zone he semi- in river processes and habitat upstream and downstream. anticipated on macroinvertebrates. No measureable cha- element	Removal of existing 10m culvert. Localis Increase in open river habitat. Localist macroinvertebrate habitat anticipates macroinvertebrate habitat anticipates.	lised but permanent ed improvement in d, but no change in quality element.	tocalised but permanent improvement to hydromorph regime. However negligible effect articipated on in parted processas and macroinverteira habitat upterma getation), downstream. No measureable change in quality elem	ology Localised but permanent loss of open river habitat. Localise er and adverse effects on macroinvertebrates articipated, but mut change in quality element when blanced against miligation. embedded in the scheme.	Localised but permanent shading of section of river channel Localised adverse effects on macroinvertextes surcipute (pructing due to reduction in lives of prasmi and aquality vegetation), but no change in quality element when balance against mitigation embedded in the scheme.	t. Localised but permanent changes to hydromorphology of regime. However negligible effect anticipated on river processes and moroinverbeath sholist optersam and did downstream of cuhert. No measureable change in quality	Localised but permanent loss of open neer habitat. Localised advence effects on macroinvertebrates anticipated, but no change in qualify element when babanded against mitigation embedded in the scheme.	Localised but permanent shading of section of river channel. Localised adverse effects on macroinvertebrates articipated (no.dring due to serection in lysos of postern and aquatic vegetation), but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and macroinvertebrate habitat upstream and downstream of culvert. No measureable change in quality element.	Some minor, localised and periodic shading of river channel. Nowever negligible effect on macroinvertebutes anticipated. No measureable change in quality element.	Creation of 320m of new realigned channel, with incorporated hydromorphological and operation/marginal habitat improvements becausing in 200 me again of ner channels, Localised improvement in macroinvertebrate habitat, but no change in quality element.	Localised but permanent change to hydromorphological regin Horever negligible effect anticipated on river processes an macroinvertebate habitat upterma and downstream. No measureable change in quality element.	Creation of 320m of new realigned channel, with incorporated hydromorphological and riparian/imarginal habitat improvements (resulting in 70m net gain of river channel), Localised improvement in microinvertebrate habitat, but no change in quality element.		Localized and temporary excavation of area of floodplain (Issumed average excavation depth: 3.1m; maximum excavation depth: 8.8m; Polietinal for ninor and temporary reduction in flow regime downterm as a result of devastering activities. Footestial adverse effects on macroinvertedness halter. There is not that a change in status could occur. Requires additional mitigation.	No direct physical impact on river channel or riparian zone leading to changes in river processes and habitat upstream and downstream. No Ribey effects inscitued on macroinvertebrates. No measureable change in quality element.	Localised and temporary excavation of area of floodplain (approx. 42% of catchment area of watercourse). No direct physical impact on mere channel or operation zone. No lettery effects anticipated on macroinvertebrate habitat. No measureable change in quality element.	Localized and temporary exercation of area of floodplain (assumed average exercation depth. 2.5m; maximum exercation depth. 2.8m). Potential for minor and temporary reduction in flow regime downstream as a result of dese	cal impact on river channel or riparian zone is in river processes and habitat upstream area men. No lakey effects anticipated on rarders. No measureable change in quality element	nament loss of open river habitat. Localized adverse meretebrates anticipated, but no change in quality balanced against mitigation embedded in the scheme. Localized including the properties of the scheme.	but permanent shading of section of river channel, adverse effects on microinvertebrates anticipated to the to a reduction livings of reparts and expanding to the to a reduction livings of reparts and expanding the continue of the section of the		Total length of new culverted river channel = 30m rotal length of daylighted river channel = 9m lessultant net loss of open river channel = ZIm Realignments. Canaley proofs: Canaley proofs: Canaley proofs: Total length of new realignment (when the channel = 60m rotal length of lost existing river channel = 55m lessultant net gain of river channel length > 5m	Borrow als. The exacation of the borrow pit at Kings Bromley North (located adjacent to the realigned AS15 Lichfield Road) will comprise approximately 0.45% of the Bourne Brook catchment. The borrow pit will be located approximately 1.45m from the watercourse (at the nearest point) and exacated to an assumed average depoint of 3.7m and a namium depth of 48 m. This may result in slight changes is volume of river flow within the Bourne Brook (due to devatering activities during the construction phase). This may have an adverse effect on mancriphytes and phylobrethom, macroinvertentiers and risk. The exacation of the borrow pit at Kings Bromley North (located adjacent to the realigned AS15 Lichfield Road) and the borrow pit at Kings Bromley North (located adjacent to the realigned AS15 Lichfield Road) and the borrow pit at Kings Bromley North (located adjacent to the realigned AS15 Lichfield Road) and the borrow pit at Kings Bromley North (located adjacent to the realigned AS15 Lichfield Road) and the borrow pit at Kings Bromley North (located adjacent to the realigned AS15 Lichfield Road) and the borrow pit at Kings Bromley North (located adjacent to the realigned AS15 Lichfield Road) and the borrow pit at Kings Bromley North (located adjacent to the realigned AS15 Lichfield Road) and the located AS15 Lichfield Road (located AS15 Lichfield Road) and the located AS15 Lichfield Road (located AS15 Lichfield Road) and the located AS15 Lichfield Road (located AS15 Lichfield Road) and the located AS15 Lichfield Road (located AS15 Lichfield Road) and the located AS15 Lichfield Road (located AS15 Lichfield Road) and the located AS15 Lichfield Road (located AS15 Lichfield Road) and the located AS15 Lichfield Road (located AS15 Lichfield Road) and the located AS15 Lichfield Road (located AS15 Lichfield Road) and the located AS15 Lichfield Road (located AS15 Lichfield Road) and the located AS15 Lichfield Road (located AS15 Lichfield Road) and the located AS15 Lichfield Road (located AS15 Lichfield Road) and the located AS	c Adverse effect anticipated when schein consistent component effects considered in combination. When balanced against mitigation embedded in the schein, there remains arisk that there could write the change in the status, to the quality element. Requires additional mitigation. a wido on the and a and a and a a adoption.	will be required to ensure that there profiled impact on the water unent. Mitigation measures will be die nitefall following ground action and monitoring of surface and groundwater levels and in action with the Environment Agency- on could take the form of: the buffer strip, or shallower batter exerustions; dation of a groundwater cut off; one of wet working techniques that	sed adverse effect anticipated when me component effects considered in nation. No change in quality letment shen balanced against mitigation edded in the scheme and additional mitigation measures.
Fish	Some minor, localised and periodic shading of riv However negligible effect on fish anticipated. No r change in quality element.	tocalbed and temporary excavation of lapprox. 0.4% of datchment area of value measureable effects articipated on fair habitat. No me quality element.		issumed it. 8 &n). No direct physical impact on river channel or riparian zone in river processes and habitat upstream and downstream. anticipated on fish. No measureable change in qualifications are could be a superior or consideration.	Removal of existing 10m culvert. Localized No likely effects the dependent habitat, but no change in qualit	Removal of existing 10m culvert. Localised but permanent in fight improvement in figh improvement in figh habitat anticipated (including in sharing and aquastic vegetation), but no quality element.	tocalised but permanent improvement to hydromorphic called regime. Newwer regligible effect anticipated on in process and fish habits updrama and downstream measureable change in quality element.		cd the classified but permanent shading of culverted section of the classified adverse effects on fin anticipated (including the classified adverse effects on fin anticipated (including the classified and expect vegetation in the classified and expect vegetation in the classified and expect vegetation and e	Localised but permanent changes to hydromorphology continue of the continue of	Localised but permanent loss of open near habitat. Localised advence effects on this intriopiete, but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent shading of culverted section of channel. Localised adverse effects on fish anticipated fincluding due to a reduction in/loss of pinsha and aquatic vegetation), but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and froh habiters and downstream of clubert. No measureable change in quality element.	Some minor, localised and periodic shading of river channel. However negligible effect on fish anticipated. No measureable change in quality element.	Creation of 320m of new realigned channel, with incorporated hydromorphological and riperian/marginal habitat e improvements lessuiting in 20 me explicating in 20 me explication	Localised but permanent change to hydromorphological regiments of the control of	incorporated hydromorphological and riparian/marginal habitat improvements (resulting in 20m net gain of river	Localised and temporary excavation of area of floodplain and langungs. 32% of catchinent area of watercourse), this direct explosical images continued to the change of th	excavation depth: 8.8m). Potential for minor and temporary reduction in flow regime downstream as a result of dewatering activities. Potential adverse effects on fish		Localised and temporary examation of area of floodplain (approx. 4.8% of catchment area of watercourse). No direct physical impact on or her channel or rigidation zone. No likely effects anticipated on fish habitat. No measureable change in quality element.	Potential for minor and temporary reduction in flow regime downstream as a result of dewatering activities. Potential adverse downstrea	cal impact on river channel or riparian zone trains in river processes and habitat upstream and effects on fish and exception of the control	Localise Locali	do but permanent shading of culverted section of called adverse effects on fish anticipated (including duction includes of primarian and quater vegetation), hange in quality element when balanced against mitigation embedded in the scheme.	water body. sosphology regime. er processes and of others. No	Normor ails. Source Brook: Borrow pit (Kings Bromley North, located adjacent to the Borrow pit (Kings Bromley North, located adjacent to the Borrow pit (Kings Bromley Rosch Source) pit (Kings Bromley North, located adjacent to the Borrow pit (Kings Bromley North, located adjacent to the watercourse Borrow pit (Kings Bromley North, located adjacent to the Borrow pit (Kings Bromley North, located adjacent to the easligned Shaw Lane) - minimum approx. 50m from watercourse	0	Adverse effect anticipated when scheme con- component effects considered in combination. When balanced against mitigation embedded in the scheme, there remains a risk that there could be change in the status of the quality element. Requires additional mitigation.	in receive to revealed ring. of a new limited channel and any diversion. Local control of the	and adverse effect anticipated when me component effects considered in nation. No change in quality element when balanced spatin miligation added in the scheme and additional miligation measures.
Dissolved oxygen High Good by 2015	Some minor, localised and periodic shading of river- potential associated reduction in photosynthetic aquatic flora). However, negligible effect on discon- concentrations anticipated. No measureable chang- element.	er channel (with Localised and temporary loss of area of watercourse Localised and temporary loss of area of watercourse under configuration of the configur	Localised and temporary excavation of area of floodglain (approx. No direct physical No direct physical No likely effects on on the program of the program o	insumed is 8.dm). No direct physical impact on river channel or ripartian zone in river processes systems and downstream. No likely effect disolved oxygen concentrations. No measureable chan- else the	ect anticipated on	Removal of existing 10m culvert. Localised but pereduction in shading of section of river channels. Po lead to localised improvement in dissolved on concentrations (due to increased photosynthetic aquatic flora), but no change in quality elem	ential to regime. However negligible effect anticipated on riv	By er Element is insensitive to impact mand.	Localized but permanent shading of culterted section of channel. Peterstal to leaf to minor and localized impact on disobled outgoin concentrations (let be reduced photocynthetic activity by aquatic flora), Localized selverse effects anticipate, but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticopated on river processes and dissolved oxygen upstream and downstream culvert. No measureable change in quality element.	s of Element is insensitive to impact	Localized but permanent chading of culterited section of channel, Potential to lead to minur and lucalized report on dissoled organ concentrations (left to reduced photosynthetic activity by aquatic flora). Localized adverse effects anticipated, but or change in quality element when balanced against mitigation embedded in the scheme.	Localized but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and dissolved oxygen upstream and downstream of culvert. No measureable change in quality element.	Some minor, localised and periodic shading of river channel (with potential associated reduction in photosynthetic activity by aquatic flora). However, negligible effect on dissolved oxygen concentrations satisficated. Ne measureable change in quality element.	Creation of 320m of new realigned channel, with incorporated by hydromorphological and riportun/marginal habitat improvements. However negligible effect anticipated on dissolved oxygen concentrations. No measureable change in quality element.	Localised but permanent change to hydromorphological registroscere regligible effect anticipated on over processes and dissolved oxygen concentrations upstream and downstream. I measureable change in quality element.	c. Creation of 320m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements. However negligible effect anticipate on dissolved oxygen concentrations. No measureable chan	Localised and temporary loss of area of floodpishin (approxi- al 32% of catchinent area of wistercourse). No direct physical sated anged on river channel or inparian zone. No likely effects or dissolved ovigen. No measure	Localized and temporary excaustion of area of floodplain joisumed average excavation depth. 31m maximum and the second second second second second reduction in low regime downstream as a result of dewatering activities. Notential localized but remporary where effects on disolved origins, but no change in quality where effects on disolved origins, but no change in quality the scheme.	No direct physical impact on niver channel or ripartine zone leading to changes in niver processes spatream and downstream. No likely effect anticipated on discolved origins concentrations. No measureable change in quality element	Localised and temporary loss of area of floodpiloin Jappron. 4.8% of catchment area of watercourse). No direct physical impact on river channel or riparian zone. No lakely effects on disolved oxygen. No measureable change in quality element.	Localized and temporary excavation of area of floodplain (assumed average excavation degith: 3.5m; mainturn excavation degith: 8.8m). Potential for mixor and temporary reaction in flow regime downstream as a result of devatering activities. Potential localized but remporary adverse effects on disolved orages, but one change in quality element when balanced against mitigation embedded in the scheme.	cal impact on river channel or ripartisn zone changes in river processes upstream and likely effect anticipated on dissolved oxygen No measureable change in quality element	Localise Charent is insensitive to impact photosystems a balance	nd but permanent shading of culverted section of Portential to lead to misor and localized impact on which does not consider the control of the control of which control of the control of the control of the control of the control of the control of control of the control of the control of control of the control of control	m of culvert. No	Total maximum area of excavation = 0.4km. ² Total water body catchment area =37.5km. ²	The two visdocts will cause some minor, localised and periodic shading of river channel. This will have a negligible effect on dissolved oxyges and waster temperature. Cubverts The 21m net length of new culverting will cause a localised but permanent shading of the river channel. This will have a minor, localise adverse effect on dissolved oxygen and water temperature. Realignments The creation of 60m of new realigned channel (resulting in a net gain of 5m of river channel) will cause a localised but permanent improvement in hydromorphological regime and marginal/riparian habitat. This will have a negligible effect on dissolved oxygen, ammonia and phosphate concentrations.	Localised adverse effect articipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.		N/a
pH High Good by 2015	Element is insensitive to impact	Element is insensitive to in	pact Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to in	impact Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	ement is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact Element is insensitive to im	act None		Sorrow gits The excavation of the borrow pit at Kings Bromley North (located adjacent to the realigned AS15 Lichfield Road) will comprise approximately 0.4% of the Bourne Brook catchment. The borrow pit will be located approximately 1.45m from the watercourse (at the nearest point) and excavated to an assumed average depth of 3.3m and a maximum depth of 8.4m. This may result in slight changes is:	Element is insensitive to impact. No measureable change to quality element		N/a
Phosphate Moderate Good by 2027	Element is insensitive to impact	tocalised and temporary excassion of pages to 45% of catchine trans of wat and temporary reduction in agricultural a associated reductions in agricultural of fertilizer, However negligible effect antic concentrations. No measureable change	rea of floodphin coursel, localised and temporary excavation of zero of floodphin coursel, localised week severage excavation depth; 3.dm, maximum excavation dep Potential for minor and temporary reduction in floor water of the proposal stated on phosphate and companies of the proposal stated on phosphate in quality element. In quality element when balanced against militagision emb the scheme.	ssumed: is & Bm), ine allared and Element is insensitive to impact no change dded in	Element is insensitive to it	impact Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Creation of 320m of new realigned channed, with isocoposated privarial/magnial habita improvements. Potential localized reduction in fine sediment inputs and nutrient localized reduction in fine sediment inputs and nutrient localized, forevower negligible effect anticipated on phosphate concentrations. No measureable change in quality element.	Localised and temporary excussion of area of floodplain lipporns. 23°C of activement are of sustercourse). Coalised and temporary reduction in agricultural activity, with potential associated reductions in agglocation of organic non inorganic fertilizer. However negligible effect anticipated on phosphate concentrations. No measurable change in qualifications are consequently associated to the concentration of the control o	Licitates an explain extraction to the late or visibilities consistent of the late of the	Element is insensitive to impact	Localised and temporary excustion of area of floodplain lapprox. ARS of catchmer are of witercourse), localised and temporary reduction in agricultural activity, with potential associated reductions in application of organic and inorganic fertilizer. However engine effect change in quality element.	Localised and temporary excavation of area of floodpain (assumed average excavation depth. 3-5m; maximum exvasion depth. 8-8m). Potential for minor and temporary reduction in flow regime downstrams as result of develocing excitible. Potential localised and temporary adverse effects on phosphate concentrations, butne change in quality element when balanced against mitigation embedded in the scheme.	ement is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact Element is insensitive to im	act		volume of river flow within the Bourne Brook (due to dewatering activities during the construction phase). This may have a minor, localised adverse effect on disolved owges, phosphate and ammonia concentrations. The excavation of the borrow pit at Kings Bromley North (bocated adjacent to the realigned AS15 Lithfield Road) and the borrow pit at Kings Bromley North (bocated adjacent to the realigned Shaw Line) will comprise approximately 3.7% and 4.8% of the Crowley Brook will be located approximately from from the watercourse (at the nearest point) and excavated to an assumed average depth of 3.8m an anaximum depth of 8.8m. The borrow pit at Kings Bromley North (bocated adjacent to the realigned Shaw Line) will be located approximately \$500 from the watercourse (at the nearest point) and excavated to an assumed average depth of 3.8m and amaximum depth of 8.8m. This may result in changes in volume of river flow within the Crawley Brook (due to dewatering activities during the construction shake). This may result in changes in volume of river flow within the Crawley Brook (due to dewatering activities during the construction shake). This may are uniter, located edverse effect on disordered orages, hopsighes and ammonian concentrations.	Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.	None required. None required.	N/a Compliant - no change in physicochemical status of water body
Ammonia High Good by 2015	Element is insensitive to impact	Localised and temporary excavation of (approx. 0.4% of catchment area of wat and temporary reduction in agricultural a associated reductions in application of fertilize. However neighble effect anti- concentrations. No measureable change	are of floodplain rouse). Localised early experience of period of the receipt of	issumed: 1. 8. Bin). Siling but Element is insensitive to impact to change dded in	Element is insensitive to in	impact Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is intensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Creation of 320m of new realigned channel, with incorporated riparian/imaginal habitat improvements. Potential localized reductions in the sediment inputs an nutrient loading. However negligible effect anticipated on ammonia concentrations. No measureable change in qualified effect.	Cacalited and temporary excustion of are on fit floodplain (approx. 3.2% of catchment use of unbestcoure), cooling of a continuous of the unbestcoure of cooling of the continuous of the contin	Localized and temporary excavation of area of Bodoplain (Issumed swerpe excavation depth. 3.m; maximum excavation depth. 8.m). Potential for minor and temporary reduction in flow regime downstream as a result of dewatering activities. Potential localized but temporary adverse effects on ammonia concentrations, but not change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Localised and temporary excavation of area of floodplain (approx. 4.8% of acthment area of watercourse). Localised and temporary reduction in agricultural activity, with potential associated reductions in application of organic and inorganic fertilizer. However negligible effect anticipated on ammonia concentrations. No measureable change in quality element.		ement is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact Element is insensitive to im	set .		Consulución jurisej. Tito may nave a mino, rocanieu auverse enec un disouveu ungen, prograne and ammuna concernations.	Localised adverse effect anticipated when scheme component effects considered in combination, he change in aughty element when balanced against mitigation embedded in the scheme.		Wa
Temperature High Good by 2015	Some minor, localised and periodic shading of riv However, negligible effect on water temperature an measureable change in quality element	rher channel. anticipated. No Element is insensitive to in	pact Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to i	Removal of existing 10m culvert. Localised but per reduction in shading of section of river channel. Re lead to localised improvement in water temperatu change in quality element.	manent ential to Element is insensitive to impact , but no	Element is insensitive to impact	Localised but permanent shading of culverted section of Channel. Potential to lead to minor and localised impact on water temperature. Localised solvene effects antiopated, but no change in quality elements when balanced against mitigation embedded in the scheme.	n but Element is insensitive to impact	Element is insensitive to impact	Localized but permanent shading of culverted section of channel Potential to lead to minor and boolised impact on water temperature. Localized shorter effects anticipated, but no change in quality demonst who ablacted against mitigation embedded in the scheme.	Element is insensitive to impact	Some minor, localised and periodic shading of river channel. However, negligible effect on switer temperature artificiated. No measureable change in quality element.	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	ement is insensitive to impact	Localise Channel, water rem no cha	d but permanent shading of culverted section of Potential to lead to minor and localised impact on persture. Localised severe effects anticipated, but Element is insensitive to im gen in quality effects where balance against mitigation embedded in the scheme.	None. Water body downstream (Trent from Moreton Brook to River Tane) affected by Proposed Scheme but no widespread advense impacts identified with the potential to propagate upstream and affect with body. Also Proposed Scheme effects to downstream water body also cours optionem of confluence with this water body.		Borrow pits	Localised adverse effect anticipated when scheme component effects considered in consistation. No change in quality element when balanced against mitigation embedded in the scheme.		Na
g g Copper, Triclosan, Zinc High High by 2015	N/A - Specific pollutants effects screened out for so component	scheme design Element is insensitive to it	Localised and temporary excavation of area of floodglain average excavation depth: 3.1m, maximum excavation depth: 3.1m, maximum excavation depth: 3.1m average excavation floor of development of devalencing activities. Protestial of temporary advense flexics on specific policitud concentration change in quality dement when balanced against milly embedded in the scheme.	No. direct physical impact on riser channel or rigarian zone before allaned but in river processes upstream and downstream. No likely effective specific pollutant concentrations. No measureable characteristics.		N/A - Specific pollutants effects screened out for scheme d	sign component	N ₁	/A - Specific pollutants effects screened out for scheme design.com	mponent	N/A	- Specific pollutants effects screened out for scheme design comp	onent	N/A -Specific pollutants: effects screened out for scheme design component	N/A-	Specific pollutants effects screened out for scheme design com	ponent	Element is insensitive to impact	Localised and temporary excavation of area of floodplain [Issumed average excavation depth. 3.2m; maximum security of the control of the control of the control of reduction in flow regime downstream as a result of de	No direct physical impact on river channel or riparities zone leading to changes in river processes sportness and downstream. No likely effects anticipated on specific pollutant concentrations. No measureable change in quality element.	Element is insensitive to impact	Localised and temporary excreation of area of floodplain (assumed average excrustion degith: 3.5m; maximum excrusion degith: 8.8m). Protentals for mixor and temporary relactions flow regime downstream as a result of devatering activities. Protential localised but temporary alverse effects on specific pollutant concentrations, but not change in quality element when balanced against mitigation embedded in the scheme.	cal impact on niver channel or riparian stere thruspes in river processes updressm and tiltely effects anticipated on specific pollutant too measureable change in quality element.	N/A - Specific polluta	ints effects screened out for scheme design component			The excavation of the borrow git at Kings Bromley North (located adjacent to the realigned ASIS Lichfield Road) will comprise approximately 0.45 of the Bound rook catchment. The borrow pit will be located approximately 2.56 m from the watercrouse (at the nearest point) and excavated to an assumed average depth of 3.5m and a maximum depth of 8.5m. This may result in slight changes it volume of river flow within the Boune Brook (also to develoring activities during the construction) phase). This may have a minor, localised adverse effect on specific pollutant concentrations. The excavation of borrow pit at Asing Bromley North (located adjacent to the realigned ASIS Lichfield Road) and the borrow pit at Kings Bromley North (located adjacent to the realigned ASIS Lichfield Road) will be located approximately 9.7m from the watercourse (at the nearest point) and excavated to an assumed average depth of 3.3m and a maximum depth of 8.8m. The brown pit at Kings Bromley North (located adjacent to the realigned ASIS Lichfield Road) will be located approximately 9.5m from the watercourse (at the nearest point) and excavated to an assumed average depth of 3.3m and a maximum depth of 8.8m. The brown pit at Kings Bromley North (located adjacent to the realigned ASIS Lichfield Road) will be located approximately 5.5m from the watercourse (at the nearest point) and excavated to a an assumed average depth of 3.5m and a maximum depth of 8.8m. The brown pit at Kings Bromley North (located adjacent to the realigned ASIS Lichfield Road) will be located approximately. This may result in Anages in volume of the refer the within the Carolwely Brook (due to devotatering activities during the construction phase). This may have a minor, localised adverse effect on specific pollutant concentrations.	Localized and temporary adverse effect articipated when scheme component effects considered in combination. No change in qualify element when balanced against miligation embedded in the scheme.	None required. None required.	N/a Compliant - no change in specific pollutant status of water body
Quantity and dynamics of water flow		Localised and temporary excavation of (approx. 0.4% of catchment area of wat physical impact on river channel. No like on quantity and dynamics of water flow change in quality elemi	Course). No direct frects anticipated No measureable t. Description of the course of	insumed is 8.8m). No direct physical impact on river channel or riparian zone inderese inderese in river processes upstream and downstream. No likely effectives a rick that quantity and dynamics of flow. No measureable change in atton.		ised improvement in Element is insensitive to impact.	Localised but permanent improvement to hydromorph regime. However negligible effect anticipated on rin processes and flow dynamics upstream and downstread measureable change in quality element.	ology Localised but permanent changes to hydromorphology reging tocalised adverse effects on flow dynamics (including potential, No localised increases in flow velocity) articipated, but no channel in quality element when balanced gainst mitigation embedded in the scheme.	me. Clai ge Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and quantity and dynamics of flow upstream and downstream. No measureable change in quality element.	in quality element when halanced against mitigation	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and quantity and dynamics of flow spotream and downstream. No measureable change in quality element.		Creation of 320m of new realigned channel, with incorporated hydromorphological improvements (resulting in 20m net gain or river channel). Localised improvement in flow dynamics, but ne change in quality element.	Localised but permanent change to hydromorphological regions of the control of th	ie. Element is insensitive to impact	Localised and temporary excavation of area of floodplain lapprox. 3.2% of actioment area of watercourse). No direct physical impact on river channel. No likely effects anticipate on quantity and dynamics of water flow. No measureable change in quality element.	Localised and temporary excusation of area of Boodplain (Issumed never excusation of piece. 3.3m; maximum excusation depth. 8.2m). Pluential for minor and temporary reduction in flow regime downstream as a result of devastering activities. Potential advense effects on the quantity and dynamics of vaser flow. There is a risk that a change in status could occur. Requires additional mitigation.	No direct physical impact on river channel or riparian zone leading to changes in river processes upstream and downstream. No likely effects anticipated on quantity and dynamics of flow. No measureable change in quality element.	Localised and temporary excavation of area of floodpilain (approx. 4.8% of Catchment area of watercourse), No direct physical impact on river channel. No likely effects anticipated on quantity and dynamics of water flow. No measureable change in quality element.	Localised and temporary excavation of area of floodplain (assumed average excavation degith: 3.5m; maximum excavation degith: 8.8m). Protectal for mixmor and temporary reaction in flow regited downstream as a result of dewastering activities. Potential adverse deflects on the quantity and dynamics of water flow. There is a risk that a change in status could occur. Requires additional mitigation.	cal impact on river channel or riparian zone changes in river processes spotteem and lo likely effects anticipated on quantity and No measureable change in quality element.	ermanent charges to hydromorphology regime. se effects on flow dynamics (tecluding potential es in flow velocity) anticipated, but no change in when halanced gainst miligation embedded in the scheme.	Localised but permanent changes to hydro However negligible effect anticipated on quantity and dynamics of flow upstream an measureable change in quality of	osphology regime, ere processes and downstream. No		The 21m net length of new culverting will cause a localised but permanent change in hydromorphological regime. This will have a min localised adverse effect on flow dynamics, river continuity, river widths and depths, structure of substrate, and structure of riparian zo Realignments The creation of 60m of new realigned channel (resulting in a net gain of 5m of river channel) will cause a localised but permanent improvement in hydromorphological regime and marginal/riparian habitat. This will have a minor, localised beneficial effect on flow dynamics and structure of riparian zone. Recrue yell: The executation of the borrow pit at Kings Bromley North (located adjacent to the realigned AS15 Lichfield Road) will comprise	nor, Adverse effect anticipated when scheme component effects considered in combination. When balanced against mitigation embedded in the scheme, there remains a risk that there could be change in the status of the quality element. Requires additional mitigation.	Local school combination of the	scalised adverse effect anticipated when theme component effects consistend in imbination. No change in quality element when balanced against mitigation nheeded in the scheme and additional mitigation measures.
Connection to groundwater bodies		Element is insensitive to it	adverse effects on the connection to groundwater bodies: risk that a change in status could occur. Requires addit mitigation.	issumed is 8.Rm), on to teretal Element is insensitive to impact here is a onal	Removal of existing 10m culvert. Localism connection to surrounding shallow gr superficial deposits. However no likely connection to groundwater bodies. No in quality element.	measureable change	Element is insensitive to impact	Localised but permanent loss of connection to surrounding shallow groundwater within superficial deposits. However likely effect anticipated on connection to groundwater bodd No measureable change in quality element.	IE 00 DETERMINE IS INSENSITIVE TO Impact es.	Element is insensitive to impact	Localised but permanent loss of connection to surrounding shallow groundwater within superficial deposits. However no likely effect anticipated on connection to groundwater bodies No measureable change in quality element.	Element is insensitive to impact	Element is insensitive to impact		Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Located and temporary excusation of area of floodplain (assumed swarp excusation feet). 3.m. maximum excusation degth: 8.5m.) Patential for minor and temporary reduction is connection to groundwater bodies as a result dewastering activities. Petential advence effects on the connection to groundwater bodies. There is a risk that a change in status could occur. Requires additional mitgation.	Element is insensitive to impact	Element is insensitive to impact	Localised and temporary excussion of area of floodplain (assumed average excustion depth: 3.5m; maximum excussion depth: 8.5m). Potential for insign and temporary resolution in connection to groundwater as a result of devastering activities. Potential adverse effects on the connection to groundwater bodies. There is a risk that a change in status could occur. Requires additional miligation.	Localised but per groundwater will anticipated on co anticipated on co	manent loss of connection to surrounding shallow thin superficial deposits. However no likely effect nnection to groundwater bodies. No measureable change in quality element.	Element is insensitive to impact Element is insensitive to im	act None		the exacution of the doubt put a fasige around year to place the support and put and a support and	Advense effect anticipated when scheme component effects considered in combination. When balanced against mitigation embedded in the scheme, there remains a risk that there could be change in the status of the quality element. Requires additional mitigation.	Local scholar	ixalised adverse effect anticipated when theme component effects considered in bibilitation. No change in quality element when balanced equinst militation when balanced equinst militation mitigation measures.
River continuity		Localised and temporary excavation of (approx. 0.4% of catchment area of wat physical impact on river channel or ripa effect anticipated on river continuity. No in quality element.	rocurse). No direct an zone. No likely Element is insensitive to impact seasureable change	Element is insensitive to impact	Removal of existing 10m culvert. Localis flow continuity, but no change in q		Element is insensitive to impact	Localised but permanent changes to hydromorphology regi- Localised adverse effects on river continuity anticipated, bu- change in quality element when balanced against mitigati- embedded in the scheme.	nne. Lano Element is insensitive to impact on	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime Localised adverse effects on river continuity anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Dement is insensitive to impact	Element is insensitive to impact		Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Localised and temporary excavation of area of floodplain (approx. 3.2% of catchment area of watercourse). No direc physical impact on river channel or riparian zone. No likely effect anticipated on river continuity. No measureable change in quality element.	: Element is insensitive to impact	Element is insensitive to impact	Localised and temporary excavation of area of floodplain (approx. 4.8% of catchment area of watercourse). No direct physical impact on river channel or riparian zone. No likely effect anticipated on river continuity. No measureable change in quality element.	Element is insensitive to impact		ermanent changes to hydromorphology regime. se effects on river continuity anticipated, but no lty element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact Element is insensitive to im	sect		will be located approximately \$7m from the watercourse (at the nearest point) and excussed to an assumed average depth of 3.8m. The bordy in \$6.8m. The bordy is kiff in \$6.00 me. The only which (borded algorismstely \$50m from the watercourse (at the nearest point) and excusated to an assumed average depth of 3.5m and a maximum depth of 3.8m. This may result in Anages in volume of their flow within the Carvally flow (but to devotately activities during the construction phase). This may result in Anages in volume of their flow within the Carvally flow (but to devotately activities during the construction phase). This may have an adverse effect on flow dynamics, groundwater connectivity, river width and depth variation and mixture. Disclass deflect on the structure and substrate of the river bed.	scheme component effects considered in	and mitigation measures for the mement of groundwater baseflow to urne Brook and Crawley Brook bourses during the construction will be required to ensure that there grifficant impact on the water mem. Mitigation measures will be	N/a
Supports Good - Supports Good - River depth and width variation	N/A - Hydromorphology effects screened out for so component		Localised and temporary excavation of area of floodplain average excavation depth: 3.3m; maximum excavation dep Determined for minor and temporary reduction in flow or	No direct physical impact on river channel or rigarian zone in river processes upstream and downstream. No likely effective river depth and variation. No measureable change in qui		ised improvement in Element is insensitive to impact in quality element.	Localised but permanent improvement to hydromorph regime. However negligible effect anticipated on rin processes and river width and depth upstream an downstream. No measureable change in quality elem	but no change in quality element when balanced against	me. ed. Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and river depth and variation upstream and downstream. No measureable change in quality element.	Localised but permanent changes to hydromorphology regime Localised advene effects on rere depth and width antiquated but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and river depth and variation upstream and downstream. No measureable change in quality element.	N/A - Hydromorphology effects screened out for scheme design component	hydromorphological improvements (resulting in 20m net gain o	Localised but permanent change to hydromorphological regiment of the control of t	ve. Element is insensitive to impact	Localised and temporary excausion of area of floodplain (approx. 32% of catchment area of watercourse). No direct physical impacts on river channel. Too killed pelfort on river depth and width variation. No measureable change in quali- element.	Localised and temporary escavation of area of floodplain fastumed severage escavation depth: 3.3m; maximum escavation depth: 8.5m, Potential for mixor and temporary reduction in flow regime downstream as a result of y dewatering activities. Potential adverse effects on the river depth and width visitation. There is a risk that a change in status could occur. Requires additional mitigation.	No direct physical impact on river channel or riparian zone leading to changes in river processes upstream and downstream. No likely effects anticipated on river depth and variation. No measureable change in quality element	Localised and temporary excavation of area of floodplain (approx. 4.8% of catchment area of watercourse). No direct physical impact on river channel. No likely effect on river depth and width variation. No measureable change in quality element.	downstream as a result of dewatering activities. Potential adverse downstream.	cal impact on river channel or riparian zone thanges in river processes upstream and likely effects anticipated on river depth and measureable change in quality element	ermanent changes to hydromorphology regime. effects on river depth and width anticipated, but no ity element when balanced against miligation embedded in the scheme.	Localised but permanent changes to hydro However negligible effect anticipated on river depth and variation uptream and measureable change in quality 4	None. Water body downstream (Trent from Moreton Brook to River Tame)			Adverse effect anticipated when scheme accomponent effects considered in combination. Consult When balanced against mitigation embedded in Mischeme, there remains a risk that there could *a wide be change in the status of the quality element. Requires additional mitigation. **Requires additional mitigation.** **Requires additional mitigation.**	intenti. Numiquation intensists is wanted in detail following ground pation and monitoring of studies and indexed looked particular action with the Environment Agency. In conclud take the follower of the f	Compilant - no change in hydromorphological status of water body minimation. No change in quality element when balanced against mitigation measures.
Structure and substrate of the river bed		Localised and temporary excavation of (approx. 0.945 of catchment area of wat physical impact on river denanel. No like on structure and substrate of river be change in quality element.	balanced against mitigation embedded in the scher	No. direct physical impact on river channel or riparian zone lighted but in river processes upstream and downstream. No likely effected in the control of th	eading to changes cts anticipated or ange in quality Removal of existing 10m culvert. Local structure and substrate of river bed, but element.	t no change in quality Element is insensitive to impact	Localised but permanent improvement to hydromorph regime. Noweer negligible effect anticipated on in processes and structure and sustrated of new systems, downstream. No measureable change in quality elem	ology Localised but permanent changes to hydromorphology regie er coalised adverse effects on structure of new bed anticipation and but no change in quality stemms when balanced against mitigation embedded in the scheme	me. ed. Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and structure and substract of river bet upstract and downstream. No measureable change in quality element.		Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. Nowever negligible effect anticipated on river processes and attructure and substrate of river bed upterm and downstream. No measureable change in quality element.		Creation of 320m of new realigned channel, with incorporated hydronosphological improvements (resulting in 20m net gain on fiver channel). Onever negligible first anticipated on structure and substitute of fiver bot. No measureable change in quality element.	Localised but permanent change to hydromorphological regiments of the control of	ie. I Element is insensitive to impact	Localized and temporary excavation of area of floodplain lappors. 3.2% of actiment area of watercounty. No direc physical impact on river channels. No likely effects antiquities on structure and substate of fiver feet. No measureable change in quality element.	created and temporary exerustion of area of floodplain. Its issued everage execution depth. 3 Dam, maintum executation depth. 5 Dam, protected from four and temporary execution in flow regime downstream as a result of dewatering activities. Potential located but temporary solvener effects on river substrate (due to a potential increas in sitiation). Join or change in equity dement when balanced against mitigation embedded in the scheme.	No direct physical impact on river channel or riparian zone leading to changes in river processe upstream and downstream. No lawly effects anticipate or structure and substate of river locd. No measurable change in quality element.	Localised and temporary excavation of area of floodplain japprox. 48% of catchment area of watercourse). No direct physical impact on where channel. No little yielfects anticipated on structure and substrate of river bed. No measureable change in quality element.	Localised and temporary excavation of area of floodplain (assumed average excavation depth: 3.5m; maximum excavation depth: 8.8m). Potential for minor and temporary reduction in flow regime downstrams as result of develo		embedded in the scheme .	Localised but permanent changes to hydroc However negligible effect articipated on structure and substrate of three bed uptreast No measureable change in quality	affected by Proposed Scheme but no widespread adverse impacts identified with the potential to propagate upstream and affect what body. Also Opposed Scheme effects to downstream water body all occur upstream of confluence with this water body. water body.			Localised adverse effect anticipated when scheme component effects considered in combustion. No change in quality etemen when balanced against mitigation embedded in the scheme.	diversion.	N/a
Structure of the riparian zone		Localised and temporary excavation of lapprox. 0.84 for datchment area of wat physical impact on prainar zone. No lite on structure of riparian zone. No mean quality element.	rrea of floodplain course). No direct effects anticipated Element is insensitive to impact	Element is insensitive to impact	Removal of existing 10m culvert. Localizations of ripartian zone, but no change	Removal of existing 10m culvert. Localised but per induction in shading of section of river channel. Limprovement in riparian zone, but no change in element.	calised	Localised but permanent loss of rigarian zone. Localised adverters on structure of rigarian zone anticipated, but no charlest on quality element when balanced gainst miligation embedded in the scheme.	orse gge Element is insensitive to impact	Element is insensitive to impact	Localised but permanent loss of riparian zone. Localised adverse effects on structure of riparian zone anticipated, but no change in quality element who hadrand against mitigation embedded in the scheme.	Element is insensitive to impact	Element is insensitive to impact		Creation of 330m of new realigned channel, with incorporated rigartian improvements (resulting in 20m net gain of river channel). Localised improvements, but no change in quality element.		Greation of 330m of new realigned channet, with incorporated rigarian improvements (resulting in 20m net gain of river channet). Localised improvement, but no channing quality element.		d Element is insensitive to impact	Element is insensitive to impact	Localised and temporary excavation of area of floodplain (approx. 4.8% of catchment area of watercourse), No direct physical impact on riparian zone. No level effects anticipated on structure of riparian zone. No measureable change in quality element.	Element is insensitive to impact	Localised but p ement is insensitive to impact quality element	ermanent loss of rigarrian zone. Localised adverse ure of rigarian zone anticipante, but no change in when balanced against miligation embedded in the scheme.	Element is insensitive to impact Element is insensitive to im	act			Negligible effect anticipated when scheme Component effects considered in combination. No measureable change in quality element.		N/a

Table 50: Trent from Moreton Brook to River Tame (G8104028047290) detailed impact Surface water body: Trent from Moreton Brook to River Tame	ct assessment - effects on current statu:											Detailed	ed Impact Assessment															Detailed Impact Asse	ment Results		
Water body ID: GB104028047290 Hydromorphological designation: Not A/HMWB	Watercourse: WFD-TMT-T-I Scheme component: Viaduct	Unnamed tributary of River Trent 1 (MB to RT) O1-01 WFD-TMT-T-01-02 t Diversion		Unnamed tributary of River Trent 2 (ME WFD-TMT-T-02-01 Viaduct			River Trent WFD-BP04 orth-east of the River Trent viaduct, between the River Trent and I	d Pine Lane		WFD-TMT-T-05-01 Highway realignment culvert		Realienment (with ass	WFD-TMT-T-05-02 ssociated removal of existing culvert; see WFI	D-TMT-T-05-03)	Removal of existing h	WFD-TMT-T-05-03 sighway culvert (with associated realignment;		tary of Bentley Brook 2	WFD-TMT-T-05-04 Daylighting (of existing culvert)		Hishway reali	WFD-TMT-T-05-05 gnment culvert (on daylighted channel; see WF	D-TMT-T-05-04)		WFD-TMT-T-05-06 Access road culvert			Overall effects on element		Additional mitigation requirem	ments
Overall Status: Poor Desc	River Trent Viaduct; Approx. viaduct w length: 1900m; Approx. viac		ing channel lost: 50m; Total net gain: 5m		ox. viaduct River Trent Vladuct; Approx. viaduct width: 15m; Approx. viad length: 1900m; Approx. viaduct height: 14m		nation depth: 10.3m; Maximum excavation depth: 16m; Excavation material: sand and gravel, 60m; Approx. total catchment area of watercourse (within water body extent): 36.6km2			Approx. culvert length: 10m; Approx. culvert diameter: 0.9m	Арр	Approx. total length of new realigned channel: 150m; Approx. total				ulvert length: 20m; Approx. existing culvert dimensions: unknown		Approx. existing culvert length: 250m; Approx. existing of	ulvert dimensions: suspected 1.2m diameter pipe (access restricted to		Approx. culvert length: 60m; Approx. culvert dimensions: unknown	tbc at detailed design) (located on existing culverted section of wa 05-04)	ercourse to be daylighted under Proposed Scheme, see WFD-TMT-T-	Apr	oprox. culvert length: 10m; Approx. culvert diameter: 0.9m		Cumulative effects - effects on element from				WFD com
Status Objective: Good by 2027 Summ	mary of embedded mitigation: Clear span viaduct. Viaducts designed to channel wherever possible to re-	The length of watercourse diversions has been reduced as far as reasonably practicable. Design of the new channel we to cross perspendicular to niver decises shading inpact. In the length of watercourse diversions has been reduced as far as reasonably practicable. Design of the new channel watercourse, not design with an extraction of the control o	Il also ensure the equivalent hydraulic capacity and incorporation of as a to enhance hydromorphological condition over the existing condition tition, the design of the new channel will allow for a 10m wide buffer z ments.	repriate where clear span viaduct. Viaducts designed to cross perpendicuse for the channel wherever possible to reduce shading important processing in the control of the c	cular to river Clear span viaduct. Viaducts designed to cross perpendicular river channel wherever possible to reduce shading impact.		orrow pits. Excavation will not take place in this zone. Depending on the permeability of the to affect watercourse flow regime. Therefore, site investigation and monitoring before during he areas excavated as borrow pit will be restored to the existing levels and land use. The mat- han the current material. Drainage measures will be designed to control groundwater levels a		Culvert length has been reduced as far as reasonably practicable. In bubstrate. Culvert sized to minimise impact on flow continuity. Detaile ater depths and velocities for fish passage. Hydromorphological impro	. Invert of culvert to be buried 300mm below the existing bed level to reduc- alifed design to be developed in general accordance with CRIA and Environm provements to be undertaken to river channel immediately upstream and do	e disruption to sediment transfer and maintain natural feathers: ment Agency guidance and to ensure appropriate low flow ownstream of the culvert to compensate for footprint loss.	h of watercourse realignments has been reduced as far as reasona es equivalent to those lost along the existing channel footprint. Wi y practicable (provided this is compatible with the watercourses is	nably practicable. Design of the new channel will also ensure the Where natural watercourse, the design will aim to enhance hydr flood risk and land drainage functions). In addition, the design implementation of marginal/riparian improvements.	ne equivalent hydraulic capacity and incorporation of appropriate iromorphological condition over the existing condition where of the new channel will allow for a 10m wide buffer zone for the	Reinstatement of river channel form, equivalent to reach	ies upstream and downstream of existing culvert. Associated with	th localised realignment of channel (see WFD-TMT-T-05-02)	Reinstatemen	of river channel form, equivalent to reaches upstream and downstres	am of existing culvert	Culvert length has been reduced as far as reasonably practicable substrate. Culvert sized to minimise impact on flow continuity. Det water depths and velocities for fish passage. Hydromorphological im	. Invert of culvert to be buried 300mm below the existing bed leve alled design to be developed in general accordance with CIRIA and provements to be undertaken to river channel immediately upstre	to reduce disruption to sediment transfer and maintain natural Environment Agency guidance and to ensure appropriate low flow um and downstream of the culvert to compensate for footprint loss. wa	Culvert length has been reduced as far as reasonably practicable. Inver- ostrate. Culvert sized to minimise impact on flow continuity. Detailed de or depths and velocities for fish passage. Hydromorphological improver	rt of culvert to be buried 300mm below the existing bed level to r design to be developed in general accordance with CIRIA and Envi ments to be undertaken to river channel immediately upstream a	o reduce disruption to sediment transfer and maintain natural nvironment Agency guidance and to ensure appropriate low flow n and downstream of the culvert to compensate for footprint loss.	scheme component(s) located in other WFD water bodies			e eq	Residual effect on element deterioration o
WFD Classification Elements Current Status	Status Objective Shading	Changes to water body hydromorphology leading for fover processes and habitats upstream and di	t to changes in Creation of new habitats	Shading	Shading	Footprint	Changes in flow velocity and volume due to dewatering	Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream	Footprint	Shading Chang	ges to water body hydromorphology leading to changes in eer processes and habitats upstream and downstream	Footprint Change			Footprint	Shading	Changes to water body hydromorphology leading to changes river processes and habitats upstream and downstream	s in Footprint	Shading	Changes to water body hydromorphology leading to change river processes and habitats upstream and downstream	nges in Footprint am	Shading	Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream	Footprint	Shading (Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream	Summary of scheme components proposed on watercours catchment with the potential to effect elements catchment with the potential to effect elements.	s within water body Summary of effects on elements tataba	Overall effect on element	Control	ne and O
Macrophystes and Phystobenshos - Moderate combined		chading of river channel. hydromorphological and riparian/marginal habitat improvements. localized but permanent change to hydromorphological and riparian/marginal habitat improvements. localized but permanent change to hydromorphological and riparian/marginal habitat improvements. localized but permanent change to hydromorphological and improvements in macrophytes and phytobenthological phytobenthological in an acceptance of the control of the con	cogical regime. Creation of 55m of new channel, with incorporation of the control of the contro	rovements Some minor, localised and periodic shading of river channel	nel. However Some minor, localised and periodic shading of niver channels the disputed. No articipated. No articipated. No measureable change in quality element.	Localised and temporary excustion of area of floodplain (approx. 0.02 confidented area of watercoarse). No direct physical impact on new champing and a physical phys	Localised and temporary excavation of area of floodplain (Assumed average excavation depth: 10.1hr, maximum excavation depth: 16m). Potential for minor of or and temporary reduction in flow regime downstream as a result of deviation of activities. Protection deviated adverse effects on exactivities, objected adverse deviation activities. Protection deviated adverse deviation amongstream deviated adverse deviation amongstream.	No direct physical impact on river channel leading to changes in river processes and habitat upstream and downstream. No lietly effects anticipate on microphysics alphysiolechilos. No effects anticipate on microphysics alphysiolechilos. No measureable change in quality element.	Localised but permanent loss of open over habitat. Localised adverse effects on macrophytes and physichembou anticopited, but no charge in quality element when blanched aginat mitigation embedded in the scheme.	Localised but permanent shading of arction of river channel. Localised adverse effect on macrophytes and phytobentics articipated (due to a reduction is photosynthetic activity), but no change in quality element when balanced against mitigation embedded in the scheme.	lised but permanent changes to hydromorphology regime. Tradition of the control	of 150m of new realigned channel, with incorporated dephological and ripartan/marginal habitat improvements inig in 30m net gain of open nev channell, Localised ment in macrophylese and phylobenthos habitat, but no change in quality element.	filed but permanent change to hydromorphological regime. wever regigible effect articipated on new processes and macrophytes and problembine habit augstream and ownstream. No measureable change in quality element.	Creation of 150m of new realigned channel, with incorporated hydromosphological and riganius/imarginal habitat improvements (resulting in 30m net gain of open niver channel). Localized improvement in macrophylex and phylothernoch subtat, but no change in quality element.	Removal of existing 20m culvert. Localised but permanent increase in open river habitat. Localised improvement in macrophyte and physiotensisch habitat anticipatent, but no change in quality element.	Removal of existing 20m culvert. Localised but permanent reduction in shading of section of river channel. Localized improvement in amorphips and physiotechico hisbitat anticipated, but no change in quality dement.			Removal of existing 250m culvert. Localised but permanent reduction in studing of section of neer channel, Localised improvement in macrophyle and optionelinos habitation anticipated, but no change in quality element.		Widercounts is currently colvented for 250m below agricultural fields at this location. New culvert to comprise larger dimensions, levers to be bound below for below to allow for build unperiod to be the color build below the below for below probability and below for build unperiod to flow, sediment and biological continuity, Localized improved in emacrophyte and physiobenthos habitat, but no change in quality element.	Watercoune is currently culverted below agricultural fields at this location. No effect anticipated on macrophyte and phytobenthorito habitat. No measureable change in quality element.	Watercourse is currently culverted for 200m below agricultural fields at this location. Design of culvert to ensure menimed impact on flow, undernate adological contently, Il casilined but permanent improvement to hydromorphology regime. Newword regime relations are improvement to hydromorphology regime. Newword registals effect anticipation of niver process and manarophytic and pshytoberthics habitat upstream and downstream. No measureable change in quality element.	verse effects on macrophytes and phytobenthos anticipated,	icalised but permanent shading of section of niver channel, occilised adverse effect on microphytes and phytoberthos cipated (due to a reduction in photosynthetic activity), but no ange in quality element when balanced against mitigation embedded in the scheme.	and the second s	Visided: Unramed ributary of River Trent 1 (MB to RT): -visident (WC5 TMT-10.0 (1)) -calverts & Daylighting / Culvert Removal Unramed tributary of Bereley Brook 2: -legistary resignment culver (WC5 TMT-10.5 (0) - 10m. no.	Windows: The three valuabits will cause some minor, localised and periodic shading of river channel. This will have a negligible effect on macrophytes and phymacroniverebrates and fab. Schorts: The control of the	Adverse effect anticipated when scheme compe effects considered in combination. When bala- gainst miligation embedded in the scheme, it against miligation embedded in the scheme, it and the compensation of the compensation of the the quality element. Requires additional mitigation of the scheme of the compensation of the compensation of the scheme of the compensation of the compensation of the scheme of the compensation of the compensation of the compensation of the scheme of the compensation of the compensation of the compensation of the scheme of the compensation of the compensation of the compensation of the scheme of the compensation of the compensation of the compensation of the scheme of the compensation of the compensation of the compensation of the compensation of the scheme of the compensation of the compensation of the compensation of the scheme of the compensation of the compensation of the compensation of the scheme of the compensation of the compensation of the compensation of the scheme of the compensation of the compensation of the compensation of the scheme of the compensation of the compensation of the compensation of the compensation of the scheme of the compensation of	set and set contains of additional mitigation measures for the prace, management of groundwater boardow to the management of proundwater boardow to the management of the management of manag	Localized adverse effect anticipated when scheme component effects considered in conditionation. No change in quality element when balanced against militgation embedded in the scheme and additional militgation measures.
d Macroinvertebrates Good		c-shading of river channel. Creation of SSm of new channel, with incorporated bydomorphological and riparian/marginal habitat improvements (resulting in Sn net gain of river channel), Localized improvement in macroinvertebrate habitat, but no change in quality element. Creation of SSm of new channel, with incorporated bydomorphological and riparian/marginal habitat improvement in macroinvertebrate habitat, but no change in quality element. Creation of SSm of new channel, with incorporated bydomorphological and riparian/marginal habitat improvements in macroinvertebrate habitat, but no change in quality element.	ogical regime. Creation of SSm of new channet, with incorporate stream. No int. Creation of SSm of new channet, with incorporate stream. No int. Creation of SSm of new channet, Los from the channe	ted revements Some minor, localised and periodic shading of river chann land regligible effect on nacroinvertebrates anticipated. No m change in quality element.	nel. However Some minor, localised and periodic shading of river channe measureable However negligible effect or miscroliverstationes anticipated, measureable change in quality dement.	Localised and temporary excavation of area of floodplain japprox. 0.02 Catchment area of watercourse). No direct physical impact on riner chan riparian zone. No likely effects anticipated on nazoniversebute habita measureable change in quality element.	Is called and temporary excusation of area of floodplain (Assumed average excusation depth: 10.1km, maximum excusation depth: 10.1km, Potential for minor and temporary reduction. In flow regime diswestness as a result of Security activities. In the second of the contract of the contrac	No direct physical impact on river channel or riparian zone leading to changes in river processes and habitat upstream and downstream. No likely effects anticipated on macroinvertebrates. No measureable change in quality element	Localized but permanent loss of open niver habitat. Localized devene effects on macroimentebrates anticipated, but no change quality element when balanced against miligation embedded in the scheme.	Localized but permanent shading of section of river channel. Localized adverse effects on macroinvertebutes atticipated founding but to a reflection in libes of rights and qualific very regardable, but on the high balances against mitigation embedded in the scheme.	tied but permanent changes to hydromorphology regime. Creation of hydromorphology regime. An every engligible effect anticipated on river processes and invertebrate habitat upstream and downstream of culvert. No measurable change in quality element.	to of 150m of new realigned channel, with incorporated dephological and ripartant/marginal habitat improvements the general participation of the property of t	lised but permanent change to hydromorphological regime. wever negligible effect anticipated on river processes and sacroinvertebrate habitat upstream and downstream. No measureable change in quality element.	Creation of 150m of new realigned channel, with incorporated hydromorphological and ripation/marginal habitat improvements (resulting in 50m and gain of open river channel). Localized improvement in macro-inventionly habitat, but no change in quality demand.	Removal of existing 20m culvert. Localised but permanent increase in open river habitat. Localised improvement in macroinventerste habitat articipated, but no change in quality dement.	Removal of existing 20m culvers. Localized but permanent reduction in shading of action of new channel, Localized improvement in microinventibute habitat anticipated (including dispression to increase in spinals and spinals registrating), but no change in quality element.	Localised but permanent improvement to hydromosphology regime. However negligible effect articipated on niver process and macroinvertebrate habitat uptream and downstram. Nimeasureable change in quality element.	Removal of existing 250m culvert. Localised but permanen increase in open nier habbat. Localised improvement in to macroinvertebrate habbat anticipated, but no change in qual element.	Remotal of existing 250m culvert. Localized but permanent reduction in shading of section of river channet. Localized lay proposement in nucroinventions in balant anticipated (including flat to a incomise in significant original vegitation), but no change in quality obsents.		Watercourse is currently colverted for 250m below agricultural logy fields at this location. New culvert to comprise larger dimensions, see where the power loss were the below for below for below for power loss was extended to allow for build up natural m. No substrate, and design of culvert to ensure minimized impact on flow, sediment and biological controlly, Localized improved for macroinvertebrate habitat, but no change in quality element.	Watercourse is currently culverted below agricultural fields at thi location, No effect anticipated on microinventribute babbat. No measureable change in quality element.	Watercourse is currently calverted for 250m below agricultural fields at this boston. Deep of cultert to ensure mointeels impact on this, settlement and balaging carbonists, bucklined but agreement in prevenient the hydromythology regime. Neurotral premisers in prevenient the hydromythology regime. Neurotral premisers in prevenient the hydromythology regime. Neurotral prevenient the hydromythology regime. Settlement is prevenient to the hydromythology of the	ocalized but permanent loss of open river habitat. Localized tree effects on macroinverte/brites anticipated, but ne change (all y element when balanced against mitigation embedded in the scheme.	called but permanent shading of section of river channel, called adverse effects on microinvertebrains anticipated schaling due to a reduction by from of ripatins and equation production. It is not seen in pushed the red which balanced against milijation embodded in the scheme.	Localized but permanent changes to hydromorphology regime. However negligible effect anticipated on hier processes and macroinvertebrate habitat systream and downstream of cubert. No measureable change in quality element.	- highway realignment culvent (WPD TMT-16-65-63)- 6001 (or westercovers that is already culvented; see WPD TMT-16-65-63)- 6001 (or westercovers that is already culvented; see WPD TMT-16-65-10) (or - access read culvent (WPD TMT-16-66)-10 m Unremoted forward trotatary of feeting from 2.2 - removal certificity from 15-65-63) (or already of existing seeker (WPD TMT-16-60)-12 (or proposed Scheme but no wedespread adverse impacts identified with the culvertatil, as WPD TMT-16-66) (or already of existing seeker (WPD TMT-16-60)-12 (or adverse impacts identified with the culturation of the control of the co	Observation and Smallpannests The creation of Sim for the diverted channel on the 'Unnamed tributary of River Trent 1' watercourse (resulting in a 5m net gain of river channel), which in area that is hydromorphological and ripartan/marginal improvements, will provide a localized but permanent improvement in river habitat. This will have a mit permitted in a feet of the complete and phydromorphological and complete, and phydromorphological and repartangent improvement in river habitat. This will have a mit permitted in a feet of the complete and phydromorphological and repartangent improvement in river habitat. This will have a mit permitted in a feet of the complete and phydromorphological and repartangent in the complete and repartangent in the compl	the quality element. Requires additional mitig th incorporated , localised	water environment. Miligation measures will be designed in detail following ground investigation and monitoring of surface water and amount of the second of	Localised adverse effect anticipated when scheme component effects considered in conditions. No change in quality demonst when histored application mitigation ended in the scheme and additional indigenous matters. Compliant - no c biological status of mitigation measures.
Plah Poor	Some minor, localised and periodic Good by 2027 However negligible effect on fish ant change in quality e	c shading of river channel. In demonstrated the permanent change to hydromorphological and representative channel. It is demonstrated that is a state of the channel of t	Ogical regime. Creation of 55m of new channel, with incorporation and the change in creating in 5m erg and river channel; to creating its fine erg and river channel; to improvement in fish habitat and fish passage, but equality element.	sted rovements Some minor, localised and periodic shading of river channel fixed negligible effect on fish anticipated. No measureable of quality element.	nel. However Some minor, localised and periodic shading of niver channel change in However negligible effect on fish anticipated. No measures change in quality element.	Localised and temporary excession of area of floodplain (appose. 0.02 calcidenest area of watercourse). No direct physical impact on river champion zone. No likely effects enticipated on fish habitor. No measure change in quality element.	Localised and temporary exaustion of area of floodplain (Assumed average excession depth: 10.1m, maximum excession depth: 10.1m, maximum excession depth: 10.1m, protection in four expense depth: 10.1m, maximum excession depth: 10.1m, Potential for minor and temporary reduction in four expense developed activities. Potential advence effects on fish habitat. There is a risk that a change in status could occur. Requires additional initigation.	No direct physical impact on river channel or riparise zone leading to changes in over processes and habitat options and downstream. No lakely effects anticipated on fish. No measureable change in quality element.	Localised but permanent bins of open river habitat. Localised lad adverse effects on fish activitated, but no change in quality element when habitated against mitigation embedded in the scheme.		fixed but parameter charges to hydromorphology regime. Lever negligible effect articipated on river processes and fish hydromorph (tracing at upstream and downstream of cluvier. No measureable change is quality element.	nof 150m of new realigned channel, with incorporated phological and riperion/marginal habitat improvements habitate improvements habitate improvements habitate improvements in fish habitate, but no change in quality element.	lised but permanent change to hydromosphological regime, ever regligble effect anticipated on river processes and fish that upstream and downstream. No measureable change in quality element.	Creation of \$50m of new realigated channel, with incorporated hydromorphological and rigosites/marginal habitat improvements (trassiting in \$50m net gain of upon river channel), lacuniting in \$50m net gain of upon river channel), lacuniting in \$50m net gain of upon river channels insprovement in 15th habitat, but no change in quality demonst.	Removal of existing 20m culvert. Localised but permanent increase in open inter habitat. Localised improvement in fish habitat, but no change in quality element.	Removal of existing 20m culvert. Localized but permanent reduction in shading of section of mer channel. Localized improvement in fish habitat articipates (including due to a increase in riparian and aquatic vegetation), but no change in quality element.	Lecited but permanent improvement to hydroxophology regime. Noweer negligible effect anticipated on river process and fish habitat systems and discontinuous. No measureable change in quality elements.	Removal of existing 250n colvert. Localized but personners sees the content in open river habitat. Improvement in fish pussage as the to length of colvert to be removed. Localized emprovement fish habitat, but no change in questly element.	improvement in fish habitat anticipated (including due to a	Localized but permanent improvement to hydromorpholo- regime. However negligible effect anticipated on river proce and fish habitat upstream and forwaterom. No measures change in quality element.	Witercours is currently culverted for 25th below agricultural facility at this boation. New culvert to comprise larger dimensions, and a state of the control to the contro	Watercourse is currently culterfied below agricultural fields at thi location. Watercourse expect out by fish buseline assessment du to poor habitat potentials. No effect anticipated on fish habitat. No enecurreable change in quality element.	Watercourse is currently cultered for \$20m below approximal feeleds at this location. Design of culter to resume minimized impact on flow, sediment and biological continuity. Localized but permanent improvement by hydromorphology regime. However negligible effect anticipated on new processes and fish habitat upstream and downstream. No measurable change in quality element.	ocalised but permanent loss of open niver habitat. Localised laces effects on fish sercicipated, but no change is quality element when balanced against milipation embedded in the scheme.	ilised but permanent shading of culverted section of channel. Jairod adverse effects on fish anticipated (including due to a duction inforci of injurian and aquatic regretation), but no ange in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. Nowever negligible office anticipates on niver processes and fish- habitat upstream and downstream of culvert. No measureable change in quality element.	regime, sediment transfer or biological continuity) Resultants net gain of open river channel = 190m Diversions & Realignment Unnamed tributary of liver Trent 1 (Mit to RT): -diversion (WPD-MT-10 Q2): Sen gain Unnamed tributary of Bentley Brook 2 - trealignment (WPD- gain Total length of new diverted river channel = 55m Total length of new diverted river channel = 55m	incoporated hydromorphological and rightral/marginal improvements, will cause a localised but permanent improvement in river habitat. This will beneficial effect on macrophytes and phytobenthon, macroinventerbrates and fish, Sorrow <u>pit</u> The exception of the borrow pit north-east of the Biver Trent visitation, between the Biver Trent and Pipe Lane will comprise only 0.02% of the Biver to a list this has been been been to be present. The borrow pit will be located approximately 60% from the observations in it the paragraph of the Biver	ave a localised Adverse effect anticipated when scheme competed in combination. When balance effects considered in combination. When balance effects considered in combination. When the contract is an assumed remains a risk that there could be change in the the quality element. Requires additional mitigation of the country of the count	oreastic of a new lined channel and temporary devention. charter of the channel and temporary devention. charter of the channel and temporary devention.	Localized adverse effect anticipated when scheme component effects considered in combination. No change in quality element when blaunced against mitigation embedded in the scheme and additional mitigation measures.
Olssolved oxygen High	anticipated. No measureable cha	Cration of 55 not her channel, with incorporate dependence of the channel (with competence channel (with opportunity) and opportunity of the channel (with opportunity) and opportunity opportunity of the channel (with opportunity) and opportunity opportunity of the channel (with opportunity) and				cocalised and temporary loss of area of floodplain (approx. 0.02% of card area of watercounce). No direct physical impact on river channel or ripara area of watercounce). No direct physical impact on river channel or ripara life. No likely effects on disoched ougen. No measurable change in quarelement. Element is insensitive to impact.	Incollect and temporary excavation of area of Rodoplain (Assumed average excavation dept. 1-bill. m. assume an excavation dept. 1-bill. Publication (Assumed average as a result of devatering to the second temporary reduction in flow regime downstream as a result of devatering to the second temporary reduction in flow regime downstream as a result of devatering to the second temporary reducer efforts on discussed expension to the change in quality element when balanced against mitigation embedded in the scheme. Element is insensitive to impact	No direct physical impact on river channel or riparian zone leading to changes in river processes upstream and downstream. No likely effect articipates on dissolved origing concentrations. No measureable change in quality element. Element is insensitive to impact		Localized but permanent shading of culverted section of channel. Potential to leed in miner and localised impact on disushed. Local congent concentrations (des to reduced photosynthetic schrifty by agustiff frost). Localized adverse effects anticipant, but no change in qualify element when balanced against mitigation embedded in the scheme. Blement is insensible to impact.			ilised but permanent change to hydromorphological regime. wewere regligible effect antiopated on river processes and bevelowed region concentrations uptream and downstream. No measureable change in quality element. Blement is insensible to impact			Remoid of existing 20m culent. Localized but permanent reduction in shading of excision of ner channel. Potentials to beaut to localized improvement in disouled oxygen concentrations. (due to increased photocymhetic activity by aquatifiora), but no change in quality element. Element is interestive to impact	measureable change in quality element.		Removal of misting 250m cultent. Localized but permanent reduction in subarging of rection of river dearney. Protection is subarging of rection of river dearney. Protection less to localized improvement in disclored engages concentrations. (due to increased photosynethric activity by aquantic forsa), but no change in quality element. Blement is insensitive to impact		gime. and Element is insensitive to impact m. No Element is insensitive to impact	measureable change in quality element.	Watercourse is currently culverted below agricultural fields at this location. No effect anticipated on disculved organ upstream and downstream of culvert. No measurable change in quality element. Element is inscriptive to impact.	Element is insensitive to impact equation in que	the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on inver processes and dissolved origing upsterns and downstram of culvert. No measureable change in quality element. Element is insensitive to impact	years regift of earlisting river channel = 50m Total length of new realigned river channel = 150m Total length of earlisting open river channel = 120m Resultant net gain of open river channel = 120m Resultant net gain of open river channel length = 35m Berrow alt Shore Treat: Lorrer pill control - east of the River Treat vindust, between Pilps Lane) - minimum 60m from wastercourse None	Colverts The 20m not length of new highway and access road colverting on the 'Unnamed tributary of Bertley brook 2' watercourse will cause a localised adverse effect on disorded oxygen and water temperature. The 60m new highway calvert on the 'Unnamed tributary of Bertley Brook 2' will be located within a reach of watercourse that is currently calvert upon the 60m new highway calvert on the 'Unnamed tributary of Bertley Brook 2' will be located within a reach of watercourse that is currently calvert upon the following the second or the secon	termanent los of terminal de la combanda de la comb	to to the state of	N/a
# Phosphate Poor	Good by 2021 Element is insensitive	e to impact Element is insensitive to impact Element is insensitive to impact	Creation of 55m of new channel, with incorpo hydromorphological and riparian/marginal habitat in	sted rovements	Element is insensitive to impact	Localised and temporary excavation of area of floodplain (approx. 0.474) catchment area of watercourse). Localised and temporary reduction	Localised and temporary excausion of area of floodplain (Assumed average exacution depth: 10.1m, maximum excaution depth: 10.1m, maximum excaution depth: 10.1m, present and temporary reduction in low regime deventers are a result of devastering and activities. Protential localised and temporary advence effects on phosphate concentrations, but no change locality deman when balanced against mitigation embedded in the scheme.			Element is insensitive to impact				Creation of 150m of new realigned channel, with incorporated riporate/impairal habitat improvements fresulting is 30m net gain of open river channel. Pletetalls location reclutions in 160m net gain of open river channel. Pletetalls location reclutions in fine sediment inputs and surient loading. Nowever negligible effect anticipated on phosphate concentrations. No measurable change in quality element.					Element is insensitive to impact				Element is insensible to impact	Element is insensitive to impact			Total water body catchment area =37km² Total water body catchment area =37km²	permanent: reduction in shading. This will have a minor, localised beneficial effect on dissolved oxygen and water temperature. **Description & Realignments** The creation of Shon of here diverted channel on the 'Unnamed tributary of liver Trent 1' watercourse (resulting in a Sm net gain of river channel), hydromorphological and rigarian/insegrabal improvements, will cause a localized but permanent improvements in hydromorphological rigarian and many shadout. This will have a neighble effect or oficiously oxygen water temperature, and ammonia and phospholate reconstruction of dyon of open river oxygenated hydromorphological and rigarian/insegrabal improvements, will cause a localized but permanent improvement in hydromorphological marginal/inparian habitat. This will have a negligible effect on dissolved oxygen, water temperature, and ammonia and phosphate concentrations. **Sorrow all**	th incorporated ginal/riparian Localised adverse effect anticipated when sch component effects considered in combination change in quality element when balanced as an	cheme on No gainst None required	No.
Ammonia Good	Good by 2015 Element is insensitive	e to impact Element is insensitive to impact Element is insensitive to impact	Creation of 55m of new channel, with incorpe hydromorphological and ripartan/marginal habitat in (resulting in 5m net gain of river channel). Potential reduction: in fine sediment puts and markine balant negligible effect articipated on ammonia concent measureable change in quality element	ited coverments localised Element is insensitive to impact flower flores. No	Element is insensitive to impact	Localised and temporary encaution of area of Roodplain japprox. 0.02 each ment are all watercovers). Localized and temporary reduction against a company of the state of the state of the state of the state of organic and songeric feelings relieve renigible effect anticipated amounts concentrations. No measureable change in quality elements.	Locilised and temporary execution of area of floodplain (Assumed average execution depth: 10.1m; maximum executation depth: 10.1m; maximum executation depth: 10.1m; Potential for minor and temporary reduction in flow regime downstream as a result of devalenting activities. Potential localised but responsy adverse effects on amonities activities. Potential localised but responsy adverse effects on amonities and the subsected applies military of the subsect of applies and the subsect of applies and the subsect of applies and the subsect of a subse	Element is insensitive to impact	Element is insensitive to impact	Element is insensible to impact	Element is insensible to impact	Element is insensitive to impact	Element is insensitive to impact	Creation of 150m of new realigned channel, with incorporated riparian/marginal habitat reprovements (resulting in 150m net gain of open niver channel). Potential localised reductions in fine sediment impost an invitre to loading. Never negligible effect articipated on ammonia concentrations. No measureable change in quality element.	Element is insensible to impact	Element is insensitive to impact	Element is insensible to impact	Element is insensitive to impact	Element is inservative to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	ione. Water bodies upstream affected y Proposed Schmen but no widespread advance imparts identified with the obtential to propagate downstream and affect water body (e., erstrictive structures significantly affecting flow regime or sediment transfer)	The exacustion of the borrow git to the north-east of the liver. Trent vidual (between the liver. Trent and Figo Lane) will comprise only 0.02% of it catchment area (within the water-book seeter, file berown put will be located approximately file from the water-ourse (it the nearest point) and assumed severage depth of 10.1m and a maximum depth of 156m. This may result in slight changes in volume of river flow within the River Trent (du settivities during the construction phase). This may have a minor, localised adverse effect on dissolved oxygen, ammonia and phosphate concentration of the result	Now Trent counted to an of ewastering to confine a confine and the component effects anticipated when soft component effects considered in combination change in quality enterwish who bilaster algar participation embedded in the scheme.	ine No and	N/a
Temperature High	Some minor, localised and periodic Good by 2015 However, negligible effect on water te measureable change in q	c shading of river channel. Element is insensitive to impact Element is insensitive to impact Element is insensitive to impact	Element is insensitive to impact	Some minor, localised and periodic thading of river of However, negligible effect on water temperature anticip measureable change in quality element.	channel. Some minor, localized and periodic shading of river channel. However, negligible effect on water temperature anticipated. No measureable change in quality element.	il. No Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Let Element is insensitive to impact to impact in	Localized but permanent shading of culverted section of channel. Petertella to lead to minor and localized impact on water temperature. Localized adverse effects articipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Removal of existing 20m culvert. Localised but permanent reduction in shading of section of river channel. Potential to lead to localised improvement in water temperature, but no change is quality element.	nd Element is insensitive to impact	Element is insensitive to impact	Removal of existing 250m culvert. Localised but permanent reduction in shading of section of river channel. Potential to lead to localised improvement in water temperature, but no change quality dement.	d Element is insensitive to impact	Element is insensitive to impact	Watercoune is currently culverted below agricultural fields at this location. No effect anticipated on water temperature. No measureable change in quality element.	Element is insensitive to impact	Local	lised but permanent shading of cuherted section of channel. Potential to lead to minor and localised impact on water programmer to the control of the cont	Element is insensitive to impact			Localised adverse effect anticipated when schoonponent effects considered in combination change in quality element when balanced against page to the school of the school of the school.	ens No.	N/a
tants	N/A - Specific pollutants effects scree component	ened out for scheme design N/A - Specific pollutants: effects screened out for scheme to	design component	N/A - Specific pollutants effects screened out for schem component	me design N/A - Specific pollutants effects screened out for scheme des component	ign Element is insensitive to impact	Localized and temporary encuestion of area of floodplain (Assumed average exacution depth; 10-lb, maximum encuestion depth; 10-lb, Potential for minor is and temporary reduction in low regine downstream as a result of dewastering activities. Potential localized but temporary adverse effects on specific pollution concentrations, but no change is quality determent when blanced against concentrations, but no change is quality determent when blanced against mitigation embedded in the scheme.	No direct physical impact on river channel or riparten zone leading to changes in river processes upstream and downstream. No likely effects anticipated on specific pollutant concentrations. No measureable change in quality element.	NA-S	- Specific pollutants effects screened out for scheme design component		N/A - Specific	tlic pollutants effects screened out for scheme design componen	nd.	N/A-	- Specific pollutants effects screened out for scheme design compa	opponent		N/A - Specific pollutants effects screened out for scheme design comp	conent	NA	- Specific pollutants effects screened out for scheme design comp	ment	N/A - Speci	offic pollutants effects screened out for scheme design component	set.	None	Secretary 25 the execution of the borrow pit to the north-east of the River Trent viadout (between the River Trent and Pips Lane) will comprise only 0.02% of transferred area justified the water body extend, The borrow pit will be located approximately 60m from the watercounse (at the reasers point) and continent area justified to the secretary pit will be located approximately 60m from the watercounse (at the reasers point) and activities during the construction phase). This may have a minor, localised adverse effect on specific pollutant concentrations.	River Trent cavated to an odewatering Localised adverse effect anticipated when sch component effects considered in combination change in quality demonst when balanced aga change in quality demonst when balanced aga change in quality demonster when balanced again militarion embedded in the scheme.	No. None required	None required N/o Compliant - no chan pollutant status of
Quantity and dynamics of water flow		Creation of 55m of new channel, with incorporated hydromorphological improvements (resulting as 5 m one gain of inver channel). Localized operations in flow dynamics, but no change in quality element. Linear in quality element.	ogical regime. occases and Element is insensitive to impact set.			Localised and temporary excausion of area of floodplain (approx. 0.02 catchesed area of watercounts). No direct physical impact on mer channel labely effects unsignated on quantity and objeanists of water flows. No measureable change in quality element.	Localised and temporary excavation of area of floodphini (Assumed average excavation depth: 10.1bx, maximum excavation depth: 16.1b.) Puteritial for minor in the state interpretation as a result of desirating to a temporary reduction in flow regime downstream as a result of desirating to activities, Potential adverse effects on the quantity and impract of state flow. There is a risk that a change of the quantity and impract of state flow. Milgation.	No direct physical impact on river channel or riparian zone leading to changes in river processes upstream and downstream. No likely effects anticipated on quantity and dispunse of flow. No measureable change in quality element.	Localised but premanent changes to hydromosphology regime. Localised suberne effects on flow dynamics (including potential costland increases in flow wiscos) unstopants, but an change in guality element when balanced against mitigation embedded in the scheme.	Dement is insensitive to impact quart	lised but permanent changes to hydromorphology regime. Creation of hydromorphology regime. hydromorphology regime. hydromorphology regime. hydromorphology regime. open neer change in quality element.	of 150m of new realigned channel, with incorporated ophological improvements (resulting is 30m net gain of Movement, Inculating is 30m net gain of Movement, Inculating Inculting Interpresented in 50m dynamic, but no change in quality element.	filled but permanent change to hydromorphological regime. wever regisples effect anticipated on other processes and substitution of the processes and morphism and openion of the overpress and openion of morphisms and processes. The overpress and openion of morphisms are also also also also also also also also	Element is insensitive to impact	Removal of existing 20m culvert. Localised improvement in flow dynamics, but so change in quality element.	Element is insensitive to impact	Localised but permanent improvement to hydromorphology regime. Neweer negligible effect articipated on inter process and flow dynamic cuprates and dynamical. No measurest change in quality element.	Removal of existing 250m culvert. Localised improvement in to dynamics, but no change in quality element.	Dement is insensitive to impact	Localised but permanent improvement to hydromorphologic region. However negligible effect anticipated on their pock and flow dynamic systems and dominant. No measure change in quality element.	Watercourse is currently culverind below agricultural fields at this location. New culvert to comprise larger dimensions, design of cosses solvent to minimise impact on flow and sediment continuity and to execute the continuity and the continuity a	Element is insensitive to impact	Watercourse is currently culverted below agricultural fields at this location. New culvert to comprise larger dimensions, design of culvert to minimise pages of minimises. As the culture to minimise pages of the culture to provide a second control pages of the culture to page the culture to the culture to page the culture to the culture to page	called but permanent changes to hydromorphology regime, called adverse effects on flow dynamics (sockading potential aloned increases in flow velocity) anticipated, but no change in alloy element when balanced against mitigation embedded in the scheme.	Dement is insensitive to impact	Localized but permanent changes to hydromorphology regime. However negligible effect settlegated on her processes and quantity and dynamics of five upsterns and downstream. No measureable change in quality element.	ione. Water bodies upstream affected proposed fixmer but no undergread adorse impacts identified with the observal impacts identified with the observal impacts identified with the observal impacts of the affect water body (e.g. restrictive structures significantly affecting flow regime or sediment transfer)	Leavests The 20th resign of more highway and access road cuberting on the 'Unnamed tributary of Bentiky brook 2' watercourse will cause a localised but the control professional	for 250m (which permanent uity, river depth Adverse effect anticipated when scheme compe effects considered in combination. When bala against mitigation embedded in the scheme, it remains a risk that there could be change in the st the quality element. Requires additional mitig	led led was size, of gitter,	Localised abertus effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme and editional mitigation measures.
Connection to groundwater bodies		Creation of 55m of new channed, with incorporated hydromorphological improvements (resulting in 5m not gain of river channel). Localized improvements in connection to shallow groundwaret within superficial disposits. However, no lake yelflect anticipated on connection to groundware busines. No measureable change in quality element.	Element is insensitive to impact			Element is insensitive to impact	Localised and temporary excussion of area of floodplain (Assumed average excussion depth: 10-lb; maximum excursion depth: 16-lb; Potential for minor and temporary reduction in correction to groundwater bodies as a result of diseasement patients; Potential deview effects on the concection to groundwater bodies. There is a risk that a change in status could occur. Requires additional magnition.	Le Element is insensitive to impact eff	Localised but permanent loss of connection to surrounding sulfave groundwater within superficial deposits. Powerer on likely effect sariospade on connection to groundwater bodies. No measureable change in quality element.	Element is insensitive to impact	Element is insensitive to impact	Element is insensible to impact	Element is insensitive to impact	Element is insensitive to impact	Removal of existing 20m culvent. Localised but permanent re- connection to surrounding shallow groundwater within superficial deposits. However milky effect antiquition of connection to groundwater bodies. No measureable change in quality element.	Element is insensitive to impact	Element is insensitive to impact	Removal of existing 250m culvers. Localised but permanent connection to surrounding shallow groundwater within superfit ofposits. Neveron to hely effect another subcondensor groundwater bodies. No measureable change in quality elements to be a superfit or the superfit of the superfit o	cital Element is insensitive to impact out	Element is insensitive to impact	Watercourse is currently culverted below agricultural fields at this location. No effect anticipated on groundwater connectivity. No measureable change in quality element.	Element is insensitive to impact	Element is insensitive to impact	Localized but permanent loss of connection to surrounding one groundwart within superficial deposits. Never on libry first autorization connection to groundwarte bodies. No measureable change in quality element.	Element is insensitive to impact	Element is insensitive to impact	None	and the structure and substrate of the river bed. Obversions & Realignments The creation of 55 in of new diverted channel on the "Unnamed tributary of River Trent 1" watercourse (resulting in a 5m net gain of river channel) localized but permanent improvement in hydromorphological regime and marginal/prisaria habitat. This will have a localized beneficial effect on fill structure of the registran localized. This will have a localized beneficial effect on the structure of the registran localized channel on the "Unnamed tributary of Benefity Brook 2" watercourse (resulting in a ret gain of 30m of open river localized but permanent improvement in hydromorphological regime and marginal/riparian habitat. This will have a localized beneficial effect on fill structure of the registran zone.	Adverse effect anticipated when scheme compo il provide a effects considered in combination. When balar dynamics and against mitigation embedded in the scheme, the	eet and a see a se	Localized adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme and additional mitigation measures.
River continuity	Supports good by 2015 N/A - Hydromorphology effects screen component	Element is insensitive to impact Element is insensitive to impact and out for scheme design tt	Element is insensitive to impact		me design N/A - Hydromorphology effects screened out for scheme design component	Localised and temporary excavation of area of floodplain japprox. 0.02 catchinent area of watercourse). No direct physical impact on river cham- riparian zone. No likely effect articipated on river continuity. No measur	s of ed or Element is insensitive to impact cable	Element is insensitive to impact documents	Localized but permanent changes to hydromorphology regime. Localized advene effects on nier continuity anticipated, but no change in quality element when balanced against militartion embedded in the scheme.	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Removal of existing 20m culvert. Localised improvement in flow continuity, but n a change in quality element.	Element is insensitive to impact	Element is insensitive to impact	Removal of existing 250m culvert. Localised improvement in fi continuity, but no change in quality element.	Ow Element is insensitive to impact	Element is insensitive to impact	Watercome is currently colvented below agricultural fields at this location. New cubert to comprise larger dimension and design of cubert to minimize impact on flow and studenter controll, Localized improvement in flow continuity, but no change in quality element.	Element is insensitive to impact	Element is insensitive to impact	called but permanent changes to hydromorphology regime. called adverse effects on river continuity anticipated, but no hange in quality dement when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Element is insensitive to impact		Section 19 in ord file borrow git to the north-east of the New Texts studies between the New Texts and Fig. lately will comprise only 0.03% of the exact areas a visit when the exist and expending the heavy and will be located approximately file from the watercomes give the news appoint and assumed severage depth of 3.0% and a maximum depth of 1.6%. This may result in slight changes in volume of river flow within the New Texts (dustributes during the contribution phase). This may have an advance effect on flow dynamics, groundwater connection, river width and depth variational deflect on the structure and substrate of the river bed.	River Trent contact to an Localised improvement anticipated when schow of wwatering component effects considered in combination, brange in quality element.	designed in detail following ground investigation and monitoring of surface water and groundwater levels and in consultation with the Environment Agency. Mitigation could take the form of:	N/a Compiliant - nc None required hydromorpholo
St. Programme of the state of t		Creation of 55m of new channel, with incorporated bydomorphological improvements (resulting in 5m net gain of river channel). However regigible effect anticipated on river groups and width upstream and downstream. No depth and width upstream and downstream. No change in quality element.	logical regime. esses and river Element is insensitive to impact measureable			Localised and temporary escavation of area of floodplain (pageros, 0.02 catchment area of watercourse). No direct physical impact on niver channilisally effect on niver depth and width variation. No measureable chan quality dement.	to of Lecalised and temporary excussion of area of floodplain (Assumed average excussion depth. 15 Jac., maximum excuration depth. 15 Jac., Privated for one of the letter	No direct physical impact on river channel or ripartan zone leading Location to changes in river processes upstream and downstream. No likely Lecular offices anticipated on river depth and variation. No measureable of Change in quality element.	Localised but permanent changes to hydromorphology regime. collede adverse effects on new depth and width articipants, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact depth	tised but permanent changes to hydromorphology regime. Creation of the processes and river processes and river and variation spotters and downstream. No measureable change in quality element.	n of 150m of new realigned channel, with incorporated phological improvements (resulting is 30m net gain of However channel), however legislighte effect anticipated on mer and width. No measureable change in quality element.	lised but permanent change to hydromorphological regime. her regigligible effect anticipated on mer processes and mer than dwidth upstream and downstream. No measureable change in quality element.	Element is insensible to impact	Removal of existing 20m culvert. Localised improvement in river width and dopth, but no change in quality element .	Element is insensitive to impact	Localised but permanent improvement to hydromorphology regime. However negligible effect articipated on inter process and rive width and depth upstream and downstream. No measureable change in quality element.	Removal of existing 250m culvert. Localised improvement in width and depth, but no change in quality element.	over Element is insensitive to impact	Localised but permanent improvement to hydromorpholog regime. However negligible effect anticipated on niver process and river width and depth upstream of downstream. No measureable change in quality element.	Watercourse is correctly culverted below agricultural fields at this leastion. New culvert to comprise larger dimensions and forage of leastion. New culvert to comprise larger dimensions and forage of leasting. No	Element is insensitive to impact	Watercourse is currently colverted below agricultural fields at this location. New colvert to comprise larger dimensions and design of colvert to entire impact on flow and designed continuous control of the colvert to resimine impact on flow and designed control of the colvert region. However, regigible effect anticipated on fiver processes and fiver depth upstream and downtream. No measureable change in quality element.	called but permanent changes to hydromorphology regime. Next adverse effects on new depth and width anticipants, but change in quality demonst when balanced against militarition embedded in the scheme.	Element is insensitive to impact d	Localized but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and river depth and variation operarea and downstream. No measureable change in quality element.	icon. Maker holds: upstraam affected y Proposed Scheme but no widespread adverse impacts identified with the contentiat to propagate downstream and		Adverse effect anticipated when scheme competer effects considered in combination. When balance against mitigation embedded in the scheme, it remains a risk that there could be change in the the quality element. Requires additional mitigation of the country of	a a wider buffer strip, or shallower butter on the executions of installation of a groundwater cut off; installation of a groundwater cut off; and the shallower butter of a state of a contract working stephenous that would seate the shallower butter of a contract of a	Localized alverse effect anticipated when scheme componer of this considerable in collection and componer of the componer of the collection of the collectio
Structure and substrate of the river bed		Creation of 55m of new channel, with incorporated hydromorphological improvements (resulting a 5m net gain of twer channel). However oranged in the channel is the channel of the channel	ogical regime. sesses structure Element is insensitive to impact nt.			Localised and temporary excivation of area of floodplain (paperox, 0.02 catchiment area of watercourse). No direct physical impact on niver channilisely effects anticipated on structure and substrate of niver bed. No measureable change in quality element.	Localised and temporary excursion of area of floodplain (Assumed average excursion depth: 10-lb, maximum excursion depth: 10-lb, Potential for misor is also and temporary reduction in flow regime downstrane as a result of dewatering to a characteristic potential localized but temporary adverse effects on inter substrate (date to a potential localized but temporary adverse effects on inter substrate (date to a potential localized but temporary adverse effects on inter substrate (date to a potential localized but temporary adverse effects on inter substrate), but no charge in equility element when between the contraction of the contra	No direct physical impact on river channel or riparian zone leading. Lot to changes in river processes upstream and downstream. No likely lecal effects anticipated on structure and substrate of river bed. No measureable change in quality element.	Localized but permanent changes to hydromorphology regime. Included adverse effects on structure of riner bed anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact struct	lised but permanent changes to hydromorphology regime. Creation of hydromorphology regime. Live and substrate of ner bed upstream and downstream. No measureable change in quality element.	of 150m of new realigned channel, with incorporated photological improvements (resulting in 10m net gain of however engigible effect anticipated on and substrate change in quality element.	liked but permanent change to hydromorphological regime. ver negligible effect anticipated on river processes structure and substrate of river bed upstream and downstream. No measureable change in quality element.	Element is insensitive to impact	Removal of existing 20m culvert. Localised improvement in structure and substrate of their bod, but no change in quality element.	Element is insensitive to impact	Localized but permanent improvement to hydromorphology regime. However negligible effect anticipated on river process and structure and substrate of river downstream. No measurea change in quality element.	Removal of existing 250m culvert. Localised improvement is structure and substrate of river bod, but no change in qualificances.	Element is insensitive to impact	Localised but permanent improvement to hydromorpholog regime. However negligible effect anticipated on niver proce and structure and substated finer downstream. No measur change in quality element.	logy Watercourse is currently culverted below agricultural fields at this boston. Invert of new culvert to be buried below river bed to allow for build up of natural substrate. Localized improvement in substrate, but no change in quality element.	Element is insensitive to impact	Watercourse is currently colverted below agricultural fields at this location. Invert of new cultert to be bursed below where bed to allow for build up of husball open from build open from build open from the formation allowant consider but perminent to improvement to hydromorphology regime. However negligible effect articitycated on river processes and buildrafe upstream and downstream. No measureable change in quality element.	called but permanent changes to hydromorphology regime. Blood adverse effects on structure of river bed anticipated, but change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and structure and substrate of river bed upstream and downstream. No measureable change in quality element.	affect water body (e.g. restrictive structures significantly affecting flow regime or sediment transfer)		Localised adverse effect anticipated when sch component effects considered in combination change in quality element when balanced age mitigation embedded in the scheme.	gainst	N/a
Structure of the riparian zone		Creation of Sim of new channel, with incorporated oparais/marginal habitat improvements (resulting in Sim net gain of river channel), Localized improvement in structure of rigarian zone, but no change in quality element.	Creation of 55m of new channel, with incorporagration/marginal habitat improvements (resulting in of river channel). Localised improvement in structure zone, but no change in quality element.	rted om net gain of ripartan		Localised and temporary excavation of area of floodplain (apprax. 0.02 catchment area of watercourse). No direct physical impact on riparian zoo. likely effects anticipated on structure of riparian zone. No measureable in quality element.	N of P. R. No Element is insensitive to impact to impact	Element is insensitive to impact effect qual	Localised but permanent loss of ripartan zone. Localised adverse ffects on structure of ripartan zone anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Creation of rigata implement is insensitive to impact channel). Loc	to of 150m of new realigned channet, with incorporated improvements (resulting in 30m net gain of open river localized improvement in structure of ripartan zone, but no change in quality element.	Element is insensitive to impact	Creation of 150m of new realigned channel, with incorporated rigartan improvements (resulting in 30m net gain of open river channel). Localised improvement, but no change in quality element.	Removal of existing 20m culvert. Localised improvement in structure of riparlan zone, but no change in qualify element.	Removal of existing 10m culvert. Localised but permanent reduction in shading of section of river channel. Localised improvement in riparian zone, but no change in quality element.	et. Element is insensitive to impact	Removal of existing 250m culvert. Localised improvement is structure of riparian zone, but no change in quality elemen	Removal of existing 250m culvert. Localized but permanent reduction in shading of section of river channel. Localized improvement in riparties zone, but no change in quality idensed	Element is insensitive to impact	Watercourse is currently culverted below agricultural fields at this location. No effect anticipated on structure of payman zone. No measureable change in quality element.	Element is insensitive to impact	Element is insensitive to impact of	called but permanent loss of riparien zone. Localised adverse cts on structure of riparien zone anticipated, but ne change in aftry element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Element is insensitive to impact			Localised improvement anticipated when sch component effects considered in combination, t change in quality element.		Nia

Table 51: Moreton Brook from Source to River Trent (GB: Surface water body: Moreton Brook from So	8104028047380) detailed impact assessment - effects on Gource to River Trent	urrent status							De	ailed Impact Assessment										Detailed Impact Assessment Res	lts			
Water body ID: GB104028047380 Hydromorphological designation: Not A/HMWB	Watercour Scheme compone	e: tt:	WFD-MRB-T-01-01			WFD-MRB-T-01-02	Unnamed tributary	of Moreton Brook 1	WFD-MRB-T-01-03			WFD-MRB-T-01-04		WFD-MRB-W-01-01	Moret	on Brook WFD-MRB-W-01-02						Addistructure to the second		
Overall Status: Moderate	Description of scheme compone	t: Stockwell Hea	Culvert th Culvert; Approx. culvert length: 69m; Approx. culvert dimer	ensions: 3.7m x 1.35m	Approx. total length of new	Realignment w realigned channel: 320m; Approx. total length of existing cha	annel: 300m; Total net gain: 20m		Highway realignment culvert Approx. culvert length: 10m; Approx. culvert diameter: 0.	Dm		Access road culvert Approx. culvert length: 10m; Approx. culvert diameter: 0	0.9m	Viaduct Moreton Brook Viaduct; Approx. viaduct width: 15m; Approx. viaduct length: 195m; Approx. viaduct height: 9n	Approx. total length of new u	Realignment realigned channel: 150m; Approx. total length of existing chann	ll: 135m; Total net gain: 15m			Overall effects on element		Additional mitigation	requirements	
Status Objective: Good by 2021	Summary of embedded mitigation	maintain natural substrate. Culvert sized to minimis	impact on flow continuity. Detailed design to be developed	xisting bed level to reduce disruption to sediment transfer and I in general accordance with CIRIA and Environment Agency	incorporation of appropriate features equivalent to those	se lost along the existing channel footprint. Where natural wat	tercourse, the design will aim to enhance hydromorphological	maintain natural substrate. Culvert sized to minimise im	pact on flow continuity. Detailed design to be developed	n general accordance with CIRIA and Environment Agency	maintain natural substrate. Culvert sized to minimise in	mpact on flow continuity. Detailed design to be developed	d in general accordance with CIRIA and Environment Agency	d Clear span viaduct. Viaducts designed to cross	The length of watercourse realignments has been reduced as far as r features equivalent to those lost along the existing channel footprint. V	Where natural watercourse, the design will aim to enhance hydr	re the equivalent hydraulic capacity and incorporation of appropriate omorphological condition over the existing condition where reasonably	Cumulative effects - effects on element from scheme component(s	,				Residual effect on e	WFD compliance outcome - element potential for deterioration
Status Objective: Good by 2021	Summary of embedded mitigate	guidance and to ensure appropriate low flow water of	epths and velocities for fish passage. Hydromorphological im tream and downstream of the culvert to compensate for foot	nprovements to be undertaken to river channel immediately stprint loss.		ly practicable (provided this is compatible with the watercour vill allow for a 10m wide buffer zone for the implementation of			hs and velocities for fish passage. Hydromorphological im, am and downstream of the culvert to compensate for fool			ths and velocities for fish passage. Hydromorphological in eam and downstream of the culvert to compensate for foc		shading impact.	practicable (provided this is compatible with the watercourses'	flood risk and land drainage functions). In addition, the design of implementation of marginal/riparian improvements.	f the new channel will allow for a 10m wide buffer zone for the	located in other WFD water bodies	Summary of scheme components proposed of watercourses within water body catchmen	on Summary of effects on elements	Overall effect on element	ruction	ration	of current status
WFD Classification Elements	Current Status Objective	Footprint	Shading	Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream		Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream	Creation of new habitats	Footprint	Shading	Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream	Footprint	Shading	Changes to water body hydromorphology leading to changes in river processes and habitats upstream an downstream		Footprint	Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream	Creation of new habitats		with the potential to effect element status			Const	o	
				Communication									- Compacture			- Compaction			Viaducts Moreton Brook	Viaducts The viaduct will cause some minor, localised and periodic shading of river channel. This will have a negligible effect of the viaduct will cause some minor, localised and periodic shading of river channel. This will have a negligible effect of the viaduct will cause some minor, localised and periodic shading of river channel. This will have a negligible effect of the viaduct will cause some minor, localised and periodic shading of river channel. This will have a negligible effect of the viaduct will cause some minor, localised and periodic shading of river channel. This will have a negligible effect of the viaduct will cause some minor, localised and periodic shading of river channel. This will have a negligible effect of the viaduct will cause some minor, localised and periodic shading of river channels.				
		Localised but permanent loss of open river habitat.	Localised but permanent shading of section of river channel. Localised adverse effect on macrophytes and				Creation of 320m of new realigned channel, with		Localised but permanent shading of section of river channel. Localised adverse effect on macrophytes and	Localised but permanent changes to hydromorphology		Localised but permanent shading of section of river channel. Localised adverse effect on macrophytes and	Localised but permanent changes to hydromorpholog	Some minor, localised and periodic shading of river	Creation of 150m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements (resulting in 15m net gain of river channel). However, localised loss of		Creation of 150m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements		- viaduct (WFD-MR8-W-01-01) Culverts	macrophytes and phytobenthos, macroinvertebrates and fish. Culverts	Localised adverse effect anticipated when scheme			
Macrophytes and Phyto combined	tobenthos - Good Good by 2015	Localised adverse effects on macrophytes and phytobenthos anticipated, but no change in quality element when balanced against mitigation embedded the change.	phytohenthos anticinated (due to a reduction in	processes and macrophytes and phytobenthos habitat upstream and downstream of culvert. No measureable	habitat improvements (resulting in 20m net gain of river channel). Localised improvement in macrophytes and	processes and macrophytes and phytobenthos habitat upstream and downstream. No measureable change in	incorporated hydromorphological and riparian/marginal habitat improvements (resulting in 20m net gain of river channel). Localised improvement in macrophytes and phytobenthos habitat, but no change in quality element.	phytobenthos anticipated, but no change in quality element when balanced against mitigation embedded in	phytobenthos anticipated (due to a reduction in photosynthetic activity), but no change in quality eleme when balanced against mitigation embedded in the	regime. However negligible effect anticipated on river processes and macrophytes and phytobenthos habitat upstream and downstream of culvert. No measureable	phytobenthos anticipated, but no change in quality element when balanced against mitigation embedded in	phytobenthos anticipated (due to a reduction in photosynthetic activity), but no change in quality elem-	regime. However negligible effect anticipated on rive processes and macrophytes and phytobenthos habita upstream and downstream of culvert. No measureable	channel. However negligible effect on macrophytes and	existing section of main river observed to comprise good aquatic habit: conditions and well-established marginal/riparian vegetation. Localise- but temporary adverse effect on macrophytes and phytobenthos anticipated (until community recovers / recolonizes new channel), but	processes and macrophytes and phytobenthos habitat upstream and downstream. No measureable change in	(resulting in 15m net gain of river channel). However negligible effect anticipated on macrophytes and phytobenthos habitat due to existing section of main river already comprising good aquatic habitat and well-patch blitch of macrinal fragricus postation. No macrophytic habits in the control of the contr		Unnamed tributary of Moreton Brook 1: - culvert (WFD-MRB-T-01-01) - 69m - highway realishment culvert (WFD-MRB-T-01-03) - 10m	The 89m net length of new culverting on the 'Unnamed tributary of Moreton Brook 1' watercourse will cause a localised but permanent loss of existing river habitat and shading. This will have a minor, localised adverse effect on macrophytes and phytobenthos, macroinvertebrates and fish.	component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.	t	N/a	
		the scheme.	scheme.	change in quality element.	phytobenthos habitat, but no change in quality element	nt. quality element.	phytobentrios nabitat, but no change in quality element.	tne scneme.	scheme.	change in quality element.	the scheme.	scheme.	change in quality element.		no change in quality element when balanced against mitigation embedded in the scheme.	quality element.	established marginal/riparian vegetation. No measureable change in quality element.		- access road culvert (WFD-MRB-T-01-04) - 10m Total length of new culverted river channel = 89m Resultant net loss of open river channel = 89m	The 69m culvert on the 'Unnamed tributary of Morton Brook 1' watercourse also has the potential to inhibit fish passage and spawning migration. However, the watercourse has been scoped out by the ecological baseline assessment due to poor habitat potential for fish and baseline field surveys have identified limited potential fish habitat present upstream of the proposed culvert location. This culvert will therefore have only a minor, localised				
															Creation of 150m of new realigned channel, with incorporated				Realignments Unnamed tributary of Moreton Brook 1:	adverse effect on fish. Realignments		_		
ST BE	Cood Cood by 2015		Localised but permanent shading of section of river channel. Localised adverse effects on macroinvertebrate anticipated (including due to a reduction in/loss of riparia	regime. However negligible effect anticipated on river	Creation of 320m of new realigned channel, with incorporated hydromorphological and riparian/marginal	al regime However negligible effect anticipated on river	Creation of 320m of new realigned channel, with incorporated hydromorphological and riparian/marginal		Localised but permanent shading of section of river channel. Localised adverse effects on macroinvertebrate anticipated (including due to a reduction in/loss of riparia	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river	Localised but permanent loss of open river habitat. Localised adverse effects on macroinvertebrates	Localised but permanent shading of section of river channel. Localised adverse effects on macroinvertebral anticipated (including due to a reduction in/loss of ripar		Some minor, localised and periodic shading of river		Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river	Creation of 150m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements (resulting in 15m net gain of river channel). However negligible effect		- realignment (WFD-MRB-T-01-02) - 20m gain Moreton Brook: - realignment (WFD-MRB-W-01-02) - 15m gain	The creation of 320m of new realigned channel on the 'Unnamed tributary of Moreton Brook 1' watercourse (result in a net gain of 20m of river channel), with incorporated hydromorphological and riparian/marginal improvements, will provide a localised but permanent improvement in river habitat. This will have a minor, localised beneficial effer on macrophytes and phytobenthos, macroinvertebrates and fish.	Localized adverse offect enticipated when scheme		Ma	
Macroinvertebrates	Good Good by 2015		and aquatic vegetation), but no change in quality eleme . when balanced against mitigation embedded in the scheme.		habitat improvements (resulting in 20m net gain of river channel). Localised improvement in macroinvertebrate habitat, but no change in quality element.		habitat improvements (resulting in 20m net gain of river channel). Localised improvement in macroinvertebrate habitat, but no change in quality element.		and aquatic vegetation), but no change in quality eleme when balanced against mitigation embedded in the scheme.	processes and macroinvertebrate habitat upstream and downstream of culvert. No measureable change in qualit element.		and aquatic vegetation), but no change in quality elem when balanced against mitigation embedded in the scheme.	nent downstroom of culturet. No more wealth about in such	channel. However negligible effect on macroinvertebrate anticipated. No measureable change in quality element		processes and macroinvertebrate habitat upstream and downstream. No measureable change in quality element.	anticipated on macroinvertebrate habitat due to existing section of main river already comprising good aquatic habitat and well- established marginal/riparian vegetation. No measureable change in quality element.		Total length of new realigned river channel = 470m Total length of lost existing river channel = 435m Resultant net gain of river channel length = 35m	The creation of 150m of new realigned channel on the Moreton Brook (resulting in a net gain of 15m of river channe will involve the loss of 135m of existing main river comprising good existing hydromorphological condition, benthic habitat and well-established marginal/riparian vegetation. This may therefore have a minor, localised but temporan		None required	N/a None required	Compliant - no change in biological status of water body
Biologic															scheme.			None. Water body downstream (Trent from Moreto Brook to River Tame) affected by Proposed Scheme b	on Dut	adverse effect on macrophytes and phytobenthos, macroinvertebrates and fish (until the new channel is recolonized				
																		no widespread adverse impacts identified with the potential to propagate upstream and affect water body (e.g. restrictive structures significantly affectin	e le					
		of culvert. However, baseline fish assessment and field	th Localised but permanent shading of culverted section of channel. Localised adverse effects on fish anticipated (including due to a reduction in/loss of riparian and	of Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river	Creation of 320m of new realigned channel, with incorporated hydromorphological and riparian/marginal	I localised but nermanent change to hydromorphological	Creation of 320m of new realigned channel, with incorporated hydromorphological and riparian/marginal	Localised but permanent loss of open river habitat.		Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river			of d Localised but permanent changes to hydromorpholog regime. However negligible effect anticipated on rive	Some minor, localised and periodic shading of river	existing section of main river observed to comprise good aquatic habit:	Localised but permanent change to hydromorphological	Creation of 150m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements (resulting in 15m net gain of river channel). However negligible effect	biological continuity)			Localised adverse effect anticipated when scheme component effects considered in combination. No			
Fish	-	spawning habitat potential upstream of culvert location	n. aquatic vegetation), but no change in quality element when balanced against mitigation embedded in the	processes and fish habitat upstream and downstream of	habitat improvements (resulting in 20m net gain of river channel).Localised improvement in fish habitat, but no change in quality element.	processes and fish habitat upstream and downstream. N	habitat improvements (resulting in 20m net gain of river channel).Localised improvement in fish habitat, but no change in quality element.	change in quality element when balanced against	aquatic vegetation), but no change in quality element	processes and fish habitat upstream and downstream of culvert. No measureable change in quality element.	change in quality element when balanced against	aquatic vegetation), but no change in quality elemen		of measureable change in quality element.	conditions and well-established marginal/riparian vegetation. Localises but temporary adverse effect on fish anticipated (until community recovers / recolonizes new channel), but no change in quality elemen	and macroinvertebrate habitat upstream and downstream. No measureable change in quality element.	comprising good aquatic habitat due to existing section of main river already comprising good aquatic habitat and well-established marginal/riparian vegetation No measureable change in quality element.	,			change in quality element when balanced against mitigation embedded in the scheme.	t	N/a	
		mitigation embedded in the scheme.													when balanced against mitigation embedded in the scheme.		•							
																		-		<u>Viaducts</u> The viaduct will cause some minor, localised and periodic shading of river channel. This will have a negligible effect				
			Localised but permanent shading of culverted section or channel. Potential to lead to minor and localised impact	of Con Localised but permanent changes to hydromorphology	Creation of 320m of new realigned channel, with	Localised but permanent change to hydromorphologica	l Creation of 320m of new realigned channel, with		Localised but permanent shading of culverted section o channel. Potential to lead to minor and localised impact of			Localised but permanent shading of culverted section channel. Potential to lead to minor and localised impact			Creation of 150m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements		Creation of 150m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements			dissolved oxygen and water temperature. Culverts	Localised adverse effect anticipated when scheme			
Dissolved oxygen	High Good by 2015	Element is insensitive to impact	dissolved oxygen concentrations (due to reduced photosynthetic activity by aquatic flora). Localised adver effects anticipated, but no change in quality element	regime. However negligible effect anticipated on river	habitat improvements. However negligible effect anticipated on dissolved oxygen concentrations. No	processes and dissolved oxygen concentrations upstream and downstream. No measureable change in quality	incorporated hydromorphological and riparian/marginal habitat improvements. However negligible effect anticipated on dissolved oxygen concentrations. No	Element is insensitive to impact	dissolved oxygen concentrations (due to reduced photosynthetic activity by aquatic flora). Localised adver effects anticipated, but no change in quality element	regime. However negligible effect anticipated on river	Element is insensitive to impact	dissolved oxygen concentrations (due to reduced photosynthetic activity by aquatic flora). Localised adve effects anticipated, but no change in quality element	regime. However negligible effect anticipated on rive	photosynthetic activity by aquatic flora). However,	(resulting in 15m net gain of river channel). However negligible effect anticipated on dissolved oxygen due to existing section of main river already comprising good hydromorphological condition and well- t. established marginal/riparian vegetation. No measureable change in	regime. However negligible effect anticipated on river	(resulting in 15m net gain of river channel). However negligible effect anticipated on dissolved oxygen due to existing section of main river already comprising good hydromorphological condition and well-			The 89m net length of new culverting on the 'Unnamed tributary of Moreton Brook 1' watercourse will cause a localised but permanent loss of existing river habitat and shading. This will have a localised adverse effect on dissolv oxygen and water temperature.	component effects considered in combination. No.	t	N/a	
			when balanced against mitigation embedded in the scheme.		measureable change in quality element.	element.	measureable change in quality element.		when balanced against mitigation embedded in the scheme.			when balanced against mitigation embedded in the scheme.	•	anticipated. No measureable change in quality element	t. established marginal/riparian vegetation. No measureable change in quality element.		established marginal/riparian vegetation. No measureable change in quality element.			Realignments The creation of 320m of realigned channel on the 'Unnamed tributary of Moreton Brook 1' watercourse (resulting in net gain of 20m of river channel) will provide a localised but permanent improvement in hydromorphological regiments.				
																			-	and marginal/riparian habitat. This will have a have a negligible effect on effect on dissolved oxygen, phosphate and ammonia concentrations. The creation of 150m of realigned channel on the Moreton Brook (resulting in a net gain of 15m of river channel) wi				
рН	High Good by 2015	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	None		have a negligible effect on dissolved oxygen, phosphate and ammonia concentrations (given that the watercourse already comprises good hydromorphological conditions and well-established marginal/riparian vegetation at this location).	Element is insensitive to impact		N/a	
22 <u> </u>																			_					
uity Eleme							Creation of 320m of new realigned channel, with incorporated hydromorphological and riparian/marginal										Creation of 150m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements (resulting in 15m net gain of river channel). However negligible effect				Negligible effect anticipated in when effects			
Phosphate	Moderate Good by 2021	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	habitat improvements. Potential localised reductions in fine sediment inputs and nutrient loading. However negligible effect anticipated on phosphate concentrations. No measureable change in quality element.	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact		anticipated on phosphate concentrations due to existing section of main river already comprising good hydromorphological condition and well-established riparian vegetation (buffer strips). No measureable				considered in combination. No measureable change in quality element	None required	None required N/a	Compliant - no change in physicochemical status of water body
Physicoch							No measureasse change in quanty element.										change in quality element.							
							Creation of 320m of new realigned channel, with										Creation of 150m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements	None. Water body downstream (Trent from Moreto						
Ammonia	High Good by 2015	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	incorporated hydromorphological and riparian/marginal habitat improvements. Potential localised reductions in fine sediment inputs and nutrient loading. However negligible effect anticipated on ammonia concentrations.	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	(resulting in 15m net gain of river channel). However negligible effect anticipated on ammonia concentrations due to existing section of main river already comprising good hydromorphological condition and well-	Brook to River Tame) affected by Proposed Scheme b no widespread adverse impacts identified with the potential to propagate upstream and affect water	out :		Negligible effect anticipated in when effects considered in combination. No measureable change in quality element		N/a	
							No measureable change in quality element.										established riparian vegetation (buffer strips). No measureable change in quality element.	e 5557						
			Localised but permanent shading of culverted section of	of.					Localised but permanent shading of culverted section o			Localised but permanent shading of culverted section	of .											
Temperature	High Good by 2015	Element is insensitive to impact	channel. Potential to lead to minor and localised impact water temperature. Localised adverse effects anticipate but no change in quality element when balanced again	on ed, Element is insensitive to impact nst	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	channel. Potential to lead to minor and localised impact water temperature. Localised adverse effects anticipate but no change in quality element when balanced again	d. Element is insensitive to impact	Element is insensitive to impact	channel. Potential to lead to minor and localised impact water temperature. Localised adverse effects anticipat but no change in quality element when balanced again	et on ted, Element is insensitive to impact	Some minor, localised and periodic shading of river channel. However, negligible effect on water temperatur anticipated. No measureable change in quality element	re Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact				Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against	e D t	N/a	
			mitigation embedded in the scheme.						mitigation embedded in the scheme.			mitigation embedded in the scheme.									mitigation embedded in the scheme.			
2 TED 1																								
Ammonia, Copper, Trick	iclosan, Zinc - Not assessed by 2015	N/A	- Specific pollutants effects screened out for scheme design o	component	N/A -	a - Specific pollutants effects screened out for scheme design o	component	N/A - S _F	pecific pollutants effects screened out for scheme design o	omponent	N/A - S _i	specific pollutants effects screened out for scheme design	n component	N/A - Specific pollutants effects screened out for scheme design component	e N/A -	Specific pollutants effects screened out for scheme design com	oonent	None						
\footstar \foots																			_	Culverts The 89m length of culverting on the 'Unnamed tributary of Moreton Brook 1' watercourse will cause a localised but				
Quantity and dynamics	rs of water flow	Localised but permanent changes to hydromorpholog regime. Localised adverse effects on flow dynamics		Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and quantity and dynamics of flow upstream	Creation of 320m of new realigned channel, with	regime. However negligible effect anticipated on river		Localised but permanent changes to hydromorphology regime. Localised adverse effects on flow dynamics (including potential localised increases in flow velocity)	Element is insensitive to impact		Localised but permanent changes to hydromorphology regime. Localised adverse effects on flow dynamics		Localised but permanent changes to hydromorpholog regime. However negligible effect anticipated on rive processes and quantity and dynamics of flow upstrear	ry r	Creation of 150m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements (resulting in 15m net gain of river channel). However negligible effect		Element is insensitive to impact	None. Water body downstream (Trent from Moreto Brook to River Tame) affected by Proposed Scheme b no widespread adverse impacts identified with the	on out	permanent change in hydromorphological regime. This will have a localised adverse effect on flow dynamics, river continuity, river width and depth variation, structure and substrate of the river bed, and the structure of the riparian zone.	component effects considered in combination. No		N/a	
Quantity and dynamics	s of water now	anticipated, but no change in quality element when balanced against mitigation embedded in the scheme		and downstream. No measureable change in quality element.	in 20m net gain of river channel). Localised improvement flow dynamics, but no change in quality element.	and downstream. No measureable change in quality	Element is insensitive to impact	anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.		and downstream. No measureable change in quality	anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.		and downstream. No measureable change in quality element		anticipated on flow dynamics due to existing section of main river already comprising good hydromorphological condition. No measureable change in quality element.	considered in conjunction with embedded mitigation. No	Liement is insensitive to impoct	potential to propagate upstream and affect water body		Realignments The creation of 320m of realigned channel on the 'Unnamed tributary of Morton Brook 1' watercourse (resulting in net gain of 20m of river channel) will provide a localised but permanent improvement in hydromorphological regiments.		t	11/2	
																			_	and marginal/riparian habitat. This will have a minor, localised beneficial effect on flow dynamics and structure of riparian zone. The creation of 150m of realigned channel on the Morton Brook (resulting in a net gain of 20m of river channel) will				
Connection to groundw	water bodies	Localised but permanent loss of connection to surround shallow groundwater within superficial deposits. However no likely effect anticipated on connection to groundwater.	er Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Localised but permanent loss of connection to surrounding shallow groundwater within superficial deposits. However no likely effect anticipated on connection to groundwater	Element is insensitive to impact	Element is insensitive to impact	Localised but permanent loss of connection to surrounding shallow groundwater within superficial deposits. However no likely effect anticipated on connection to groundwater	Flament is insensitive to impact	Element is insensitive to impact		Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	None		involve the loss of 135m of existing main river comprising good existing hydromorphological condition and well established marginal/riparian vegetation. This may therefore have a minor, localised but temporary adverse effect of the structure of the riparian zone (until vegetation fully establishes along the new realigned channel).	Negligible effect anticipated in when effects		N/a	
		bodies. No measureable change in quality element.						bodies. No measureable change in quality element.			bodies. No measureable change in quality element.										compe in quarry crement			
		Localised but permanent changes to hydromorpholog	,					Localised but permanent changes to hydromorphology			Localised but permanent changes to hydromorphology										Localised adverse effect anticipated when scheme	e e		
River continuity		regime. Localised adverse effects on river continuity anticipated, but no change in quality element when balanced against mitigation embedded in the scheme	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	regime. Localised adverse effects on river continuity anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Element is insensitive to impact	regime. Localised adverse effects on river continuity anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Element is insensitive to impact		Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact				component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.	t	N/a	
cal Quality	Supports good Supports good by 2015													N/A - Hydromorphology effects screened out for scheme design component	e			1				None required	None required	Compliant - no change in hydromorphological status of water
norphologi		Localised but permanent changes to hydromorpholog regime. Localised adverse effects on river depth and wic	tth Florest is issociative to impost	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river	Creation of 320m of new realigned channel, with incorporated hydromorphological improvements (resulting the company of the com		d Classack is lessorable to import	Localised but permanent changes to hydromorphology regime. Localised adverse effects on river depth and width	Flowest is investible to invest		Localised but permanent changes to hydromorphology regime. Localised adverse effects on river depth and width		Localised but permanent changes to hydromorpholog regime. However negligible effect anticipated on rive	design component	Creation of 150m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements (resulting in 15m net gain of river channel). However negligible effect	regime. However, negligible effect anticipated on river	Florent is investition to invest				Localised adverse effect anticipated when scheme component effects considered in combination. No	200	N/a	body
River depth and width	variation	anticipated, but no change in quality element when balanced against mitigation embedded in the scheme	Element is insensitive to impact	regime. However negligible effect anticipated on river processes and river depth and variation upstream and downstream. No measureable change in quality element.				anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	processes and river depth and variation upstream and	anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	processes and river depth and variation upstream and downstream. No measureable change in quality elements		anticipated on river depth and width due to existing section of main riv already comprising good hydromorphological condition. No measureable change in quality element.		Element is insensitive to impact	None. Water body downstream (Trent from Moreto	in.		change in quality element when balanced against mitigation embedded in the scheme.	t	N/d	
				Localised but permanent changes to hydromorphology	Creation of 320m of new realigned channel, with	Localised but permanent change to hydromorphological	1			Localised but permanent changes to hydromorphology			Localised but permanent changes to hydromorpholog	ly .	Creation of 150m of new realigned channel, with incorporated	Localised but permanent change to hydromorphological		Brook to River Tame) affected by Proposed Scheme b no widespread adverse impacts identified with the potential to propagate upstream and affect water						
Structure and substrate bed	te of the river	Localised but permanent changes to hydromorpholog regime. Localised adverse effects on structure of river b anticipated, but no change in quality element when balanced against mitigation embedded in the scheme	Element is insensitive to impact	regime. However negligible effect anticipated on river processes and structure and substrate of river bed upstream and downstream. No measureable change in	incorporated hydromorphological improvements (resultir in 20m net gain of river channel). However negligible effe anticipated on structure and substrate of river bed. No	regime. However negligible effect anticipated on river fect processes structure and substrate of river bed upstream and downstream. No measureable change in quality	n Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. Localised adverse effects on structure of river bed anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	regime. However negligible effect anticipated on river processes and structure and substrate of river bed upstream and downstream. No measureable change in	anticipated, but no change in quality element when	Element is insensitive to impact	regime. However negligible effect anticipated on rive processes and structure and substrate of river bed upstream and downstream. No measureable change i		hydromorphological and riparian/marginal habitat improvements (resulting in 15m net gain of river channel). However negligible effect anticipated on structure and substrate of river bed due to existing section of main river already comprising good bydromorphological	regime. However, negligible effect anticipated on structure and substrate of river bed upstream and downstream when considered in conjunction with embedded	Element is insensitive to impact	body			Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.	t l	N/a	
		balanced against mitigation embedded in the scheme		quality element.	measureable change in quality element.	element.		balanced against mitigation embedded in the scheme.		quality element.	balanced against mitigation embedded in the scheme.		quality element		section of main river already comprising good hydromorphological condition. No measureable change in quality element.	mitigation. No measureable change in quality element.					mitigation embedded in the scheme.			
															Creation of 150m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements		Creation of 150m of new realigned channel (with incorporated							
Structure of the riparia	an zone	Localised but permanent loss of riparian zone. Localise adverse effects on structure of riparian zone anticipate but no change in quality element when balanced again will result to the scheme.	Flement is insensitive to impact	Element is insensitive to impact	Creation of 320m of new realigned channel, with incorporated riparian improvements (resulting in 20m ne gain of river channel). Localised improvement, but no	net Flement is insensitive to impact		adverse effects on structure of riparian zone anticipated, but no change in quality element when balanced against	Element is insensitive to impact	Element is insensitive to impact	Localised but permanent loss of riparian zone. Localised adverse effects on structure of riparian zone anticipated, but no change in quality element when balanced against mitigation ampedded in the school.	Flement is insensitive to impact	Element is insensitive to impact		(resulting in 15m net gain of river channel). However, localised loss of existing section of main river observed to comprise well-established marginal/riparian vegetation. Localised but temporary adverse effect of trucking of insprise process assistant with weathering artificients of	Element is insensitive to impact	riparian/marginal habitat improvements), resulting in 15m net gain of river channel. However, negligible effect anticipated on ammonia concentrations due to existing section of main river already comprising	3			Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation empodded in the scheme in the scheme.	p t	N/a	
		mitigation embedded in the scheme.			change in quality element.		change in quality element.	mitigation embedded in the scheme.			mitigation embedded in the scheme.				structure of riparian zone anticipated (until vegetation establishes alon new channel), but no change in quality element when balanced again mitigation embedded in the scheme.		well-established riparian habitat. No measureable change in quality elements.				mitigation embedded in the scheme.			

rent from Tittensor to River Sow (GB1040280532 water body: Trent from Tittensor to F	272) detailed impact assessment - effects on current : River Sow	statu:																Detailed Impact Assessment																	Detailed Impact Assessment R	esults	
GB104028053272 hological designation: Not A/HMWB	Waterco Scheme compo	ourse: WFI	TTS-T-01-01 alignment		Unnamed tributary of River Trent 1 (T WFD-TTS-T-01-02 Culvert			WFD-TTS-T-01-03 Realignment		River Trent WFD-TTS-W-01-01 Viaduct	Culvertio	WFD-TTS-T-08-01 ffline - extension of existing culvert)		WFD-TTS-W-08-02 Viaduct	WFD-TTS-T-08-03 Underbridge		WFD-TTS-T-08-04 Realignment (with removal of ex	4 existing culvert)		,	VFD-TTS-T-08-05 Realignment		Filly Brook Highway realignment culvert (r.	WFD-TTS-T-08-06 (replacement of existing highway culvert; on reali	aligned channel)	WFD-TTS-T-08-0: Access road culvert (on realig	ned channell		WFD-TTS-T-08-08 Realignment	WFD-TTS-T-08-09 Viaduct		WFD-TTS-T-08-10 Realignment			Overall effects on element		Additional mitigation requirements
us: Bad	Description of scheme compo	onent: Approx. total length of new realigned channel: 120m;	•	1	Folldish Culvert; Approx. culvert length: 61m; Approx. culvert dim		Approx. total length of new rea	aligned channel: 40m; Approx. total length of existing chan	sannel: 60m; Total net loss: 20m Ap	Great Haywood Vladuct; Approx. viaduct width: 15m; Approx. viaduct length: 780m; Approx. viaduct height: 16m	Approx. existing culvert Length: 30m; Approx. existing culvert dim	ensions: 1.68m width x 1.5m height; Approx. length of culvert expan existing)		aduct; Approx. viaduct width: 15m; Approx. underbridge: 25 underbridge: 25	West Underhalden America testal largeth of	Approx. existing culvert length: suspected approx. 300			gain in open channel: 385m		ISm; Approx. total length of existing channel: 285m; No li	No loss/gain App		n; Approx. existing culvert length: 67m; Approx. existing culvert dimer		Approx. culvert length: 10m; Approx. culve		Approx. total length of realigne	ned channel: 190m; Approx. total length of existing channel: 200m; Total net loss: 1	M6 Meaford Vladuct; Approx. vladuct wi	idth: 15m;	of realigned channel: 210m; Approx. total length of existing channel: 200m; Total net gain: 10	m		Over an effects on element		Additional mitigation requirements
ctive: Poor by 2027	Summary of embedded mitig:	The length of watercourse realignments has been reduced as far as reasonably incorporation of appropriate features equivalent to those lost along the eartiest hydromorphological condition over the existing condition where reasonably p	acticable. Design of the new channel will also ensure the equival sting channel footprint. Where natural watercourse, the design cticable (provided this is compatible with the watercourses' floo	nt hydraulic capacity and Culvert length has been reduced as far a transfer and maintain natural substrate risk and land drainage Environment Agency guidance and to ens.	s reasonably practicable. Invert of culvert to be buried 300mm be c. Culvert sized to minimise impact on flow continuity. Detailed de are appropriate low flow water depths and velocities for fish pass	n below the existing bed level to reduce disruption to sediment d design to be developed in general accordance with CIRIA and assage. Hydromorphological improvements to be undertaken to	The length of watercourse realignments has been reduced incorporation of appropriate features equivalent to hydromorphological condition over the existing condition	d as far as reasonably practicable. Design of the new chann to those lost along the existing channel footprint. Where nat on where reasonably practicable (provided this is compatib	annel will also ensure the equivalent hydraulic capacity and natural watercourse, the design will aim to enhance tible with the watercourses' flood risk and land drainage	Clear span viaduct. Viaducts designed to cross perpendicular to river channel wherever possible to reduce the design into the control of the		N/a		an viaduct. Viaducts designed to cross dar to river channel wherever possible to reduce shading impact.		Reinstatem n of the new channel will also ensure the equivalent hydraulic cap ble (provided this is compatible with the watercourses' flood risk :	ent of river channel form equivalent to reaches upstrea acity and incorporation of appropriate features. Design and land drainage functions). In addition, the design of	tream and downstream of existing culvert. sign will aim to enhance hydromorphological condition over soft the new channel will allow for a 10m wide buffer zone f	The ler over the existing condition where reasonably he for the implementation of marginal/riparian hydroxidations are considered to the conditions of the conditions of the conditions are conditionally as the condition of the condition o	th of watercourse realignments has been reduced as far as reason scorporation of appropriate features equivalent to those lost along morphological condition over the existing condition where reasona	bly practicable. Design of the new channel will also ensu he existing channel footprint. Where natural watercours ly practicable (provided this is compatible with the water	nsure the equivalent hydraulic capacity and unuse, the design will aim to enhance maintain natur to ensure to ensure	ight has been reduced as far as reasonably practicable. Invital substrate. Culvert sized to minimise impact on flow con appropriate low flow water depths and velocities for fish	meert of culvert to be buried 300mm below the existing bed level to ro ontinuity. Detailed design to be developed in general accordance with ish passage. Hydromorphological improvements to be undertaken to r	or reduce disruption to sediment transfer and the Culvert length to CRIA and Environment Agency guidance and transfer and or river channel immediately upstream and Environment Agency	n has been reduced as far as reasonably practicable. Invert of culvert to be buried maintain natural substrate. Culvert sized to minimize impact on flow continuity. I gency guidance and to ensure appropriate low flow water depths and velocities for	800mm below the existing bed level to reduce disruption to sediment etailed design to be developed in general accordance with CIRIA and r fish passage. Hydromorphological improvements to be undertaken in	The length of watercourse realignments has been reduced a incorporation of appropriate features equivalent to to hydromorphological condition over the existing condition	i as far as reasonably practicable. Design of the new channel will also ensure the eq those lost along the existing channel footprint. Where natural watercourse, the de on where reasonably practicable (provided this is compatible with the watercourse'	ivalent hydraulic capacity and gn will aim to enhance perpendicular to river channel wherever general color risk and land drainage	to cross The length of watercourse realignments has bee incorporation of appropriate features equipossible to hydromorphological condition over the existin	n reduced as far as reasonably practicable. Design of the new channel will also ensure the equivalent to those lost along the existing channel footprint. Where natural watercourse, the design condition where reasonably practicable (provided this is compatible with the watercourses'	ivalent hydraulic capacity and gn will aim to enhance lood risk and land drainage located in other WFD water	cts on onent(s) r bodies			Residual effect on ou element de
		functions). In addition, the design of the new channel will allow for a	m wide buffer zone for the implementation of marginal/riparian	mprovements. river cha	nnel immediately upstream and downstream of the culvert to co	compensate for footprint loss. Changes to water body bydromorphology leading to	functions). In addition, the design of the new cha	hannel will allow for a 10m wide buffer zone for the implementation of the implementatio	ementation of marginal/riparian improvements.	reduce shading impact.		Changes to water to	hody budramorphology landing to	reduce stading impact.			improvements.	rs to water body bydromorphology leading to		functions). In addition, the design of the new channel will allow for	r a 10m wide buffer zone for the implementation of mary	marginal/riparian improvements.	downstre	ream of the culvert to compensate for footprint loss.	sees to water hady bydromorphology leading to	river channel immediately upstream and downstream of the cu	Changes to water body hydromorphology leading	functions). In addition, the design of the new char	annel will allow for a 10m wide buffer zone for the implementation of marginal/rips Changes to water body buffergroup below leading to	ian improvements.	functions). In addition, the design of the	he new channel will allow for a 10m wide buffer zone for the implementation of marginal/ripa Changes to water body buffermorphology leading to	ian improvements.	Summary of scheme components proposed on water water body catchment with the potential to effect	erourses within element status	Overall effect on element	Constructor Operation
ification Elements	Status Objective	Changes to water b changes in river pro	sses and habitats upstream and Creation of n ownstream	w habitats Footprint	Shading	changes in river processes and habitats upstream and downstream	d Footprint	changes in river processes and habitats upstream and downstream	d Creation of new habitats	Shading	Footprint	Shading changes in river pro	ocesses and habitats upstream and downstream	Shading	Shading	Footprint	Shading changes in r	In river processes and habitats upstream and downstream	Creation of new habitats	Footprint changes in river	processes and habitats upstream and downstream	Creation of new habitats	Footprint	Shading changes	es in river processes and habitats upstream and downstream	Footprint Shading	changes in river processes and habitats upstream downstream	and Footprint	Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream	f new habitats Shading	Footprint	Changes to water dooly nyoromorphology leading to changes in river processes and habitats upstream and downstream	f new habitats				
		Creation of 120m of new realigned channel, with incorporated hydromorphological and riparian/marginal regime. However ne	t change to hydromorphological Creation of 120m of new	ealigned channel, with Localised but permanent loss of open rive Ical and riparian/marginal Localised adverse effects on macrophy	tes and channel. Localised dut permanent shading of section of rictes and	of river ytes and regime. However negligible effect anticipated on river	y Creation of 40m of new realigned channel, with incorporated hydromorphological and riparian/marginal	Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river	al Creation of 40m of new realigned channel, with incorporated hydromorphological and riparian/marginal	Some minor, localised and periodic shading of river	Localised but permanent loss of open river habitat. Localised adverse effects on macrophytes and channel.	d but permanent shading of section of river Localised but permanent shading shadin	nent changes to hydromorphology egligible effect anticipated on river	Localised but p channel. Localised but p channel. Localised but p	ut permanent shading of a section of river callsed adverse effect on macrophytes and habitat in	on of 385m of new realigned channel, with ted hydromorphological and riparian/marginal improvements (including removal of approx.	existing 300m culvert. Localised but duction in shading of section of river hydromor	calised but permanent improvement to incorpora morphological regime (including removal of habitat	eation of 385m of new realigned channel, with orated hydromorphological and riparian/marginal incorporate improvements (including removal of approx.	tion of 285m of new realigned channel, with rated hydromorphological and riparian/marginal regime. Howev	manent change to hydromorphological incorporated hy	of 285m of new realigned channel, with d hydromorphological and riparian/marginal watercourse	permanent loss of open river habitat. However, existing is currently culverted at this location beneath existing	Localised but permanent shading of section of river channel. However, existing watercourse is currently culverted	sed but permanent changes to hydromorphology me. However, existing watercourse is currently Localised but p totalised ad totalised ad	permanent loss of open river habitat. Localised but permanent shading of schannel. Localised adverse effect on macrophytes and	ction of river crophytes and regime. However negligible effect anticipated on r	logy Creation of 190m of new realigned channel, with Li	Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river incorporated hydromorphological regime.	ew realigned channel, with sological and riparian/marginal Some minor, localised and periodic shadi	Creation of 210m of new realigned channel, incorporated hydromorphological and riparian/r	with Localised but permanent change to hydromorphological Creation of 210m of anarginal regime. However negligible effect anticipated on river incorporated hydromorphological regime.	ew realigned channel, with sological and ripartan/marginal	Viaducts River Trent: - viaduct (WFD-TTS-W-01-01)	Viaducts The vaducts will cause some minor, localised and periodic shading of the river channel. This will have a neglig macrophytes and phytobenthos, macroinvertebrates and fish.	ible effect on Localised improvement when effects	
Macrophytes and Phytob	benthos - combined -	habitat improvements (resulting in 5m net gain of river channel). Localised improvement in macrophytes and phytobenthos habitat, but no change in quality element.	ytes and phytobenthos habitat eam. No measureable change in lity element. habitat improvements (resul channel). Localised improve phytobenthos habitat, but no	ng in 5m net gain of river nent in macrophytes and change in quality element.	rin quality phytobenthos anticipated (due to a reduction photosynthetic activity), but no change in qual element when balanced against mitigation embed the scheme.	upstream and downstream of culvert. No measureable change in quality element.	t habitat improvements (resulting in 20m net loss of river channel). Localised improvement in macrophytes and phytobenthos habitat, but no change in quality element.	processes and macrophytes and phytobenthos habitat upstream and downstream. No measureable change in quality element.	chabitat improvements (resulting in 20m net loss of river channel). Localised improvement in macrophytes and phytobenthos habitat, but no change in quality element.	hannel. However negligible effect on macrophytes and phytobenthos anticipated. No measureable change in quality element	phytobenthos anticipated, but no change in quality phytoto ment when balanced against mitigation embedded in the scheme.	penthos anticipated (due to a reduction in ynthetic activity), but no change in quality hen balanced against mitigation embedded in the scheme.	ophytes and phytobenthos habitat stream of culvert. No measureable ge in quality element.	wever negligible effect on macrophytes and os anticipated. No measureable change in quality element	nthos anticipated (due to a reduction in thetic activity), but no change in quality en balanced against mitigation embedded in the scheme.	ting culvert). Localised but permanent increase en river habitat. Localised improvement in yet and phytobenthos habitat anticipated, but no change in quality element.	sed improvement in macrophyte and habitat anticipated, but no change in quality element.	00m existing culvert]. However negligible effect atted on river processes and macrophyte and in op neasureable change in quality element.	existing culvert). Localised but permanent increase open river habitat. Localised improvement in phyte and phytobenthos habitat anticipated, but no change in quality element.	improvements (resulting in no net gain/loss of annel). Localised improvement in macrophytes hytobenthos habitat, but no change in quality element.	acrophytes and phytobenthos habitat wnstream. No measureable change in quality element.	orovements (resulting in no net gain/loss of ell. Localised improvement in macrophytes benthos habitat, but no change in quality element.	me road crossing. Therefore no effect anticipated on and phytobenthos relative to existing condition. No measureable change in quality element.	culverted at this location beneath existing Yarnfield Lane road crossing. Therefore no effect articipated on macrophyte and phytobenthos relative to existing condition. No measureable change in quality element.	crossing. Therefore no effect anticipated on river sees and macrophytes and phytobenthos habitat am and downstream of culvert. No measureable change in quality element.	anticipated, but no change in quality phytobernhos anticipated (due to a photosynthetic activity), but no cha the scheme.	eduction in ge in quality processes and macrophytes and phytobenthos hal ge in quality on embedded in change in quality element.	bitat habitat improvements (resulting in 10m net loss of river channel). Localised improvement in macrophytes and phytobenthos habitat, but no change in quality element.	processes and macrophytes and phytobenthos habitat upstream and downstream. No measureable change in quality element. https://doi.org/10.1001/j.j.j.j.j.j.j.j.j.j.j.j.j.j.j.j.j.j.j.	sulting in 10m net loss of river overment in macrophytes and no change in quality element.	habitat improvements (resulting in 10m net gain channel). Localised improvement in macrophyth phytobenthos habitat, but no change in quality in	of river processes and macrophytes and phytobenthos habitat approximation and downstream. No measureable change in channel). Localised important and downstream. Quality element.	sulting in 10m net gain of river overment in macrophytes and no change in quality element.	Underbridges Filly Brook: - underbridge (WFD-TTS-T-08-03	<u>Underbridge</u> The underbridge will cause some localised shading of the river channel. This will have a minor, localised adver macrophytes and phytobenthos, macroinvertebrates and fish.	considered in combination, but no change in quality element.	N/a
					Localised but permanent shading of section of ri	of there					Incilia	d but nermanent shading of section of over		Localised but o		on of 385m of new realigned channel, with				tion of 285m of new realigned channel, with	Creation of .	of 285m of new realigned channel, with		Localised but permanent shading of section of river	sed but permanent changes to hydromorphology	Localised but permanent shading of s	ction of river							Culverts Unnamed tributary of River Trent 1 (T to RS): - culvert (WFD-TTS-T-01-02) - 61m	Culverts The 124m net length of new culverting will cause a localised but permanent loss of existing river habitat and s will have a minor, localised adverse effect on macrophytes and phytobenthos, macroinvertebrates and fish.	hading. This	
Macroinvertebrates	Moderate Good by 2027	channel). Localised improvement in macroinvertebrate downstream. No	It change to hydromorphological gible effect anticipated on river evertebrate habitat upstream and easureable change in quality element. Caralism of 120m of new incorporated hydromorphological incorporated hydromorphological	ical and riparian/marginal Ing in 5m net gain of river anticipated, but no change in quality elem	er habitat. channel. Localised adverse effects on tebrates macroinvertebrates anticipated (including due tenent when reduction in/loss of riparian and aquatic vegetation the scheme. no chanse in quality element when balanced as:	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and macroinvertebrate habitat upstream and downstream of culvert. No measureable change in	y Creation of 40m of new realigned channel, with incorporated hydromorphological and riparian/marginal dhabitat improvements (resulting in 20m net loss of river channel). Localised improvement in macroinvertebrate	regime. However negligible effect anticipated on river processes and macroinvertebrate habitat upstream and downstream. No measureable change in quality	al Creation of 40m of new realigned channel, with incorporated hydromorphological and riparian/marginal dhabitat improvements (resulting in 20m net loss of river channel). Localised improvement in macroinvertebrate	Some minor, localised and periodic shading of river channel. However negligible effect on macroinvertebrates anticipated. No measureable chance in quality element bale	Localised but permanent loss of open river habitat. Localised adverse effects on macroinvertebrates macroin micropated, but no change in quality element when reduction lanced against mitigation embedded in the scheme.	hannel. Localised adverse effects on wertebrates anticipated (including due to a n/loss of riparian and aquatic vegetation), but te in quality element when balanced against downstream of cu	nent changes to hydromorphology egligible effect anticipated on river olinvertebrate habitat upstream and ulvert. No measureable change in	or, localised and periodic shading of river nnel. However negligible effect on brates anticipated. No measureable change in quality element	nnel. Localised adverse effects on habitat in habitat in 300m existing	improvements (including removal of approx. ting culvert). Localised but permanent increase	duction in shading of section of river hydromor ed improvement in macroinvertebrate approx. 300m	morphological regime (including removal of habitat 00m existing culvert). However negligible effect 300m exis	tat improvements (including removal of approx. existing culvert). Localised but permanent increase	rated hydromorphological and riparian/marginal regime. However the channel Localised improvement in received in the channel control of th	r negligible effect anticipated on river	d hydromorphological and riparian/marginal watercourse i provements (resulting in no net gain/loss of Vamileld La	permanent loss of open river habitat. However, existing is currently culverted at this location beneath existing ine road crossing. Therefore no effect anticipated on ebrates relative to existing condition. No measureable	channel. However, existing watercourse is currently culverted at this location beneath existing Yarnfield Lane road crossing. Therefore no effect anticipated on macroinvertebrates relative to existing condition. No processes	me. However, existing watercourse is currently ed at this location beneath existing Yamfield Lane crossing. Therefore no effect anticipated on river ses and macroinvertebrate habitat upstream and balanced against	permanent loss of open river habitat. channel. Localised adverse effi macroinvertebrates anticipated (incl. t mitization embedded in the scheme. t mitization embedded in the scheme.	cts on Localised but permanent changes to hydromorpho ding due to a regentation), but processes and macroinvertebrate habitat upstream downstream of culvert. No measureable change	Creation of 190m of new realigned channel, with liver incorporated hydromorphological and riparian/marginal and habitat improvements (resulting in 10m net loss of river channel). Localised improvement in macroinvertebrate	Localised but permanent change to hydromorphological regime. However negligible effect anticipated on microproseted hydromorp processes and macroinvertebrate habitat upstream and downstream. No measureable change in quality element.	channel. However negligible effect sulting in 10m net loss of river	t on habitat improvements (resulting in 10m pet gain	with Localised but permanent change to hydromorphological marginal gime. Neuver-neglighte effect anticipated non rivel incorporated hydromorp of river of river downstream. Nemeasureable change in quality change, the control of	cological and riparian/marginal	 offline culvert (WFD-TTS-T-08-01) - 50m extentior highway realignment culvert (WFD-TTS-T-08-06) - (replacement of existing 67m culvert) 	 -70m limited fish habitat potential upstream of these proposed culvert locations and both watercourses have been 	to recorded Localised improvement when effects scoped out considered in combination, but no change in quality element.	N/a
logical Quality		habitat, but no change in quality element.	element. habitat, but no chang	in quality element.	mitigation embedded in the scheme.	against duvisiteam of current, no measureause change in quality element.	habitat, but no change in quality element.	element.	habitat, but no change in quality element.			ge in quality element when balanced against downstream of cu illigation embedded in the scheme.		against mit	mitigation embedded in the scheme.	en river habitat. Localised improvement in riparian and a riparian and a quality element.	quality element.	change in quality element.	invertebrate habitat anticipated, but no change in quality element.	downstream element.	element.	element.	change in quality element.	road crossing. Therefore no effect anticipated on macroinvertebrates relative to existing condition. No measureable change in quality element.	mstream of culvert. No measureable change in quality element.	t mitigation embedded in the scheme. no change in quality element when be mitigation embedded in the s	quality element.	habitat, but no change in quality element.	element. habitat, but no cl	inge in quality element.	habitat, but no change in quality elemen	t. element. habitat, but no ch	nge in quality element.	(replacement of existing 6-7m culvert) - access road culvert (WFD-TTS-T-08-07) - 10m Total net length of new culverted river channel = : imcluding culvert removal associated with realignm	proposed culverts will therefore have only a minor, localised adverse effect on fish.	ions. These	None required None required bic
Pia				Localised but permanent loss of open rive Potential adverse effect on fish passage a length of culvert. However, baseline fish ass	er habitat. Iso due to essment and					LC Pr lengt	Localised but permanent loss of open river habitat. Potential adverse effect on fish passage also due to gth of culvert. However, baseline fish assessment and				Creation	on of 385m of new realigned channel, with			ania di Mina di anno aliandi di anno di alia			Localised but p	permanent loss of open river habitat. Potential adverse passage also due to length of culvert. However, existing										None. Water body downstream (Trent t Brook to River Tame) affected by Propi but no widespread adverse impacts id the potential to propagate upstream an	sed Scheme ntified with affect water Realignments (and associated removal of existing	The creation of 1230m of new realigned channel on the 'Unnamed tributary of River' Trent 1' watercourse and (resulting in a total net gain of 70m of open river channel), with incorporated hydromorphological and riparial improvements, and will cause a localised but permanent improvement in river habitat. This will therefore hav	'Filly Brook' n/marginal e a minor,	
Fish	Bad Poor by 2027		t change to hydromorphological gible effect anticipated on river itat upstream and downstream. channel). Localised improver	ing in Sm net gain of river	culverts are (including due to a reduction in/loss of riparian a	tection of icipated Localised but permanent changes to hydromorphology an and element processes and fish habitat upstream and downstream of	habitat improvements (resulting in 20m net loss of river	regime. However negligible effect anticipated on river	habitat improvements (resulting in 20m net loss of river cha	Some minor, localised and periodic shading of river thannel. However negligible effect on fish anticipated. No measureable change in quality element	Id surveys suggest poor habitat potential and limited ish spawning habitat potential upstream of culvert channel. (including cation. Also, existing culverts oresent upstream of the culvert aquatic v	out permanent shading of culverted section of Localised adverse effects on fish anticipated g due to a reduction in/loss of riparian and egetation), but no change in quality element processes and fish ha	nent changes to hydromorphology egligible effect anticipated on river abitat upstream and downstream of No meass	or, localised and periodic shading of river wever negligible effect on fish anticipated. Including due to aquatic vegetat	sue to a potential reduction in riparian and 300m existi	ting culvert). Localised but permanent increase channel. Lo	ralised improvement in fish habitat	dum existing curvert). However negligible effect habitat	tat improvements (including removal or approx. habita	tion of 285m of new realigned channel, with rated hydromorphological and riparian/marginal improvements (resulting in no net gain/loss of hannell. Localized improvement in fish habitat.	habitat improv	provements (resulting in no net gain/loss of notential uns	ggest poor habitat potential and limited fish habitat	culverted at this location beneath existing Yarnfield Lane culverted	ed at this location beneath existing Yamfield Lane Localised adver	rse effects on fish anticipated, but no (including due to a reduction in/loss of	riparian and regime. However negligible effect anticipated on a	iver habitat immension (consistent in 10m and less of shore	Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river processes and fish habitat upstream and downstream.	and the second state of th	into porace nyerono protogramano npariany	with Localsed but permanent change to hydromorphological regime. However negligible effect anticipated on river but no No measureable change in quality element. Creation of 210m of Localsed but permanent of commentaries incorporated hydromorp processes and fish habitat upstream and downstream. No measureable change in quality element.	the state of the s	stly affecting Unnamed tributary of River Trent 1 (T to RS): - realignment (WFD-TTS-T-01-01) - 5m gain - realignment (WFD-TTS-T-01-03) - 20m loss Filly Brook:	macroinvertebrates and fish. This will also improve fish passage, having a beneficial effect on fish.	rovement in Localised improvement when effects considered in combination, but no change in quality element.	N/a
		change in quality element.	change in quality element.	ty element. already restricting fish access (including a si the watercourses passes beneath the Trent Canal). Localised adverse effects on fish and no change in quality element when balan	phon where and Mersey scheme. (c)qated, but ced against	element processes and fish habitat upstream and downstream of d in the culvert. No measureable change in quality element.	change in quality element.	No measureable change in quality element.	change in quality element.	ad qu	location (limiting available fish habitat). Localised diverse effects on fish anticipated, but no change in quality element when balanced against mitigation appended in the cohomology.	alanced against mitigation embedded in the scheme.	reable change in quality element.	when balance	inced against mitigation embedded in the scheme. Scheme. fish ha	river habitat. Removal of significant existing on fish passage also. Localised improvement in aquatic vegetat habitat, but no change in quality element.	ion), but no change in quality element.	wistream. No measureable change in quality element.	se in open river habitat. Localised improvement in sh habitat, but no change in quality element.	hannel). Localised improvement in fish habitat, but no change in quality element.	eable change in quality element.	out no change in quality element. likely already on fish relat	rts are present downstream of this location, which are restricting fish access. Therefore no effect anticipated tive to existing condition. No measureable change in quality element.	road crossing. Therefore no effect anticipated on fish road cro relative to existing condition. No measureable change in processes quality element.	ses and fish habitat upstream and downstream of mitigati ert. No measureable change in quality element.	ion embedded in the scheme. when balanced against mitigation en scheme.	culvert. No measureable change in quality elem	change in quality element.	processes and fish habitat upstream and downstream. No measureable change in quality element. change in	quality element.	change in quality element.	No measureable change in quality element. change in	quality element.	 realignment (with removal of existing culvert) (W 385m gain (open channel) realignment (WFD-TTS-T-08-05) - no gain/loss 	FFD-TTS-T-08-04)		
				mitigation embedded in the scher	me.						timetote ii die Aleine.																							- realignment (WFD-TTS-T-08-10) - 10m gain Total length of new realigned river channel = 1230	Om Viaduxts	*******	
			it change to hydromorphological gible effect anticipated on river incorporated hydromorphological		Localised but permanent shading of culverted secti channel. Potential to lead to minor and localised in on dissolved oxygen concentrations (due to redu	section of d impact Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river		Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river	al Creation of 40m of new realigned channel, with S incorporated hydromorphological and riparian/marginal	Some minor, localised and periodic shading of river channel (with potential associated reduction in	Localised I channel. P on disso	out permanent shading of culverted section of otential to lead to minor and localised impact ved oxygen concentrations (due to reduced regime. However ne	anent changes to hydromorphology Some minor, egligible effect anticipated on river channel (w	or, localised and periodic shading of river (with potential associated reduction in on dissolved or	ut permanent shading of a section of river ential to lead to minor and localised impact incorporate to design the state of the section of the sec	ion of 385m of new realigned channel, with Removal of ted hydromorphological and riparian/marginal permanent re-			eation of 385m of new realigned channel, with crated hydromorphological and riparian/marginal incorp	etion of 285m of new realigned channel, with Localised but per ated hydromorphological and riparian/marginal regime. However				Localised but permanent shading of culverted section of channel. Potential to lead to minor and localised impact on dissolved oxygen concentrations (due to reduced photosynthetic activity by aquatic flora). However, culverted	sed but permanent changes to hydromorphology me. However, existing watercourse is currently ed at this location beneath existing Yamfield Lane	Localised but permanent shading of cul- channel. Potential to lead to minor and on dissolved oxygen concentrations (e	erted section of ocalised impact Localised but permanent changes to hydromorphic act to reduced regime. However negligible effect anticipated on i	logy Creation of 190m of new realigned channel, with Linver incorporated hydromorphological and riparian/marginal	Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river incorporated hydromorphological regime.	ew realigned channel, with Some minor, localised and periodic shadl channel (with potential associated red	ing of river Creation of 210m of new realigned channel, uction in incorporated hydromorphological and riparian/r	with Localised but permanent change to hydromorphological Creation of 210m of anarginal regime. However negligible effect anticipated on river incorporated hydromorphological	ew realigned channel, with sological and riparian/marginal	Total length of existing river channel = 1160m (30) Resultant net gain of open river channel length = 1	Om Visducts The valout will cause some minor, localised and periodic shading of river channel. This will have a negligible of a dissolved ongern and water temperature. Underbridge	Localised improvement when effects	
Dissolved oxygen	High Good by 2015	habitat improvements however negligible effect anticipated on dissolved oxygen concentrations. No measureable change in quality element.			photosynthetic activity by aquatic flora). Localis adverse effects anticipated, but no change in qua element when balanced against mitigation embe in the scheme.	processes and dissolved oxygen upstream and downstream of culvert. No measureable change in quality element.	habitat improvements. However negligible effect anticipated on dissolved oxygen concentrations. No measureable change in quality element.	processes and dissolved oxygen concentrations upstream and downstream. No measureable change in quality element.	habitat improvements. However negligible effect in anticipated on dissolved oxygen concentrations. No measureable change in quality element.	negligible effect on dissolved oxygen concentrations	Element is insensitive to impact adverse element v	processes and d downstream of cu when balanced against mitigation embedded in the scheme.	dissolved oxygen upstream and photosynthet ulvert. No measureable change in negligible effe anticipated. No	hetic activity by aquatic flora). However, effect on dissolved oxygen concentrations No measureable change in quality element.	thetic activity by aquatic flora). Localised lects anticipated, but no change in quality en balanced against mitigation embedded in the scheme.	improvements (including removal of approx. channel. Potent existing culvert). Localised improvement in ed oxygen concentrations, but no change in quality element.		ated on river processes and dissolved oxygen dissolventrations upstream and downstream. No dissolveneasureable change in quality element	tat improvements (including removal of approx. Om existing culvert). Localised improvement in olved oxygen concentrations, but no change in quality element.	tat improvements. However negligible effect pared on dissolved oxygen concentrations. No measureable change in quality element.	d dissolved oxygen concentrations wastream. No measureable change in quality element. habitat improvement of the concentrations waste or measurement.	mprovements. However negligible effect ed on dissolved oxygen concentrations. No soureable change in quality element.	Element is insensitive to impact	existing watercourse is currently culverted at this road cro- location beneath existing Yarnfield Lane road crossing. Therefore no effect anticipated on dissolved caygen relative to existing condition. No measureable change in	notesses and dissorted oxygen opsicialis and	photosynthetic activity by aquatic flo adverse effects anticipated, but no ch element when balanced against mitiga in the scheme.	a). Localised processes and dissolved oxygen upstream and downstream of culvert. No measureable change in quality element.	habitat improvements. However negligible effect e in anticipated on dissolved oxygen concentrations. No measureable change in quality element.	processes and dissolved oxygen concentrations upstream and downstream. No measureable change in quality element. habitat improvemen anticipated on dissolve measureable change in measure	However negligible effect doxygen concentrations. No negligible effect on dissolved oxygen coninge in quality element.	However, habitat improvements. However negligible el centrations anticipated on dissolved oxygen concentration ality element. measureable change in quality element	ffect processes and dissolved oxygen concentrations as. No upstream and downstream. No measureable change in anticipated on dissolve measureable chi	. However negligible effect d oxygen concentrations. No nge in quality element.		The underbridge will cause some localised shading of river channel. This will have a minor, localised adverse e dissolved oxygen and water temperature. Culverts	ffect on considered in combination, but no change in quality element.	N/a
																								quality element.											The 124m net length of new culverting will cause a localised but permanent shading of river channel. This will minor, localised adverse effect on dissolved oxygen and water temperature.		
рН	High Good by 2015	Element is insensitive to impact Element	insensitive to impact Element is insen	tive to impact Element is insensitive to impact	t Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact Element	t is insensitive to impact Elec	Element is insensitive to impact Eler	Element is insensitive to impact	Element is insensitive to impact Elem	nent is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact Elem	ent is insensitive to impact Ele	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact Elem	nent is insensitive to impact Element is insensitive to im	sact Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact Element is i	sensitive to impact Element is insensitive to impact	t Element is insensitive to impact	Element is insensitive to impact Element is in	sensitive to impact None		Realignments (and associated removal of existing culverts) The creation of 1200m of realigned channel on the 'Unnamed tributary of River Trent 1' watercourse and Filly (resulting in a total net agin of 70m of open river channel) will cause a localized but permanent improvement hydromorphological regime and marginal/riparian habitat. This will have a negligible effect on dissolved oxyg shorbwhar and samongic concentrations.	Brook Element is insensitive to impact. No measureable change to quality element en,	N/a
ilty Elements			Creation of 120m of new incorporated hydromorphole	ealigned channel, with pical and riparian/marginal					Creation of 40m of new realigned channel, with incorporated hydromorphological and riparian/marginal												Creation of incorporated by	of 285m of new realigned channel, with d hydromorphological and riparian/marginal							Creation of 190m of incorporated hydromorp	ew realigned channel, with nological and riparian/marginal		Creation of 210m of incorporated hydromorp	ew realigned channel, with hological and riparian/marginal		phosphate and ammonia concentrations. The associated removal of 410m of existing culvert on the Filly Brook will cause a localised but permanent recishading. This will have a localised beneficial effect on dissolved oxygen and water temperature.		
Phosphate	Poor Good by 2027	Element is insensitive to impact Element	habitat improvements. Pote fine sediment inputs and n negligible effect antic concentrations. No meas	ial localised reductions in trient loading. However ated on phosphate eable change in quality	t Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	habitat improvements. Potential localised reductions in fine sediment inputs and nutrient loading. However negligible effect anticipated on phosphate concentrations. No measureable change in quality	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact Element	t is insensitive to impact Elec	Element is insensitive to impact Elem	Element is insensitive to impact	Element is insensitive to impact Elem	nent is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact Elem	ent is insensitive to impact fine sediment negligibli concentratio	rovements. Potential localised reductions in nent inputs and nutrient loading. However gible effect anticipated on phosphate ations. No measureable change in quality	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact Elem	nent is insensitive to impact Element is insensitive to im	sact Element is insensitive to impact	Element is insensitive to impact	habitat improvements. Element is insensitive to impact fine sediment injure negligible effect concentrations. No m	otential localised reductions in d nutrient loading. However ticipated on phosphate assureable change in quality	t Element is insensitive to impact	Flement is insensitive to impact fine sediment inputs a negligible effect a concentrations. No m	otential localised reductions in d nutrient loading. However titicipated on phosphate assureable change in quality			Negligible effect anticipated in when effects considered in combination. No measureable change in quality element	None required None required N/a phy
Physical			Creation of 120m of new	nt. ealigned channel, with					element. Creation of 40m of new realigned channel, with												Creation of	element. of 285m of new realigned channel, with							Creation of 190m of	ement. ew realigned channel, with		Creation of 210m of	ew realigned channel, with				
Ammonia	Good Good by 2015	Element is insensitive to impact Element	incorporated hydromorpholo habitat improvements. Pote fine sediment inputs and n negligible effect anti	jical and riparian/marginal ital localised reductions in trient loading. However Element is insensitive to impact pated on ammonia	t Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	incorporated hydromorphological and riparian/marginal habitat improvements. Potential localised reductions in fine sediment inputs and nutrient loading. However negligible effect anticipated on ammonia	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact Element	t is insensitive to impact Elec	Element is insensitive to impact Elem	Element is insensitive to impact	Element is insensitive to impact Elem	nent is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact Elem	incorporated by habitat improv ent is insensitive to impact fine sediment negligib	d hydromorphological and riparian/marginal rovements. Potential localised reductions in nent inputs and nutrient loading. However ligible effect anticipated on ammonia	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact Elem	nent is insensitive to impact Element is insensitive to im	sact Element is insensitive to impact	Element is insensitive to impact	incorporated hydromor habitat improvements. Element is insensitive to impact fine sediment inputs a negligible effect	nological and riparian/marginal obtential localised reductions in during the control of the cont	t Element is insensitive to impact	incorporated hydromorp habitat improvements. F Element is insensitive to impact fine sediment inputs a negligible effect:	nological and riparian/marginal None. Water body downstream (Trent footential localised reductions in dinutrient loading. However nticipated on ammonia the potential to propagate upstream an	om Moreton ed Scheme tiflied with affect water		Negligible effect anticipated in when effects considered in combination. No measureable change in quality element	s N/a
			concentrations. No meass	eable change in quality nt.					concentrations. No measureable change in quality element.												concentratio	ations. No measureable change in quality element.							concentrations. No m	asureable change in quality ement.		concentrations. No m	body lement.				
Temperature	High Good by 2015	Element is insensitive to impact Element	insensitive to impact Element is insen	tive to impact Element is insensitive to impact	Localised but permanent shading of culverted sect channel. Potential to lead to minor and localised in on water temperature. Localised adverse effect	section of ed impact effects Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	S Element is insensitive to impact	Some minor, localised and periodic shading of river channel. However, negligible effect on water	Localised channel. Element is insensitive to impact on wa	out permanent shading of culverted section of observation to lead to minor and localised impact ter temperature. Localised adverse effects to the control of	Some minor, channel. It is insensitive to impact	or, localised and periodic shading of river il. However, negligible effect on water on water te	out permanent shading of a section of river tential to lead to minor and localised impact t temperature. Localised adverse effects	Removal of Element is insensitive to impact permanent re	existing 300m culvert. Localised but duction in shading of section of river	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact Elen	ent is insensitive to impact Ele	Element is insensitive to impact	Element is insensitive to impact	Localised but permanent shading of culverted section of channel. Potential to lead to minor and localised impact on water temperature. However, existing watercourse is currently culverted at this location beneath existing	Element is insensitive to impact Elem	Localised but permanent shading of cul channel. Potential to lead to minor and on water temperature. Localised ad on water temperature. Localised ad	erted section of ocalised impact erse effects Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact Element is	Some minor, localised and periodic shad channel. However, negligible effect or	ing of river n water Leader Leader Leader	Element is insensitive to impact Element is in	sensitive to impact			Localised improvement when effects considered in combination, but no change	N/a
					anticipated, but no change in quality element w balanced against mitigation embedded in the sch	nt when e scheme.				quality element.	anticipa	ted, but no change in quality element when against mitigation embedded in the scheme.	temperature (quality element. balanced again	d, but no change in quality element when gainst mitigation embedded in the scheme.	water tempera	ture, but no change in quality element.							Yarnfield Lane road crossing. Therefore no effect anticipated on water temperature relative to existing condition. No measureable change in quality element.		anticipated, but no change in quality balanced against mitigation embedde	element when			quality element.	ne criminge in					in quality element.	
2,4-dichlorophenol, Amm	monia (Annex 8), juron, Mecoprop, High High by 2015									N/A - Specific pollutants, effects screened out for			N/A - Specifi	rific pollutants, effects screened out for N/A - Specific	erific pollutants effects screened out for															N/A - Specific pollutants effects screene	ed out for						
Copper, Dimethoate, Linu Toluene, Triclosan, Zinc		N/A - Specific pollutants effects	reened out for scheme design component		N/A - Specific pollutants effects screened out for scheme des	design component	N/A - Spec	ccific pollutants effects screened out for scheme design con	omponent	scheme design component			5	scheme design component	scheme design component		N/A - Specific pollutants effects screened out for sch	scheme design component		N/A - Specific pollutants ef	ects screened out for scheme design component		N/A - Specific pol	ollutants effects screened out for scheme design component		N/A - Specific pollutants effects screened out for s	heme design component	N/A - Specif	cific pollutants effects screened out for scheme design component	scheme design component	CO SOLE TO	N/A - Specific pollutants effects screened out for scheme design component	None				
		Creation of 120m of new realigned channel, with Localised but perman	et change to hydromorphological	Localised but permanent changes to hydror	morphology	Localised but permanent changes to hydromorphology	Creation of 40m of new realigned channel, with	Localised but permanent change to hydromorphological		Loca	calised but permanent changes to hydromorphology	Localised but perma	ment changes to hydromorphology		Creation	on of 385m of new realigned channel, with	Locali	ocalised but permanent improvement to	Cre	tion of 285m of new realigned channel, with Localised but per	manent change to hydromorphological	Localised by	ut permanent changes to hydromorphology regime.	Localised regime	sed but permanent changes to hydromorphology me. However, existing watercourse is currently Localised but per	rmanent changes to hydromorphology	Localised but permanent changes to hydromorpho	logy Creation of 190m of new realigned channel, with Li	Localised but permanent change to hydromorphological		Creation of 210m of new realigned channel,	with Localised but permanent change to hydromorphological	None. Water body downstream (Trent i	om Moreton	Culverts The 124m net length of new culverting will cause a localised but permanent change in hydromorphological re will have a localised adverse effect on flow dynamics, river continuity, river width and depth variation, structu	gime. This	
Quantity and dynamics or	of water flow	Creation of 120m of new realigned channel, with incorporated hydromorphological improvements (resulting is fine net gain of three channel). Localized disprovement in flow dynamics, but no change in quality element.	gible effect anticipated on river and dynamics of flow upstream measureable change in quality element.	regime. Localised adverse effects on flow (including potential localised increases in fite anticipated, but no change in quality ele- balanced against mitigation embedded in i	dynamics ow velocity) Element is insensitive to impact ment when the scheme.	regime. However negligible effect anticipated on river processes and quantity and dynamics of flow upstream and downstream. No measureable change in quality element	incorporated hydromorphological improvements (resulting in 20m net loss of river channel). Localised improvement in flow dynamics, but no change in quality element.	Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river processes and quantity and dynamics of flow upstream and downstream. No measureable change in quality element.	Element is insensitive to impact	re (incl an bale	regime. Localised adverse effects on flow dynamics cluding potential localised increases in flow velocity) inticipated, but no change in quality element when lanced against mitigation embedded in the scheme.	Element is insensitive to impact processes and quant and downstream. I	egligible effect anticipated on river tity and dynamics of flow upstream No measureable change in quality element		(including Loca hydroman	g removal of approx. 300m existing culvert). callsed but permanent improvement to orphology regime. Localised improvement in unamire, but no channe is expelled improvement in unamire. but no channe is expelled element.	nent is insensitive to impact approx. 300m anticipat dynamics	morphological regime (including removal of 00m existing culvert). However negligible effect ipated on river processes and quantity and mics of flow upstream and downstream. No nearwankle change in custifix plement	Element is insensitive to impact (result improv	tion of 285m of new realigned channel, with rporated hydromorphological improvements ig in no net gain/loss of river channel). Localised but per regime. However processes and quality element.	r negligible effect anticipated on river iantity and dynamics of flow upstream n. No measureable change in quality element.	Element is insensitive to impact beneath exist effect anticipal	ting watercourse is currently culverted at this location ting Yarnfield Lane road crossing. Therefore negligible ted on flow dynamics relative to existing condition. No measureable change in quality element.	Culverted Element is insensitive to impact road cro processe and do	ed at this location beneath existing Yarnfield Lane regime. Localis crossing. Therefore no effect anticipated on river sees and quantity and dynamics of flow upstream downstream. No measureable change in quality balanced against	sed adverse effects on flow dynamics tial localised increases in flow velocity) It no change in quality element when It mitigation embedded in the scheme.	regime. However negligible effect anticipated on a processes and quantity and dynamics of flow upstr and downstream. No measureable change in qua- element	incorporated hydromorphological improvements (resulting in 10m net loss of river channel). Localised improvement in flow dynamics, but no change in quality element.	Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river processes and quantity and dynamics of flow upstream and downstream. No measureable change in quality element.	ensitive to impact	incorporated hydromorphological improvem (resulting in 10m net gain of river channel). Loc improvement in flow dynamics, but no change is element.	with tocalised but permanent change to hydromorphological regime. However negligible effect articipated on river and quantity and primarics of flow upstream and downstream. No measureable change in quality schemat.	but no widespread adverse impacts id the potential to propagate upstream an body (e.g. restrictive structures significa biological continuity)	affect water tily affecting	substrate, and structure of riparian zone. Realignments (and associated removal of existing culverts) The scaling of 100 of easilyment bened on the University of Bluer Tens 1 substrates and filling the scaling of 100 of easilyment bened on the University of Bluer Tens 1 substrates and filling the scaling of 100 of the scale of	Localised improvement when effects considered in combination, but no change in quality element.	N/a
															100 01	transce, our no trange in quanty contract.		manufacture Crange in quanty sometic				Incalined but	namenant los of connection to currencellos chillen		element								Dissignal Continuity)		Realignments (and associated removal of existing cuberst). The creation of 1220m of nealigned channel on the Unnamed tributary of River Trent 1 watercourse and Filly (resulting in a total net gain of 70m ofopen river channel) will cause a localised but permanent improvement in hydromorphological regime and marginal/riparian habitat. This will have a localised beneficial effect orflow of spanian zone.	n nynamics and	
Connection to groundwa	ater bodies	Element is insensitive to impact Element	nsensitive to impact Element is insen	Localised but permanent loss of conne surrounding shallow groundwater within : deposits. However no likely effect anticip	ction to superficial pated on Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	su	Localised but permanent loss of connection to surrounding shallow groundwater within superficial deposits. However no likely effect anticipated on	Element is insensitive to impact Element	t is insensitive to impact		Creation of removal of perman groundwa	of 385m of new realigned channel (including of approx. 300m existing culvert). Localised but inent re-connection to surrounding shallow water within superficial deposits. However no	nent is insensitive to impact i	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact Elem	ent is insensitive to impact Eler	groundwat anticipated on Element is insensitive to impact watercourse	ter within superficial deposits (with no likely effect connection to groundwater bodies). However, existing is currently culverted at this location beneath existing	Element is insensitive to impact	Localised bu surrounding sh Element is insensitive to impact deposits. How	t permanent loss of connection to hallow groundwater within superficial wever no likely effect anticipated on Element is insensitive to im	sact Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact Element is in	sensitive to impact	Element is insensitive to impact	Element is insensitive to impact Element is in	sensitive to impact None		The associated removal of 300m of existing culver to not the filly Brook will cause a localised but permanent impromorephological regione. This will have a localised beneficial effect on flow dynamics, river continuity, rive depth variation, structure of substrate, and structure of riparian zone.	rovement in r width and Negligible effect anticipated in when effects considered in combination. No	N/a
				change in quality element.	caureane					Co	deposits. However no likely effect anticipated on onnection to groundwater bodies. No measureable change in quality element.				likely effectionless. I	ect anticipated on connection to groundwater No measureable change in quality element						on connecti	r rosu crossing. Therefore negative energy anticipated ion to groundwater relative to existing condition. No measureable change in quality element.		chierection to g	rounawater bodies. No measureable lange in quality element.										measureable change in quanty element	
_				Localised but permanent changes to hydror	norphology					Loca	calised but permanent changes to hydromorphology				Creation or removal of	of 385m of new realigned channel (including of approx. 300m existing culvert). Localised but						Localised by However, exis	ut permanent changes to hydromorphology regime. Iting watercourse is currently culverted at this location		Localised but per	rmanent changes to hydromorphology										Localised improvement when effects	
River continuity		Element is insensitive to impact Element	insensitive to impact Element is insen	tive to impact anticipated, but no change in quality elembalanced against mitigation embedded in t	continuity ment when the scheme.	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	en bali	egime. Localised adverse effects on river continuity inticipated, but no change in quality element when lanced against mitigation embedded in the scheme.	Element is insensitive to impact Element	t is insensitive to impact		perman Localise	unent changes to hydromorphology regime. Led improvement in flow continuity, but n o change in quality element.	nent is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact Elem	ent is insensitive to impact Eler		ting Yamfield Lane road crossing. Therefore negligible ated on river continuity relative to existing condition. Io measureable change in quality element.	Element is insensitive to impact	Element is insensitive to impact anticipated, but balanced against	ed adverse effects on river continuity it no change in quality element when it mitigation embedded in the scheme. Element is insensitive to im	act Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact Element is in	ensitive to impact	Element is insensitive to impact	Element is insensitive to impact Element is in	sensitive to impact			considered in combination, but no change in quality element.	N/a
hological Qu	Supports Good Supports good by 20	015	at change to histography already				Creation of ACC - F	Localized but names	N/A	/A - Hydromorphology effects screened out for scheme design component			N/A - Hydromor	torphology effects screened out for scheme N/A - Hydromory design component	Creation	ion of 385m of new realigned channel, with	Local	ocalised but permanent improvement to		ation of 185m of new particular investigation				Localised	ed but permanent changes to hydromorphology			Creation of 100m of account	Localized but narrowant drawn to be increased in	N/A - Hydromorphology effects screened ou design component	st for scheme	with Localized but agreement of the second o					None required None required by
River depth and width va	ariation	Creation of 12 um of new realigned channes, with incorporated hydromorphological improvements (resulting in 5m net gain of river channes). However negligible effect anticipated on river depth and width.	it change to hydromorphotogical gible effect anticipated on river epth and width upstream and easureable change in quality element.	tocaused out permanent changes to hydror regime. Localised adverse effects on river width anticipated, but no change in qualit when balanced against mitigation embed	morphology depth and ty element Element is insensitive to impact dded in the	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and river depth and variation upstream and downstream. No measureable change in quality	Creation or 40m or new realigned channel, with incorporated hydromorphological improvements (resulting in 20m net loss of river channel). However negligible effect anticipated on river depth and width.	Locaised but permanent change to hydromorphologic regime. However negligible effect anticipated on river processes and river depth and width upstream and downstream. No measureable change in quality element.	Element is insensitive to impact	Loc req wi	caused out permanent changes to nyroromorphology egime. Localised adverse effects on river depth and width anticipated, but no change in quality element when balanced against mitigation embedded in the	Element is insensitive to impact processes and river downstream. No	anent changes to hydromorphology agligible effect anticipated on river depth and variation upstream and measureable change in quality		incorpo (including Localised b rezime, Loc	torated nydromorphological improvements ng removal of approx. 300m existing culvert). but permanent changes to hydrothyddiaddiaddiaddiaddiaddiaddiaddiaddiaddi	hydromo approx. 300m anticipated o uostream ar	calised but permanent improvement to morphological regime (including removal of 00m existing culvert). However negligible effect ed on river processes and river depth and width n and downstream. No measureable change in quality element.	Element is insensitive to impact (result neglig	tion or zasm or new realigned channel, with propriated hydromorphological improvements regime. However processes and downstream downstream	manent change to hypromorphological r regligible effect anticipated on river river depth and width upstream and No measureable change in quality element.	Element is insensitive to impact beneath exist effect antic	ut permanent changes to hydromorphology regime. Isting watercourse is currently culverted at this location Isting Yarnfield Lane road crossing. Therefore negligible cipated on river depth and width relative to existing	regime Element is insensitive to impact Lane roa	me. However, existing watercourse is currently regime. Localise width anticipated and crossing. Therefore no effect anticipated on processes and river denth and variation unstream when balanced	rmanent changes to hyporomorphology ed adverse effects on river depth and ed, but no change in quality element d against mitigation embedded in the	Localised but permanent changes to hydromorphic regime. However negligible effect anticipated on a processes and river depth and variation upstram downstream. No measurable change in quality	logy Creation or 3 50m of new realigned channel, with liver (resulting in 10m net loss of river channel). However and negligible effect anticipated on river depth and width. No measureable change in quality element.	Localised out permanent change to hydromorphological regime. However negligible effect anticipated on river processes and river depth and width upstream and downstream. No measureable change in quality	sensitive to impact	creation of 21um of new realigned channer, incorporated hydromorphological improvem (resulting in 10m net gain of river channel). Ho negligible effect anticipated on river depth and	uch Locarused out permanent change to hydromorphological refressions. However negligible effect anticipated on river processes and river depth and width upstream and downstream. No measureable change in quality element.	sensitive to impact			Localised improvement when effects considered in combination, but no change in quality element.	N/a
		No measureable change in quality element.	element.	scheme.		element	No measureable change in quality element.	clement.			schieme.		element			but no change in quality element.	-	quality element.		o measureable change in quality element.	element.	conditi	on. No measureable change in quality element.	and dow	ownstream. No measureable change in quality element	scrieme.	and the second of the second o	No measuréable change in quality element.	element.		No measureable change in quality elemen	nt. element.	None. Water body downstream (Trent f Brook to River Tame) affected by Prop but no widespread adverse impacts id	om Moreton sed Scherne httlifed with affect water			
	of the share had	Creation of 120m of new realigned channel, with incorporated hydromorphological improvements regime. However ne	et change to hydromorphological gible effect anticipated on river	Localised but permanent changes to hydror regime. Localised adverse effects on struct	morphology ure of river	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river	y Creation of 40m of new realigned channel, with incorporated hydromorphological improvements femilies in 10m - 15m.	Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river	al Clamant - Investigation	Loc	calised but permanent changes to hydromorphology agine. Localised adverse effects on structure of river	Localised but perma regime. However no	enent changes to hydromorphology egligible effect anticipated on river		Creatio incorpo	ion of 385m of new realigned channel, with sociated hydromorphological improvements property of the pages 200	Local hydromo approx 300m	ocalised but permanent improvement to morphological regime (including removal of 00m existing culvert). However negligible effect	Cre inc	ation of 285m of new realigned channel, with reporated hydromorphological improvements regime. However, the control of the con	manent change to hydromorphological r negligible effect anticipated on river	Localised by However, exis	tut permanent changes to hydromorphology regime. sting watercourse is currently culverted at this location	Localises regime culverted	sed but permanent changes to hydromorphology me. However, existing watercourse is currently ed at this location beneath existing Yarnfield Lane regime. Localised but per	rmanent changes to hydromorphology nd adverse effects on structure of river	Localised but permanent changes to hydromorphic regime. However negligible effect anticipated on i	logy Creation of 190m of new realigned channel, with incorporated hydromorphological improvements	Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river	andha ta innert	Creation of 210m of new realigned channel, incorporated hydromorphological improvem	with Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river	body (e.g. restrictive structures signification) biological continuity)	ttly affecting		Localised improvement when effects	
Structure and substrate of		(resulting in 5m net gain of river channel). However negligible effect anticipated on structure and substrate of river bed. No measureable change in quality element.	measureable change in quality element.	bed anticipated, but no change in quality el balanced against mitigation embedded in	the scheme.	upstream and downstream. No measureable change in quality element	(resulting in 20m net loss of river channel). However in negligible effect anticipated on structure and substrate of river bed. No measureable change in quality element.	processes structure and substrate of river bed upstream and downstream. No measureable change in quality element.	і постинує то япрасс	bed bal:	d anticipated, but no change in quality element when lanced against mitigation embedded in the scheme.	Element is insensitive to impact processes and strupstream and down	estream. No measureable change in quality element		urkluding Localised river	ng removal of approx. 300m existing culvert). Elen di improvement in structure and substrate of rr bed, but no change in quality element.	nent is insensitive to impact anticipated o upstream an	emorphological regime (including removal or Oom existing culvert). However negligible effect ed on river processes and substrate of river bed in and downstream. No measureable change in quality element.	neglig of river	ng in no net gain/loss of river channes). However processes struct- ole effect anticipated on structure and substrate oed. No measureable change in quality element.	re and substrate of river bed upstream m. No measureable change in quality element.	Element is insensitive to impact beneath exist effect antic condition	cipated on structure of river bed relative to existing ion. No measureable change in quality element.	Element is insensitive to impact road cro procer upstrean	cesses and structure and substrate of river bed bed anticipated, it amam and downstream. No measureable change in quality element	but no change in quality element when t mitigation embedded in the scheme.	upstream and downstream. No measureable char quality element	ige in negligible effect anticipated on structure and substrate of river bed. No measureable change in quality element.	processes structure and substrate of river bed upstream and downstream. No measureable change in quality element.	impact	negligible effect anticipated on structure and su of river bed. No measureable change in quality	shotstrate and downstream. No measureable change in quality element.	AN HIPPANA			in quality element.	N/a
																ion of 385m of new realizant channel with			nation of 385m of new realizant channel with			of 285m of new realizand channel with	at permanent loss of riparian was likeways and like														
Structure of the riparian	zone	Creation of 120m of new realigned channel, with incorporated riparian improvements (resulting in 5m net gain of river channel). Localized improvement, but no change in quality element.	Creation of 120m of new incorporated riparian improv gain of river channel. Such ange in our change	ealigned channel, with ments (resulting in 5m net ad improvement, but no ty element. Localised but permanent loss of riparian zon but no change in quality element when i against mitigation embedded in the se	ne. Localised anticipated, balanced Element is insensitive to impact theme.	Element is insensitive to impact	Creation of 40m of new realigned channel, with incorporated riparian improvements (resulting in 20m net loss of river channel). Localised improvement, but no change in quality element.	Element is insensitive to impact	Creation of 120m of new realigned channel, with incorporated riparian improvements (resulting in 5m net gain of river channel). Localised improvement, but no change in quality element.	Loca adve b	calised but permanent loss of riparian zone. Localised eruse effects on structure of riparian zone anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact Element	t is insensitive to impact		Creatio incorpora (including Locallised in	on of 385m of new realigned channel, with stated rigarian/marginal habitat improvements ang removal of approx. 300m existing culvert). improvement in structure of riparian zone, but no change in quality element.	existing 300m culvert. Localised but duction in shading of section of river ed improvement in structure of riparian it no change in quality element.	Creat incorpor Element is insensitive to impact (includi Localised	porated riparian/marginal habitat improvements inc credit incompared to the province of the p	tion of 285m of new realigned channel, with porated hydromorphological improvements go in no net gain/loss of river channel). Localised rovement, but no change in quality element.	ent is insensitive to impact (resulting in no improvement)	of 285m of new realigned channel, with tated hydromorphological improvements no net gain(loss of river channel). Localised watercourse ment in structure of riparian zone, but no change in quality element.	is currently culverted at this location beneath existing e road crossing. Therefore negligible effect anticipated re of riparian zone relative to existing condition. No	Element is insensitive to impact	Element is insensitive to impact adverse effects or but no change agreement with	manent loss of riparian zone. Localised structure of riparian zone anticipated, ri quality element when balanced (gation embedded in the scheme.	Sect Element is insensitive to impact	Creation of 190m of new realigned channel, with incorporated riparian improvements (resulting in 10m net loss of river channel). Localised improvement, but no change in quality element.	Creation of 190m of Incorporated riparian in et loss of river channe no change	ew realigned channel, with provements (resulting in 10m . Localised improvement, but squality element.	Creation of 210m of new realigned channel, incorporated riparian improvements (resulting net gain of river channel). Localised improveme no change in quality element	with in 10m	ew realigned channel, with provements (resulting in 10m . Localised improvement, but quality element.			Localised improvement when effects considered in combination, but no change in quality element.	N/a
				The state of the s												no change in quanty element.			no change in quality element.			charige in quanty element.	measureable change in quality element.						III Crisings			TO Mange					

Table 53: Trent and Mersey Canal, summit to Alrewas (GB70410142) detailed impact assessment - effects on current status Detailed Impact Assessment Results Detailed Impact Assessment Surface water body: Trent and Mersey Canal, summit to Alrewas Water body ID: Watercourse: Trent and Mersey Canal GB70410142 WFD-TMC-W-01-01 Hydromorphological designation: Scheme component: Artificial Water Body (AWB) Overall effects on element Additional mitigation requirements Viaduct Description of scheme component: Great Haywood Viaduct; Approx. viaduct width: 15m; Approx. viaduct length: Overall Status: 780m; Approx. viaduct height: 16m **Cumulative effects - effects on element** WFD compliance outcome -Residual effect on Summary of embedded mitigation: Clear span viaduct. Viaducts designed to cross perpendicular to river channel from scheme component(s) located in potential for deterioration Status Objective: Good by 2015 wherever possible to reduce shading impact. element other WFD water bodies of current status Summary of scheme components proposed on watercourses within Summary of effects on elements Overall effect on element water body catchment with the potential to effect element status WFD Classification Elements **Current Status** Status Objective Trent and Mersey Canal: The viaduct will cause some minor, Some minor, localised and periodic shading of river channel. However Negligible effect anticipated in when effects viaduct (WFD-TMC-W-01-01) localised and periodic shading of Macrophytes and Phytobenthos - combined Not assessed by 2015 negligible effect on macrophytes and phytobenthos anticipated. No idered in combination. No measureable change river channel. This will have a measureable change in quality element. in quality element negligible effect on macrophytes and phytobenthos, macroinvertebrates and fish. Some minor, localised and periodic shading of river channel. However Negligible effect anticipated in when effects Compliant - no change in biological None required Not assessed by 2015 negligible effect on macroinvertebrates anticipated. No measureable change onsidered in combination. No measureable change Macroinvertebrates status of water body in quality element. in quality element Negligible effect anticipated in when effects Some minor, localised and periodic shading of river channel. However negligible effect on fish anticipated. No measureable change in quality Not assessed by 2015 sidered in combination. No measureable change element. in quality element The viaduct will cause some minor, Some minor, localised and periodic shading of river channel (with potential localised and periodic shading of Negligible effect anticipated in when effects associated reduction in photosynthetic activity by aquatic flora). However, river channel. This will have a lered in combination. No measureable change Dissolved oxygen N/a negligible effect on dissolved oxygen concentrations anticipated. No negligible effect on dissolved in quality element measureable change in quality element. oxygen and water temperature. lement is insensitive to impact. No measureable Good by 2015 Element is insensitive to impact N/a change to quality element Compliant - no change in None required None required physicochemical status of water body ement is insensitive to impact. No measureable Element is insensitive to impact change to quality element None ement is insensitive to impact. No measureable Good by 2015 Element is insensitive to impact N/a change to quality element Some minor, localised and periodic shading of river channel. However, Negligible effect anticipated in when effects negligible effect on water temperature anticipated. No measureable change in Good by 2015 sidered in combination. No measureable change N/a quality element. in quality element Ammonia (Annex 8), Copper, Triclosan, Zinc N/A - Specific pollutants effects screened out for scheme design component Quantity and dynamics of water flow Connection to groundwater bodies River continuity Not assessed by 2015 N/A - Hydromorphology effects screened out for scheme design component River depth and width variation Structure and substrate of the river bed Structure of the riparian zone

Table 54: Sow - Doxey Bk	to R Penk (GB104028046790)	ı) detailed impact assess	sment - effects on	n current status																	
Surface water body Water body ID:	: Sow - Doxey Bk to R P GB104028046790	Penk		Watercourse:					Detailed Impact Assessment Unnamed tributary of Kingston Brook 2							Detailed Impact Asso	essment Results				
Hydromorphological designa	ition: Heavily Modified W	Vater Body (HMWB)		Scheme component:		WFD-SDP-T-02-01 Culvert			WFD-SDP-T-02-02 Realignment			WFD-SDP-T-02-03 Access road culvert				Overall effects on element		Additional mitigation	on requirements		
Overall Status:	Moderate		Descrip	ption of scheme component:	Hopton Culv	ert; Approx. culvert length: 33m; Approx. culvert dimensions:	4.2m x 1.35m	Approx. total length of new i	realigned channel: 125m; Approx. total length of existing chan	nel: 100m; Total net gain: 25m		Approx. culvert length: 10m; Approx. culvert diameter: 0.9m		umulative effects - effects							WFD compliance
Status Objective:	Moderate by 2015		Summa	ary of embedded mitigation:	maintain natural substrate. Culvert sized to minimise impact and to ensure appropriate low flow water depths and velocities are supported to the contract of t	cticable. Invert of culvert to be buried 300mm below the exist on flow continuity. Detailed design to be developed in gene ocities for fish passage. Hydromorphological improvements to downstream of the culvert to compensate for footprint loss.	ral accordance with CIRIA and Environment Agency guidance be undertaken to river channel immediately upstream and	incorporation of appropriate features equivalent to those condition over the existing condition where reasonably practices.	ced as far as reasonably practicable. Design of the new channel ost along the existing channel footprint. Where natural water cticable (provided this is compatible with the watercourses' flow for a 10m wide buffer zone for the implementation of marg	course, the design will aim to enhance hydromorphological ood risk and land drainage functions). In addition, the design	maintain natural substrate. Culvert sized to minimise impac and to ensure appropriate low flow water depths and velo	cticable. Invert of culvert to be buried 300mm below the existict on flow continuity. Detailed design to be developed in generocities for fish passage. Hydromorphological improvements to downstream of the culvert to compensate for footprint loss.	ring bed level to reduce disruption to sediment transfer and eral accordance with CIRIA and Environment Agency guidance	on element from scheme mponent(s) located in other WED water hodies	Summary of scheme components propos on watercourses within water body	ed Summary of effects on elements	Overall effect on element	ruction	ration	Residual effect on element	outcome - potential for deterioration of current status
WFD Classification I	Elements	c	Current Status	Status Objective	Footprint	Shading	Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream	Footprint	Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream	Creation of new habitats	Footprint	Shading	Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream		catchment with the potential to effect element status			Const	Ope		
	Macrophytes and P combined	Phytobenthos - Po	oor	Moderate by 2015	Localised but permanent loss of open river habitat. Localised adverse effects on macrophytes and phytobenthos anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent shading of section of river channel. Localised adverse effect on macrophytes and phytobenthos anticipated (due to a reduction in photosynthetic activity), but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and macrophytes and phytobenthos habitat upstream and downstream of culvert. No measureable change in quality element.	Creation of 125m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements (resulting in 25m net gain of river channel). Localised improvement in macrophytes and phytobenthos habitat, but no change in quality element.		Creation of 125m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements (resulting in 25m net gain of river channel). Localised improvement in macrophytes and phytobenthos habitat, but no change in quality element.	Localised but permanent loss of open river habitat. Localised adverse effects on macrophytes and phytobenthos anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent shading of section of river channel. Localised adverse effect on macrophytes and phytobenthos anticipated (due to a reduction in photosynthetic activity), but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and macrophytes and phytobenthos habitat upstream and downstream of culvert. No measureable change in quality element.		Culverts Unnamed tributary of Kingston Brook 2 - culvert (WFD-SDP-T-02-01) - 33m - access road culvert (WFD-SDP-T-02-03) - 10m Total net length of new culverted river channel = 43m Resultant net loss of open river channel = 43m	Culverts The 43m net length of new culverting will cause a localised but permanent loss of existing river habitat and shading. This will have a minor, localised adverse effect on macrophytes and phytobenthos, macroinvertebrates and fish. The 33m culvert on the 'Unnamed tributary of Kingston Brook 2' watercours also has the potential to inhibit fish passage and spawning migration. However, baseline field surveys have recorded limited fish habitat potential upstream of the proposed culvert location and the watercourse has been scoped out by the ecological baseline assessment due to poor habitat potential for fish. The watercourse at this site location has also been	scheme.			N/A	-
Biological Quality Elements	Macroinvertebrates	es Go	ood	Good by 2015	Localised but permanent loss of open river habitat. Localised adverse effects on macroinvertebrates anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Localised adverse effects on macroinvertebrates anticipated (including due to a reduction in/loss of riparian and aquatic	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and macroinvertebrate habitat upstream and downstream of culvert. No measureable change in quality element.	habitat improvements (resulting in 25m net gain of river	Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river processes and macroinvertebrate habitat upstream and downstream. No measureable change in quality element.	Creation of 125m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements (resulting in 25m net gain of river channel). Localised improvement in macroinvertebrate habitat, but no change in quality element.	Localised but permanent loss of open river habitat. Localised adverse effects on macroinvertebrates anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	The second secon	regime. However negligible effect anticipated on river processes and macroinvertebrate habitat upstream and		Total length of new realigned river chann = 125m Total length of existing river channel = 100m	observed to run dry due to effects of the existing Hopton Pools impoundment upstream (further limiting habitat potential for fish). This in culvert will therefore have only a minor, localised adverse effect on fish.	Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.	None required	None required.	N/A	Compliant - no change in biological status of water body
	Fish	М	1 oderate	Moderate by 2015	spawning habitat potential upstream of culvert location. Watercourse at site location also observed to run dry also,	Localised but permanent shading of culverted section of channel. Localised adverse effects on fish anticipated (including due to a reduction in/loss of riparian and aquatic vegetation), but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and fish habitat upstream and downstream of culvert. No measureable change in quality element.	Creation of 125m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements (resulting in 25m net gain of river channel). Localised improvement in fish habitat, but no change in quality element.	Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river processes and fish habitat upstream and downstream. No measureable change in quality element.	Creation of 125m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements (resulting in 25m net gain of river channel). Localised improvement in fish habitat, but no change in quality element.	Localised but permanent loss of open river habitat. Localised adverse effects on fish anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent shading of culverted section of channel. Localised adverse effects on fish anticipated (including due to a reduction in/loss of riparian and aquatic vegetation), but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and fish habitat upstream and downstream of culvert. No measureable change in quality element.			and phytobenthos, macroinvertebrates and fish.	Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.			N/A	
	Dissolved oxygen	G	ood	Good by 2015	Element is insensitive to impact	Localised but permanent shading of culverted section of channel. Potential to lead to minor and localised impact on dissolved oxygen concentrations (due to reduced photosynthetic activity by aquatic flora). Localised adverse effects anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and dissolved oxygen upstream and downstream	Creation of 125m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements. However negligible effect anticipated on dissolved oxygen concentrations. No measureable change in quality element.	Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river processes and dissolved oxygen concentrations upstream and downstream. No measureable change in quality element.	incorporated hydromorphological and riparian/marginal	Element is insensitive to impact	Localised but permanent shading of culverted section of channel. Potential to lead to minor and localised impact on dissolved oxygen concentrations (due to reduced photosynthetic activity by aquatic flora). Localised adverse effects anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and dissolved oxygen upstream and downstream			Culverts The 43m net length of new culverting will cause a localised but permanent shading of the river channel. This will have a minor, localised adverse effect on dissolved oxygen and water temperature. Realignments The creation of 125m of realigned channel on the 'Unnamed tributary of Kingston Brook 2' watercourse (resulting in a net gain of 25m of river channel), will cause a localised but permanent improvement in hydromorphological regime and marginal/riparian habitat. This will have a negligible effect on dissolved oxygen, ammonia and phosphate concentrations.	Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.			N/A	
s	рН	Hi	igh	Good by 2015	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact				Element is insensitive to impact. No measureable change to quality element			N/A	
sicochemical Quality Elemen'	Phosphate	М	1oderate	Good by 2027	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Creation of 125m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements. Potential localised reductions in fine sediment inputs and nutrient loading. However negligible effect anticipated on phosphate concentrations. No measureable change in quality element.	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact				Negligible effect anticipated in when effects considered in combination. No measureable change in quality element	None required	None required.	N/A	Compliant - no change in physicochemical status of water body
Phy	Ammonia	н	igh	Good by 2015	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Creation of 125m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements. Potential localised reductions in fine sediment inputs and nutrient loading. However negligible effect anticipated on ammonia concentrations. No measureable change in quality element.	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	None			Negligible effect anticipated in when effects considered in combination. No measureable change in quality element			N/A	
	Temperature	Hi	igh	Good by 2015		Localised but permanent shading of culverted section of channel. Potential to lead to minor and localised impact on water temperature. Localised adverse effects anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Localised but permanent shading of culverted section of channel. Potential to lead to minor and localised impact on water temperature. Localised adverse effects anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact				Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.			N/A	
Specific Pollutants	Ammonia, Copper,	, Triclosan, Zinc			N/A - S	Specific pollutants effects screened out for scheme design con	nponent	N/A - :	Specific pollutants effects screened out for scheme design con	nponent	N/A - S	Specific pollutants effects screened out for scheme design com	nponent								
	Quantity and dynar	amics of water flow			Localised but permanent changes to hydromorphology regime. Localised adverse effects on flow dynamics (including potential localised increases in flow velocity) anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and quantity and dynamics of flow upstream and downstream. No measureable change in quality element	incorporated hydromorphological improvements (resulting in 25m net gain of river channel). Localised improvement in	Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river processes and quantity and dynamics of flow upstream and downstream. No measureable change in quality element.		Localised but permanent changes to hydromorphology regime. Localised adverse effects on flow dynamics (including potential localised increases in flow velocity) anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and quantity and dynamics of flow upstream and downstream. No measureable change in quality element			Culverts The 43m net length of new culverting will cause a localised but permanent change in hydromorphological regime. This will have a minor, localised adverse effect on flow dynamics, river continuity, river widths and depth, structure of substrate, and structure of riparian zone. Realignments The creation of 125m of realigned channel on the 'Unnamed tributary of Kingston Brook 2' watercourse (resulting in a net gain of 25m of river	Negligible effect anticipated in when effects considered in combination. No measureable change in quality element			N/A	
	Connection to grou	undwater bodies			Localised but permanent loss of connection to surrounding shallow groundwater within superficial deposits. However no likely effect anticipated on connection to groundwater bodies. No measureable change in quality element.	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Localised but permanent loss of connection to surrounding shallow groundwater within superficial deposits. However no likely effect anticipated on connection to groundwater bodies. No measureable change in quality element.	Element is insensitive to impact	Element is insensitive to impact			channel), will cause a localised but permanent improvement in hydromorphological regime and marginal/riparian habitat. This will have a minor, localised beneficial effect on flow dynamics and structure of riparian zone.	Negligible effect anticipated in when effects considered in combination. No measureable change in quality element			N/A	
cal Quality Elements	River continuity		Supports good	Supports good by 2015	Localised but permanent changes to hydromorphology regime. Localised adverse effects on river continuity anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. Localised adverse effects on river continuity anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Element is insensitive to impact				Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.	None required	None required.	N/A	Compliant - no change in hydromorphological status of
Hydromorphologi	River depth and wi				Localised but permanent changes to hydromorphology regime. Localised adverse effects on river depth and width anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and river depth and variation upstream and downstream. No measureable change in quality element	Creation of 125m of new realigned channel, with incorporated hydromorphological improvements (resulting in 25m net gain of river channel). However negligible effect anticipated on river depth and width. No measureable change in quality element.	Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river processes and river depth and width upstream and downstream. No measureable change in quality element.	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. Localised adverse effects on river depth and width anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and river depth and variation upstream and downstream. No measureable change in quality element				Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.			N/A	water body
	Structure and subst	strate of the river bed			Localised but permanent changes to hydromorphology regime. Localised adverse effects on structure of river bed anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and structure and substrate of river bed upstream and downstream. No measureable change in quality element	Creation of 125m of new realigned channel, with incorporated hydromorphological improvements (resulting in 25m net gain of river channel). However negligible effect anticipated on structure and substrate of river bed. No measureable change in quality element.	Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river processes structure and substrate of river bed upstream and downstream. No measureable change in quality element.	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. Localised adverse effects on structure of river bed anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and structure and substrate of river bed upstream and downstream. No measureable change in quality element				Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.			N/A	
	Structure of the rip	parian zone			Localised but permanent loss of riparian zone. Localised adverse effects on structure of riparian zone anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Element is insensitive to impact	Creation of 125m of new realigned channel, with incorporated riparian improvements (resulting in 25m net gain of river channel). Localised improvement, but no change in quality element.	Element is insensitive to impact	Creation of 125m of new realigned channel, with incorporated riparian improvements (resulting in 25m net gain of river channel). Localised improvement, but no change in quality element.		Element is insensitive to impact	Element is insensitive to impact				Negligible effect anticipated in when effects considered in combination. No measureable change in quality element			N/A	

Table 55: Meece Brook from Source to Chatcull Brook	ook (GB104028053080) de	letailed impact assessment - effects on Brook	o current status											Detailed Im _l	npact Assessment														Detailed Impact Assessment Result			
Water body ID: GB104028053080 Hydromorphological designation: Not A/HMWB		Waterco Scheme compo	ourse:		NEE-T-02-01 al of existing highway culvert)		Highway Realignment Culvert (on re	WFD-MEE-T-02-02	g highway culvert; see WFD-MEE-T-02-01)		WFD-MEE-T-02-03 Access road culvert (on realigned channel)	Unnamed tributary		WFD-MEE-T-02-04	iel)	WFD-MEE-T-02-05 Underbridge		WFD-MEE-T-02-06 Access road culvert (on realigned chann	n		WFD-MEE-T-02-07 Realignment		WFD-MEE-W-01-01 Viaduct	Meece Br	rook WFD-MEE-W-01-02 Realignment				Overall effects on element	Ad	ditional mitigation requirements	
Overall Status: Poor		Description of scheme compo	onent: Appro	t. total length of new realigned channel: 100m; Approx. total lengt		d); Total net gain: Sm		Approx. culvert length: 10m; Approx. culvert dimensions			Approx. culvert length: 10m; Approx. culvert dimensions: 0.9m			prox. culvert length: 10m; Approx. culvert dimensions: 0		Swynnerton Footpath 10 Underbridge; Approx. total lengt of underbridge: 70m: Approx. total width of underbridge		Approx. culvert length: 10m; Approx. culvert dimensions: 0		Approx. total length of new r	realigned channel: 45m; Approx. total length of existing chann	el: 30m; Total net gain: 15m	Meece Brook Viaduct; Approx. viaduct width: 15m; Appro: viaduct length: 240m; Approx. viaduct height: 12m	Approx. total length of new realig	ligned channel: 65m; Approx. total length of existing channel: 55m;	n; Total net gain: 10m	ulative effects - effects on		Ordin Circus of Cicincil	~	anional miligation requirements	WFD compliance
Status Objective: Good by 2027		Summary of embedded mitiga	The length of watercourse realignments has beer ation: the existing channel footprint. Where natural war and land drait	reduced as far as reasonably practicable. Design of the new chan rercourse, the design will aim to enhance hydromorphological con age functions). In addition, the design of the new channel will allo	el will also ensure the equivalent hydraulic capacity and inco tion over the existing condition where reasonably practicabl for a 10m wide buffer zone for the implementation of marg	proporation of appropriate features equivalent to those lost all le (provided this is compatible with the watercourses' flood is ginal/riparian improvements.			existing bed level to reduce disruption to sediment transfer and ed in general accordance with CIRIA and Environment Agency improvements to be undertaken to river channel immediately											The length of watercourse realignments has been reduc incorporation of appropriate features equivalent to those k condition over the existing condition where reasonably p			Clear span viaduct. Viaducts designed to cross perpendicular to river channel wherever possible to reduc shading impact.	incorporation of appropriate features equivalent to those lost a	as far as reasonably practicable. Design of the new channel will al- along the existing channel footprint. Where natural watercourse, t cticable (provided this is compatible with the watercourses' flood r w for a 10m wide buffer zone for the implementation of marginal/	, the design will aim to enhance hydromorphological CON	element from scheme ponent(s) located in other WFD water bodies					Residual effect on outcome - potential for deterioration of curre status
WFD Classification Elemen	ents C	Current Status Status Object		Shading	Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream	0	up Footprint	pstream and downstream of the curvert to compensate for fo	Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream			Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream		n and downstream of the curvert to compensate for root Shading	Changes to water body hydromorphology leading changes in river processes and habitats upstream a downstream	0	- Op-	stream and downstream or the curvert to compensate for roo	Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream		allow for a 10m wide outler took for the implementation or more considerable to the changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream		Shading		w tor a 10m wide outlet zone for the implementation or marginal// Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream		watercour	of scheme components proposed on ses within water body catchment with otential to effect element status	Summary of effects on elements	Overall effect on element	Construction	
Macrophytes and combined	nd Phytobenthos - M	Aoderate Good by 2027	Creation of 100m of new realigned channel, incorporated hydromorphological and riparian/habitat improvements (resulting in 5m net gain channel). Localised improvement in macrophy phytobenthos habitat, but no change in quality	with harginal of existing 10m culvert. Localised but perman reduction in shading of section of river channel. Localise improvement in macrophyte and phytobenthos habit anticipated, but no change in quality element.	regime. However negligible effect anticipated on river processes and macrophytes and phytobenthos habita	cal Creation of 100m of new realigned channel, with incorporated hydromorphological and riparian/margir at habitat improvements (resulting in 5m net gain of my channel). Localized improvement in macrophytes an phytobenthos habitat, but no change in quality eleme	Localised adverse effects on macrophytes and phytobenthos anticipated, but no change in quality element when balanced against mitigation embedded	Localised but permanent shading of section of rive channel. Localised adverse effect on macrophytes an phytobenthos anticipated (due to a reduction photosynthetic activity), but no change in quality elem when balanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and macrophytes and phytobenthos habitat upstream and downstream of culvert. Mo measureable change in quality element.	Localised but permanent loss of open river habitat. Localised adverse effects on macrophytes and phytoberthos anticipated, but no chape in quality element when balanced against mitigation embedded in the scheme.	phytobenthos anticipated (due to a reduction in	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and macrophytes and phytobenthos habitat upstream and downstream of culvert. No measureable change in quality element.	element when balanced against mitigation embedded in	Localised but permanent shading of section of river channel. Localised adverse effect on macrophytes and phytobenthos anticipated (due to a reduction in photosynthetic activity), but no change in quality eleme when balanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorpholo regime. However negligible effect anticipated on riv processes and macrophytes and phytobenthos habit upstream and downstream of culvert. No measureal change in quality element.		Localised but permanent loss of open river habitat. Localised adverse effects on macrophytes and phytobenthos anticipated, but no change in quality element when balanced against mitigation embedded the scheme.	Localised but permanent shading of section of river channel. Localised adverse effect on macrophytes and phytobenthos anticipated (due to a reduction in photopynthetic activity), but no change in quality eleme when balanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and macrophytes and phytobenthos habitat upstream and downstream of culvert. No measureable change in quality element.	Creation of 45m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements (resulting in 15m net gain of river channel). Localised improvement in macrophytes and phytobenthos habitat, but no change in quality element.	Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river processes and macrophytes and phytobenthos habitat upstream and downstream. No measureable change in quality element.	incorporated hydromorphological and riparian/marginal habitat improvements (resulting in 15m net gain of river channel). Localised improvement in macrophytes and	Some minor, localised and periodic shading of river channel. However negligible effect on macrophytes and phytobenthos anticipated. No measureable change in quality element		Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river processes and macrophytes and phytobenthos habitat chann upstream and downstream. No measureable change in proce	tat improvements (resulting in 10m net gain of river anel). However negligible effect anticipated on river cesses and macrophytes and phytobenthos habitat	Underbridg Unnamed tr - underbridg Culverts & C	D-MEE-W-01-01) mac s Und butary of Meece Brook 2: The (WFD-MEE-T-02-05) on r ulvert Removal Cub	aducts we value to will cause some minor, localised and periodic shading of river channel. This will have a negligible effect on acrophytes, phytobenthos, macroinvertebrates and fish. **nderbridge** **nd	mitigation embedded in the scheme.		N/a
Macroinvertebral Page Page Page Page Page Page Page Page	rates M	Aoderate Good by 2027	incorporated hydromorphological and riparian/	with Removal of existing 10m culvert. Localised but perman reduction in shading of section of river channel. Localise improvement in macroinvertebrate habitat anticipate the laterate confidence in contraste in prairia and aquatic vegetation), but no change in quality element.	nt d d regime. However negligible effect anticipated on river processes and macroinvertebrate habitat upstream an downstream. No measureable change in quality eleme	Continued 100m of new realizand shaped with	Localised but permanent loss of open river habitat.	Localised but permanent shading of section of rive channel. Localised adverse effects on macroinvertebrant and staticipated (including due to a reduction in/loss of rigar and squarts vegetation), but no change in quality den when balanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and macroinvertebrate habitat upstream and downstream of culvert. No measureable change in quality element.	Eocalised but permanent loss of open river habitat.	Localised but permanent shading of section of river channel. Localised adverse effects on macroinvertebrates anticipated (including due to a reduction infloss of riparian and aquatic vegetation), but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and macroinvertebrate habitat upstream and downstream of culvert. No measureable change in quality element.	Localised but permanent loss of open river habitat. Localised adverse effects on macroinvertebrates anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Localized but permanent shading of section of river channel. Localised adverse effects on macroinvertebrats intelepisted (including due to a reduction lin/loss of ripari and squate vegetation), but no thange in quality de	Localised but permanent changes to hydromorpholo regime. However negligible effect anticipated on riviant processes and macroinvertebrate habitat upstream and downstream of culvert. No measureable change in quelement.		Localised but permanent loss of open river habitat. Localised adverse effects on macroinvertebrates anticipated, but no change in quality element when balanced against mitigation embedded in the scheme	Localized but permanent shading of section of river channel. Localised adverse effects on macroinvertebrat articipated (including due to a reduction, infest of ripart and aquatic vegetation), but no change in quality de	regime. However negligible effect anticipated on river	Creation of 45m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements (resulting in 15m net gain of river channel). Localized improvement in macroinvertebrate habitat, but no change in quality element.	Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river processes and macroinvertebrate habitat upstream and downstream. No measureable change in quality element.	Creation of 45m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements (resulting in 15m net gain of river channel). Localised improvement in macroinvertebrate habitat, but no change in quality element.		channel). However negligible effect anticipated on river p	Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river habits processes and macroinvertebrate habitat upstream and ownstream. No measureable change in quality element.	Creation of 65m of new realigned channel, with portated hydromorphological and riparian/marginal tat improvements fessibilities in 10m net gain of river neel). However regisplies effect anticipated on river sesses and microinvertebrate habitat upstream and stream. No measureable change in quality element.	- realignmer culver1 (WF - highway re 10m - access road - access road - access road	(with removal of existing highway have) AMEE-T-02-01-10m ligmment culvert (WFD-MEE-T-02-02)-10m culvert (WFD-MEE-T-02-03)-10m culvert (WFD-MEE-T-02-03)-10m of a logical culvert (WFD-MEE-T-02-03)-10m of a for me culvert (WFD-MEE-T-02-03)-10m of a for me culvert deformer of the form	eve a minor, localised adverse effect on macrophytes, phytobenthos, macroinvertebrates and fish.	Localised adverse effect anticipated when scheme component effects considered in	None required None required	N/a Compliant - no change in biological status of water bi
Fish	Pc	foor Good by 2027	incorporated hydromorphological and riparian/ habitat improvements (resulting in 5m net gain channel). Localised improvement in macroinve	with Removal of existing 10m culvert. Localised but perman reduction in shading of section of river channel. Localise for river channel improvement in fish habitat anticipated (including due lebrate increase in riparian and augustic vegetation), but no chain quality element.	d Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river	cal for the component of the component o	inal Localised but permanent loss of open river habitat. Localised adverse effects on fish anticipated, but no chain in quality element when balanced against mitigation		n of education of the control of the	Localised but permanent loss of open river habitat. Localised adverse effects on fish anticipated, but no changin quality element when balanced against mitigation embedded in the scheme.	Localised but permanent shading of culverted section of channel. Localised adverse effects on fish anticipated (including due to a reduction in/loss of riparian and aquatic vegetation), but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and fish habitat upstream and downstream of culvert. No measureable change in quality element.	Localised but permanent loss of open river habitat. Localised adverse effects on fish anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent shading of culverted section on channel. Localised adverse effects on fish anticipated including due to a reduction infloss of riparian and agua vegetation), but on change in quality element when balanced against mitigation embedded in the scheme balanced against mitigation embedded in the scheme	culvest. No measureable change in quality elemen	(including due to a potential reduction in riparian and aquatic vegetation), but no change in quality element	Localised but permanent loss of open river habitat. Localised adverse effects on fish anticipated, but no chas in quality element when balanced against mitigation embedded in the scheme.	nge	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and fish habitat upstream and downstream of culvert. No measureable change in quality element.	habitat improvements (resulting in 15m net gain of river	Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river processes and fish habitat upstream and downstream. No measureable change in quality element.	Creation of 45m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements (resulting in 15m ent gain of river channel). Localized improvement in fish habitat, but no change in quality element.	channel. However negligible effect on fish anticipated. N	channel). However negligible effect anticipated on river pro	Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river crocesses and fish habitat upstream and downstream. No measureable change in quality element.	nnel). However negligible effect anticipated on river	Resultant n Realignmen Unnamed tr - realignmer - realignmen Meece Bro	of removed culverts = 10m curr	urrent morphological status of the water body is 'supports good'). This relatively short gain in river channel is therefore like have a negligable effect on macrophytes, phytobenthos, macroinvertebrates and fish.	Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.		N/a
Dissolved oxygen	en Go	Good by 2015	anticipated on dissolved oxygen concentration	Removal of existing 10m culvert. Localised but perman reduction in shading of section of river channel. Poten to lead to localised improvement in dissolved oxyge concentrations (due to increased photosynthetic activit a	by and downstream. No measureable change in quality	cal Creation of 100m of new realigned channel, with er incorporated hydromorphological and riparian/margi am habitat improvements. However negligible effect anticipated on dissolved oxygen concentrations. No measureable change in quality element.		Localised but permanent shading of culverted sectior channel. Potential to lead to minor and localised impact dissolved oxygen concentrations (due to reduced photosynthetic activity by aquatic flora). Localised adveffects anticipated, but no change in quality element balanced against mitigation embedded in the schen	n of ct on Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river verse processes and dissolved oxygen upstream and downstream when of culvert. No measureable change in quality element.	n Element is insensitive to impact	Localised but permanent shading of culverted section of channel. Potential to lead to minor and localised impact on dissolved oxygen concentrations (due to reduced photosynthetic activity by aquatic flora). Localised adverse effects anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and dissolved oxygen upstream and downstream of culvert. No measureable change in quality element.		Localised but permanent shading of culverted section on channel. Potential to lead to minor and localised impact dissolved ongoen concentrations (due to reduced photosynthetic activity by aquatic flora), Localised adver effects anticipated, but no change in quality element wh balanced against militigation embedded in the scheme		Localised but permanent shading of a section of river channel. Potential to lead to minor and localised impact of dissolved oxygen concentrations (due to reduced earn photosynthetic activity by aquatic flora). Localised advers to.t. effects anticipated, but no change in quality element whe balanced against mitigation embedded in the scheme.		Localised but permanent shading of culverted section or channel. Potential to lead to minor and localised impact dissolved onygen concentrations (due to reduced photosynthetic activity by aquatic flora). Localised adve- effects anticipated, but no change in quality element wh balanced against mitigation embedded in the scheme		n anticipated on dissolved express concentrations. No	regime. However negligible effect anticipated on river processes and dissolved oxygen concentrations upstream and downstream. No measureable change in quality	anticipated on dissolved oxygen concentrations. No	Some minor, localised and periodic shading of river chann (with potential associated reduction in photosynthetic activity by aquatic flora). However, negligible effect on dissolved oxygen concentrations anticipated. No measureable change in quality element.		regime. However negligible effect anticipated on river incorp processes and dissolved oxygen concentrations upstream and downstream. No measureable change in quality anti			t gain of river channel length = 30m Und The on o Cuh The	wature will cause some minor, localised and periodic shading of river channel. This will have a negligible effect on scolved oxygen and water temperature. **nderbridges** **n	element when balanced against mitigation embedded in the scheme.		N/a
рН	Hi	ligh Good by 2015	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact		Rea The	calised adverse effect on dissolved oxygen and water temperature. <u>salignments</u> er creation of 145m of realigned channel on the 'Unnamed tributary of Meece Brook 2' watercourse (resulting in a net gain 20 m of river channel) will cause a localised but permanent improvement in hydromorphological regime and riparian	Element is insensitive to impact. No measureable change to quality element	-	N/a
Phosphate Phosphate	Pc	oor Good by 2027	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Creation of 100m of new realigned channel, with incorporated hydromorphological and riparian/margin habitat improvements. Potential localised reductions fine sediment inputs and nutrient loading. However negligible effect anticipated on phosphate concentration. No measureable change in quality element.	s in Flement is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Creation of 45m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements. Potential localised reductions in fine sediment inputs and nutrient loading. However negligible effect anticipated on phosphate concentrations. No measureable change in quality element.	Element is insensitive to impact s.	Element is insensitive to impact	incorp Element is insensitive to impact fine negligit	Creation of 65m of new realigned channel, with protated hydromorphological and riparian/marginal tatt improvements. Potential localised reductions in es ediment inputs and nutrient loading. However pible effect anticipated on phosphate concentrations. No measureable change in quality element.		hab The neg	Zom or river Channely will cause a localised out permanent miprovement in rypormorporological regime and riparian blottat. This will have a negligible effect on dissolved oxygen, ammonia and phosphate concentrations. He creation of 65m of realigned channel on the Meece Brook (resulting in a net gain of 10m of river channel) will cause a sliggible effect in twee on hydromorphological regime and riparian habitat (as the current hydromorphological status of th atter body is 'supports good'). This will have a negligible effect on dissolved oxygen, phosphate and ammonia concentration.	effects considered in combination. No measureable change in quality element	None required None required	N/a Compliant - no change ir physicochemical status of w body
Sy ski	н	figh Good by 2015	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Creation of 100m of new realigned channel, with incorporated hydromorphological and riparian/margin habitat improvements. Potential localised reductions fine sediment inputs and nutrient loading. However negligible effect anticipated on ammonia concentration No measureable change in quality element.	inal	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Creation of 45m of new realigned channel, with incorporated hydromorphological and riparian/marginal habitat improvements. Potential localised reductions in fine sediment inputs and nutrient loading. However negligible effect anticipated on ammonia concentrations. No measureable change in quality element.	Element is insensitive to impact	Element is insensitive to impact	incorp Element is insensitive to impact fine negligi	Creation of 65m of new realigned channel, with porated hydromorphological and riparian/marginal latt improvements. Potential localised reductions in es sediment inputs and nutrient loading. However gibble effect anticipated on ammonia concentrations. No measureable change in quality element.				Negligible effect anticipated in when effects considered in combination. No measureable change in quality element		N/a
Temperature	н	fligh Good by 2015	Element is insensitive to impact	Removal of existing 10m culvert. Localised but perman reduction in shading of section of river channel. Poten to lead to localised improvement in water temperature, no change in quality element.	Flement is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Localised but permanent shading of culverted section channel. Potential to lead to minor and localised imparwater temperature. Localised adverse effects anticipa but no change in quality element when balanced aga mitigation embedded in the scheme.	ct on sted, Element is insensitive to impact ainst	Element is insensitive to impact	Localised but permanent shading of culverted section of channel. Potential to lead to minor and localised impact on water temperature. Localised adverse effects anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Element is insensitive to impact	Localised but permanent shading of culverted section or channel. Potential to lead to minor and localised impact water temperature. Localised adverse effects anticipate but no change in quality element when balanced again mitigation embedded in the scheme.	ed, Element is insensitive to impact	Localised but permanent shading of a section of river channel. Potential to lead to minor and localised impact o water temperature. Localised adverse effects anticipated but no change in quality element when balanced agains mitigation embedded in the scheme.	Element is insensitive to impact	Localised but permanent shading of culverted section channel. Potential to lead to minor and localised impact water temperature. Localised adverse effects anticipate but no change in quality element when balanced again miligation embedded in the scheme.	n I, Element is insensitive to impact t	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Some minor, localised and periodic shading of river channel. However, negligible effect on water temperature anticipated. No measureable change in quality element.	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	None			Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.		N/a
Ammonia (Annex Bo July Zinc	nex 8), Copper, Triclosan,	Not assessed by 201	15	N/A - Specific pollutants effects so	eened out for scheme design component		N/A	/A - Specific pollutants effects screened out for scheme design	n component	N/A-	Specific pollutants effects screened out for scheme design comp	ionent	N/A - Spr	tecific pollutants effects screened out for scheme design o	component		N/A	A - Specific pollutants effects screened out for scheme design of	omponent	N/A - S ₁	pecific pollutants effects screened out for scheme design com	ponent	N/A - Specific pollutants effects screened out for scheme design component	N/A - Specif	cific pollutants effects screened out for scheme design component							
	lynamics of water flow		Creation of 100m of new realigned channel, incorporated hydromorphological improvements in 5m net gain of river channel). Localised improfit flow dynamics, but no change in quality eler	resulting Element is insensitive to impact	Localised but permanent change to hydromorphologic regime. However negligible effect anticipated on river processes and quantity and dynamics of flow upstream downstream. No measureable change in quality eleme	er Element is insensitive to impact	Localised but permanent changes to hydromorpholog regime. Localised adverse effects on flow dynamics (including potential localised increases in flow velocit) anticipated, but no change in quality element when balanced against mitigation embedded in the scheme		Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and quantity and dynamics of flow upstream and downstream. No measureable change in quality element		Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river roccesses and quantity and dynamics of flow upstream and downstream. No measureable change in quality element	Localised but permanent changes to hydromorphology regime. Localised adverse effects on flow dynamics (including potential localised increases in flow velocity) anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Localised but permanent changes to hydromorpholo regime. However negligble effect anticipated on reprocesses and quantity and dynamics of flow upmard downstream. No measureable change in quality elem	and	Localised but permanent changes to hydromorpholog regime. Localised adverse effects on flow dynamics (including potential localised increases in flow velocity anticipated, but no change in quality element when balanced against mitigation embedded in the scheme		regime. However negligible effect anticipated on river processes and quantity and dynamics of flow upstream an	Creation of 45m of new realigned channel, with incorporated hydromorphological improvements (resulting d in 15m net; gain of river channel). Localised improvement in flow dynamics, but no change in quality element.	regime. However negligible effect anticipated on river processes and quantity and dynamics of flow upstream and	Element is insensitive to impact		Creation of 65m of new realigned channel, with incorporated hydromorphological improvements (resulting In 10m net gain of river channel). However negligible effect anticipated on river processes and quantity and dynamics of flow upstream and downstream. No measureable change in quality element.	regime. However negligible effect anticipated on river rocesses and quantity and dynamics of flow upstream and	Element is insensitive to impact		hyd dep Rea The of 2 hab	Interest is 20m net length of culverting will cause a localised but permanent will cause a localised but permanent change in the 20m net length of culverting will cause a minor, localised adverse effect on flow dynamics, river continuity, river width a pith variation, structure of substrate, and structure of riparian zone. Leadingments are created on 6145m of realigned channel on the 'Unnamed tributary of Meece Brook 2' watercourse (resulting in a net gain 20m of river channel) will cause a localised but permanent improvement in hydromorphological regime and riparian bibliat. This will have a minor, localised beneficial effect on flow dynamics and structure of riparian zone. The creation of 65m of realigned channel on the Meece Brook (resulting in a net gain of 10m of river channel) will cause a	scheme component effects considered in combination. No change in quality		N/a
Connection to gro	groundwater bodies		Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Localised but permanent loss of connection to surround shallow groundwater within superficial deposits. Howen no likely effect anticipated on connection to groundwat bodies. No measureable change in quality element.	ever Element is insensitive to impact	Element is insensitive to impact	tocalised but permanent loss of connection to surroundin shallow groundwater within superficial deposits. However no likely effect anticipated on connection to groundwate bodies. No measureable change in quality element.	Element is insensitive to impact	Element is insensitive to impact	Localised but permanent loss of connection to surrounding shallow groundwater within superficial deposits. However no likely effect anticipated on connection to groundwater bodies. No measureable change in quality element.	Element is insensitive to impact	Element is insensitive to impact		Localised but permanent loss of connection to surround shallow groundwater within superficial deposits. Howeven no likely effect anticipated on connection to groundwat bodies. No measureable change in quality element.	ver Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact		Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact		neg	egligible effect in river on hydromorphological regime and riparian habitat (as the current hydromorphological status of thater body is Supports good). This will have a negligible effect on flow dynamics and structure of riparian zone.	Negligible effect anticipated in when effects considered in combination. No measureable change in quality element		N/a
River continuity	У		Creation of 100m of new realigned channel, incorporated hydromorphological and riparian/habitat improvements (resulting in 5m net gain channel), including removal of existing 10m co. Localised improvement in river continuity, but no quality element.	narginal of river Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Localised but permanent changes to hydromorpholog regime. Localised adverse effects on river continuity anticipated, but no change in quality element when balanced against mitigation embedded in the scheme	VY Element is insensitive to impact ne.	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. Localised adverse effects on river continuity anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. Localised adverse effects on river continuity anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Element is insensitive to impact	N/A - Hydromorphology effects screened out for scheme	Localised but permanent changes to hydromorpholog regime. Localised adverse effects on river continuty anticipated, but no change in quality element when balanced against mitigation embedded in the scheme	Y Element is insensitive to impact e.	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact	N/A - Hydromorphology effects screened out for scheme	Element is insensitive to impact	Element is insensitive to impact	Element is insensitive to impact				Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.		N/a Compliant - no change in
is the property of the propert	Su d width variation	upport Good Supports Good by 2(Creation of 100m of new realigned channel, incorporated hydromorphological improvements in 5m net gain of river channel). However negligible anticipated on river depth and width. No meas change in quality element.	resulting le effect Element is insensitive to impact reable	Localised but permanent change to hydromorphologic regime. However negligible effect anticipated on rives processes and river depth and width upstream and downstream. No measureable change in quality eleme	Element is insensitive to impact	Localised but permanent changes to hydromorpholog regime. Localised adverse effects on river depth and wis anticipated, but no change in quality element when balanced against mitigation embedded in the scheme	Element is insensitive to impact	processes and river depth and variation upstream and	regime. Localised adverse effects on river depth and widt	Element is insensitive to impact	Localised but permanent changes to hydromorphology regime. However negliple effect anticipated on river processes and river depth and wriation upstream and downstream. No measureable change in quality element	regime. Localised adverse effects on river depth and width anticipated, but no change in quality element when	Element is insensitive to impact	Localised but permanent changes to hydromorpholo regime. However negligible effect anticipated on riv processes and river depth and variation upstream as downstream. No measureable change in quality elem	design component Ey er dd	Localised but permanent changes to hydromorpholog regime. Localised adverse effects on river depth and wis anticipated, but no change in quality element when balanced against mitigation embedded in the scheme	th Element is insensitive to impact e.	Localised but permanent changes to hydromorphology regime. However negligible effect articipated on river processes and river depth and variation upstream and downstream. No measureable change in quality element	Creation of 45m of new realigned channel, with incorporated hydromorphological improvements (resulting in 15m net gain of river channel). However negligible effect anticipated on river depth and width. No measureable change in quality element.	Localised but permanent change to hydromorphological regime. However negligible effect anticipated on river processes and river depth and width upstream and downstream. No measureable change in quality element.	Element is insensitive to impact	design component	Creation of 65m of new realigned channel, with incorporated hydromorphological improvements (resulting in 10m net gain of river channel). However negligible effect anticipated on river depth and with. No measureable change in quality element.	regime. However negligible effect anticipated on river	Element is insensitive to impact				Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.	None required None required	hydromorphological status o water body N/a
	substrate of the river bed		Creation of 100m of new realigned channel, incorporated hydromorphological improvements in 5m net gain of river channel). However negligible anticipated on structure and substrate of fiver anticipated constructure and substrate of river measureable change in quality element	resulting ele effect Element is insensitive to impact ele. No	Localised but permanent change to hydromorphologic regime. However negligible effect anticipated on river processes structure and substrate of river bed upstrear and downstream. No measureable change in quality element.	er	Localised but permanent changes to hydromorpholog regime. Localised adverse effects on structure of river anticipated, but no change in quality element when balanced against mitigation embedded in the scheme	bed Element is insensitive to impact n.n.e.	Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and structure and substrate of river bed upstream and downstream. No measureable change in quality element	Localised but permanent changes to hydromorphology regime. Localised adverse effects on structure of river be anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.		Localised but permanent changes to hydromorphology regime. However negligible effect anticipated on river processes and structure and substrate of river bed upstream and downstream. Mo measureable change in quality element	Localised but permanent changes to hydromorphology regime. Localised adverse effects on structure of river bed anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Localised but permanent changes to hydromorpholo regime. However negligible effect anticipated on riv processes and structure and substrate of river bed upstream and downstream. No measureable change quality element	gy er in	Localised but permanent changes to hydromorpholog regime. Localised adverse effects on structure of river anticipated, but no change in quality element when balanced against mitigation embedded in the scheme	py seed Element is insensitive to impact e.	regime. However negligible effect anticipated on river	Creation of 45m of new realigned channel, with incorporated hydromorphological improvements (resulting in 15m net gain of river channel). However negligible effect anticipated on structure and substrate of river bed. No measureable change in quality element.	regime. However negligible effect anticipated on river	Element is insensitive to impact		Creation of 65m of new realigned channel, with incorporated hydromorphological improvements (resulting in 10m net gain of river channel). However negligible effect anticipated on structure and substrate of river bed. No measureable change in quality element.	regime. However negligible effect anticipated on river	Element is insensitive to impact				Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.		N/a
Structure of the r	e riparian zone		incorporated riparian improvements (resulting i	with Sm net reduction in shading of section of river channel. Localise but no improvement in riparian zone, but no change in quali	d Flamont is inconsition to impost	Creation of 100m of new realigned channel, with incorporated riparian improvements (resulting in 5m gain of river channel). Localised improvement, but n change in quality element.	net adverse effects on structure of riparian zone anticipate	sed ted, Element is insensitive to impact inst	Element is insensitive to impact	Localised but permanent loss of riparian zone. Localised adverse effects on structure of riparian zone anticipated but no change in quality element when balanced agains mitigation embedded in the scheme.	Element is insensitive to impact	Element is insensitive to impact	Localised but permanent loss of riparian zone. Localised adverse effects on structure of riparian zone anticipated, but no change in quality element when balanced against mitigation embedded in the scheme.	Element is insensitive to impact	Element is insensitive to impact		Localised but permanent loss of riparian zone. Localise adverse effects on structure of riparian zone anticipate but no change in quality element when balanced again mitigation embedded in the scheme.	nd Lot, Element is insensitive to impact	Element is insensitive to impact	Creation of 45m of new realigned channel, with incorporated riparian improvements (resulting in 15m net gain of river channel). Localised improvement, but no change in quality element.	Element is insensitive to impact	Creation of 45m of new realigned channel, with incorporated riparian improvements (resulting in 15m net gain of river channel). Localised improvement, but no change in quality element.	rt.	Creation of 65m of new realigned channel, with incorporated riparian improvements (resulting in 10m net gain of river channel). However negligible effect anticipated on river processes and quantity and structure of riparian zone. No measureable change in quality element.	Element is insensitive to impact gai anticipa	creation of 65m of new realigned channel, with corated faparian improvements (resulting in 10m net ain of river channel). However negligible effect pated on river processes and quantity and structure riparian zone. No measureable change in quality element.				Localised adverse effect anticipated when scheme component effects considered in combination. No change in quality element when balanced against mitigation embedded in the scheme.		N/o

| 55200) detailed impact assessment - effects on current status Lea GB11058055200 Watercourse: | | Unnamed tributary of River Lea 3 | Unnamed tributar | of River Lea 4 | | River Lea
 | | | Unnamed tributary of River Lea S | |
 | | Detailed Impact Assessment | Unnamed tributary of River Lea 6 |
 | | | | |
 | | Unnamed tributary | of River Lea 7 | |
 | | Det | iled Impact Assessment Results | |
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Not A/HMWB Scheme component:		WFD-LEA-T-03-01 Diversion (of partially culverted channel)	WFD-LEA-
 | WFD-LEA-W-01-03
Viaduct | | Unnamed tributary of River Lea 5 WFD-8P05 orrow pit - west of Netherset Hey Farm | | WFD-LEA-T-06-01
Diversion (with removal of existing culvert)
 | | WFD-LEA-T-06-02
Access road culvert (on diverted channel; see W | VFD-LEA-T-06-01) | WFD-LEA-T-06-03
Culvert (on diverted channel; see WFD-LE
 | LEA-T-06-01) | WFD-LEA-T-06-04
Diversion | | WFD-LEA-T-07-01
Access road culvert |
 | WF
Access road culvert (on rea | /FD-LEA-T-07-02
ealigned channel; see WFD-LEA-T-07-04) | WFD-LEA-T-07-03 Underbridge Madeby Erideway 2 Accommodation Underbrid | Realignment (wit | WFD-LEA-T-07-04
n removal of existing culvert) (through underbridge; see WFD-LEA-T-07-03)
 | | Overall effects on element | | Additional mitigation requirements |
 |
| Bad Description of scheme component: The length | Approx. total length of new diverted channe
length of watercourse diversions has been reduced as far as reasonably practic | it 210m; Approx. total length of existing channel: 330m (145m open channel; 185m culverned; 0.0m diameter culvers); Total net gain of open channel: 6
able. Design of the new channel will also ensure the equivalent hydroulic capacity and incorporation of appropriate features equivalent to those lost also | the existing channel footprint. Where | 1:2m; Approx. viaduct verigit: Nover Lea Valduct; Approx. viaduct worth: 1:2m; Approx. viaduct length: 785m; Approx. viaduct height: 21m | Approx. total borrow pit surface area: 0.5eem: ; Assumed average excavation pit to watercourse (at r A 50m buffer zone is incorporated between mearby watercourse and borrow watercourse and the borrow pit excavation, there is the potential for dewat | spettic 4-2m; Mixemum excavation deptits: 12m; Excavation material: sand and gravet; Api
rest point; 50m; Total catchment area of watercourse: 27.36m; 2
pits: Excavation will not take place in this zone. Depending on the permeability of the un-
ing and excavation activities to affect watercourse flow regime. Therefore, site investigat
 | ox. distance from borrow Checkey Brook Viadoutt, Approx. viadout width: 136 Approx. viadout length: 180m; Approx. viadout height: ethying strata between a n and monitoring before Clear span viadout. Viadouts designed to cross | Approx. total borrow pit surface area: 0.56em; Assumed average exclavate: 15m Excavation will involve the temporarily loss and diversion of the lower reach anniva mission and approximately annivary approximately. | septin: 4.3m; Maamum exclavion depth: 12m; tocavition material; sand and grave; Walercourise located within hotigin
catchment area of watercourse: 2.28km. ² The watercourse. The watercourse will be temporarily diverted around the exclavation area. The exclusion strategy at this
tend. temporary diversion channel comprising equivalent hydraulic capacity and hydromorphological condition as the ex- | rit; Total Approx. total length of new diverted channer: 300m; Approx. total length of existing chann siste will The length of watercourse diversion has been reduced as far as reasonably practicable. C | ner: 425m (suspected to be all curvertild, restricted access to upstream end of watercourse - to
channel: 365m Design of the new channel will also ensure the equivalent hydraulic capacity and incorporation
 | to be reverewed at detailed dissign stage; Total net gain of open Culvert length has been reduce on of appropriate features equivalent to those lost along the culturates. Culvert single that the minimi | Approx. culvert length: 10m; Approx. culvert diamet d as far as reasonably practicable. Invert of culvert to be buried 300mm below the existing in impact on flow continuity. Detailed design to be developed in general accordance with | | Wrinehill Wood Culvert; Approx. culvert length: 55m; Approx. culvert di
ed as far as reasonably practicable. Invert of culvert to be buried 300mm below the existing bed
 | t dimensions: 135m x 135m ed level to reduce disruption to sediment transfer and maintain natural substrate. | Approx. total length of new diverted channel: 90m; Approx. total length of existing of The length of watercourse diversion has been reduced as far as reasonably practicable. Design of the new cha incrementation of assessments features an evident to those lost above the a vicinize channel features. What | hannel: 160m; Total net loss: 70m Innel will also ensure the equivalent hydraulic capacity and Culvert length is external statement the decien will aim to enhance maintain natural. | Approx. culvert length: 10m; Approx. culvert di
has been reduced as far as reasonably practicable. Invert of culvert to be buried 300mm bei
tural outstrate. Culvert shed to minimize invest on flow continuity. Datalaid facilies to be if | Sameter: 0.9m slow the existing bed level to reduce disruption to sediment transfer and Culver feed feed accordance with CRBL and Feedmanner Asserv maintain
 | Approx. culvert length
vert length has been reduced as far as reasonably practicable. Invert of culvert
ain natural cultorate in full and country to the continuing a second or the continuing that | h: 10m; Apprex. culvert diameter: 0.9m 1 to be buried 300mm below the existing bed level to reduce disruption to so stalled fiscien to be developed in paperal accordance with CRUL and Environ | total length of underbridge: 80m; Approx. total underbridge: 80m; Approx. total underbridge: 30m ediment transfer and under deenny uniform. (Fear one) bridge I Inderbridge length has been in | dith of Approx. total length of new diverted channel: 267m. The length of watercourse realignments has been reduced as far as reasonably | Approx. total length of existing channel: 255m (130m open channel; 125m culverted); Total net gain of open niver channel; 137m
vracticable. Design of the new channel will also ensure the equivalent hydraulic capacity and incorporation of appropriate features ex-
 | Cumulative effects - effects on element from | | | | WFF
 |
| Good by 2027 Summary of embedded mitigation: natural wa | al watercourse, the design will aim to enhance hydromorphological condition o | er the existing condition where reasonably practicable (provided this is compatible with the watercourser flood risk and land drainage functions), in or
allow for a 10m wide buffer zone for the implementation of magninal/reparties improvements. | tion, the design of the new channel will channel wherever possible to | duce shading impact. river channel wherever possible to reduce shading impact. | during and after devastaring and excavation activities will be required to pro
the existing levels and land use in accordance with the Phase 2 Borrow P
assumed to consist of a lower permeability than the current material. | ct the integrity of these watercourses. Following construction, the areas excavated as bo
Agricultural Restoration Strategy. The materials used to backfill the borrow git as part of
airage measures will be designed to control groundwater levels and to sustain basellow
 | ow pit will be restored to perpendicular to river channel wherever possible to re-
he restoration plan are shading impact. the watercourse. | watercourse. This temporary diversion will be in place for no longer th construction in | rea year, with the existing watercourse being fully reinstated within this timeframe. Watercourse will be restored follow
refance with the Phase 2a Borrow Pits Agricultural Restoration Strategy. | existing channel footprint. Where natural watercourse, the design will aim to enhance hydralining drainage functions). In addition, the design of the | dromorphological condition over the existing condition where reasonably practicable (provides
the new channel will allow for a 30m wide buffer zone for the implementation of marginal/ripa
 | of this is compatible with the watercourses' flood risk and land arian improvements. water depths and velocities for fit | h passage. Hydromorphological improvements to be undertaken to river channel immed
loss. | Glately upstream and downstream of the culvert to compensate for footprint Culvert sized to minimise impression and downstream of the culvert to compensate for footprint velocities for fish | t on flow continuity. Detailed design to be developed in general accordance with CRIA and Environ
scage. Hydromorphological improvements to be undertaken to river channel immediately upstre
 | nvironment Agency guidance and to ensure appropriate low flow water depths and
tream and downstream of the culvert to compensate for footprint loss. | hydromorphological condition over the existing condition where reasonably practicable (provided this is com-
functions), in addition, the design of the new channel will allow for a 30m wide buffer zone for the im | patible with the watercourses' flood risk and land drainage guidance and
glementation of marginal/riparian improvements. | to ensure appropriate low flow water depths and velocities for fish passage. Hydromospho
upstream and downstream of the culvert to compensa | ological improvements to be undertaken to river channel immediately and to
take for footprint loss.
 | to ensure appropriate low flow water depths and velocities for fish passage. H
downstream of the cul | Hydromosphological improvements to be undertaken to river channel imme
ulvert to compensate for footprint loss. | distrily upstream and far as reasonably practicable. | along the existing channel footprint. Where natural watercourse, the design will
flood risk and land drainage functions). In addition, | im to enhance hydromorphicigical condition over the existing condition where reasonably practicable (provided this is compatible
to design of the new channel well allow for a 10m while harder provided the provided the compatible to
design of the new channel well allow for a 10m while buffer zone for the implementation of marginal/rigarian improvements.
 | scheme component(s) located in other WFD water bodies Summary of scheme components proposed on water with the potential to effice | terctories within mater body catchment I demonstration Summary of effects on elements | Overall effect on element | rvetten | Residual effect on element for det
 |
| ements Current Status Status Objective | Footprint | Shading Changes to water hody hydromorphology leading to changes in river processes and habitats upstream and downstream | Creation of new habitats Shade | Shading | Footgrint Chan | Changes to water body hy changes in river processes.
 | romorphology feeding to
d habitats upstream and
ream | Footprist Ch | Is in flow velocity and volume due to dewatering processes and habitats upstream and downstream processes and habitats upstream and downstream | as in river Footprint Sha | Changes to water body hydromorphology leading to changes
in river processes and habitats upstream and downstream
 | SS Creation of new habitats Footpe | int Shading | Changes to water body hydromorphology leading to changes in river for processes and habitats upstream and downstream | print Shading
 | Changes to water body hydromorphology leading to changes in river processes and habitats upstream and downstream | Footprint Changes to water body hydromorphology leading to
in river processes and habitats systream and down | changes Creation of new habitats | Footprint Shading | Changes to water body hydromorphology leading to changes
in river processes and habitats upstream and downstream
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Shading changes in river processes and
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d habitats upstream and Shading
nam | Footprint | Obanges to water body hydronosphology leading to changes in river processes and habitats upstream and creation of ne downstream.
 | | | | 8 | ð
 |
Macrophysis and Physiolenthes- combined and Good by 2027 byliomore set gain of	Orastion of 210m of new diversion channel, with incorporated comprehological and rigarian/imarginal habitat improvements (resulting in pain of 65m of open new channel). Localised improvement in macrophres and phytobenthos habitat, but no change in quality element.	Creation of 220m of new diversion channel, with incorporated hydromorphological and reparted invariance channels, with incorporated hydromorphological and reparted invariance channels in regional experiments of the processor of	220m of new diversion channel, with demonsphalisgical and riparine/imaginal maging the common production of the common	ting of ner channel. Youwest Some minur, localized and periodic shading of ner channel. Newsorr regisjole affect on macouphysis and physiotechnics acticipated. No measureable change in quality element.	Localised and temporary excusation of area of floodpales (agrees. "Not of catchesent area of entercorres), the direct control of the catchesent area of entercorres), the direct control of the catchesent of the	temporary excavation of area of floodulain (Assumed action depth. 5.5m; maximum excavation depth. 15m), for minimum et unique production in four productions are received as a restart of dewatering activities. Postnetial absents exployers and phytobachs shalabit. There is a site of the status could occur. Neglews additional miligation.	river channel leading to the habition of the control of habition options and habition options and habition options and however negligible effect on macrophytes and physioberthos anticipated. The measureable change let	Direct physical impact on river channel and rigarian zone. Temporary lists and diversion of approx. 400 and river habitation and properties and physical production of approx. 400 and river habitation and properties of a physical production and physical production and physical production habitat, but no change in quantity element when ablanced apparent motigation and shall a complete department of the software.	Intergency scanding of area of foodplain (Nasmod deptod optics, 55%; maximum exception ages; 15th the mine and temporary administration in the region as a result of designing circles. Proteins allower sourceptives and phyloticols build. There is all region sourceptives and phyloticols build. There is all region sourceptives and phyloticols build. There is all region and designing circles and designing circles and and designing circles and designing circles and designing and designing circles and designing and designing circles and militagetics and edition of the submin- minguistics and designing circles.	Country States of Millind rises diseased charact, with incorporate processor and the photocophological and organization of Millind rises diseased charact, with incorporate photocophological and organization processor and organization of the control of the contr	or disented channel, including of a desting qualified channel because the control of the contro	d Cestion of 365m of new diverted channel, with incorporated hydromorphological and optional/marginal hibitation improvements frolking removal of support different distributions of the companies of the companie	Columnial (pase WTO-LEA-T-OS- Columnia proposal con new divertised columnial (pase WTO-LEA-T-OS- CO). Presence: existing existences in commonly columnial in biblicat relative to existing hange in qualify element.	Cubert progosal on new diverted channel jave WFDLEAT 05 dtg. Lat 105 from the control of the co	ad channel (pies WFO-LEA 7-56- ties is convently quiet with billion 12) Thorseover, existing evaluations in convently quieteral not physichenthic relative to able change in qualify element, voicing condition. No measureable change in qualify element,	Culent proposed on new diverted channel (see WID-LEA-T-06-CE). Reverver- scaling watercourse is currently culented below agricultural feels at this location, with next-fit Silve and selection controlling. Design fine culent to ensur minimized impact on flow, sediment and biological continuity, localized, approximation in conceptive habitat downsteam therefore subjected reliable to existing condition, but no change in quality element.	Consider of 50m of new dended channel, with expressed by the many public of an improvious production of the consideration of the consi	hological Creation of Stim of new diversed channel, with acceptanced hydromorphological and the companies of the companies of the control o	guernant los el que river habitat. Advante difest en managiny es institution de la completation de la compl	not fried hydrox and Localized but permanent changes to hydromorphology regime. Nowever negligible office introduced on few stages to have understand of colorer. No measureable change in quality element.	to but permanent loss of open new habbat Localised has permanent loss of expensive relation on microphysics and physiobenthic includes, but no change in quality element when more departer mitigation embedded in the scheme. But no change in quality streams and the scheme in quality streams are considered to the scheme.	ment thisding of laction of niver channel. Localised but permanent change lect on maturalysis and physiocentum signer. However negligible els signer. However negligible els signer. However may light to segment the signer of the segment of the se	ges to hydromophology that articipated an oliver that articipated articipated an oliver that articipated articipated an oliver that articipated an oliver that articipated articipated and oliver that articipated an oliver that articipated and oliver that articipated an oliver that articipated and	Custion of 375m of new realigned channel, with incorporated hydromophological and riparin habitat improvements. Including removed libit instruction colored referenced. but promounced in concepting and updated the habitat, but no change in quality dement.	grow. 10th of eating cohest. Localised but permanent change in hydromophological responses of the control of the control of the supported by th	point channel, with	The three solution consists of the solution of	Adverse effect anticipated when someone component effects considered in combination. When balanced applies evidenties enthetied in the scheme these		Localized software effect and significant when others component effects, considered in controllection. But changes in qualify demonst when halvesed against militation embedded in the scheme.
Means rains are federaliss. Proof Stand Sty 2021 Styllmann on a	Creation of 210m of new deversion chained, with incorporated demorphological and rigarita/invaryant habitat improvement in possibility in rang pain of 65m of our few charged, Localisting processes of micromiversibirate habitat, but no change in quality element.	Orazion di 20 in il rium diversion diversio, della militari improposate in plantamingologia indi quantifungiagi and quantifungiagi and quantifungiagi and plantamingologia di diversione della media polariza in proposate di productione militari in plantamina di productione di p	220or of new diversion channel, with community and community and expensive recognition and expensive recognition and expensive recognition and expensive recognition and particular development of from a display effect on macroenteristation and expensive recognition and expensive	ting of ner channel. However time minor, localised and periodic challing of neir channel. Newwer neighbir office or macronivershirals articipate. No measureable change in purify channel.	Localised and temporary excavation of area of floodplain (approx. 2x of catchment area of watercounts). No direct physical regact on the Chemical or regards track. No direct physical regact on the Chemical Organization. No direct physical regards on the Chemical Organization. No direct physical regards on the Chemical Organization of	tempony exception of any of Rodylan (Naumed and Agent). She cannot except a figure that the state of the stat	er channel or rigarian zone sees and shaket updawan some minor, localised and periodic shading of free cha Novemer originals effect on microsvereblockes and change is quality and the measureable change in quality duri	Over physical impact on over channel and rigarian zone. Temporary loss and discrizin of appace. Allow of over habitat assessment and the administration actual consistence as during elemental and the administration actual consistence during elemental place. A referent behavior and pushing element when balanced against miligation enhanced as the scheme.	I temporary excussion of area of fundation (foscessed and for the second of the second	Countries of Silline of new diserted claimers, with transported physiometries. Constituted Silline of new diserted claimers, with transported physiometries physiometries physiometries (Silline of new desired Silline of new desire	destend channel, locksdag of a discoling closed channel and a fill of the control of the control of the control of the control of the control of the control of the control of the control of the control	Coation of \$10m of new discreted shared, with incorporated hydromorphising at and operated hydrogenet habitat insurements (sharing secured of \$25m of entire). Proceedings and the second of \$25m of entire) are considered to the second of \$25m of entire and the second of \$25m of entire and \$25m of	Colored (per WFO-LEA T-GG. Colored promoting Colored (per WFO-LEA T	Colors proposed on twe-discrete discrete (less WFO LEAT 66.51). Colors proposed on twe-discrete discrete (less WFO LEAT 66.51). Colors proposed on twe-discrete discrete dis	bit channel jav WFD-LEAT GL. Culture proposed on new disenter channel (saw WFD-LEAT GL. SITE Newson, existing variations and convertigation of the channel	Collect proposed on see diserted channel (par NRO LLA T.O.C.), Newsour, soling seatments is consently calended below agrounded data at the booking, which restricts flow and determine continuity, Dodge of their cubert for booking, which restricts flow and determine continuity, Dodge of continuity, Locked improvement in macroinventriculate hibbits development benefitive and copied institute to existing condition, but no change in quality placement.	Cosation of 50m of new disented channel, with warrandeals hydromorphisinguical and operation long and facilitated representations to clinical representation to contract the contract of the contract to clinical representation of the contract of the con	Creation of 90m of new diverted channel, with ecoparated lydering phrasing at and applications of 90m of new diverted channel, with ecoparated lydering phrasing at and applications of phrasing phrasing at the phrasing phrasing at the phrasing phr	a permanent los of agent ner habito. Litarillar has permanent shading of section for the contract of the cont	to of class Included but permanent changes to hydromorphology regions. Proseever regisplish effect aritispand on new processors and manufacture-induces ballets operation and advantages of culture-induces ballets operated by demonstrating of culture-induces ballets observed to question demonstrating observed to question demonstrati	to that permanent toos of open new habitat, Localises to effect on monotoneratherise settingues, but no in quality element who shakened applies mitigation embedded in the scheme.	nent blading of section of fewer channel. List on macroministrations set opposed or specific production of the production of the original production of the original and quantity of the original production or the original production of the original production or t	gas to hydromorphising: Licalized but permanent shading of a section lical self-companies of the section of the section of the self-companies of the section of the sectio	Couline of 376s of one miligand disease, with secretary and the secretary of the secretary	gern. 15th of entiting culent. 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The wall have a mine, facilitate function effect on managinarysis, physiciaethous, account the set 200 or does not accluse the "Windows Sharp for the 1" a "Windows Sharp for the 1" and "Windo	Advance affect and pulse of the property of th	distinct insignation measures for the anaugement of doubteaster leadings to the flourish broke of Crawley consideration of the flourish broke of Crawley to destructions design for contentation place will be legisted to exercise that there is no significant impact on the private for exercise measures will be designed in all following regional investigation and monotoning of all following regional investigation and monotoning of the service and promised when do in consistant on the least service and promised when do in consistant on the water buffer (bit, or this least the consistant on the water buffer (bit, or this least the consistant of the water buffer (bit, or this least the consistant or the water buffer (bit, or this least the consistant or this	Localized arborns effect enticipated when whence component effects considered in continuous and continuous con
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No Electron of Spicalises, to the District on distric	temporary provision of area of floodplan (seamed using days 6.5 m, mamma excausion depth. titled for more and temporary wholeton in the respec- tor more and temporary wholeton from the respec- tation of the string production in the string the constructions. See each of the string production of the string pr	ser channel or riginate pose processes optimizes and anticipation disclaimed and periodic shading of near the legith partners and anticipation disclaims in photographic standard change in quality at all the process of the process of the process of the measurable change in quality at	Direct physical impact on over channel and operato zone. Beginners you and direction of agents, 400m of lover machine. The control of the control operator operator of the control operator operator of the control operator opera	Interprety provides of an east Resignion Dissement enters depth. Exist, maximum excussion slept. Test, destine depth. Exist, maximum excussion slept. Test, the remove and snepporty reduction in their regions as a result of destineing form. The residual region in the region of a destine and a second region of a s	recording control of Miller of twe disented claims, with homographic processors of Miller of twe disented claims, with homographic processors of the control of supported Company of the control of the c	or dismented channel, locksdring or of existing collemented channel regard of \$200 of open ment of existing collemented channel regard control of open ment open concentrations to sharing original concentrations (but to control open concentrations) below to change in qualify sharinest.	Countion of 3 film of new diserted channel, with incorporated hydromorphistigal and regard-inverged habitet improvements (include growned of supervised Closed animprovement included Closed animprovement control of diserted oranges consist of subsets of orange control oranges or quality demand.	Culturil proposed on new diversid channel java WFD-LF GD, Prosence, existing substances is correctly can go be been agreed to the case to be a considerable of the basic form being regularized and this lackform con- serticipated on dissilated origin. No measurable cha- quisity shared.	EA.T-G. Culture proposed on new disarthed channel jace WFD-LEA.T-G-G-Q1, related. However, entiting switnerscens is converting clustered before any collusion field. Edita, it is bloom. Therefore we define indicated on disclosuled cauges in politicans and disemblation of culture. No measurements diskupp in quarity plannel.	Culted proposed on new disented cleaned (pas WPD SLAT OIL 20). Thereaver, reliefly exercisors in convertly calended differ to impact being profusal field in the location. Therefore cleaned anticipated on dissistent orapes. No measurable change in quality desease.	Colonet proposed on new district channel (see WID-LEA-T-66-E1). Thesework. Colonet proposed on new district channel (see WID-LEA-T-66-E1). Thesework. Colonet proposed on new district channel (see WID-LEA-T-66-E1). Thesework channel (see WID-LEA-T-66-E1). Thesework channel (see WID-LEA-T-66-E1). The measureable change in quality idensest.	Creation of 10m of view diserted channel, with exceptrated by the comprising of an of spinnel program habitating represents for Louised improvement to by Ambitating represents for Louised improvement of the Major in Traversor regisplish effect antiquent or spinnel. To recover regisplish effect antiquent or programment or Spinnels (Lough In quality sheemed May measureable change In quality sheemed	Creation of 80m of new diversid channel, with incorporated hydromorphistical and objective channels with the displacement of displacements. Cashed inspresented in displacement, but no change in quality demand.	Section for permanent shalling of solvents shared. 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Instead of adjacent registrate fact sets (capital on relevant exposures and adjacent registrate fact sets (capital on relevant processes and distinct degree connections, subsequent photosynthetic activity by specific change in quality element. Castion of 130m of even acceptance of the processes and distinct of	Resultate set gain of open river channel = 407 m. Marrow 201 Mar	The underbridge will cause a localised but normanent sharing of river channel. This may have a localised adverse eff	gible effect or disched ongen and water temperature. To disched ongen and water temperature. Localised alwars affect antiquated when it turns though the discharge of the dis		N/a
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Table 57: Checkley Brook - Upper (GB112068055230) detailed impact assessment - effects on current status Surface water body: Checkley Brook - Upper Detailed Impact Assessment Results Detailed Impact Assessment Water body ID: Watercourse: **Checkley Brook** GB112068055230 WFD-CBU-W-01-01 Additional mitigation Hydromorphological designation: Scheme component: Not A/HMWB Overall effects on element Viaduct requirements Cumulative effects - effects WFD compliance Checkley Brook Viaduct; Approx. viaduct width: 15m; Approx. viaduct Description of scheme component: Overall Status: Residual effect on outcome - potential for on element from scheme length: 180m; Approx. viaduct height: 15m Summary of embedded mitigation: Clear span viaduct. Viaducts designed to cross perpendicular to river channel component(s) located in deterioration of current element Status Objective: Good by 2015 wherever possible to reduce shading impact. other WFD water bodies status Summary of scheme components proposed on watercourses within water body catchment Summary of effects on elements Overall effect on element with the potential to effect element status **Current Status** Status Objective WFD Classification Elements Shading Checkley Brook: The viaduct will cause some minor, Some minor, localised and periodic shading of river channel. However egligible effect anticipated in when effects viaduct (WFD-CBU-W-01-01) localised and periodic shading of Macrophytes and Phytobenthos -Good by 2015 negligible effect on macrophytes and phytobenthos anticipated. No nsidered in combination. No measureable river channel. This will have a measureable change in quality element. change in quality element. negligible effect on macrophytes, phytobenthos, macroinvertebrates Some minor, localised and periodic shading of river channel. However Negligible effect anticipated in when effects Compliant - no change in biological Good by 2015 negligible effect on macroinvertebrates anticipated. No measureable considered in combination. No measureable None required. None required. Macroinvertebrates status of water body change in quality element. change in quality element. Negligible effect anticipated in when effects Some minor, localised and periodic shading of river channel. However negligible effect on fish anticipated. No measureable change in quality considered in combination. No measureable element. change in quality element. The viaduct will cause some minor, Some minor, localised and periodic shading of river channel (with potential localised and periodic shading of Negligible effect anticipated in when effects associated reduction in photosynthetic activity by aquatic flora). However, river channel. This will have a Dissolved oxygen Good by 2015 sidered in combination. No measureable negligible effect on dissolved oxygen concentrations anticipated. No negligible effect on dissolved change in quality element. measureable change in quality element. oxygen and water temperature. Good by 2015 Element is insensitive to impact. Element is insensitive to impact. N/a Compliant - no change in None required. None required. physicochemical status of water Good by 2015 Element is insensitive to impact. Element is insensitive to impact. N/a None Good by 2015 N/a Element is insensitive to impact. Element is insensitive to impact. Negligible effect anticipated in when effects Some minor, localised and periodic shading of river channel. However, negligible effect on water temperature anticipated. No measureable change considered in combination. No measureable N/a Good by 2015 in quality element. change in quality element. N/A - Specific pollutants effects screened out for scheme design component Quantity and dynamics of water flow Connection to groundwater bodies Supports good by 2015 N/A - Hydromorphology effects screened out for scheme design component River depth and width variation Structure and substrate of the river bed Structure of the riparian zone

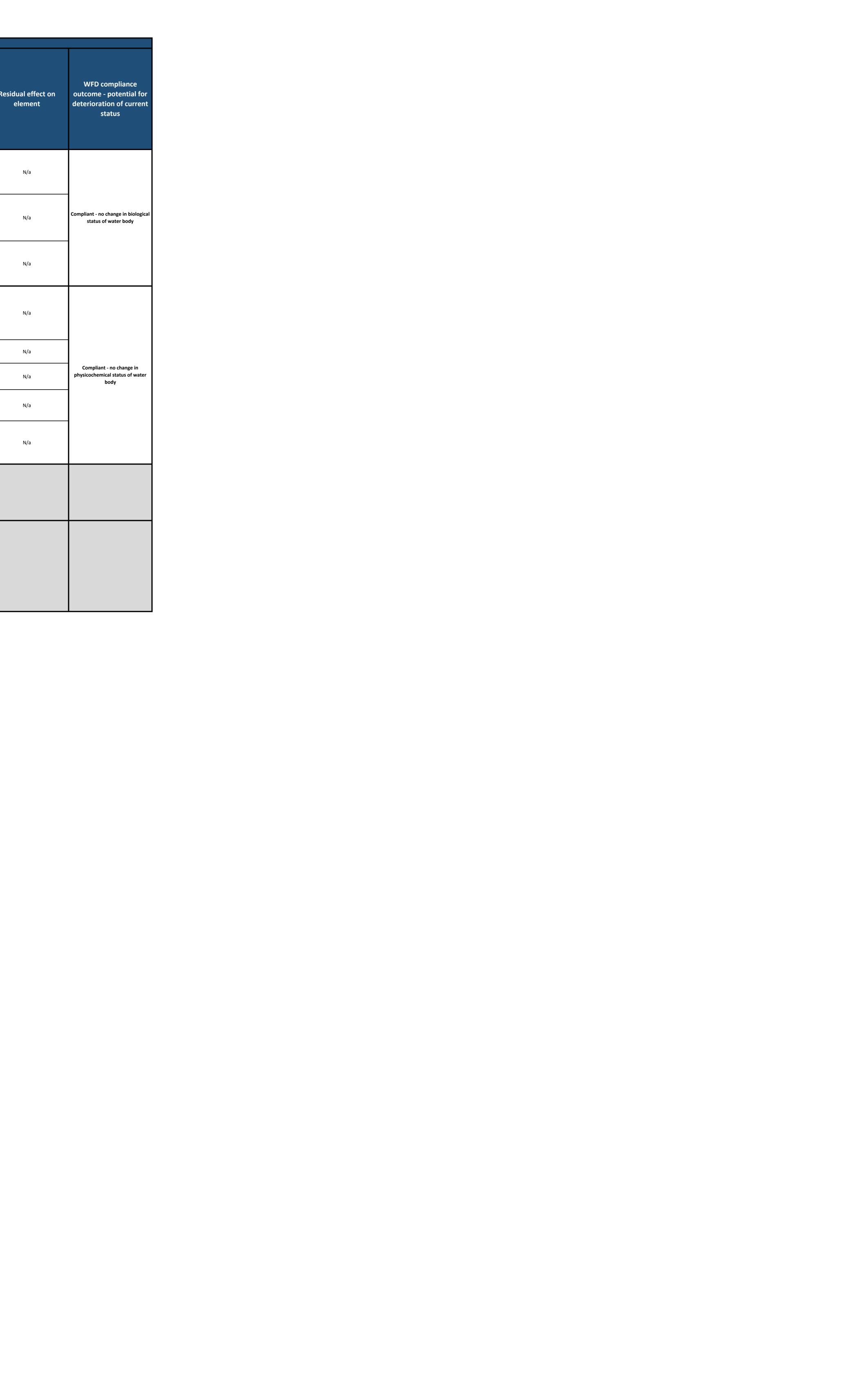


Table 58: Wistaston Brook (GB112068055280) detailed impact assessment - effects on current status **Detailed Impact Assessment Results** Surface water body: Wistaston Brook **Detailed Impact Assessment Unnamed tributary of Mere Gutter 6** Mere Gutter (Wistaston Brook) GB112068055280 WFD-BP06 WFD-BP06 Hydromorphological designation: Not A/HMWB Scheme component Borrow pit - north of Checkley Lane Borrow pit - north of Checkley Lane **Overall effects on element Additional mitigation requirements** Approx. total borrow pit surface area: 0.4km2; Maximum excavation depth: above local groundwater level; Excavation material: sand and gravel; Approx. distance from borrow pit to watercourse (at nearest Approx. total borrow pit surface area: 0.4km2 (approx. 0.3km2 of which located within Wistaston Brook catchment area); Maximum excavation depth: above local groundwater level; Excavation Description of scheme component point): 196m; Approx. catchment area of watercourse: 3.78km2 material: sand and gravel; Approx. distance from borrow pit to watercourse (at nearest point): 720m; Approx. catchment area of section of watercourse within water body extent: 38.3km2 umulative effects - effects on A vertical buffer will be provided between the base of the borrow pit excavations and the groundwater level, ensuring that there are no impacts on groundwater flows. Excavations will be in A vertical buffer will be provided between the base of the borrow pit excavations and the groundwater level, ensuring that there are no impacts on groundwater flows. Excavations will be in accordance with the element from scheme measures described in the draft CoCP and any rainfall and surface water runoff intercepted by the borrow pit will be treated and re-circulated into the downstream catchment at an appropriate rate and location, otential for deterioratio Summary of embedded mitigation: therefore ensuring that there is no significant impact on the volume or quality of water reaching the mere. Following construction, the areas excavated as borrow pit will be restored to the existing levels and land an appropriate rate and location, therefore ensuring that there is no significant impact on the volume or quality of water reaching the mere. Following construction, the areas excavated as borrow pit will be restored to the existing levels and land an appropriate rate and location, therefore ensuring that there is no significant impact on the volume or quality of water reaching the mere. Following construction, the areas excavated as borrow pit will be restored to the existing levels and land an appropriate rate and location, therefore ensuring that there is no significant impact on the volume or quality of water reaching the mere. Following construction, the areas excavated as borrow pit will be restored to the existing levels and land an appropriate rate and location, therefore ensuring that there is no significant impact on the volume or quality of water reaching the mere. 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Potential for dewatering nnamed tributary of Mere Gutter 6 The excavation of the borrow pit north of Checkley Lane will Localised and temporary excavation of area of catchment area. Potential for dewatering activities activities to disrupt surface and groundwater flows towards the watercourse, in turn borrow pit (north of Checkley Lane) -comprise approximately 0.8% of the Wistaston Brook catchment. to disrupt surface and groundwater flows towards the watercourse, in turn reducing flow regime Localised and temporary excavation of area of upper direct physical impact on river channel leading ninimum approx. 196m from educing flow regime during the construction phase. However, a vertical buffer will be A vertical buffer above local groundwater levels will be applied during the construction phase. However, a vertical buffer will be implemented between the base catchment (approx. 0.8% of total catchment area of rea. No direct physical impact on river channel or riparian of the borrow pit excavations and the local groundwater level and any rainfall and surface water ring excavation of the borrow pit, and any surface water runoff

Negligible effect anticipated in when effects anges in river processes and habitat upstrean ercourse). No direct physical impact on river channel or Macrophytes and Phytobenthos - combined Poor zone. No likely effects anticipated on macrophyte and vnstream. No likely effects anticipated on dered in combination. No measureable Mere Gutter (Wistaston Brook): tercepted by the borrow pit will be treated and re-circulated runoff intercepted by the borrow pit will be re-circulation into the downstream catchment at an riparian zone. No likely effects anticipated on macrophyte benthos habitat. No measureable change in quality tes and phytobenthos. No measureable change in quality element. appropriate rate and location. These embedded measures will ensure that there are negligible borrow pit (north of Checkley Lane) Into the downstream catchment at an appropriate rate and and phytobenthos habitat. No measureable change in change in quality element. embedded measures will ensure that there are no impacts on the flow regime of the No measureable change in quality element. impacts on the flow regime of the watercourse. Therefore negligible effects anticipated on location. These measures will ensure that there are negligible quality element. ninimum approx. 720m from watercourse. No likely effects are anticipated on macrophyte and phytobenthos habitat. macrophyte and phytobenthos habitat. No measureable change in quality element. impacts on the flow regime of the 'Unnamed tributary of Mere No measureable change in quality element. Gutter 6' and Mere Gutter/Wistaston Brook watercourses. This will therefore have a negligible effect on macrophytes, otal area of excavation = 0.4km² **Total water body catchment area** phytobenthos, macroinvertebrates and fish. ocalised and temporary excavation of area of catchment area. Potential for dewatering Localised and temporary excavation of area of catchment area. Potential for dewatering activities =38.3km² activities to disrupt surface and groundwater flows towards the watercourse, in turn to disrupt surface and groundwater flows towards the watercourse, in turn reducing flow regime Localised and temporary excavation of area of upper direct physical impact on river channel o educing flow regime during the construction phase. However, a vertical buffer will be No direct physical impact on river channel or alised and temporary excavation of area of catchment | during the construction phase. However, a vertical buffer will be implemented between the base catchment (approx. 0.8% of catchment area of riparian zone leading to changes in river ompliant - no change in biologica rian zone leading to changes in river processes legligible effect anticipated in when effect rcourse). No direct physical impact on river channel or None required. None required. area. No direct physical impact on river channel or riparian of the borrow pit excavations and the local groundwater level and any rainfall and surface water processes and habitat upstream and sidered in combination. No measureal status of water body Good by 2015 nd habitat upstream and downstream. No likely None Macroinvertebrate zone. No likely effects anticipated on macroinvertebrate runoff intercepted by the borrow pit will be re-circulation into the downstream catchment at an riparian zone. No likely effects anticipated on nstream. No likely effects anticipated or change in quality element. effects anticipated on macroinvertebrates. No ulation into the downstream catchment at an appropriate rate and location. These habitat. **No measureable change in quality element.** appropriate rate and location. these embedded measures will ensure that there are negligible rate habitat. No measureable change in brates. No measureable change in measureable change in quality element mbedded measures will ensure that there are no impacts on the flow regime of the impacts on the flow regime of the watercourse. Therefore negligible effects anticipated on quality element. quality element watercourse. No likely effects are anticipated on macroinvertebrate habitat. **No** macroinvertebrate habitat. No measureable change in quality element. measureable change in quality element. ocalised and temporary excavation of area of catchment area. Potential for dewatering ocalised and temporary excavation of area of catchment area. Potential for dewatering activities activities to disrupt surface and groundwater flows towards the watercourse, in turn to disrupt surface and groundwater flows towards the watercourse, in turn reducing flow regime reducing flow regime during the construction phase. However, a vertical buffer will be No direct physical impact on river channel or No direct physical impact on river channel or Localised and temporary excavation of area of upper alised and temporary excavation of area of catchment | during the construction phase. However, a vertical buffer will be implemented between the base implemented between the base of the borrow pit excavations and the local groundwater arian zone leading to changes in river processes catchment (approx. 0.8% of catchment area of Negligible effect anticipated in when effect riparian zone leading to changes in river ea. No direct physical impact on river channel or riparian of the borrow pit excavations and the local groundwater level and any rainfall and surface water abitat upstream and downstream. No likely watercourse). No direct physical impact on river channel or level and any rainfall and surface water runoff intercepted by the borrow pit will be reprocesses and habitat upstream and Good by 202 None sidered in combination. No measureab zone. No likely effects anticipated on fish habitat. **No** runoff intercepted by the borrow pit will be re-circulation into the downstream catchment at an riparian zone. No likely effects anticipated on fish habitat. | circulation into the downstream catchment at an appropriate rate and location. These | downstream. No likely effects anticipated on fish change in quality element. ffects anticipated on fish. No measureable measureable change in quality element. appropriate rate and location. these embedded measures will ensure that there are negligible change in quality element No measureable change in quality element. embedded measures will ensure that there are no impacts on the flow regime of the **No measureable change in quality element** impacts on the flow regime of the watercourse. Therefore negligible effects anticipated on fish watercourse. No likely effects are anticipated on fish habitat. **No measureable change in** habitat. No measureable change in quality element. quality element. The excavation of the borrow pit north of Checkley Lane will Localised and temporary excavation of area of catchment area. Potential for dewatering Localised and temporary excavation of area of catchment area. 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No direct physical impact on river channel or riparian of the borrow pit excavations and the local groundwater level and any rainfall and surface water sses upstream and downstream. No likel upstream and downstream. No likely effect direct physical impact on river channel or riparian zone. No level and any rainfall and surface water runoff intercepted by the borrow pit will be rentercepted by the borrow pit will be treated and re-circulated idered in combination. No measureable zone. No likely effects on dissolved oxygen. No runoff intercepted by the borrow pit will be re-circulation into the downstream catchment at an effect anticipated on dissolved oxygen **likely effects on dissolved oxygen. No measureable** circulation into the downstream catchment at an appropriate rate and location. These into the downstream catchment at an appropriate rate and change in quality element. appropriate rate and location, these embedded measures will ensure that there are negligible measureable change in quality element. ns. No measureable change in No measureable change in quality element change in quality element. embedded measures will ensure that there are no impacts on the flow regime of the ocation. These measures will ensure that there are negligible impacts on the flow regime of the watercourse. Therefore negligible effects anticipated on quality element watercourse. No likely effects are anticipated on dissolved oxygen. No measureable npacts on the flow regime of the 'Unnamed tributary of Mere dissolved oxygen. No measureable change in quality element. change in quality element. Gutter 6' and Mere Gutter/Wistaston Brook watercourses. This will therefore have a negligible effect on dissolved oxygen, phosphate and ammonia concentrations. Element is insensitive to impact. 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Localised and temporary reduction in implemented between the base of the borrow pit excavations and the local groundwater legligible effect anticipated in when effects Compliant - no change in ctivity, with potential associated reductions in application of the borrow pit excavations and the local groundwater level and any rainfall and surface water None required. None required. Element is insensitive to impact agricultural activity, with potential associated reductions in level and any rainfall and surface water runoff intercepted by the borrow pit will be re-Element is insensitive to impact None nsidered in combination. No measureable physicochemical status of water bod of organic and inorganic fertilizer. However negligible runoff intercepted by the borrow pit will be re-circulation into the downstream catchment at an application of organic and inorganic fertilizer. However | circulation into the downstream catchment at an appropriate rate and location. These change in quality element. effect anticipated on phosphate concentrations. No appropriate rate and location. these embedded measures will ensure that there are negligible negligible effect anticipated on phosphate concentrations. embedded measures will ensure that there are no impacts on the flow regime of the measureable change in quality element. impacts on the flow regime of the watercourse. Therefore negligible effects anticipated on No measureable change in quality element. watercourse. No likely effects are anticipated on phosphate concentrations. No phosphate concentrations. No measureable change in quality element. measureable change in quality element. ocalised and temporary excavation of area of catchment area. Potential for dewatering Localised and temporary excavation of area of catchment area. 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Localised and temporary reduction in implemented between the base of the borrow pit excavations and the local groundwater egligible effect anticipated in when effect tivity, with potential associated reductions in application of the borrow pit excavations and the local groundwater level and any rainfall and surface water Good by 2015 Element is insensitive to impact cultural activity, with potential associated reductions in level and any rainfall and surface water runoff intercepted by the borrow pit will be re-None idered in combination. No measureable Element is insensitive to impact of organic and inorganic fertilizer. However negligible runoff intercepted by the borrow pit will be re-circulation into the downstream catchment at an change in quality element. application of organic and inorganic fertilizer. However | circulation into the downstream catchment at an appropriate rate and location. These effect anticipated on ammonia concentrations. **No** appropriate rate and location. these embedded measures will ensure that there are negligible embedded measures will ensure that there are no impacts on the flow regime of the egligible effect anticipated on ammonia concentrations. measureable change in quality element. impacts on the flow regime of the watercourse. Therefore negligible effects anticipated on No measureable change in quality element. watercourse. No likely effects are anticipated on ammonia concentrations. **No** ammonia concentrations. No measureable change in quality element. measureable change in quality element. Element is insensitive to impact. **No** Good by 2015 Element is insensitive to impact Element is insensitive to impact Element is insensitive to impact None Element is insensitive to impact Element is insensitive to impact Element is insensitive to impact measureable change to quality element The excavation of the borrow pit north of Checkley Lane will comprise approximately 0.8% of the Wistaston Brook catchment Localised and temporary excavation of area of catchment area. Potential for dewatering A vertical buffer above local groundwater levels will be applied Localised and temporary excavation of area of catchment area. Potential for dewatering activities activities to disrupt surface and groundwater flows towards the watercourse, in turn to disrupt surface and groundwater flows towards the watercourse, in turn reducing flow regime during excavation of the borrow pit, and any surface water runoff No direct physical impact on river channel or No direct physical impact on river channel or reducing flow regime during the construction phase. However, a vertical buffer will be during the construction phase. However, a vertical buffer will be implemented between the base riparian zone leading to changes in river intercepted by the borrow pit will be treated and re-circulated parian zone leading to changes in river processes mplemented between the base of the borrow pit excavations and the local groundwater ligible effect anticipated in when effect Ammonia (Phys-Chem), Copper, Triclosan, of the borrow pit excavations and the local groundwater level and any rainfall and surface water esses upstream and downstream. No likely Compliant - no change in specific into the downstream catchment at an appropriate rate and Not assessed by 2015 Element is insensitive to impact upstream and downstream. No likely effects Element is insensitive to impact level and any rainfall and surface water runoff intercepted by the borrow pit will be re-None dered in combination. No measureable None required. None required runoff intercepted by the borrow pit will be re-circulation into the downstream catchment at an effects anticipated on specific pollutant pollutant status of water body ocation. These measures will ensure that there are negligible ticipated on specific pollutant concentrations circulation into the downstream catchment at an appropriate rate and location. These change in quality element. appropriate rate and location. these embedded measures will ensure that there are negligible rations. No measureable change in mpacts on the flow regime of the 'Unnamed tributary of Mere No measureable change in quality element. embedded measures will ensure that there are no impacts on the flow regime of the impacts on the flow regime of the watercourse. Therefore negligible effects anticipated on quality element. Gutter 6' and Mere Gutter/Wistaston Brook watercourses. This watercourse. No likely effects are anticipated on specific pollutant concentrations. No specific pollutant concentrations. No measureable change in quality element. measureable change in quality element. will therefore have a negligible effect on specific pollutant The excavation of the borrow pit north of Checkley Lane will Localised and temporary excavation of area of catchment area. Potential for dewatering comprise approximately 0.8% of the Wistaston Brook catchment. ocalised and temporary excavation of area of catchment area. Potential for dewatering activities activities to disrupt surface and groundwater flows towards the watercourse, in turn A vertical buffer above local groundwater levels will be applied to disrupt surface and groundwater flows towards the watercourse, in turn reducing flow regime No direct physical impact on river channel or No direct physical impact on river channel or Localised and temporary excavation of area of upper reducing flow regime during the construction phase. However, a vertical buffer will be during excavation of the borrow pit, and any surface water runoff alised and temporary excavation of area of catchment | during the construction phase. However, a vertical buffer will be implemented between the base riparian zone leading to changes in river parian zone leading to changes in river processes catchment (approx. 0.8% of catchment area of implemented between the base of the borrow pit excavations and the local groundwater egligible effect anticipated in when effect area. No direct physical impact on river channel. No likely of the borrow pit excavations and the local groundwater level and any rainfall and surface water ercepted by the borrow pit will be treated and re-circulated cesses upstream and downstream. No likely Quantity and dynamics of water flow upstream and downstream. No likely effects watercourse). No direct physical impact on river channel. level and any rainfall and surface water runoff intercepted by the borrow pit will be redered in combination. No measureable to the downstream catchment at an appropriate rate and effects anticipated on quantity and dynamics of water | runoff intercepted by the borrow pit will be re-circulation into the downstream catchment at an ts anticipated on quantity and dynamics o ticipated on quantity and dynamics of flow. No No likely effects anticipated on quantity and dynamics of circulation into the downstream catchment at an appropriate rate and location. These change in quality element. flow. No measureable change in quality element. location. These measures will ensure that there are negligible appropriate rate and location. these embedded measures will ensure that there are negligible flow. No measureable change in quality measureable change in quality element. water flow. No measureable change in quality element. embedded measures will ensure that there are no impacts on the flow regime of the impacts on the flow regime of the watercourse. Therefore negligible effects anticipated on impacts on the flow regime of the 'Unnamed tributary of Mere watercourse. No likely effects are anticipated on quantity and dynamics of water flow. **No** quantity and dynamics of water flow. No measureable change in quality element. Gutter 6' and Mere Gutter/Wistaston Brook watercourses. This measureable change in quality element. will therefore have a negligible effect on flow dynamics, river width and depth variation, structure of substrate. ocalised and temporary excavation of area of catchment rea. Vertical buffer to be implemented between base of Localised and temporary excavation of area of catchment area. Potential for dewatering Localised and temporary excavation of area of upper ctivities to disrupt groundwater flows towards the watercourse, in turn reducing flow catchment (approx. 0.8% of catchment area of regime during the construction phase. However, a vertical buffer will be implemented egligible effect anticipated in when effec construction phase. However, a vertical buffer will be implemented between the base of the rcourse). Vertical buffer to be implemented betw cavation and local groundwater level. No likely effects Element is insensitive to impact Connection to groundwater bodies between the base of the borrow pit excavations and the local groundwater level. This will Element is insensitive to impact idered in combination. No measureal se of excavation and local groundwater level. No likely rrow pit excavations and the local groundwater level. This will ensure that there are no impacts nticipated on connection to groundwater bodies. **No** ensure that there are no impacts on the flow regime of the watercourse. No likely effects change in quality element. n groundwater flows to the watercourse. No likely effects are anticipated on connection to ects anticipated on connection to groundwater bodies. measureable change in quality element. ire anticipated on connection to groundwater bodies. No measureable change in quality groundwater bodies. No measureable change in quality element. No measureable change in quality element. Localised and temporary excavation of area of upper calised and temporary excavation of area of catchment Negligible effect anticipated when scheme catchment (approx. 21% of catchment area of area. No direct physical impact on river channel or riparian Element is insensitive to impact Element is insensitive to impact ercourse). No direct physical impact on river channel or Element is insensitive to impact Element is insensitive to impact mponent effects considered in combinat River continuity zone. No likely effect anticipated on river continuity. No No measureable change in quality element riparian zone. No likely effect anticipated on river measureable change in quality element. Compliant - no change in continuity. No measureable change in quality element. upports Good Supports good by 2015 None required. None required hydromorphological status of water ocalised and temporary excavation of area of catchment area. Potential for dewatering Localised and temporary excavation of area of catchment area. Potential for dewatering activities activities to disrupt surface and groundwater flows towards the watercourse, in turn to disrupt surface and groundwater flows towards the watercourse, in turn reducing flow regime No direct physical impact on river channel or Localised and temporary excavation of area of upper reducing flow regime during the construction phase. However, a vertical buffer will be No direct physical impact on river channel or calised and temporary excavation of area of catchment | during the construction phase. However, a vertical buffer will be implemented between the base | iparian zone leading to changes in river processes catchment (approx. 0.8% of catchment area of implemented between the base of the borrow pit excavations and the local groundwater riparian zone leading to changes in river legligible effect anticipated in when effect rea. No direct physical impact on river channel. No likely of the borrow pit excavations and the local groundwater level and any rainfall and surface water River depth and width variation upstream and downstream. No likely effects watercourse). No direct physical impact on river channel. | level and any rainfall and surface water runoff intercepted by the borrow pit will be re- | processes upstream and downstream. No likely idered in combination. No measureable fect on river depth and width variation. **No measureable** runoff intercepted by the borrow pit will be re-circulation into the downstream catchment at an anticipated on river depth and variation. No No likely effect on river depth and width variation. No circulation into the downstream catchment at an appropriate rate and location. These effects anticipated on river depth and variation. change in quality element. change in quality element. appropriate rate and location. these embedded measures will ensure that there are negligible measureable change in quality element measureable change in quality element. embedded measures will ensure that there are no impacts on the flow regime of the **No measureable change in quality element** mpacts on the flow regime of the watercourse. Therefore negligible effects anticipated on river watercourse. No likely effects are anticipated on river depth and width variation. No depth and width variation. No measureable change in quality element. measureable change in quality element. Localised and temporary excavation of area of catchment area. Potential for dewatering ocalised and temporary excavation of area of catchment area. Potential for dewatering activities activities to disrupt surface and groundwater flows towards the watercourse, in turn to disrupt surface and groundwater flows towards the watercourse, in turn reducing flow regime No direct physical impact on river channel or Localised and temporary excavation of area of upper reducing flow regime during the construction phase. However, a vertical buffer will be alised and temporary excavation of area of catchment | during the construction phase. However, a vertical buffer will be implemented between the base riparian zone leading to changes in river riparian zone leading to changes in river processes catchment (approx. 0.8% of catchment area of implemented between the base of the borrow pit excavations and the local groundwater egligible effect anticipated in when effec area. No direct physical impact on river channel. No likely of the borrow pit excavations and the local groundwater level and any rainfall and surface water processes upstream and downstream. No likely upstream and downstream. No likely effects watercourse). No direct physical impact on river channel. level and any rainfall and surface water runoff intercepted by the borrow pit will be re-Structure and substrate of the river bed idered in combination. No measureab cts anticipated on structure and substrate of river bed. runoff intercepted by the borrow pit will be re-circulation into the downstream catchment at an effects anticipated on structure and substrate of ipated on structure and substrate of river bed. No likely effects anticipated on structure and substrate of circulation into the downstream catchment at an appropriate rate and location. These change in quality element. No measureable change in quality element. appropriate rate and location. these embedded measures will ensure that there are negligible river bed. 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Element is insensitive to impact

Element is insensitive to impact

emponent effects considered in combination

No measureable change in quality element.

watercourse). No direct physical impact on riparian zone.

No likely effects anticipated on structure of riparian zone.

No measureable change in quality element.

Element is insensitive to impact

Element is insensitive to impact

effects anticipated on structure of riparian zone. No

measureable change in quality element.

Structure of the riparian zone

Table 59: Betley Mere (GB31234330) detailed impact assessment - effects on current status Detailed Impact Assessment Results **Detailed Impact Assessment** Surface water body: Betley Mere water body ID: **Betley Mere** GB31234330 Watercourse: WFD-BP06 ydromorphological Additional mitigation Heavily Modified Water Body (HMWB) Scheme component: **Overall effects on element** Borrow pit - north of Checkley Lane requirements pprox. total borrow pit surface area: 0.4km² (approximately 0.2km² located within catchment area of Betley Mere). Maximum excavation depth: above local groundwater level; Excavation material: sand and gravel; Approx. distance from borrow pit to mere (at nearest point): Overall Status: Description of scheme component: 470m; Approx. catchment area of Betley Mere: 8.2km² **Cumulative effects -**WFD compliance effects on element from Residual effect on outcome - potential for A vertical buffer will be provided between the base of the borrow pit excavations and the groundwater level, ensuring that there are no impacts on groundwater flows. Excavations will be in accordance with the measures described in the draft CoCP and any rainfall and surface. Summary of embedded mitigation:

water runoff intercepted by the borrow pit will be treated and re-circulated into the downstream catchment at an appropriate rate and location, therefore ensuring that there is no significant impact on the volume or quality of water reaching the mere. Following construction scheme component(s) deterioration of current Status Objective: Poor by 2015 the areas excavated as borrow pit will be restored to the existing levels and land use in accordance with the Phase 2a Borrow Pits Agricultural Restoration Strategy. The materials used to backfill the borrow pit as part of the restoration plan are assumed to consist of a lower located in other WFD status mary of scheme components proposed permeability than the current material. Drainage measures will be designed to control groundwater levels and to sustain baseflow to the watercourse. water bodies on watercourses within water body Overall effect on element Summary of effects on elements catchment with the potential to effect element status Changes to water body hydromorphology leading to changes in **Current Status** Status Objective WFD Classification Elements Changes in flow velocity and volume due to dewatering lake processes and habitat borrow pit (the borrow pit north of The excavation of the borrow pit north of Checkley Lane will comprise approximately Checkley Lane) - minimum approx. 2.4% of the Betley Mere catchment. A vertical buffer above local groundwater levels 470m from mere will be applied during excavation of the borrow pit, and any surface water runoff Localised and temporary excavation of area of catchment area (approximately 2.4%). Potential for dewatering activities to disrupt surface and groundwater flows towards the mere, in turn reducing water levels during the construction phase. However, a vertical

No direct physical impact on lake processes and habitat. No likely Negligible effect anticipated i tercepted by the borrow pit will be treated and re-circulated into the downstream buffer will be implemented between the base of the borrow pit excavations and the local groundwater level and any rainfall and effects anticipated on phytoplankton. No measureable change in No direct physical impact on lake. No likely effects anticipated on when effects considered in Compliant - no change in tchment at an appropriate rate and location. These measures will ensure that there Total area of excavation = 0.4km² Poor by 2015 None required. None required. phytoplankton. No measureable change in quality element. surface water runoff intercepted by the borrow pit will be re-circulation into the downstream catchment at an appropriate rate biological status of water body ombination. No measureable e negligible impacts on surface and groundwater flows and the water level of the (approx. 0.2km² of which is located quality element. and location. These embedded measures will ensure that there are negligible impacts on flows to and the water level of the mere. change in quality element. mere. This will therefore have a negligible effect on phytoplankton. within Betley Mere catchment area) Therefore negligible effects anticipated on phytoplankton. No measureable change in quality element. Total water body surface water catchment area = 8.3km² The excavation of the borrow pit north of Checkley Lane will comprise approximately Localised and temporary excavation of area of catchment area (approximately 2.4%). Potential for dewatering activities to disrupt 2.4% of the Betley Mere catchment. A vertical buffer above local groundwater levels Negligible effect anticipated ir surface and groundwater flows towards the mere, in turn reducing water levels during the construction phase. However, a vertical will be applied during excavation of the borrow pit, and any surface water runoff when effects considered in o direct physical impact on lake. No likely effects anticipated on salinity. | buffer will be implemented between the base of the borrow pit excavations and the local groundwater level and any rainfall and Good by 2015 Element is insensitive to impact intercepted by the borrow pit will be treated and re-circulated into the downstream No measureable change in quality element. surface water runoff intercepted by the borrow pit will be re-circulation into the downstream catchment at an appropriate rate ombination. No measureable catchment at an appropriate rate and location. These measures will ensure that there and location. These embedded measures will ensure that there are negligible impacts on flows to and the water level of the mere. change in quality element. are negligible impacts on surface and groundwater flows and the water level of the Therefore negligible effects anticipated on salinity. No measureable change in quality element. mere. This will therefore have a negligible effect on salinity and total phosphorus. Compliant - no change in physicochemical status of wate None required. None required. Localised and temporary excavation of area of catchment area (approximately 2.4%). Potential for dewatering activities to disrupt Negligible effect anticipated in surface and groundwater flows towards the mere, in turn reducing water levels during the construction phase. However, a vertical when effects considered in No direct physical impact on lake. No likely effects anticipated on total buffer will be implemented between the base of the borrow pit excavations and the local groundwater level and any rainfall and Total phosphorus Bad by 2015 Element is insensitive to impact phosphorus. No measureable change in quality element. surface water runoff intercepted by the borrow pit will be re-circulation into the downstream catchment at an appropriate rate combination. No measureable and location. These embedded measures will ensure that there are negligible impacts on flows to and the water level of the mere. change in quality element. Therefore negligible effects anticipated on total phosphorus. No measureable change in quality element. The excavation of the borrow pit north of Checkley Lane will comprise approximately 2.4% of the Betley Mere catchment. A vertical buffer above local groundwater levels None will be applied during excavation of the borrow pit, and any surface water runoff Localised and temporary excavation of area of catchment area (approximately 2.45%). Potential for dewatering activities to disrupt Negligible effect anticipated i surface and groundwater flows towards the mere, in turn reducing water levels during the construction phase. However, a vertical intercepted by the borrow pit will be treated and re-circulated into the downstream when effects considered in Compliant - no change in specific No direct physical impact on lake. No likely effects anticipated on specific buffer will be implemented between the base of the borrow pit excavations and the local groundwater level and any rainfall and catchment at an appropriate rate and location. These measures will ensure that there Ammonia (Phys-Chem), Copper, Triclosan, Zinc Not assessed by 2015 None required. Element is insensitive to impact None required. surface water runoff intercepted by the borrow pit will be re-circulation into the downstream catchment at an appropriate rate pollutant concentrations. No measureable change in quality element. pollutant status of water body ombination. No measureab are negligible impacts on surface and groundwater flows and the water level of the and location. These embedded measures will ensure that there are negligible impacts on flows to and the water level of the mere. mere. This will therefore have a negligible effect on specific pollutant concentrations. change in quality element. Therefore negligible effects anticipated on specific pollutant concentrations. No measureable change in quality element. The excavation of the borrow pit north of Checkley Lane will comprise approximately Localised and temporary excavation of area of catchment area (approximately 2.4%). Potential for dewatering activities to disrupt surface and groundwater flows towards the mere, in turn reducing water levels during the construction phase. However, a vertical No direct physical impact on lake processes and habitat. No likely 2.4% of the Betley Mere catchment. A vertical buffer above local groundwater levels

Negligible effect anticipated in will be applied during excavation of the borrow pit, and any surface water runoff when effects considered in No direct physical impact on lake. No likely effects anticipated on lake depth | buffer will be implemented between the base of the borrow pit excavations and the local groundwater level and any rainfall and Lake depth variation effects anticipated on lake depth variation. No measureable variation. No measureable change in quality element. surface water runoff intercepted by the borrow pit will be re-circulation into the downstream catchment at an appropriate rate intercepted by the borrow pit will be treated and re-circulated into the downstream combination. No measureable change in quality element. and location. These embedded measures will ensure that there are negligible impacts on flows to and the water level of the mere. catchment at an appropriate rate and location. These measures will ensure that there change in quality element. Therefore negligible effects anticipated on lake depth variations. No measureable change in quality element. are negligible impacts on surface and groundwater flows and the water level of the mere. This will therefore have a negligible effect on lake depth variation, quantity, structure and substrate of lake bed, and structure of the lake shore. Negligible effect anticipated in o direct physical impact on lake. No likely effects anticipated on quantity, No direct physical impact on lake processes and habitat. No likely Compliant - no change in when effects considered in Quantity, structure and substrate of lake bed structure and substrate of lake bed. No measureable change in quality Element is insensitive to impact effects anticipated on quantity, structure and substrate of lake N/a None required. None required. hydromorphological status of Supports good by 2015 combination. No measureable bed. No measureable change in quality element. water body change in quality element. Negligible effect anticipated in No direct physical impact on lake processes and habitat. No likely Io direct physical impact on lake. No likely effects anticipated on structure when effects considered in Structure of lake shore effects anticipated on structure of lake shore. No measureable Element is insensitive to impact of lake shore. No measureable change in quality element. combination. No measureable change in quality element. change in quality element.

3 Groundwater

- 3.1.1 The baseline assessment has identified six groundwater bodies as being affected by the Proposed Scheme (see Section 5, main report and Annex D).
- The preliminary assessment has then identified the relevant impacts of the various scheme components and the associated likely effects on the different WFD status elements of the surface water bodies affected by the Proposed Scheme (see Section 7.1, main report and Annex F1.2). This, in turn, has identified which quality elements are screened-in for detailed assessment for each water body.
- 3.1.3 The detailed impact assessment results for the groundwater bodies affected by the Proposed Scheme are summarised here in Tables 60 65.

body: Staffordshire Trent Valley - Mercia Mo	udstone East and Coal Measure	Scheme Comp	onent: Blithbury Central cutting	Blithbury North cutting	Cuttings Stockwell Heath cutting	Moreton cutting	Brancote South cutting	Pyford Brook viaduct	Kings Bromley viaduct	Viaducts River Trent viaduct	Moreton Brook viaduct	Great Haywood viaduct	Overbridge B5014 Uttoxeter Road overbridge					
0300)			WFD-GW-MME-C-01	WFD-GW-MME-C-02	WFD-GW-MME-C-o3	WFD-GW-MME-C-04	WFD-GW-MME-C-o5	WFD-GW-MME-VF-01	WFD-GW-MME-VF-02	WFD-GW-MME-VF-03	WFD-GW-MME-VF-04	WFD-GW-MME-VF-05	WFD-GW-MME-OF-01					
Current Status (2015 Cycle 2)	nfidence Status objective	ldentified po e quantitative ir	surface water bodies, GWDTE or reduction in groundwater contribution	Lowering of groundwater levels and reduction in groundwater contributions to surface water bodies, GWDTE or "Damming" of groundwater flow and reduction in groundwater contribution	Lowering of groundwater levels and reduction in groundwater contributions to surface water bodies, GWDTE or reduction in groundwater contribution	Lowering of groundwater levels and reduction in groundwater contributions to surface water bodies, GWDTE or "Damming" of groundwater flow and reduction in groundwater contribution	surface water bodies, GWDTE or reduction in groundwater contributions		Temporary and Permanent Construction "Damming" of groundwater flow and reduction in groundwater contributions	Temporary and Permanent Construction "Damming" of groundwater flow and reduction in groundwater contributions	Temporary and Permanent Construction "Damming" of groundwater flow and reduction in groundwater contributions	Temporary and Permanent Construction "Damming" of groundwater flow and reduction in groundwater contributions	Temporary and Permanent Construction "Damming" of groundwater flow and reduction in groundwater contributions		npact on Current WFD Status	Additional Mitigation Requirements	Residual Effect on Current WFD Element Status	WFD complia potential for o curren
er intrusions Good Unc	certain Good by 2015			ater quality water as no sources of poor water quality water as no sources of poor wa			groundwater abstractions by temporary dewatering/permanent groundwater control No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element		No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element			No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element	No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element		Remains Good Status	None required	Remains Good Status	Compli
	certain Good by 2015		any rivers. Potential spring near Blithbury West is within radius of influence but will be	Absent groundwater level data in area, therefore assumed worst case scenario and water levels near ground surface. Radius of influence for dewatering is a calculated max of 22m, no watercourses or surface water features in this area within this radius of influence so will not affect the baseflow of scheme element.	Absent groundwater level data in area, therefore assumed worst case scenario and water levels near ground surface. Radius of influence for dewatering is a calculated max of 15m, no watercourses within this radius of influence so will not affect the baseflow of any rivers. No watercourses or surface water feature this area within this radius of influence for dewatering is a calculated max of 15m, no watercourses within this radius of influence so will not affect the baseflow of significant impacts identified as a result scheme element.	Groundwater in area predicted to be 2.5-3m below ground level (Geoindex borehole logs), cut max depth of 18.9mbgl, potential ingress, reduce hydraulic gradient between will hillslope and rivers to east and west. Radius of influence is a max of 29.2m no surface water features within this radius may reduce groundwater baseflow to nearest spring is Spring_96 (76m away) however the spring supplies a man-made pond that is being infilled as a result of the scheme.	Groundwater 10m below ground level, (BGS borehole log at Upper Hanyards) proposed cutting base deeper than this. Radius of influence calculated as 31.2m in the Mercia Mudstone. No watercourses or surface water features in this area within this radius of influence so will not affect baseflow of any rivers. No significant impacts identified as a result of scheme element.	Shallow groundwater may provide baseflow to Pyford Brook. Changing of groundwater flow paths around viaduct piers. Piling		Changing of groundwater flow paths around viaduct piers. Piling	Changing of groundwater flow paths around viaduct piers. Piling	Shallow groundwater may provide baseflow to River Trent. Changing of groundwater flow paths around viaduct piers. Piling could impact shallow groundwater flow, very localised.		Potential localised impacts identified, negligible impact with embedded mitigation	Remains Good Status	None required	Remains Good Status	Com
ent GWDTE's) Good Und	certain Good by 2015		No impacts identified as a result of scheme element. No impacts identified as a result of scheme element.	neme No impacts identified as a result of scheme element. No impacts identified as a result of scheme element.	me No impacts identified as a result of scheme element. No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element. No impacts identified as a result of scheme element.	eme No impacts identified as a result of scheme element. No impacts identified as a result of scheme element.	e No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element.	Area of potentially groundwater fed marshland, north of Little Spinney. Earthworks have potential to affect local groundwater flow and influence flow pathways in connection with the groundwater in connection with the marshland.	No impacts identified as a result of scheme element.	Pasturefields SSSI is up hydraulic gradient of the Proposed Scheme, viaduct will not have an impact on this GWDTE.	No impacts identified as a result of scheme element.	Potential localised impacts identified, negligible impact with embedded mitigation	Remains Good Status	None required	Remains Good Status	C
Good Ver	y Certain Good by 2015		15m radius of influence, small area of influence and as formations within the Mercia Mudstone Group are generally classified as Secondary B to Unproductive, not thought to influence large extent of the groundwater body, impact on local aquifer only. Additional monitoring required to determine skerry bands and groundwater levels within the mudstone. Length and depth of cutting, as wel radius of influence very small in comp. to extent of the Mercia Mudstone Group groundwater body. Therefore not thou influence large extent of the groundwater body, impact on local aquifer only. Additional monitoring required to determine skerry bands and groundwater levels within the mudstone.	as influence and as formations within the Mercia Mudstone Group are generally classified as Secondary B to Unproductive, not thought to influence large extent of the groundwater body, impact on very local aquifer only. Additional monitoring required to determine skerry bands and groundwater levels within the mudstone. Length and depth of cutting, as well a radius of influence very small in compar to extent of the Mercia Mudstone Group groundwater body. Therefore not thoug influence large extent of the groundwater body, impact on very local aquifer only. Additional monitoring required to determine skerry bands and groundwater levels within the mudstone.	Length and depth of cutting, as well as radius of influence and as formations within the Mercia Mudstone Group are generally classified as Secondary B to Unproductive, not thought to influence large extent of the groundwater body, impact on very local aquifer only. Additional monitoring required to determine skerry bands and groundwater levels within the mudstone. Length and depth of cutting, as well as radius of influence very small in comparis to extent of the Mercia Mudstone Group a groundwater body. Therefore not though influence large extent of the groundwater body, impact on very local aquifer only. Additional monitoring required to determine skerry bands and groundwater levels within the mudstone.	30m radius of influence, small area of influence and as formations within the Mercia Mudstone Group are generally classified as Secondary B to Unproductive, not thought to influence large extent of the groundwater body, impact on local aquifer only. Additional monitoring required to determine skerry bands and groundwater levels within the mudstone. Length and depth of cutting, as well a radius of influence very small in compari to extent of the Mercia Mudstone Group groundwater body. Therefore not though influence large extent of the groundwater body, impact on local aquifer only. Additional monitoring required to determine skerry bands and groundwater levels within the mudstone.	rison Hanyards Farm however abstraction at Upper Hanyards Farm however abstraction will be	Shallow groundwater may provide baseflow to Pyford Brook. Changing of groundwater flow paths around viaduct piers. Piling could impact shallow groundwater flow, very localised.	Shallow groundwater may provide baseflow to Crawley Brook. Changing of groundwater flow paths around viaduct piers. Piling could impact shallow groundwater flow, very localised.	Shallow groundwater may provide baseflow to River Trent. Changing of groundwater flow paths around viaduct piers. Piling could impact shallow groundwater flow, very localised.	Shallow groundwater may provide baseflow to Moreton Brook. Changing of groundwater flow paths around viaduct piers. Piling could impact shallow groundwater flow, very localised.	Shallow groundwater may provide baseflow to River Trent. Changing of groundwater flow paths around viaduct piers. Piling could impact shallow groundwater flow, very localised.	Potential localised impacts on flow regime.	Potential localised impacts identified, negligible impact with embedded mitigation	Remains Good Status	None required	Remains Good Status	Con
tatus Good Und					Cuttings				'	Viaducts		,	Overbridge					_
Staffordshire Trent Valley - Mercia Mi	udstone East and Coal Measure	es Scheme Comp	onent: Blithbury Central cutting WFD-GW-MME-C-01	Blithbury North cutting WFD-GW-MME-C-02	Stockwell Heath cutting WFD-GW-MME-C-03	Moreton cutting WFD-GW-MME-C-04	Brancote South cutting WFD-GW-MME-C-05	Pyford Brook viaduct	Kings Bromley viaduct	River Trent viaduct	Moreton Brook viaduct	Great Haywood viaduct WFD-GW-MME-VF-05	B5014 Uttoxeter Road overbridge					
			Phase: Temporary and Permanent Construction	WFD-GW-MME-C-02 Temporary and Permanent Construction	Temporary and Permanent Construction	Temporary and Permanent Construction	Temporary and Permanent Construction	WFD-GW-MME-VF-01 Temporary and Permanent Construction	WFD-GW-MME-VF-02 Temporary and Permanent Construction	WFD-GW-MME-VF-03 Temporary and Permanent Construction	WFD-GW-MME-VF-04 Temporary and Permanent Construction	WFD-GW-MME-VF-05 Temporary and Permanent Construction	WFD-GW-MME-OF-01 Temporary and Permanent Construction				Residual Effect on Current WFD	WFD

Overall Quantitative Status	Good Uncertain Good by 2015															
					Cuttings					Viaducts			Overbridge			
Groundwater body: Stafford (GB40402G300300)	dshire Trent Valley - Mercia Mudstone East and Coal Measures	Scheme Componer	Blithbury Central cutting WFD-GW-MME-C-01	Blithbury North cutting WFD-GW-MME-C-02	Stockwell Heath cutting WFD-GW-MME-C-03	Moreton cutting WFD-GW-MME-C-04	Brancote South cutting WFD-GW-MME-C-05	Pyford Brook viaduct	Kings Bromley viaduct	River Trent viaduct WFD-GW-MME-VF-03	Moreton Brook viaduct	Great Haywood viaduct	B5014 Uttoxeter Road overbridge			
		Phas		Temporary and Permanent Construction	Temporary and Permanent Construction	Temporary and Permanent Construction	Temporary and Permanent Construction	WFD-GW-MME-VF-01 Temporary and Permanent Construction	WFD-GW-MME-VF-02 Temporary and Permanent Construction	Temporary and Permanent Construction	WFD-GW-MME-VF-04 Temporary and Permanent Construction	WFD-GW-MME-VF-05 Temporary and Permanent Construction	WFD-GW-MME-OF-01 Temporary and Permanent Construction			Residual Effect on Current WFD WFD compliance outcome -
	Current Status Confidence Status objective (Cycle 2)	Identified potent chemical impac	Disturbing or mobilising existing poor quality groundwater by temporary dewatering or depressurisation and permanent groundwater control Creating or altering of pathways along vexisting poor quality groundwater control migrate	which an Disturbing or mobilising existing poor quality groundwater by temporary dewatering or depressurisation and permanent groundwater control Creating or altering of pathways alor existing poor quality groundwate migrate	groundwater by temporary dewatering or	■ groundwater by temporary dewatering or ■		 Creating or altering of pathways along which existing poor gua 	ality Creating or altering of pathways along which existing poor qua groundwater can migrate	lity Creating or altering of pathways along which existing poor quali groundwater can migrate	ty Creating or altering of pathways along which existing poor qualit groundwater can migrate	r Creating or altering of pathways along which existing poor quality groundwater can migrate	Overall Ef Creating or altering of pathways along which existing poor quality groundwater can migrate	ect Impact on Current WFD Sta	tus Additional Mitigation Requirements	Element Status potential for deterioration of current status
1. Saline or other intrusions	Good Uncertain Good by 2015			No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element No likely saline or other intrusion of poor quality water as no sources of poor quality identified in vicinity of scheme element	water quality water as no sources of poor water quality water as no sources of poor water	ater quality water as no sources of poor water quality water as no sources of	on of poor voor water scheme No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element	No likely saline or other intrusion of poor quality water as no	No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element		No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element	No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element	No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element	ntified Remains Good Status	None required	Remains Good Status Compliant - no change in status
2. Surface water	Good Uncertain Good by 2015		of 15m, no watercourses within this radius of influence so will not affect the baseflow of		water levels near ground surface. Radius of in this area within this radius of influences. influence for dewatering is a calculated max	Groundwater in area predicted to be 2.5-3m below ground level (Geoindex borehole logs), cut max depth of 18.9mbgl, potential ingress, reduce hydraulic gradient between hillslope and rivers to east and west. Radius of influence is a max of 29.2m no surface water features within this radius may reduce groundwater baseflow to nearest spring is Spring_96 (76m away) however the spring supplies a man-made pond that is being infilled as a result of the scheme. Groundwater in area predicted to be 2.5-3m below ground level (Geoindex logs), cut max depth of 18.9mb ingress, reduce hydraulic gradien hillslope and rivers to east and of influence is a max of 29.2m water features within this radius groundwater baseflow to nearest Spring_96 (76m away) however supplies a man-made pond the infilled as a result of the scheme.	borehole I, potential borehole log at Upper Hanyards) proposed cutting base deeper than this. Radius of influence calculated as 31.2m in the Mercia Mudstone. No watercourses or surface water features in this area within this radius of influence so will not affect the baseflow of any riv st spring is it is being Groundwater 10m below ground level, (BGS borehole log at Upper Hanyards) proposed cutting base deeper than this. Radius of influence calculated as 31.2m in the Mercia with the spring is influence so will not affect baseflow of any rivers. No significant impacts identified as a result of scheme element.	vers. Changing of groundwater flow paths around viaduct piers. Pili		ng Changing of groundwater flow paths around viaduct piers. Pilin	Changing of groundwater flow paths around viaduct piers. Piling	Shallow groundwater may provide baseflow to River Trent. Changing of groundwater flow paths around viaduct piers. Piling could impact shallow groundwater flow, very localised.		ligible Remains Good Status	None required	Remains Good Status Compliant - no change in status
3. Groundwater Dependent Terrestrial Ecosystems (GWD	OTE's) Good Very Certain Good by 2015		No impacts identified as a result of scheme element. No impacts identified as a result of scheme element.	neme No impacts identified as a result of scheme element. No impacts identified as a result of scheme element.	cheme No impacts identified as a result of scheme No impacts identified as a result of sch element.	neme No impacts identified as a result of scheme No impacts identified as a result of scheme element.	of scheme No impacts identified as a result of scheme No impacts identified as a result of scheme element.	heme No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element.	Piling in area could create contaminant pathways to shallow groundwater in connection with the marshland, north of Little Spinney.		Pasturefields SSSI is up hydraulic gradient of the Proposed Scheme, viaduct will not have an impact on this GWDTE. No impacts identified as result of scheme element.	No impacts identified as a result of scheme element. No impacts identified as a result of scheme element. impact with er mitigati	bedded Remains Good Status	None required	Remains Good Status Compliant - no change in status
4. Drinking Water Protected Areas (DrWPAs)	Good Uncertain Good by 2015		element. No poor quality groundwater expected in the vicinity of the cutting, and expected in the vicinity of the cutting,	and expected in the vicinity of the cutting, and expected in the vicinity of the cuttir	vater element. No poor quality groundwater element. No poor quality groundwat	is approximately 3m bgl. Average depth of Moreton Grange private abstract	of scheme individual i	quality groundwater expected in the vicinity of the cutting, an	No impacts identified as a result of scheme element. No poor nd quality groundwater expected in the vicinity of the cutting, and the element is not within an SPZ.	The state of the s	· · · · · · · · · · · · · · · · · · ·	No impacts identified as a result of scheme element. No poor quality groundwater expected in the vicinity of the cutting, and the element is no within an SPZ.	No impacts identified as a result of scheme element. No poor quality groundwater expected in the vicinity of the cutting, and the element is not within an SPZ.	ntified Remains Good Status	None required	Remains Good Status Compliant - no change in status
5. General quality assessmen	ut Good Uncertain Good by 2015		Application of the CoCP will ensure materials and fluids used during construction are managed so that there is no significant adverse effect on groundwater quality. Application of the CoCP will ensure materials and fluids used during construction are managed so that there is no significant adverse effect on groundwater quality.	materials and fluids used during materials and fluids used during construction are managed so that there is	materials and fluids used during materials and fluids used during ere is construction are managed so that there is	materials and fluids used during materials and fluids used of construction are managed so that there is	at there is construction are managed so that there is construction are managed so that there is no significant adverse effect on	Application of the CoCP will ensure materials and fluids used during construction are managed so that there is no significal adverse effect on groundwater quality.			The state of the s	Application of the CoCP will ensure materials and fluids used during construction are managed so that there is no significant adverse effect or groundwater quality.	Application of the CoCP will ensure materials and fluids used during construction are managed so that there is no significant adverse effect on groundwater quality.	ntified Remains Good Status	None required	Remains Good Status Compliant - no change in status

Overall Chemical Status Good Uncertain Good by 2015

Table Gz. Staffordshire Trent Valley - PT Sandstone Staffordshire (GB4040xG900900) detailed impact assessment - eff Groundwater body: Staffordshire Trent Valley - PT Sandstone Staffordshire (GB4040xG900900) Sche	ects on current status me Component: Blithbury South cutting WFD-GW-SPT-C-cs	Brancote South cutting WFD-GW-SPT-C-ca	Brancote North cutting WFD-GW-SPT-C-03	Hopton South cutting WFD-GW-SPT-Coq	Hopton North Cutling WFD-GW-SPT-C-os		Cuttings Swynnerton South cutting WFD-GW-SPT-C-06	Swynnerton North cutting WFD-GW-SPT-C-67	Hatton So WFD-GW	outh cutting Hatton North WSPT-Ca8 WFD-GW-SP	Whitmore Whitmore WTD-Gr	South cutting W.SPT.C.10	Viaduct Meece Brook viaduct WFD-GW-SPT-VF-01	Ove Bg024 Uttaxeter Road overbridge Ag18 Weston Road overbridge WFD-GW-SPT-OF-02 WFD-GW-SPT-OF-02	rbridges A529 Newcastle Road overbridge A53 Newcastle WFD-GW-SPT-OF-69 WFD-	rcastle Road overbridge D-GW-SPT-OF-034	Retaining Wall Hopton retaining wall WED-GW-SPT-RT-ex	Southern porous portal of the Whitmore Heath t WFD-GW-SPT-GT-03	Cut and Cover Tunnel The cut and cover	r section of the Whitmore Heath tunnel WFD-GW-SPT-GT-62	Bored Tunnel The twin bore section of the Whitmore Heath tunnel WFD-GW-SPT-8T-oz				
Current Status Confidence Status objective Identified poter	Lowering of groundwater contributions to surface water bodies, GWDTT or "Damming" of groundwater for production in groundwater bodies, GWDTT or "Damming" of groundwater from production in groundwater for control "Damming" of groundwater production in groundwater control "Damming" of groundwater production in groundwater control "Damming" of groundwater control "Damming" of groundwater production in groundwater control "Damming" of groundwater production in	Lowering of groundwater levels and reduction in groundwater of influence water bound in groundwater contributions to surface water buttons by temporary dewatering/permanent groundwater control	Lowering of groundwater levels and reduction in groundwater flow and points of groundwater contributions to surface water bodies, softion or groundwater startactions by temporary dewatering permanent groundwater contrib	Lowering of groundwater levels and reduction in groundwater contribution to surface water bodies, GWDTE or groundwater abstraction by temporary dewatering/permanent groundwater control of the control o	Lowering of groundwater levels and reduction in groundwater contributions to surface water bons seems of the control of the co	Lowering of groundwater leve and reduction in GWDTG groundwater contributions GWDTG groundwater contributions dewatering/permanent groundwater contributions	s and reduction in rface water bodies, Toamming* of groundwater flow and reduction in groundwater contributions	Lowering of groundwater levels and reduction in groundwater contributions to surface water bodies, "Damming" of groundwater flow and reduction for GNOTT or groundwater structures by temporary groundwater contributions dewatering/permanent groundwater control	Lowering of groundwater levels and reduction in groundwater contributions to surface water bodies, GWDT or conducter abstractions by temporary dewatering/permanent groundwater control	Lowering of groundwater levels and reduction in groundwater levels and reduction in groundwater contributions groundwater contributions abstractions by temporary dewatering/permanent groundwater control	"Damming" of groundwater flow and reduction in groundwater contributions of groundwater contributions groundwater contributions of watering/permanent groundwater control dewatering/permanent groundwater control	"Damming" of groundwater flow and reduction in groundwater contributions	r groundwater flow and reduction in groundwater "Dammis contributions	Temporary and Pelmatient Construction Emporary and Pelmatient Construction ng" of groundwater flow and reduction in groundwater contributions "Damming" of groundwater flow and reduction in groundwater contributions	Temporary and relimations Construction Lemporary and Lemp	Lowering of groundwater levels and reduction in groundwater contributions Lowering of groundwater levels and reduction in groundwater contributions of CWDTT or groundwater abstractions dewatering/permanent groundwater cont	on in On in Lowering of groundwater flow and reduction in groundwater contributions Geometrial Lowering of groundwater flow and reduction in groundwater contributions dewateri	indwater levels and reduction in groundwater ons to surface water bodies, GWDT or ownwater abstractions by temporary ing/permanent groundwater control	Lowering of groundwater levels and reduction in groundwater contributions Lowering of groundwater contributions to surface water bodies of GWOTE or contributions to surface water for gwoth the contributions of the c	in les. "Damming" of groundwater flow and reduction in groundwater contributions	weering of groundwater levels and reduction in groundwater institutions to surface water bodies, GWDTE or groundwater abstractions by temporary devatering/permanent groundwater control		Impact on Current WFD Status	Additional Mitigation Requirements Resid	WFD compliance outcome- todual Effect on Current WFD Element Status WFD compliance outcome- potential for deterioration of current status
Saline or other intrusions Good Very Certain Good by 2015	No impacts identified as a result of scheme No impacts identified as a result of element.	t of scheme No impacts identified as a result of scheme element. No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element.	Mo impacts identified as a result of scheme element. No impacts identified as a result of sc	theme element. No impacts identified as a result of scheme No impacts element.	No likely saline or other intrusion as no sources of poor water qualitiement.	of poor quality water No likely saline or other intrusion of poor quality w, y identified in vicinity as no sources of poor water quality identified in vicinity ent. of scheme element	ter No likely saline or other intrusion of poor quality water as No likely saline or other intrusion of poor quality intrusion of poor quality identified in vicinity of no sources of poor water quality identified in vic	ater as No likely saline or other intrusion of poor quality water as inty of no sources of poor water quality identified in vicinity of scheme element	ss No likely saline or other intrusion of poor quality water as No likely saline or other intrusion of poor quality water as no I no sources of poor water quality identified in vicinity of sources of poor water quality identified in vicinity of scheme scheme element.	to likely saline or other intrusion of poor quality water as No likely saline or other intrusion of poor quality water no sources of poor water quality identified in vicinity of scheme element. No likely saline or other intrusion of poor quality water no sources of poor water quality identified in vicinity of scheme element.	No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element scheme element	saline or other intrusion of poor quality water have nd, as there are no sources of poor water quality poor v poor v	ne or other intrusion of poor quality water as no sources of No likely saline or other intrusion of poor quality water as no sources of of poor water quality identified in vicinity of scheme element	No impacts from saline or other intrusion of poor quality water have been identified, as there are no sources of poor water quality identified in wicinity of the scheme element. No impacts from saline or have been identified, as quality identified in quality identified in	or other intrusion of poor quality water as there are no sources of poor water as there are no sources of poor water used to the scheme element.	ty water No likely saline or other intrusion of poor quality water as no No likely saline or wicinity sources of poor water quality identified in vicinity of scheme sources of poor water element.	or other intrusion of poor quality water as no water quality identified in vicinity of scheme element.	other intrusion of poor quality water as no No likely saline or other intrusion of poor quality were ter quality identified in vicinity of scheme element No likely saline or other intrusion of poor quality were no sources of poor water quality identified in vicin scheme element	ster as No likely saline or other intrusion of poor quality water as no ty of sources of poor water quality identified in vicinity of scheme element	to likely-saline or other intrusion of poor quality water as no purces of poor water quality identified in vicinity of scheme element. No likely-saline or other intrusion of poor quality water as no sour poor water quality identified in vicinity of scheme element.	es of No impacts identified	Remains Good Status	None required	Remains Good Status Compilant - no change in status
3. Surface water Poor Uncertain Good by 2027	Groundwater is suspected to be approx. 4- 5 m below cutting base. Cutting will not interfer with groundwater levels and is therefore not expected to interfer with surface water contributions. Additionally no surface water features including springs in vicinity.	Groundwater som below ground level, proposed outring base deeper than this significant in Sherwood Sandstone. No watercourses or surface water feature in this water feature in the same water feature in the sherical water feature in this water feature in the sherical water	res in Not removing significant quantities of material from the water body (basically at grade), not to will of from the water body (basically at grade), not to work the proposition of groundwater or disturb groundwater. Groundwater thought to be below cutting base by approx. ym. No impact on surface water.	Groundwater suspected to be a6m below the base of the cutting (B.s.g. mA/OD as opposed to a06.6mA/OD at max depth). Tooghi not to have assignificant impact to groundwater flow. No impact on surface water. Cutting does not penetrate below water or reduction in groundwater contribution impacts identified as a result of sche impacts.	Absert groundwater level data in area, therefore assumed worst case scenario and water levels assumed worst case scenario and water levels to the control of	inted for the purposes of this required and no impact on flus of influence for dewatering is of 121m, no watercourses within	t least 35m below the fig proundwater levels for soundwater levels sourface water. The cutting does not penetrate below the water 1 talk for proundwater levels contributions. No significant impacts identified as result of scheme element.	Maximum groundwater levels are approximately symbolio with abase of the cutting, therefore no impacts on a groundwater and no nearby surface water receptors. Significant enably surface water receptors. Significant in identified as a result of scheme element.	No. St. No. Maximum groundwater levels are approximately 18 m below the base of the cutting, therefore no impacts on groundwater and no nearby surface water receptors.	Cutting does not penetrate below water table. No damming or reduction in groundwater contributions. No nearby surface water receptors. No significant impacts is dentified as a result of scheme element.	Cutting does not penetrate below water table. No lamming or reduction in groundwater contributions. No lamming or reduction in groundwater contributions was proproximately fin below the base of the cutting dentified as a result of scheme element.		trook. Groundwater level not known at this location be shallow and groundwater is expected to provide Morece Book. Presental for locations from the controlling of changing of groundwater flow paths around visduct root known for expected for design, constructions and operations around piers. Surface and operations of potential impacts would be minor and localised around piers.	ndations as part of the scheme element. CoCP and best	No impacts identified as a result of scheme element. No impacts identifies	Highton culvert allows surface water from Highton to flow under the route of the proposed scholled as a result of scheme element. Baseflow to this water course from groundwaters to be minimal. No impacts identified as a result of scheme element.	ton Pools Hopton culvert allows surface water from Hopton Pools to life with the water of the proposed scheme. Baseflow to base of the with discovered the country of the proposed scheme. Baseflow to base of the simpacts identified as a result of scheme element.	individer levels are expected to be below the porous portal, therefore no impacts on read no nearby surface water receptors. As a re-	or expected to penetrate below water table. Luction in groundwater contributions. No expectors. No significant impacts identified each of scheme element. Maximum groundwater levels are expected to be the base of the cut and cover tunnel, therefore impacts on groundwater and no nearby surface w receptors.	The cut and cover tunnel is not expected to penetrate below water table. No damming or reduction in groundwater contributions. No nearly surface water receptors. No significant impacts identified as a result of scheme element.	The nontherrmost section of the Whitmore Heath twin bore turned may intersect the saturated zone of the Sterood solutions in considerable solutions and the saturated zone, construction of the turned will one of the solution of the solutio	e a. theret feered Potential localised impacts identified, negligible impact with Hall embedded mitigation	No significant deterioration	None required	No significant deterioration Compliant - no change in status
3 - Groundwater Dependent Terrestrial Ecosystems (GWOTE's) Good Uncertain Good by 2015	No impacts identified as a result of scheme No impacts identified as a result element.	t of scheme No impacts identified as a result of scheme element. No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element. No impacts identified as a result of scheme element.	eme No impacts identified as a result of scheme element. No impacts identified as a result of sc	theme element. No impacts identified as a result of scheme No impacts element.	dentified as a result of scheme No impacts identified as a result element.	of scheme element. No impacts identified as a result of scheme elemen	st. No impacts identified as a result of scheme element. No impacts identified as a result of scheme ele	ent. No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element. No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element. No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element. No impacts i	cts identified as a result of scheme element. No	impacts identified as a result of scheme element. No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element. No impacts identifie	ied as a result of scheme element. No impacts identified as a result of scheme el	ement. No impacts identified as a result of scheme element. No impacts is	identified as a result of scheme element. No impacts ident	ntified as a result of scheme element. No impacts identified as a result of scheme elem	ent. No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element. No impacts identified as a result of scheme element.	No impacts identified	Remains Good Status	None required	Remains Good Status Compliant - no change in status
4. Water balance Poor Uncertain Poor by 2015	Major aguifer though no abstractions in the vicinity from the sandstone (within skin) of the cutting. No GWOTE in the area of the cutting the GWOTE in the area of the cutting the cutting does not penetrate belt small helsby Formation outcop, underneath Mercia Muddene, not thought to significantly impact the underlying Sherwood sandstone aquiter WDE body; if any effect would be local, though as does not cut into groundwater on significant effect assigned.	Cutting may affect groundwater flow to unlicensed private abstraction at Upper Ion water Hayards Farm however abstraction will be denoished as part of the scheme. Radius of denoished as part of the	v to per ill be las of a foroundwater thought to be below cutting for and water thought to be below cutting for and base by approx. 7m. Cutting does not penetrate below water table. No damming or reduction in the last by approx. 7m. Cutting does not penetrate below water table. No damming or reduction in machine impacts identified as a result of scheme impacts identified as a result of scheme impacts identified as a result of scheme.	er Groundwater suspected to be a sim below the base of the cutting the common support of the cutting the common support of the cutting the common support of the cutting the c	Radius of influence calculated max 32377, however only a short section of this cutting is within the Shewood Sandstone. The lateral and section of the sapiler amont person which the section of the sapiler amont person which the section of the sapiler amont person that the sales of influence and depth of the cutting. The destribed.	uence calculated max 131m, short section of this cutting is cood Sandstone. The lateral and for the aquifer's most peater of influence and depth of the fore no significant impacts identified.	t least sym below the ion of groundwater on water balance. No damming or changes to the water balance on water balance. Of scheme element.	lie. Groundwater is suspected to be at least sym below the base of the cutting. No abstraction of groundwater required therefore no impact on water balance. The cutting does not penetrate below the water. No damming or changes to the water balance expected. No significant impacts destribled as a of scheme element.	able. Groundwater is suspected to be at least 18m below the base of the cutting, No abstraction of groundwater required therefore no impact on water balance.	The cutting does not penetrate below the water table. No damming or changes to the water balance expected. No significant impacts demented as a result of the cutting. No abstraction of groundwater required therefore no impact on water balance.	The cutting does not penetrate below the water table. No damming or changes to the water balance expected. No significant impacts identified as a result of scheme element. Groundwater is expected to be at least 6m below the base of the cutting. No abstraction of groundwater required therefore no impact on water balance.	The cutting does not penetrate below the water table. No damming or changes to the water balance expected. No significant impacts identified as a result of scheme element.	Localised impacts on flow regime.	Potential localised impacts on flow regime. Potential localised impacts on flow regime	The overbridge foundations will not penetrate below the water table. No damming or changes to the water balance expected. No significant impacts identified as a result of scheme element, sch	ions are unlikely to penetrate below the image or changes to the water balance and impacts identified as a result of significant impacts identified as a result of cheme element.	e lateral Extend of retaining wall small compared to the lateral and Maximum groun scheme wertical extent of the Shenwood Sandatore. No significant base of the polympacts identified as a result of the scheme element.	indivister levels are expected to be below the most portal, therefore no impacts on water balance due to abstraction. The portal portal the portal dark dark to abstract the portal portal dark dark to abstract the portal porta	or levels are expected to be below the base of the cost on water balance due to the base of the cut and cover tunnel, therefore impacts on water balance due to abstruction.	elow Maximum groundwater levels are expected to be below the base of the cut and cover turnet, therefore no impacts on water balance due to damming of groundwater.	The bored tunnel is will be constructed in closed face mode dis designed to be watertight therefore no impact on water balance is expected due to potential ground, damming, with only localised impacts on flow regime.	No impacts identified. Water level around Whitmore Tunnel thought to be below the base of the funnel, except to north thought to be a bored tunnel and will not need deviatering.	h No significant deterioration	None required	No significant deterioration Compliant - no change in status
Overall Quantitative Status Poor Uncertain Poor by 2015					•	•	•		•		·			·	·			,	·		'			•	<u> </u>
Groundwater body: Staffordshire Trent Valley - PT Sandstone Staffordshire (GB404016300500)	Phase: Temporary and Permanent Construction	Brancete South cutting WPD-GW-SPT-C-92 Temporary and Permanent Construction	Brancote North cutting WPD-GW-SPT-C-23 Temporary and Permanent Construction	Hopton South cotting WTO-GM-SPT.C-64 Temporary and Permanent Construction	Hopton North cutling WFD-GW-SPT-C-os Temporary and Permanent Consti	ttion	Cuttings Swynnerton South cutting WFD-GW-SPT-C-o6 Temporary and Permanent Construction	Swynnerton North cutting WED-GW-SPE-C-ey Temporary and Permanent Construction	Hatton So WFD-GW Temporary and Peri	outh cutting Hatton North W SPT C 08 WTD GW SP wmanent Construction Temporary and Perman	cutting Whitmore i-C-sg WFD-Gr ent Construction Temporary and Per	South cutting W-SPT-C-10 wmanent Construction Tempo	Viaduct Meece Brook viaduct WFD-GW-SPT-VF-01 apporary and Permanent Construction	One Ore Asia Weston Road overbridge Bsoss Uttoxeter Road overbridge WID-GW-SFT-OF-ca Temporary and Permanent Construction Temporary and Permanent Construction	hridges Assa Newcastle Road overbridge Assa Newcastle Road overbridge WTD-GW-SPT-OF-as WTD Temporary and Permanent Construction Temporary and	rcastle Road overbridge D-GW-SPT-OF-03 nd Permanent Construction Tempora	Retaining Wall Hopton retaining wall WID-CW-ST-KT cs. ry and Permanent Construction	Southern porous portal of the Whitmore Heath t WFD-GW-SPT-GT-o2 Temporary and Permanent Construction	Cut and Cover Tunnel The cut and cover numel The cut and cover Tunnel	r section of the Whitmore Heath tunnel WFD-GW-SPT-GT-02 ry and Permanent Construction	Bored Tonnel The twin bore section of the Whitmore Heath tunnel WID_DWISFT-8T-0s Temporary and Permanent Construction	OwallEffet	Impact on Current WED Status	Additional Mitigation Requirements Resid	wFD compliance outcome obtained of control of the c
Current Status Confidence Status objective Identified po	tential chemical qualify groundwater by temporary deviating poor qualify groundwater by temporary deviating open qualify groundwater control apermanent groundwater control	sys along Disturbing or mobilising existing poor quality groundwater repressurisation and permanent groundwater control Creating or altering of pathways along we existing poor quality groundwater can mit control	Disturbing or mobilising existing poor quality groundwater by temporary devatering or altering of pathways along wh which groundwater by temporary devatering or depressurisation and permanent groundwater can existing poor quality groundwater can migrate	which Disturbing or mobilising existing poor quality groundwater on the property of the property dewatering or depressurisation and permanent promote production of the property of the proper	Disturbing or mobilising existing poor quality groundwater by temporary devastering or depressursation and permanent groundwater existing poor control	tering of pathways along which uality groundwater can migrate groundwater the temporary depressurisation and permanent	ing poor quality dewatering or groundwater control Creating or altering of pathways along which exists poor quality groundwater can migrate	ng Disturbing or mobilising existing poor quality groundwater by temporary dewatering or depressurisation and permanent groundwater control Creating or altering of pathways along which exis quality groundwater can migrate	ng poor Disturbing or mobilising existing poor quality groundwater by temporary dewatering or depressurisation and permanent groundwater control	er Creating or altering of pathways along which existing poor quality groundwater by temporary dewatering or depressuriation and permanent groundwater control	Creating or altering of pathways along which existing poor quality groundwater to minigrate groundwater to temporary devastering or depressurisation and permanent groundwater control	Creating or altering of pathways along which existing poor undering or altering or altering quality groundwater can migrate	ring of pathways along which existing poor quality groundwater can migrate Creating of	r altering of pathways along which existing poor quality groundwater can migrate Creating or altering of pathways along which existing poor groundwater can migrate	quality Creating or altering of pathways along which existing poor quality groundwater can migrate ground	thways along which existing poor quality groundwater by temporary dewatering and water can migrate depressurisation and permanent groundwater	silty Creating or altering of pathways along which existing poor quality groundwater can migrate Disturbing or motor control	abilising existing poor quality groundwater by watering or depressurisation and permanent groundwater control	f pathways along which existing poor quality groundwater to temporary dewatering or depressurisation and permanent groundwater contains an advantage of the contains and permanent groundwater contains a contain	Creating or altering of pathways along which existing poor quality control	sturbing or mobilising existing poor quality groundwater by temporary dewatering or depressurisation and permanent groundwater control Creating or altering of pathways along which existing poor qua groundwater can mi	ty		,	Status Current status
1. Saline or other intrusions Good Very Certain Good by 3615	No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element No likely saline or other intrusion quality identified in vicinity of element	on of poor soon water quality water as no sources of poor water quality water as no sources of poor water quality water as no sources of poor water quality identified in vicinity of scheme element quality identified in vicinity of scheme element quality.	No likely saline or other intrusion of poor quality water as no sources of poor water quality water as no sources of poor water quality identified in vicinity of scheme element	No likely saline intrusion identified in the vicinity. Cutting may penetrate the historical landfill at Staffordoline County Money own. Records show the landfill was sent; uncapped and unimed. Let up not visited by Threefore any mobile of Contaminants will have most likely have been leached locally. Controllocation will be understann accordance with the COCP. Any waste encountered will be removed as part of the work. Gorniforder likely beneate the cutting base therefore dewatering unikely.	r quality water as no No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element identified.	or other intrusion of poor quality sources of poor water quality six mits of scheme element of scheme element	of poor quality water No likely saline or other intrusion of poor quality wy ydentified in vicinity as no sources of poor water quality identified in vici- of scheme element	ter No likely saline or other intrusion of poor quality water as No likely saline or other intrusion of poor quality mater as no sources of poor water quality identified in vicinity of scheme element.	No likely saline or other intrusion of poor quality water as no sources of poor water quality dentified in vicinity of scheme element	ss No likely saline or other intrusion of poor quality water as no no sources of poor water quality identified in vicinity of sources of poor water quality identified in vicinity of scheme element.	to likely saline or other intrusion of poor quality water as: No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in wicinity of scheme element.	No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element scheme element.	r other intrusion of poor quality water as no sources No likely sall requality identified in vicinity of scheme element poor v	ne or other intrusion of poor quality water as no sources of a lookely saline or other intrusion of poor quality water as no ources of a lookely saline or other intrusion of poor quality water as no of poor water quality identified in vicinity of scheme element of poor water quality identified in vicinity of scheme element	No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element. No likely saline or other sources of poor water quality dentified in vicinity of scheme sources of poor water quality dentified in vicinity of scheme	er intrusion of poor quality water as no quality identified in vicinity of scheme element. No likely saline or other intrusion of poor quality as no sources of poor water quality identified in of scheme element.	ty water No likely saline or other intrusion of poor quality water as no No likely saline or vicinity sources of poor water quality identified in vicinity of scheme sources of poor we element.	or other intrusion of poor quality water as no water quality identified in vicinity of scheme element sources of poor water	ther intrusion of poor quality water as no no Sweet saline or other intrusion of poor quality water as no no sources of poor water quality dentified in vicin of sources of poor water quality dentified in vicin no sources of poor water quality dentified in vicin no sources of poor water quality dentified in vicin no sources of poor water quality dentified in vicin no sources of poor water quality water as no no sources of poor water quality water as no sources of poor water quality dentified in vicin water quality water as no sources of poor water quality dentified in vicin sources of poor water quality water as no sources of poor water quality water as	nter as No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme selement.	to likely saline or other intrusion of poor quality water as no nources of poor water quality destrified in vicinity of scheme element. No likely saline or other intrusion of poor quality water as no sour poor water quality identified in vicinity of scheme element.	es of No impacts identified	Remains Good Status	None required	Remains Good Status Compliant - no change in status
2. Surface water Poor Uncertain Good by 2027	Groundwater is suspected to be approx. 4- ym below cotting base. Cutting will not interfere with groundwater levels and is therefore one expected to interfere with surface water contributions. Additionally no surface water features including springs in vicinity. Cutting does not penetrate below table. No damming or relative table. No	Groundwater som below ground level, proposed cutting base deeper than this proposed cutting base deeper than this service of of full-time calculated as 2,4 min the Sherwood Sandstoon. No watercourses or surface water feature in this sare within this dails of influence calculated as a well not a diffect the basefood of any rivers. No significant impacts dentified as a result of scheme element.	Not removing significant quantities of material from the water body (bascall) at grade), not . Cutting does not penetrate below water ta hought to impact or groundwater or disturb. No damming or reduction in groundwate or disturb. So groundwater. Groundwater throught to be below cutting base by approx. 7m. No impact identified as a result of scheme element.	table. Groundwater suspected to be 36m below the base of the tere cutting this z, mADO as opposed to 36.6mADO at max depth. Thought not to have a significant impact or reduction in groundwater flow. No impact on surface water. Cutting does not penetrate below water or reduction in groundwater contribution in the contribution of the contributi	Absent groundwater level data in area, therefore assumed worst case scenario and water levels near ground surface. (However groundwater elevations in the logious South Cutting although this has been discounted for the purposes of this scenario, the second of influence for devautering is a calculated max of a zm, no watercoones within this radius of influences ow will not affect the baseflow of any rivers.	s or surface water features in this sradius of influence so will not base of the cutting. No lowering town of any rivers. No significant mobilisation of groundwater and therefore no mobilisation of groundwater.	t least 3,5m below the gor abstraction of other cutting. No impacts identified as a result of scheme elemen yor abstraction of other cutting, or comection with surface water. Co and best practice for design, construction and operation reduce risks to water quality.	Groundwater is suspected to be at least 19m below the base of the cutting. No lowering or abstraction of groundwater and therefore no potential impact on mobilisation of groundwater due to the cutting. On conscious with surface water. October practice for design, construction and open reduce risks to water quality.	Groundwater is suspected to be at least 18m below the base of the cutting. No lowering or abstraction of and groundwater and therefore no potential impact on mobilisation of groundwater due to the cutting.	No impacts identified as a result of scheme element. No poor quality groundwater expected in the vicinity of the cutting, or connection with surface water. CoCP and best practice for design, construction and operation reduce risks to water quality.	No impacts identified as a result of scheme element. No processing groundwater expected in the vicinity of the base of the cutting, No conection with surface water. CCP and best practice for design, construction and operation reduce risks to water quality.	No poor quality groundwater expected in the vicinity of the cutting, Meece Brook is proximity to the cutting which may create near pathway for publican however with CoCP and best practice for design, construction and operation risks to water quality are negligible.	te Brook. Potential creation of preferential flow e aquifer due to pling. CoCP and best practice for on and operations, and natural alterations of any groundwater groundwater for the control of the control of the control impacts to negligible.	Surface watercourse sinks at the western side of the overbridge. No implicately to the east of the overbridge. No implicated as a result of scheme element. No poor quality despected to be disturbed or mobilised in the vicinity of the overbridge. The overbridge are not some. Potential for introviec construction overbridge. Or an are not known. Potential for introviec construction of poor quality construction of poor quality construction of poor quality constructions. The poor quality groundwater expected in the verbridge. COP and beet practice for design, construct operation reduce risks to water quality.	tige and acts No impacts identified as a result of scheme element. No poor augilty groundwater expected in the sicinity of the overhiding, anality groundwater expected by or connection with surface water. COP and bett practice for design, construction and operation reduce risks to water quality.	hopton culvert allows surface water from Hopton to the vicinity of the overbridge, or sewater. COPA makes practice for loperation reduce risks to water quality. Hopton culvert allows surface water from Hopton to flow under the route of the proposed strict water from Hopton water from Hopton water from Hopton under the route of the proposed strict water from Hopton under the route of the proposed strict water from Hopton under the route of the proposed strict water from Hopton under the route of the proposed strict water from Hopton under the route of the proposed strict water from Hopton under the route of the proposed strict water from Hopton under the route of the proposed strict water from Hopton under the route of the proposed strict water from Hopton under the route of the proposed strict water from Hopton under the route of the proposed strict water from Hopton under the route of the proposed strict water from Hopton under the route of the proposed strict water from Hopton under the route of the proposed strict water from Hopton under the route of the proposed strict water from Hopton under the route of the proposed strict water from Hopton under the route of the proposed strict water from Hopton under the route of the proposed strict water from Hopton under the route of the proposed strict water from Hopton under the route of t	ton Pools Hopton culvert allows surface water from Hopton Pools to Groundwater is to mem. If they they water course from groundwater likely the seminimal. No impacts identified as a result of scheme element.	expected to be below the base of the porous No impacts identified expected to be below the base of the porous No impacts identified quality groundwater quality groundwater connection with surface due to the cutting.	and as a result of scheme element. No poor are expected in the vicinity of the portal, or and cover turnet. No lowering or abstraction or groundwater and therefore no potential impact mobilisation of groundwater due to the cutting mobilisation of groundwater due to the cutting and the control of the cutting mobilisation of groundwater due to the cutting the control of the cutting and cover turnet.	he cut and the cut with the cut of scheme element. No poor of cut	o dewatering proposed during construction of the twin bore unnel and no existing poor quality groundwater expected in season and popular processors to an and popular expected in the vicinity of the twin bore tunnel. Co and best practice for design, construction and popular expected in the vicinity of the twin bore tunnel. Co and best practice for design, construction and operation enter until to surface water quality due to new preferential pathways.	ity P Ro impacts identified kis	No significant deterioration	None required	No significant deterioration Compliant - no change in status
3. Groundwater Dependent Terrestruit Ecosystems Good Very Certain Good by 2015 GOOD TES)	No impacts identified as a result of scheme No impacts identified as a result of element.	t of scheme No impacts identified as a result of scheme No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element. No impacts identified as a result of scheme element.	me No impacts identified as a result of scheme element. No impacts identified as a result of sc	theme element. No impacts identified as a result of scheme No impacts element.	dentified as a result of scheme element. No impacts identified as a result	of scheme element. No impacts identified as a result of scheme elemen	st. No impacts identified as a result of scheme element. No impacts identified as a result of scheme ele	ent. No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element. No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element. No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element. No impacts identified groundwater expe	offed as a result of scheme element. No poor quality properties in the vicinity of the cutting, or hydraulic connection with GWOTE.	identified as a result of scheme element. No poor quality re expected in the vicinity of the overbridge, or hydraulic connection with GWOTE. No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element. No poor quality groundwater expected in the vicinity of the overbridge, or hydraulic connection with GWOTE. CoCP and best practice for design, construction and operation reduce risks to water quality, construction and operation reduce risks to water.	is a result of scheme element. No poor extend in the vicinity of the overbridge, or th GWDTE_CoCP and best practice for loperation reduce risks to water quality.	iement. No impacts identified as a result of scheme element. No impacts is	identified as a result of scheme element. No impacts ident	rntified as a result of scheme element. No impacts identified as a result of scheme elem	ent. No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element. No impacts identified as a result of scheme element.	No impacts identified	Remains Good Status	None required	Remains Good Status Compliant - no change in status
4. Drinking Water Protected Areas (DNVPAs) Poor Uncertain Good by 2027	No impacts identified as a result of scheme element. No poor quality groundwater expected in the vicinity of the cutting, and the element is not within an SPZ.	to of scheme individual control of the control of t	heme. No impacts identified as a result of scheme element. No poor quality groundwater expected in the vicinity of the cutting, and the element is not within an SPZ.	No impacts identified as a result of scheme element. Element is not within an \$72^*\$C. Oction; may penetrate the historical landfill at Dalforoshive County Showingtone. Leat input of wister 1936. Therefore say mobile coally. Construction will be understann in accordance with the GoCP. Any waste encountered will be removed as part of the works. Groundwater kiely hearest the cating base therefore dewatering unikely.	wy penetrate the ty Shonoground. No impacts identified as a result of scheme No impacts a normalize element. No poor quality groundwater expected elements. No po to be en leaked in the viction yof the cutting, and the element is in accordance with re-removed is not within an SPZ.	Identified as a result of scheme Goundwater is suspected to be are quality groundwater expected in base of the cutting. No lowering groundwater and therefore no mobilisation of groundwater in	Although groundwater is expected to be at least to be to the using, excausion start to be a stream of an extraction of the conting, excausion start the government of the conting, excausion start the government of the conting of the conting, and the conting of the continuous of the con	Groundwater is suspected to be at least sym below the base of the cutting. No lowering or abstraction of groundwater and therefore no potential impact on mobilisation of groundwater due to the cutting. Although groundwater is expected to be at least below the base of the cutting. No lowering or abstraction of groundwater and therefore no potential impact on mobilisation of groundwater due to the cutting and the SEP3. Application of the CGP. Will extend to the CGP will extend the C	Groundwater is suspected to be at least 18m below the base of the cutting. No lowering or abstraction of groundwater and therefore no potential impact on enables along the property of the cutting.	Although groundwater is expected to be at least slim below the base of the cutting, excavation into the unstatured zone of the aquifer may create a pathway for poor quality water to infiltrate into the aquifer within the 52%, polication of the CoCP will ensure materials and fluids used during construction are managed so that there is no significant effect on the DrWPA.	Although groundwater is expected to be at least sumbleow the base of the cutting, excavation into the insulanteed none of the audier may create a pathway for poor quality water to inflate into the aquifer which the STS2 Application of the COP will ensure materials and fluids used during construction are managed so that there is no significant effect on the DNPA.	Although groundwater is expected to be at least 6m below the base of the custing, exception into the unsaturated zone of the aquier may create a pathway for poor quality water to infiltrate into the aquifer within the 5°23. Application of the CCOP will ensure naturations and flusion and potentially in practice for design, quality in the control of t	quality groundwater is expected in the vicinity of the spotential for impacts to enter quality in the SP2, or the SP2 and impacts to enter quality in the SP2. No impacts up the SP2 and best quality of the viaduct but sensitive setting in SP24/SP21.	identified as a result of scheme element. No poor quality spected in the vicinity of the overbridge, and the element is dentified as a result of the scheme element. Therefore no identified as a result of the scheme element. not within an SPZ.	No impacts identified as a result of scheme element. No poor impacts gualty groundwater expected in the vicinity of the overholding, and the element is not within an SFZ. CoCP and best practice for design, construction and operation reduce risks to water design.		nent. No DVWPAs within skm of the scheme element. Therefore portal. No low impacts identified as a result of the scheme element. Therefore in therefore in the scheme element.	expected to be below the base of the porous wering or abstraction of groundwater and no potential impact on mobilisation of aquifer within the SP.	ter is expected to be below the base of the tips into the uncaturated zone of the applies for poor quality where to deficate into a PEZ_A. Application of the CoCP will ensure dedung control on are managed so that significant effect on the DrWPA.	Although groundwater is expected to be below the base of the lot of call and cover tunes, exception into the instituted zero of the highly form you relate pathworf no proportion and the second of the CoCP will ensure the secon	Juned may be constructed in saturated zone of the agailer, of-ewatering proposed during construction of the tent both of the control of the tent both of the control of the tent both of the control of the CoP will ensure materials and list used during construction are managed so that there is no significant effect on the DNWPA (SPZg).	Although works may increase potential contaminant pathways, nesting poor quality water is espected in the SPZ around the publication of the CPZ with instruction near Whitmore, and no long term impacts and predicted. Application of the CoPZ will ensure martials use is predicted. Application of the CoPZ will ensure martials used during construction are managed so that there is no signification. Effect on the CPZ will be supported by the control of the co	impacts predicted and short term impacts unlity, howe implications for but should be reduced assuming mitigation measures for the PWS near Whitmore are agreed prior to construction.	on measures with Severn Trent Water and the Environment by an progress) for management of the water supply from the adstraction site new Withmore. The potential temporary cts of the scheme on the water abstraction are only related to work the agent configuration measures may these potential or the agent mining an measures may these potential of the progress of the progress of the progress of the ly, and agent miningston measures will need to ensure no monation of either. The detailed design of, and maintenance ck and drainage measures within the \$PZ associated with this elouped in close constants on with Severn Intro Water Limited ment Agency, and will ensure that operation of the Proposed sould in a permanent significant adverse effect on the DrWPA.	No significant deterioration Compliant - no change in status
5. General quality assessment Good Uncertain Good by 2015	Application of the CoCP will ensure materials and fluids used during construction are managed so that there is no significant adverse effect on groundwater quality. Application of the CoCP will ensure materials and fluids used during construction are managed so that there is no significant adverse effect on groundwater quality.	Juring and fluids used during construction are managed so that there is no significant managed so that there is no significant managed so that there is no significant addressed to the state of the sta	Application of the CoCP will ensure materials are and fluids used during construction are with many construction are adversed managed so that there is no significant adverse effect on groundwater quality. Application of the CoCP will ensure materials and fluids used during construction are and fluids used during construction are and surface and surfac	Cutting may penetrate the historical landfill at Staffordshire courts Sloweyound. Recrost show the landfill was inert, courts Sloweyound. Recrost show the landfill was inert, and mysolize contaminants will have most likely have been leached locally. Construction will be undertaken in y. accordance with the CGCP. Any waste encountered will be removed as part of the works. Groundwater likely beneath the cutting base. Cutting may penetrate the historical land County Showgound. Recrost show the concapped and unified. Last support does not problem to concapped and unified. Last support does not problem to consider the location of the county support of the county support of the county support removed as part of the works. Groundwater the cutting base.	dfill at Staffordshire Landfill was leet, te sigh, Therefore Application of the CoCP will ensure materials and fluids used during construction are undertaken in amaged so that there is no significant advene effect on groundwater quality.	No existing poor quality group of control of the co	ndwater expected. Instruction and Ity could only occur if Inscription of the CoCP Instruction of the C	No existing poor quality groundwater expected. Potential pollution during construction and degradation of groundwater quality could only occur floor managed appropriately. Application of the CoCP will ensure managed to that there is no significant effect on general groundwater quality.	No existing poor quality groundwater expected. Potential of pollution during construction and degradation of gord undester quality could only occur? front managed appropriately, Application of the GCP will ensure materials and fluids used during construction are managed so that there is no significant effect on general groundwater quality.	al No existing poor quality groundwater expected. Potential published may construction and degradation of groundwater guality could only occur if not managed appropriately. Application of the CoCP will ensure a managed so that there is no significant effect on general groundwater quality.	to existing poor quality groundwater expected. Potential pollution during construction and degradation of Potential pollution during construction and degradation. Potential pollution during construction are degradation of the COP will ensure materials and fluids used during construction are managed as that there is no significant effect on general groundwater quality.	No existing poor quality ground-water expected. Potential pollution during construction and degradation of the pollution during construction and engradation of apopoputable. Application of the CoCP will ensure materials and fluids used during construction are managed so that there is no significant effect on general ground-water quality.	preferential pathways into the aquifer due to piling, all to impact general water quality. No existing poor shallow grour overpression, and natural attenuation of any turbidity operations, and natural attenuation of any turbidity extraction, will reduce in risk and potential impacts to negligible.	poor quality groundwater expected. Under scenario of dwater levels, there would be little or no unsaturated sine and degradation of groundwater quality could occur if not compositedly, Application of the CoCP will ensure materials and fluids used construction are managed on that there is no significant adversarial configurations are managed on that there is no significant adversarial configuration are managed on that there is no significant adversarial configuration are managed on that there is no significant adversarial configuration are managed on that there is no significant adversarial configuration are managed on that there is no significant adversarial configuration are managed on that there is no significant adversarial configuration.	There is expected to be significant unsaturated zone in the applier but overheight foundations could create new preference applies pathways, there is operated its invaping a primary pathways. The proposal pathways is not an add best practice for design, construction and operations, and natural attention of any turbidity resulting from construction, and will reduce risks and potential impacts to negligible.	e significant unsaturated zone in the dipe foundations could create new herefore potential to impact general used during constriction ner managed to that on significant adverse effect on groundwater of potential impacts to negligible.	Application of the CoCP will ensure materials and fluids there is used during construction are managed to that there is no significant adverse effect on groundwater quality. No existing poor potential politics or groundwater quality: and fluids and fluids described there is no significant adverse effect on groundwater quality:	or quality groundwater expected. There is a front of using construction and degradation of requisity could only occur if not managed opplication of the CoCP will ensure materials during construction are managed so that fixed the effect on general groundwater quality.	thy groundwater expected. Excavation of the preferential pathway for poor quality water preferential pathway for poor quality groundwater expected. The preference quality could only occur if not many trials and fluids used during construction are there is no significant effect on general groundwater quality.	he are No existing poor quality groundwater expected. Excavation of the intention portal codd provide a preferential pathway for poor quality water and during construction however degradation of groundwater quality per received to the provided of the provided provided to the provided of the provided provided to the p	No existing poor quality groundwater expected. Little or no instituted to one in the Sherwood Sandstone and potential poll instituted zone in the Sherwood Sandstone with poll institute	Although works may increase potential contaminant pathways, application of the CoCP will ensure materials and fluids used durin or of an experimental or or an experimental or or an experimental or	9 Remains Good Status	None required	Remains Good Status Compliant - no change in status

Table 62: Staffordshire Trent \	alley - Mercia Mudstoi	ne West (GB40402G300400) d	detailed impact assessm	nent - effects on current status						Cuttings					Via	aducts		Overbridges						
				Scheme Component:	Hopton No	rth Cutting	Yarlet South	cutting		entral cutting	Yarlet Norti	th cutting	Mea	aford cutting	Filly Brook viaduct	M6 Meaford viaduct	B5066 Sandon Road overbridge	A34 Stone Road overbridge	B5026 Eccleshall Road overbridge					
Groundwater body: Staffords	hire Trent Valley - Me	rcia Mudstone West (GB404)	402G300400)	Seneme component	<u> </u>	-SPT-C-01	WFD-GW-MM			/-MMW-C-03	WFD-GW-M			GW-MMW-C-o5	WFD-GW-MMW-VF-01	WFD-GW-MMW-VF-02	WFD-GW-MMW-OF-01	WFD-GW-MMW-OF-02	WFD-GW-MMW-OF-03					
				Phase:	Temporary and Per	nanent Construction	Temporary and Perman	nent Construction	Temporary and Per	rmanent Construction	Temporary and Perma	nanent Construction		Permanent Construction	Temporary and Permanent Construction	Temporary and Permanent Construction	Temporary and Permanent Construction	Temporary and Permanent Construction	Temporary and Permanent Construction					
	Current Status	Confidence Sta	atus objective	entified potential quantitative impacts: de	Lowering of groundwater levels and reduction in groundwater contributions to surface water bodies, GWDTE or groundwater abstractions by temporary ewatering/permanent groundwater control	"Damming" of groundwater flow and reduction in groundwater contributions		"Damming" of groundwater flow and reduction in groundwater contributions	Lowering of groundwater levels and reduction in groundwater contributions to surface water bodies, GWDTE or groundwater abstractions by temporary dewatering/permanent groundwater contro	reduction in groundwater contributions	Lowering of groundwater levels and reduction in groundwater contributions to surface water bodies, GWDTE or groundwater abstractions by temporary dewatering/permanent groundwater control	"Damming" of groundwater flow and reduction in groundwater contributions	Lowering of groundwater levels and reduction in groundwater contributions to surface water bodies, GWDTE or groundwater abstractions by temporary dewatering/permanent groundwater contro	"Damming" of groundwater flow and reduction in groundwater contributions	"Damming" of groundwater flow and reduction in groundwater contributions	"Damming" of groundwater flow and reduction in groundwater contributions	"Damming" of groundwater flow and reduction in groundwate contributions	er "Damming" of groundwater flow and reduction in groundwat contributions	er "Damming" of groundwater flow and reduction in groundwat contributions	Overall Effect	Impact on Current WFD Status	Additional Mitigation Requirements	Residual Effect on Current WFD Element Status	WFD compliance outcome - potential for deterioration of current status
1. Saline or other intrusions	Good	Uncertain Goo	ood by 2015		No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element		quality water as no sources of poor water q		poor quality water have been identified, as there are no sources of poor water quality	poor quality water have been identified, as there are no sources of poor water quality		poor quality water have been identified, a there are no sources of poor water quality	poor quality water have been identified, as there are no sources of poor water quality	quality water have been identified, as there are no sources of poor water quality identified in vicinity	No impacts from saline or other intrusion of poor quality water have been identified, as there are no sources of poor water quality identified in vicinity of the scheme element.		No likely saline or other intrusion of poor quality water as no	No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element	No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element		Remains Good Status	None required	Remains Good Status	Compliant - no change in statu
2. Surface water	Good	Uncertain Goo	ood by 2015	ti v gr fc	Absent groundwater level data in area, herefore assumed worst case scenario and vater levels near ground surface. (However roundwater elevations in the Hopton South Cutting nearby indicate that groundwater elevations may be below the base of the cutting although this has been discounted or the purposes of this assessment). Radius of influence for dewatering is a calculated max of 25m in the Mercia Mudstone, no vatercourses within this radius of influence o will not affect the baseflow of any rivers.	an absence of groundwater level data in this area, however if the cutting is within or penetrates the saturated zone (skerries) within the mudstone, drainage measures will be designed following ground investigation and monitoring to ensure groundwater flow is maintained, and to prevent a groundwater level rise upgradient of the cutting where required. No impacts	Groundwater levels uncertain in the area, overall in the Mercia Mudstone West WFD groundwater body water levels are uncertain. Maximum radius of influence of 38.5m at worst case scenario, no surface water features within this distance.	o nearby surface water receptors. There is absence of groundwater level data in this area, however if the cutting is within or penetrates the saturated zone (skerries) within the mudstone, drainage measures will be designed following ground investigation and monitoring to ensure groundwater flow is maintained, and to event a groundwater level rise upgradient if the cutting where required. No impacts identified as a result of the scheme element.	No impacts identified as a result of scheme element. Groundwater levels are not known in this area. Taking a worst case groundwater level at ground level, cutting radius on influence estimated at a maximum of 3.6m. No surface water features are within	No nearby surface water receptors. There is an absence of groundwater level data in this area, however if the cutting is within or penetrates the saturated zone (skerries) within the mudstone, drainage measures will be designed following ground investigation and monitoring to ensure groundwater flow in s maintained, and to prevent a groundwater level rise upgradient of the cutting where required. No impacts identified as a result of the scheme element.	Groundwater levels are not known in this area. Taking a worst case groundwater level at ground level, cutting radius on influence estimated at a maximum of 4.5m. No surface water features are within this distance that will be significantly impacted. A potential spring (not mapped) which may supply a pond north of Pirehill Farm would be lost, but two more ponds will be created (standard ecological mitigation).	No nearby surface water receptors. There an absence of groundwater level data in th area, however if the cutting is within or penetrates the saturated zone (skerries) within the mudstone, drainage measures will be designed following ground investigation and monitoring to ensure groundwater flow is maintained, and to prevent a groundwater level rise upgradier of the cutting where required. No impacts identified as a result of the scheme element.	No impacts identified as a result of scheme element. Groundwater levels are not known in this area. Taking a worst case groundwater level at ground level, cutting radius on influence estimated at a maximum of 1.6m. No surface water features are withint this distance.	saturated zone (skerries) within the mudstone, drainage measures will be designed following ground investigation and monitoring to ensure	Crosses Filly Brook. Groundwater level not known at this location, but if shallow, groundwater may provide some baseflow to Filly Brook. Potential for localised mounding of groundwater or changing of groundwater flow paths around viaduct piers. CoCP and best practice for design, construction and operations reduce risk and potential impacts would be minor and localised around piers.	Crosses the M6, and is in proximity to Filly Brook. Groundwater level not known at this location, but if shallow, groundwater may provide some baseflow to surface water. Potential for localised mounding of groundwater or changing of groundwater flow paths around viaduct piers. CoCP and best practice for desig construction and operation reduces risk and potentia impacts would be minor and localised around piers.	surface water receptors.	No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element.	Potential localised impacts identified, negligible impact with embedded mitigation	Remains Good Status	None required	Remains Good Status	Compliant - no change in statu
3. Groundwater Dependent Terrestrial Ecosystems (GWDTE's)	Good	Very Certain Goo	ood by 2015	١	No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element.	No impacts identified as a result of scheme No element.	lo impacts identified as a result of scheme element.	e No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element.	No impacts identified as a result of schem element.	ne No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element.	. No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element.	No impacts identified	Remains Good Status	None required	Remains Good Status	Compliant - no change in status
4. Water balance	Good	Very Certain Goo	ood by 2015		as been calculated as 25m. The lateral and vertical extent of the aquifer is much greater than the radius of influence and depth of the cutting. Therefore no significant impacts identified. Additional monitoring required to determine skerry bands and groundwater levels within the	Within the mudstone the radius of influence has been calculated as 25m. The lateral and vertical extent of the aquifer is much greater than the radius of influence and depth of the cutting. Therefore no significant impacts identified. Additional monitoring required to determine skerry bands and groundwater levels within the mudstone and further confirm the radius of influence.	38.5m radius of influence, small area of influence and as formations within the Mercia Mudstone Group are generally classified as Secondary B to Unproductive, not thought to influence large extent of the groundwater body, impact on local aquifer only. Additional monitoring required to determine skerry bands and groundwater levels within the mudstone and further confirm the radius of influence.	influence and as formations within the Mercia Mudstone Group are generally lassified as Secondary B to Unproductive, of thought to influence large extent of the roundwater body, impact on local aquifer only. Additional monitoring required to determine skerry bands and groundwater levels within the mudstone and further	know, but taking a precautionary assessment, potential inflows are estimated	Localised impacts on flow regime.	Groundwater levels at this location are not know, but taking a precautionary assessment, potential inflows are estimated at a maximum of 491 m³/d. Abstracted water will be returned to ground with SuDS where possible or to surface waters within the same catchment. Additional monitoring required to determine skerry bands and groundwater levels within the mudstone.	Localised impacts on flow regime.	Groundwater levels at this location are not know, but taking a precautionary assessment, potential inflows are estimated at a maximum of 25 m³/d. Abstracted water will be returned to ground with SuDS where possible or to surface waters within the same catchment. Additional monitoring required to determine skerry bands and groundwater levels within the mudstone.	Localised impacts on flow regime.	Localised impacts on flow regime.	Localised impacts on flow regime.	Potential localised impacts on flow regime	Localised impacts on flow regime.	Localised impacts on flow regime.	Potential localised impacts identified, negligible impact with embedded mitigation	Remains Good Status	None required	Remains Good Status	Compliant - no change in statu

Overall Overatitative Status Cond Harantein Cond hypers				
Overall Quantitative Status Good Uncertain Good by 2015	Overall Quantitative Status	Good	Uncertain	Good by 2015

				Colonia Company			Cuttings	Viaduo	ucts	Overbridges					
Groundwater be	ly: Staffordshire Trent	nt Valley - Mercia N	Mudstone West (GB40402G300400)	Scheme Componer	t: Hopton North cutting		entral cutting Yarlet North cutting	Meaford cutting Filly Brook viaduct	M6 Meaford viaduct	B5066 Sandon Road overbridge A34 Stone Road overbridge	B5026 Eccleshall Road overbridge				
				Dhaa	P: Temporary and Permanent Construction		W-MMW-C-o2 WFD-GW-MMW-C-o3 ermanent Construction Temporary and Permanent Construction	WFD-GW-MMW-C-04 WFD-GW-MMW-VF-01 Temporary and Permanent Construction Temporary and Permanent Construction	WFD-GW-MMW-VF-02	WFD-GW-MMW-OF-02 The second Research Construction	WFD-GW-MMW-OF-03				WED compliance outcome
	Curre	ent Status Co	onfidence Status objective	Phas Identified potential chemc impact	Disturbing or mobilising existing poor quality groundwater by temporary dewatering or depressurisation and permanent groundwater control Creating or altering of pathways al existing poor quality groundwater in migrate	g which groundwater by temporary dewatering or altering of pathways along which groundwater by temporary dewatering or altering of pathways along which	ity Creating or altering of pathways along which Disturbing or mobilising existing poor quality Creating or altering of pathways along which	Temporary and Permanent Construction Disturbing or mobilising existing poor quality groundwater by temporary dewatering or depressurisation and permanent groundwater control Temporary and Permanent Construction Creating or altering of pathways along which existing poor quality groundwater can migrate poor quality groundwater can migrate	Temporary and Permanent Construction Creating or altering of pathways along which existing poor quality groundwater can migrate	Temporary and Permanent Construction Creating or altering of pathways along which existing poor quality groundwater can migrate Creating or altering of pathways along which existing poor quality groundwater can migrate		verall Effect Impact on Current WFD Status	Additional Mitigation Requirements	esidual Effect on Current WFD Element Status	WFD compliance outcome - potential for deterioration of current status
1. Saline or othe	ntrusions Good	d Ur	ncertain Good by 2015		No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element No likely saline or other intrusion quality water as no sources of poor quality identified in vicinity of selement	water quality water as no sources of poor water quality water as no sources of poor water quality identified in vicinity of scheme quality identified in vicinity of scheme quality water as no sources of poor water quality water as no source	No impacts from saline or other intrusion of poor quality water have been identified, as there are no sources of poor water quality identified in vicinity of the scheme element. No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element. No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element.	quality water as no sources of poor water No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in o sources of poor water quality identified in vicinity of	No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element	No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element element	, , , , , , , , , , , , , , , , , , , ,	npacts identified Remains Good Status	None required	Remains Good Status	Compliant - no change in status
2. Surface water	Good	d Ur	ncertain Good by 2015		Absent groundwater level data in area, therefore assumed worst case scenario and water levels near ground surface. (However groundwater elevations in the Hopton South Cutting nearby indicate that groundwater elevations may be below the base of the cutting although this has been discounted for the purposes of this assessment). Radius of influence for dewatering is a calculated max of 25m in the Mercia Mudstone, no watercourses within this radius of influence so will not affect the baseflow of any rivers. Absent groundwater level data in therefore assumed worst case scer water levels near ground surface. (groundwater elevations in the H South Cutting nearby indicate groundwater elevations in the Hespton Cutting nearby indicate groundwater elevations in the Hespton Cutting nearby indicate groundwater elevations in the Hespton Cutting nearby indicate groundwa	Absent groundwater level data in area, therefore assumed worst case scenario and water levels near ground surface. Radius of influence for dewatering is a calculated max of 38.5m, no watercourses within this radius of influence so will not affect the baseflow of any rivers. Absent groundwater level data in area, therefore assumed worst case scenario and water levels near ground surface. Radius of influence for dewatering is a calculated max of 38.5m, no watercourses within this radius of influence so will not affect the baseflow of any rivers. Absent groundwater level data in area, therefore assumed worst case scenario and water levels near ground surface. Radius of influence for dewatering is a calculated max of 38.5m, no watercourses within this radius of influence so will not affect the baseflow of any rivers. No impacts identified as a result of schem water levels near ground surface. Radius of influence so will not affect the baseflow of any rivers.	element. No poor quality groundwater expected in the vicinity of the cutting, or connection with surface water. CoCP and	element. No poor quality groundwater expected in the vicinity of the cutting or potential cut	Potential creation of preferential flow pathways into the aquifer due to piling. CoCP and best practice for design, construction and operations, and natural attenuation of	No impacts identified as a result of scheme element. No poor quality groundwater expected in the vicinity of the overbridge, or connection with surface water. CoCP and best practice for design, construction and operation reduce risks to water quality. No impacts identified as a result of scheme element. No po quality groundwater expected in the vicinity of the overbridge or connection with surface water. CoCP and best practice for design, construction and operation reduce risks to water quality.	quality groundwater expected in the vicinity of the overbridge, or connection with surface water. CoCP and best practice for No im	npacts identified Remains Good Status	None required	Remains Good Status	Compliant - no change in status
WFD dassification elen GWDTE's) GWDTE's)		d Ve	ery Certain Good by 2015		No impacts identified as a result of scheme element. No impacts identified as a result of scheme element.	cheme No impacts identified as a result of scheme No impacts identified as a result of scheme element. No poor quality groundwater	expected in the vicinity of the cutting, or hydraulic connection with GWDTE. CoCP expected in the vicinity of the cutting, or element. No poor quality groundwater expected in the vicinity of the cutting, or expected in the vicinity of the cutting, or	element. No poor quality groundwater the vicinity of the cutting, or hydraulic connection expected in the vicinity of the cutting, or hydraulic connection with GWDTE. CoCP and best practice for design.	· · · · · · · · · · · · · · · · · · ·	No impacts identified as a result of scheme element. No poor quality groundwater expected in the vicinity of the overbridge, or hydraulic connection with GWDTE. CoCP and best practice for design, construction and operation reduce risks to water quality. No impacts identified as a result of scheme element. No po quality groundwater expected in the vicinity of the overbridge or hydraulic connection with GWDTE. CoCP and best practice for design, construction and operation reduce risks to water quality.	e, quality groundwater expected in the vicinity of the overbridge,	pacts identified Remains Good Status	None required	Remains Good Status	Compliant - no change in status
4. Drinking Wate Areas (DrWPAs)		d Ur	ncertain Good by 2015		element. No poor quality groundwater element. No poor quality groun	element. No poor quality groundwater expected in the vicinity of the cutting, and expected in the vicinity of the cutting, and expected in the vicinity of the cutting.	No impacts identified as a result of scheme element. No poor quality groundwater expected in the vicinity of the cutting, and the element is not within an SPZ. CoCP and best practice for design, construction and operation reduce risks to water quality. No impacts identified as a result of scheme element. No poor quality groundwater expected in the vicinity of the cutting, and the element is not within an SPZ. CoCP and best practice for design, construction and operation reduce risks to water quality.	No impacts identified as a result of scheme element. No poor quality groundwater expected in the vicinity of the cutting, and the element is not within an SPZ. CoCP and best practice for design, construction and operation reduce risks to water	No impacts identified as a result of scheme element. No poor quality groundwater expected in the vicinity of the viaduct, and the element is not within an SPZ. CoCP and best practice for design, construction and operation reduce risks to water quality.	No impacts identified as a result of scheme element. No poor quality groundwater expected in the vicinity of the overbridge, and the element is not within an SPZ. CoCP and best practice for design, construction and operation reduce risks to water quality. No impacts identified as a result of scheme element. No po quality groundwater expected in the vicinity of the overbridge, and the element is not within an SPZ. CoCP and best practice for design, construction and operation reduce risks to water quality.	e, quality groundwater expected in the vicinity of the overbridge, and the element is not within an SPZ. CoCP and best practice No im	pacts identified Remains Good Status	None required	Remains Good Status	Compliant - no change in status
5. General qualit	assessment Good	d Ur	ncertain Good by 2015		levels, there would be little or no unsaturated zone therefore a greater potential impact to groundwater quality during construction in this area. Application of the CoCP will ensure materials and fluids used during construction are managed so	Under scenario of shallow groundwater levels, there would be little or no unsaturated zone therefore a greater potential impact to groundwater quality during construction in this area. Application of the CoCP will ensure materials and fluids used during construction are managed so that there is no significant adverse effect on groundwater quality. Under scenario of shallow groundwater levels, there would be little or no unsaturated zone therefore a greater potential impact to groundwater quality during construction in this area. Application of the CoCP will ensure materials and fluids used during construction are managed so that there is no significant adverse effect on groundwater quality. No existing poor quality groundwater expected. Under scenario of shallow groundwater levels, there would be little or no unsaturated zone therefore a greater potential impact to groundwater quality during construction in this area. Application of the CoCP will ensure materials and fluids used during construction are managed so that there is no significant adverse effect on groundwater quality.	expected. Under scenario of shallow groundwater levels, tlittle or no unsaturated zone therefore a greater potential impact to groundwater quality during construction in this area. Application of the CoCP will ensure materials and fluids used during construction are managed so	expected. Under scenario of shallow groundwater levels, there would be little or no unsaturated zone therefore a greater potential impact to groundwater guality. No existing poor quality groundwater expected. Under scenario of shallow groundwater levels, there would be little or no unsaturated zone therefore a greater potential impact to groundwater guality. No existing poor quality groundwater expected. Creation of new preferential pathways into the aquifer due to piling, therefore potential to impact go quality. No existing poor water quality.	due to piling, therefore potential to impact general water quality. No existing poor water quality expected. CoCP and best practice for design, construction and operations, and natural attenuation of any turbidity resulting from	Creation of new preferential pathways into the aquifer due to piling or foundations, therefore potential to impact general water quality. No existing poor water quality expected. CoCP and best practice for design, construction and operations, and natural attenuation of any turbidity resulting from construction, will reduce risks and potential impacts to negligible. Creation of new preferential pathways into the aquifer due piling or foundations, therefore potential to impact general water quality. No existing poor water quality expected. CoCP and best practice for design, construction and operations, and natural attenuation of any turbidity resulting from construction, will reduce risks and potential impacts to negligible.	piling or foundations, therefore potential to impact general water quality. No existing poor water quality expected. CoCP	npacts identified Remains Good Status	None required	Remains Good Status	Compliant - no change in status

Overall Chemical Status Good Uncertain Good by 2015

Table 63: Manchester and East Cheshire Carbonif	e1003 Aquile13 (GB41202)	dio2900) detalled limpa	act assessment - effects off correct	Cuttings		Retaining \	Wall	Viaduct	Overbridge	Bo	ored Tunnel					
			Scheme Componer	200 (2) 22 23 23	Madeley cutting	Whitmore Wood Re		River Lea viaduct	A525 Bar Hill Road overbridge	The twin bore section of the Whitmore Heath tunnel	Northern porous portal of the Whitmore Heath tunnel					
Groundwater body: Manchester and East Chesh	hire Carboniterous Aquit	ers (GB41202G102900)		WFD-GW-MCA-C-01	WFD-GW-MCA-C-02	WFD-GW-MC	A-C-02	WFD-GW-MCA-VF-01	WFD-GW-MCA-OF-01	WFD-GW-MCA-BT-01	WFD-GW-MCA-BT-02					
			Phas	e: Temporary and Permanent Construction	Temporary and Permanent Construction	Temporary and Perman	ent Construction	Temporary and Permanent Construction	Temporary and Permanent Construction	Temporary and Permanent Construction	Temporary and Permanent Construction					
Current Statu	s Confidence	Status objective	Identified potential quantitati impaci	Lowering of groundwater levels and reduction in groundwater contributions to surface water bodies, GWDTE or groundwater in groundwater flow and reduction abstractions by temporary dewatering/permanent groundwater contributions control	hodioc GM/DTE or groundwater abstractions by	Lowering of groundwater levels and reduction in groundwater contributions to surface water bodies, GWDTE or groundwater abstractions by temporary dewatering/permanent groundwater control		"Damming" of groundwater flow and reduction in groundwater contributions	"Damming" of groundwater flow and reduction in groundwater contributions	Lowering of groundwater levels and reduction in groundwater contributions to surface water bodies, GWDTE or groundwater abstractions by temporary dewatering/permanent groundwater control	Lowering of groundwater levels and reduction in groundwater contributions to surface water bodies, GWDTE or groundwater abstractions by temporary dewatering/permanent groundwater groundwater contributions control		Impact on Current WFD Status	Additional Mitigation Requirements	Residual Effect on Current WFD Element Status	WFD compliance outco potential for deteriorat current status
Saline or other intrusions Good	Very Certain	Good by 2015		No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element identified in vicinity of scheme identified in vicinity of scheme	No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element		No likely saline or other intrusion of poor quality wate as no sources of poor water quality identified in vicinit of scheme element	er No impacts from saline or other intrusion of poor quality ty water have been identified, as there are no sources of poor water quality identified in vicinity of the scheme element.			No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element identified in vicinity of scheme identified in vicinity of scheme		Remains Good Status	None required	Remains Good Status	Compliant - no chang status
2. Surface water Good	Uncertain	Good by 2015		Wood and one to the south) which are diverted beneath the route at this location. Any water which may be removed from the aquifer during construction (dewatering), would be discharged perpendicular to the tributaries, and potential	the aquifer and some dewatering may be required during construction. Dewatering radius of influence has been assessed as a maximum of	The retaining wall may intersect the saturated zone of the aquifer and some dewatering may be required during construction of the associated cutting (Whitmore North cutting). Dewatering radius of influence has been assessed as a maximum of 42m, and lowering groundwater level may therefore impact on two tributaries of the River Lea (one to the north of Whitmore Wood and one to the south) which are diverted beneath the route at this location. Any water which may be removed from the aquifer during construction (dewatering), would be discharged back to the catchment to prevent deterioration of the surface water courses. Dewatering and discharge arrangements would be designed in detail following site investigation in consultation with, and ensuring appropriate permits are in place with the Environment Agency.	influence local groundwater level by acting as a dam to groundwater flow. However, the retaining wall is perpendicular to the tributaries, and potential impact is expected to be negligible with best practice design measures. Drainage and discharge arrangements would be designed in detail following site	groundwater flow paths around viaduct piers. CoCP and best practice for design, construction and operations reduce risk and potential impacts would be minor and localised around	No impacts identified as a result of scheme element.	The northernmost section of the Whitmore Heath twin bore tunnel may intersect the saturated zone of the aquifer, however it will be constructed using a tunnel boring machine in close face mode designed to be 100% watertight throughout construction. Therefore dewatering of the aquifer is not required and impacts	therefore impact on the tributary of the River Lea which is diverted beneath the route at this location at Snape Hall Culvert. Any water which may be removed from the aquifer during	impacts identified, negligible impact with	Remains Good Status	None required	Remains Good Status	Compliant - no change status
3. Groundwater Dependent Terrestrial Ecosystems (GWDTE's)	Very Certain	Good by 2015		No impacts identified as a result of scheme element. Whitmore Wood LWS is described as "Coniferous plantation and a stand of semi-natural broadleaved woodland with most of the diversity in the ground flora confined to rides and tracksides. A stream supports wet woodland vegetation". Ecological surveys have show that none of the recorded species in Whitmore Wood LWS are restricted to wetland habitats, and as such the site is not considered to be groundwater dependent. Impacts on the surface water courses are assessed above. No impacts identified as a result of scheme element. Whitmore Wood LWS is described as "Coniferous plantation and a stand of semi-natural broadleaved woodland with most of the diversity in the ground flora confined to rides and tracksides. A stream supports wet woodland vegetation". Ecological surveys have show that none of the recorded species in Whitmore Wood LWS are restricted to wetland habitats, and as such the site is not considered to be groundwater dependent. Impacts on the surface water courses are assessed above.	No impacts identified as a result of scheme element. No impacts identified as a result of scheme element.	have show that none of the recorded species in Whitmore Wood LWS are restricted to wetland habitats, and as such the site is not considered to be groundwater dependent. Impacts on	plantation and a stand of semi-natural broadleaved woodland with most of the diversity in the ground flor confined to rides and tracksides. A stream supports we woodland vegetation". Ecological surveys have show that none of the recorded species in Whitmore Wood LWS are restricted to wetland habitats, and as such the	d he	No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element. No impacts identified as a result of scheme element.	. No impacts identified as a result of scheme element. No impacts identified as a result of scheme element.	No impacts identified	Remains Good Status	None required	Remains Good Status	Compliant - no change status
4. Water balance Good	Very Certain	Good by 2015		The cutting may intersect the saturated zone of the aquifer and some dewatering may be required during construction. There may be local impacts on water balance however any water which may be removed from the aquifer during construction (dewatering), would where reasonably practicable, be discharged back to ground using SuDS or to the catchment. Dewatering and discharge arrangements would be designed in detail following site investigation in consultation with, and ensuring appropriate permits are in place with the Environment Agency.	potential groundwater damming, with only	The retaining wall may intersect the saturated zone of the aquifer and some dewatering may be required during construction of the associated cutting (Whitmore North cutting). There may be local impacts on water balance however any water which may be removed from the aquifer during construction (dewatering), would where reasonably practicable, be discharged back to ground using SuDS or to the catchment. Dewatering and discharge arrangements would be designed in detail following site investigation in consultation with, and ensuring appropriate permits are in place with the Environment Agency.		No impact on water balance is expected due to potential groundwater damming, with only localised impacts on the flow regime.	Localised impacts on flow regime.	The bored tunnel is will be constructed in closed face mode and is designed to be watertight therefore no impact on water balance is expected. No impact on water balance is expected due to poten groundwater damming, with only localised impacts of flow regime.	The northern porous portal may intersect the saturated zone of the aquifer and some dewatering may be required during construction. There may be local impacts on water balance however any water which may be removed from the aquifer during construction (dewatering), would where reasonably practicable, be discharged back to ground using SuDS or to the catchment. Dewatering and discharge arrangements would be designed in detail following site investigation in consultation with, and ensuring appropriate permits are in place with the Environment Agency.	Potential localised impacts identified, negligible impact with embedded mitigation.	Remains Good Status	None required	Remains Good Status	Compliant - no change status
Overall Quantitative Good	Uncertain	Good by 2015	7													
		,5					Mall	Violent	Outshide		aved Tunnel					
		100	Scheme Componer	Cuttings of: Whitmore North cutting	Madeley cutting	Retaining \ Whitmore Wood Re		Viaduct River Lea viaduct	Overbridge A525 Bar Hill Road overbridge		ored Tunnel Northern porous portal of the Whitmore Heath tunnel					
Groundwater body: Manchester and East Chesh	nire Carboniferous Aquif	ers (GB41202G102900)		WFD-GW-MCA-C-01	WFD-GW-MCA-C-02	WFD-GW-MC		WFD-GW-MCA-VF-01	WFD-GW-MCA-OF-01	WFD-GW-MCA-BT-01	WFD-GW-MCA-BT-02					

Overall Quantitative	Good	Uncertain	Good by 2015]													
						Cuttings		Retaining V	Wall	Viaduct	Overbridge		Borec	Tunnel			
Groundwater body: Manchest	eter and East Cheshire	e Carboniferous Aquife	ers (GB41202G102900)	Scheme Components	Whitmore North of		ey cutting	Whitmore Wood Re		River Lea viaduct	A525 Bar Hill Road overbridge		the Whitmore Heath tunnel	Northern porous portal of the Whitmore Heath tunnel			
, in the second second				Phase	WFD-GW-MCA-0 Temporary and Permanen		V-MCA-C-02 rmanent Construction	WFD-GW-MCA Temporary and Permane		WFD-GW-MCA-VF-01 Temporary and Permanent Construction	WFD-GW-MCA-OF-01 Temporary and Permanent Construction		/-MCA-BT-01 ermanent Construction	WFD-GW-MCA-BT-02 Temporary and Permanent Construction			
	Current Status	Confidence	Status objective	Identified potential quantitative impacts	Disturbing or mobilising existing poor quality groundwater by temporary dewatering or depressurisation and permanent groundwater control	Disturbing or mobilising existing poor quality	Creating or altering of pathways along which	ushing or mobilising ovieting poor quality groundwater by		Creating or altering of pathways along which existing poor quality groundwater can migrate		Disturbing or mobilising existing poor quality groundwater by temporary dewatering or depressurisation and permanent groundwater control	Creating or altering of pathways along which existing poor quality groundwater can migrate	Disturbing or mobilising existing poor quality groundwater by temporary dewatering or depressurisation and permanent groundwater control Creating or altering of pathways along which existing poor quality groundwater can migrate	Overall Effect Impact on Current WFD Statu	s Additional Mitigation Requirements	Residual Effect on Current WFD Element Status WFD compliance outcome - potential for deterioration of current status
1. Saline or other intrusions	Good	Very Certain	Good by 2015			No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element No likely saline or other intrusion of poor water water as no sources of poor water quality identified in vicinity of scheme element								No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element	No impacts identified Remains Good Status	None required	Remains Good Status Compliant - no change in status
2. Surface water	Good	Uncertain	Good by 2015		No impacts identified as a result of scheme element. No existing poor quality groundwater expected to be disturbed or mobilised in the vicinity of the cutting or potential dewatering radius of influence. CoCP and best practice for design, construction and operation reduce risks to surface water quality.	element. No poor quality groundwater expected to be expected in the vicinity of the cutting. CoCP and best practice for design, construction and cutting or potential dewatering radius of	element. No poor quality groundwater expected in the vicinity of the cutting, or connection with surface water. CoCP and best practice for design, construction and operation reduce risks to water CoCP an	ng poor quality groundwater expected to be disturbed or billised in the vicinity of the retaining wall or potential watering radius of influence of the associated cutting.	No poor quality groundwater expected in the vicinity of the retaining wall. CoCP and best practice for	Crosses the River Lea. Potential creation of preferential flow pathways into the aquifer due to piling. CoCP and best practice for design, construction and operations, and natural attenuation of any turbidity resulting from construction, will reduce risk and potential impacts to negligible.		twin bore tunnel and no existing poor quality groundwater expected in this area. CoCP and best	poor quality groundwater expected in the vicinity of the twin bore tunnel. CoCP and best practice for design,	No impacts identified as a result of scheme element. No existing poor quality groundwater expected to be disturbed or mobilised in the vicinity of the portal or potential dewatering radius of influence. CoCP and best practice for design, construction and operation reduce risks to surface water quality. No impacts identified as a result of scheme element. No poor quality groundwater expected in the vicinity of the portal, or connection with surface water. CoCP and best practice for design, construction and operation reduce risks to water quality due to preferential pathways	No impacts identified Remains Good Status	None required	Compliant - no change in status
3. Groundwater Dependent Terrestrial Ecosystems (GWDTE's)	Good	Uncertain	Good by 2015		No impacts identified as a result of scheme element. Whitmore Wood LWS is described as "Coniferous plantation and a stand of semi-natural broadleaved woodland with most of the diversity in the ground flora confined to rides and tracksides. A stream supports wet woodland vegetation". Ecological surveys have show that none of the recorded species in Whitmore Wood LWS are restricted to wetland habitats, and as such the site is not considered to be groundwater dependent. Impacts on the surface water courses are assessed above.	"Conferous plantation and a stand of semi- natural broadleaved woodland with most of the diversity in the ground flora confined to rides and tracksides. A stream supports wet woodland vegetation". Ecological surveys have show that none of the recorded species in Whitmore Wood LWS are restricted to	No impacts identified as a result of scheme element. Wood L of se diversity streams have selement. Wood L' site is no	m supports wet woodland vegetation". Ecological surveys we show that none of the recorded species in Whitmore d LWS are restricted to wetland habitats, and as such the not considered to be groundwater dependent. Impacts on	plantation and a stand of semi-natural broadleaved woodland with most of the diversity in the ground flora confined to rides and tracksides. A stream supports wet woodland vegetation". Ecological surveys have show that none of the recorded species in Whitmore Wood LWS are restricted to wetland	No impacts identified as a result of scheme element. No poor quality groundwater expected in the vicinity of the cutting, or hydraulic connection with GWDTE.			No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element. No impacts identified as a result of scheme element. element.	No impacts identified Remains Good Status	None required	Compliant - no change in status
4. Drinking Water Protected Areas (DrWPAs)	Poor	Very Certain	Good by 2027		The cutting may be constructed in saturated zone of the aquifer Local dewatering during construction could mobilise groundwat though no existing poor quality groundwater is expected in this area. Application of the CoCP will ensure materials and fluids used during construction are managed so that there is no significant effect on groundwater quality. The cutting is not within a groundwater SPZ.	No poor quality groundwater expected in the vicinity of the cutting. Application of the CoCP will ensure materials and fluids used during	No poor quality groundwater expected in the vicinity of the cutting. Application of the CoCP will ensure materials and fluids used during construction are managed so that there is no significant. The cutting is not within a	etaining wall may be constructed in saturated zone of the er. Local dewatering during construction of the associated ing could mobilise groundwater though no existing poor y groundwater is expected in this area. Application of the will ensure materials and fluids used during construction are managed so that there is no significant effect on roundwater quality. The retaining wall is not within a groundwater SPZ.	No poor quality groundwater expected in the vicinity of the retaining wall. Application of the CoCP will ensure	No existing poor quality groundwater is expected in the vicinity of the viaduct, and the element Is not within an SPZ. CoCP and best practice for design, construction and operation reduce risks to water quality.	No impacts identified as a result of scheme element. No poor quality groundwater expected in the vicinity of the overbridge, and the element is not within an SPZ.	of the twin bore tunnel and no existing poor quality	No poor quality groundwater expected in the vicinity of the twin bore tunnel. Application of the CoCP will ensure materials and fluids used during construction are managed so that there is no significant effect on the DrWPA (SPZ ₃) due to preferential pathways.	The portal may be constructed in saturated zone of the aquifer. Local dewatering during construction could mobilise groundwater though no existing poor quality groundwater is expected in this area. Application of the CoCP will ensure materials and fluids used during construction are managed so that there is no significant effect on the DrWPA (SPZ ₃). No poor quality groundwater expected in the vicinity of the portal. Application of the CoCP will ensure materials and fluids used during construction are managed so significant effect on the DrWPA (SPZ ₃) due to preferential pathways.		None required	No significant deterioration Compliant - no change in status
5. General quality assessment	Good	Uncertain	Good by 2015		No existing poor quality groundwater is expected. Potentially little or no unsaturated zone therefore a greater potential impacto groundwater quality during construction in this area. Application of the CoCP will ensure materials and fluids used during construction are managed so that there is no significant effect on general groundwater quality.	No existing poor quality groundwater expected. Little or no unsaturated zone therefore a greater potential impact to groundwater quality during construction in this area and the cutting could provide a preferential pathway for poor quality water during construction. Application of the CoCP will ensure materials and fluids used during construction are managed so that there is no significant effect on general groundwater quality.	nrovide a preterential nathway for noor quality	xisting poor quality groundwater is expected. Little or no saturated zone therefore a greater potential impact to groundwater quality during construction in this area. lication of the CoCP will ensure materials and fluids used g construction are managed so that there is no significant effect on general groundwater quality.	this area and the cutting could provide a preferential pathway for poor quality water during construction.	Creation of new preferential pathways into the aquifer due to piling, therefore potential to impact general water quality. No existing poor water quality expected. CoCP and best practice for design, construction and operations, and natural attenuation of any turbidity resulting from construction, will reduce risks and potential impacts to negligible.	No existing poor quality groundwater expected. Under scenario of shallow groundwater levels, there would be little or no unsaturated zone therefore a greater potential impact to groundwater quality during construction in this area. Application of the CoCP will ensure materials and fluids used during construction are managed so that there is no significant effect on general groundwater quality.	No existing poor quality groundwater expected. Little or no unsaturated zone therefore a greater potential impact to groundwater quality during construction in this area. Application of the CoCP will ensure materials and fluids used during construction are managed so that there is no significant effect on general groundwater quality.	No existing poor quality groundwater expected. Little or no unsaturated zone therefore a greater potential impact to groundwater quality during construction in this area and the tunnel could provide a preferential pathway for poor quality water during construction. However construction is in closed face mode with little interaction with the aquifer. Application of the CoCP will ensure materials and fluids used during construction are managed so that there is no significant effect on general groundwater quality.	No existing poor quality groundwater expected. Little or no unsaturated zone therefore a greater potential impact to groundwater quality during construction in this area. Application of the CoCP will ensure materials and fluids used during construction are managed so that there is no significant effect on general groundwater quality. No existing poor quality groundwater expected. LLittle or no unsaturated zone therefore a greater potential impact to groundwater quality during construction in this area and the portal could provide a preferential pathway for poor quality water during construction. Application of the CoCP will ensure materials and fluids used during construction are managed so that there is no significant effect on general groundwater quality.	Potential localised impacts identified, negligible impact with embedded mitigation.	None required	Compliant - no change in status

Overall Chemical Good Uncertain Good by 2015

								Bore	ed Tunnel							
	Groundwater body: South C	heshire and North Sta	ffordshire Permo-T	riassic Sandstone	Scheme Component:	Southern porous portal of t	the Madeley tunnel	The twin bore sec	tion of the Madeley tunnel	Northern porous portal of	of the Madeley tunnel					
	Aquifers (GB41201G103400))				WFD-GW-CSPT	T-BT-01	WFD-6	GW-CSPT-BT-02	WFD-GW-CS	SPT-BT-03					
					Phase:	Temporary and Permane	nent Construction	Temporary and	Permanent Construction	Temporary and Perma	anent Construction					WFD compliance outcome -
		Current Status	Confidence	Status objective	Identified potential quantitative impacts:	Lowering of groundwater levels and reduction in groundwater contributions to surface water bodies, GWDTE or groundwater abstractions by temporary dewatering/permanent groundwater control	"Damming" of groundwater flow and reduction in groundwater contributions	Lowering of groundwater levels and reduction in groundwater contributions to surface water bodies, GWDTE or groundwater abstractions by temporary dewatering/permanent groundwater control	"Damming" of groundwater flow and reduction in groundwater contributions	Lowering of groundwater levels and reduction in groundwater contributions to surface water bodies, GWDTE or groundwater abstractions by temporary dewatering/permanent groundwater control	"Damming" of groundwater flow and reduction in groundwater contributions	Overall Effect	Impact on Current WFD Status	Additional Mitigation Requirements	Residual Effect on Current WFD Element Status	potential for deterioration of current status
	1. Saline or other intrusions	Good	Uncertain	Good by 2015					No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element			No impacts identified	Remains Good Status	None required	Remains Good Status	Compliant - no change in status
ion elements	2. Surface water	Good	Uncertain	Good by 2015		required during construction. The dewatering groassessment for the porous portal was undertaken along floor	If within the saturated zone, could influence local roundwater level by acting as a dam to groundwater ow. There are no surface water courses in proximity which could be influenced by any local damming impacts.	The northernmost section of the Madeley twin bore tunnel may intersect the saturated zone of the aquifer, however it will be constructed using a tunnel boring machine in close face mode designed to be 100% watertight throughout construction. Therefore dewatering of the aquifer is not required and impacts on nearby surface water will be negligible.	If within the saturated zone, construction of the tunnel will create a cylinder of no flow through the aquifer, and potentially decrease the hydraulic conductivity of the aquifer in the area immediately adjacent to the tunnel lining. There are no surface water courses nearby which could be impacted	The northern porous portal will mostly intercept superficial deposits, but may also intersect a narrow saturated zone of the aquifer and some minor dewatering may be required during construction. There are no surface water features which are thought to be hydraulically connected with the dewatered zone.		No impacts identified	Remains Good Status	None required	Remains Good Status	Compliant - no change in status
WFD classificati	3. Groundwater Dependent Terrestrial Ecosystems (GWDTE's)	Good	Very Certain	Good by 2015		No impacts identified as a result of scheme element.	lo impacts identified as a result of scheme element.	No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element.	No impacts identified	Remains Good Status	None required	Remains Good Status	Compliant - no change in status
	4. Water balance	Good	Uncertain	Good by 2015		The southern porous portal may intersect the saturated zone of the aquifer and some dewatering may be required during construction. There may be local impacts on water balance however any water which may be removed from the aquifer during construction (dewatering), would where reasonably practicable, be discharged back to ground using SuDS or to the catchment. Dewatering and discharge arrangements would be designed in detail following site investigation in consultation with, and ensuring appropriate permits are in place with the Environment Agency.	No impact on water balance is expected due to otential groundwater damming, with only localised impacts on the flow regime.	The bored tunnel will be constructed in closed face mode and is designed to be watertight therefore no impact on water balance is expected.	No impact on water balance is expected due to potential groundwater damming, with only localised impacts on flow regime.		No impact on water balance is expected due to potential groundwater damming, with only localised impacts on the flow regime.	Potential localised impacts identified, negligible impact with embedded mitigation.	Remains Good Status	None required	Remains Good Status	Compliant - no change in status

Overall Quantitative Status Good Uncertain Good by 2015

							Bore									
	roundwater body: South Cheshi	ire and North Sta	ffordshire Permo-Tri	assic Sandstone Aquifers	Scheme Component:	Southern porous portal	of the Madeley tunnel	The twin bore sec	tion of the Madeley tunnel	Northern porous portal of	the Madeley tunnel					
(BB41201G103400)					WFD-GW-C	SPT-BT-01	WFD-6	SW-CSPT-BT-02	WFD-GW-CSP	T-BT-03					
					Phase:	Temporary and Perm	anent Construction	Temporary and	Permanent Construction	Temporary and Permar	nent Construction				Bodd at Effect of Court WEB	WFD compliance outcome -
		Current Status	Confidence	Status objective	Identified potential chemcial impacts:	Disturbing or mobilising existing poor quality groundwater by temporary dewatering or depressurisation and permanent groundwater control	Creating or altering of pathways along which existing poor quality groundwater can migrate	Disturbing or mobilising existing poor quality groundwater by temporary dewatering or depressurisation and permanent groundwater control	Creating or altering of pathways along which existing poor quality groundwater can migrate	Disturbing or mobilising existing poor quality groundwater by temporary dewatering or depressurisation and permanent groundwater control	Creating or altering of pathways along which existing poor quality groundwater can migrate	Overall Effect	Impact on Current WFD Status	Additional Mitigation Requirements	Residual Effect on Current WFD Element Status	potential for deterioration of current status
1	Saline or other intrusions	Good	Uncertain	Good by 2015					No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element		No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element	No impacts identified	Remains Good Status	None required	Remains Good Status	Compliant - no change in status
2	Surface water	Good	Uncertain	Good by 2015		No impacts identified as a result of scheme element. No existing poor quality groundwater expected to be disturbed or mobilised in the vicinity of the portal or potential dewatering radius of influence. CoCP and best practice for design, construction and operation reduce risks to surface water quality.	No poor quality groundwater expected in the vicinity of the portal, or connection with surface water. CoCP	No dewatering proposed during construction of the twin bore tunnel and no existing poor quality groundwater expected in this area. CoCP and best practice for design, construction and operation reduce risks to water quality.	No impacts identified as a result of scheme element. No poor quality groundwater expected in the vicinity of the twin bore tunnel. CoCP and best practice for design, construction and operation reduce risks to surface water quality due to new preferential pathways.	No impacts identified as a result of scheme element. No existing poor quality groundwater expected to be disturbed or mobilised in the vicinity of the portal or potential dewatering radius of influence. CoCP and best practice for design, construction and operation reduce risks to surface water quality.	in the vicinity of the portal, or connection with surface water. CoCP and best practice for design,	No impacts identified	Remains Good Status	None required	Remains Good Status	Compliant - no change in status
ı ı	Groundwater Dependent errestrial Ecosystems GWDTE's)	Good	Very Certain	Good by 2015		No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element.	No impacts identified	Remains Good Status	None required	Remains Good Status	Compliant - no change in status
WFD classif	Drinking Water Protected reas (DrWPAs)	Good	Uncertain	Good by 2015		No existing poor quality groundwater is expected in the vicinity of the portal, and the element Is not within an SPZ. CoCP and best practice for design, construction and operation reduce risks to water quality.	No impacts identified as a result of scheme element. No poor quality groundwater expected in the vicinity of the portal, and the element is not within an SPZ.	No existing poor quality groundwater is expected in the vicinity of the tunnel, and the element Is not within an SPZ. CoCP and best practice for design, construction and operation reduce risks to water quality.	INO impacts identified as a result of scheme element. No noor	No existing poor quality groundwater is expected in the vicinity of the portal, and the element Is not within an SPZ. CoCP and best practice for design, construction and operation reduce risks to water quality.	element. No poor quality groundwater expected	No impacts identified	Remains Good Status	None required	Remains Good Status	Compliant - no change in status
5	General quality assessment	Good	Uncertain	Good by 2015		Potentially little or no unsaturated zone therefore a greater potential impact to groundwater quality during construction in this area. Application of the CoCP will ensure materials and fluids used during construction are managed so that there is no significant effect on	impact to groundwater quality during construction in this area and the portal could provide a preferential pathway for poor quality water during construction. Application of the CoCP will ensure materials and	No existing poor quality groundwater expected. Little or no unsaturated zone therefore a greater potential impact to groundwater quality during construction in this area. Application of the CoCP will ensure materials and fluids used during construction are managed so	No existing poor quality groundwater expected. Little or no unsaturated zone therefore a greater potential impact to groundwater quality during construction in this area and the tunnel could provide a preferential pathway for poor quality water during construction. However construction is in closed face mode with little interaction with the aquifer. Application of the CoCP will ensure materials and fluids used during construction are managed so that there is no significant effect on general groundwater quality.	greater potential impact to groundwater quality during construction in this area. Application of the CoCP will ensure materials and fluids used during construction	No existing poor quality groundwater expected. Little or no unsaturated zone therefore a greater potential impact to groundwater quality during construction in this area and the portal could provide a preferential pathway for poor quality water during construction. Application of the CoCP will ensure materials and fluids used during construction are managed so that there is no significant effect on general groundwater quality.	identified, negligible impact	Remains Good Status	None required	Remains Good Status	Compliant - no change in status

Overall Chemical Status Good Uncertain Good by 2015

Table 65: Weaver and Dane Quaternary Sand and Gravel Aquifers (GB4: Groundwater body: Weaver and Dane Quaternary Sand and Gravel A	41202G991700) detailed impact assess Aquifers (GB41202G991700)	ssessment - effects on current status Scheme Component:	Crewe South o WFD-GW-WD	-	Blakenhall Northbound spur cutting WFD-GW-WDQ-C-02	Cuttings Blakenhall cutting WFD-GW-WD	-	Chorlton cutting (WCML) WFD-GW-WDQ-C-04	Basford cutting (W WFD-GW-WDQ-G		Brook viaduct (HS2 mainline) VFD-GW-WDQ-VF-o1	Den Lane west viaduct (HS2 spur (N)) WFD-GW-WDD-VF-02	Viaducts Den Lane east viaduct (HS2 spur (S)) WFD-GW-WDQ-VF-o3	Blakenhall viaduct (HS2 spur (N)) WFD-GW-WDD-VF-04	Chorlton viaduct (HS2 spurs) WFD-SW-WDQ-VF-o5	Chorlton retaining wall 4 WFD-GW-WDQ-RT-06		Retaining Walls rlton retaining wall 5 FD-GW-WDQ-RT-97	Choriton reta WFD-GW-W		Tuunel Crewe south portal WFD-GW-WDQ-BT-01		Overbridge Newcastle Road overbridge WFD-GW-WDQ-OF-01	Borrow Pit Borrow pit north of Checkley Lane WFD-GW-WDQ-BP-02				
Current Status Confidence	Status objective	Identified potential gr quantitative impacts: G	Temporary and Perman	**Damming** of groundwater flow and reduction in groundwater contributions groundwater gro	Temporary and Permanent Construction f groundwater levels and roundwater contributions to atter bodies, GWDTE or adstractions by temporary. "Damming" of groundwater flow and reduction in groundwater contributions	Temporary and Permand	"Damming" of groundwater flow and reduction in groundwater contributions groundwater spread to the spread of the s	Temporary and Permanent Construction weering of groundwater levels and tion in groundwater contributions to surface water bodies, GWDTE or indwater abstractions by temporary ering/permanent groundwater control	Temporary and Permanent Lowering of groundwater levels and	t Construction Temporary	y and Permanent Construction	Temporary and Permanent Construction	Temporary and Permanent Construction	Temporary and Permanent Construction	Temporary and Permanent Construction "Damming" of groundwater flow and reduction in	Lowering of groundwater levels and reduction in groundwater contributions to surface water bodies, GWDTE or groundwater abstractions by temporary dewatering/permanent groundwater control	Temporary Lowering of groundwater levels and reduction in groundwater contributions to surface water be	on in oddes, "Damming" of groundwater flow and reduction in groundwater contributions	Temporary and Perm Lowering of groundwater levels and reduction in groundwater contributions to surface water bodies,	anent Construction "Damming" of groundwater flow and reduction in		Temps of groundwater flow and reduction in "Damming" of gr	porary and Permanent Construction	Temporary and Permanent Construction Lowering of groundwater levels and reduction in	Overall Effect Impact on Current V	D Status Additional Mitigation Requireme	Residual Effect on Current WFD Element Stat	WFD compliance outcome - potential for deterioration of current status
Saline or other intrusions Good Very Certain	Good by 2015	, w	No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element	quality water as no sources of poor water quality water quality identified in vicinity of scheme quality iden	e or other intrusion of poor as no sources of poor water quality water as no sources of poor water quality identified in vicinity of scheme element	No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element	quality water as no sources of poor water quality quality identified in vicinity of scheme quality	kely saline or other intrusion of poor ty water as no sources of poor water litry identified in vicinity of scheme element No likely saline or other intrusion of quality water as no sources of poor quality identified in vicinity of sche element	rater quality water as no sources of poor water quali ne quality identified in vicinity of scheme qua	ity water as no sources of poor water ality identified in vicinity of scheme	other intrusion of poor quality water have been urces of poor water quality identified in vicinity of the scheme element.	likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element	No likely saline or other intrusion of poor quality water as no sources of j water quality identified in vicinity of scheme element	No impacts from saline or other intrusion of poor quality water have been identified, as there are no sources of poor water quality identified in vicinity of the scheme element.	No likely saline or other intrusion of poor quality water a no sources of poor water quality identified in vicinity of scheme element	s No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element of scheme element		y water No likely saline or other intrusion of poor quality water No sources of poor water quality identified in vicinity as no sources of scheme element	No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element	No likely saline or other intrusion of poor quality wat as no sources of poor water quality identified in vicinii of scheme element	er ty No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element	e or other intrusion of poor quality water of poor water quality identified in vicinity of scheme element water qualit	er intrusion of poor quality water as no sources of ity identified in vicinity of scheme element	No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element of scheme element	No impacts identified Remains Good 5	atus None required	Remains Good Status	Compliant - no change in status
2. Surface water Good Uncertain	Good by 2015	Ti aqı c b tt aı	The cutting may intersect the saturated zone of the pulier and some dewatering may be required during construction. Dewatering radius of influence has been assessed as a maximum of 23 m in the north where it potentially cuts through significant hickness of glacial sand and gravel. However there are no surface water bodies within this distance of the cutting therefore there will be no impact.	The exact thickness of the aquifer and saturated zone is not known. There is potential for the cutting to create a damming effect if it cuts through the thickness of the aquifer and prevents groundwater flow across the cutting. Drainage measures will be designed following ground investigation and monitoring to ensure groundwater flow is maintained. There are no surface water courses in proximity to the cutting which would be effected.	The exact thickness of the aquifer and saturated zone is not known. There is potential for the cutting to create a damming effect if it cuts through the thickness of the aquifer and prevents adius of influence has been maximum of 17 m and there water bodies within this cutting therefore there will be no impact. The exact thickness of the aquifer and saturated zone is not known. There is potential for the cutting thickness of the aquifer and saturated zone is not known. There is potential for the cutting thickness of the aquifer and saturated zone is not known. There is potential for the cutting thickness of the aquifer and saturated zone is not known. There is potential for the cutting the creating prounds a damming and prevents and pr	The cutting may intersect the saturated zone of the aquifer and some dewatering may be required during construction. Dewatering radius of influence has been assessed as a maximum of 127 m (based on maximum cut depth) though this is likely to be a large overestimate as it is based on a literature value hydraulic conductivit for a highly permeable sand a and gravel along the entire length of the cutting. There are no surface water features scoped in the assessment in this radius of influence.	The exact thickness of the aquifer and saturated zone is not known. There is potential for the cutting to create a damming effect if it cuts through the thickness of the aquifer and prevents groundwater flow across the cutting. Drainage measures will be designed following ground investigation and monitoring to ensure groundwater flow is maintained. There are no surface water courses in proximity to the cutting which would be effected.	cutting may intersect the saturated of the aquifer and some dewatering by be required during construction. Attering radius of influence has been ted as a maximum of 121 m (based on num cut depth) though this is likely to arge overestimate as it is based on a permeable sand and gravel along the length of the cutting. There are no ce water features in proximity to the cutting that would be impacted	The cutting may intersect the saturated zone of the aquifer and some dewatering may be required during construction. Dewatering radius of influence has been assessed as a maximum of 121 m (hased on a maximum cut depth) though this is likely to be a large overestimate as it is based on a highly permeable sand and gravel along the other incling. There are not surface water features in proximity to the cutting that would be impacted	e exact thickness of the aquifer and turated zone is not known. There is ottential for the cutting to create a mining effect if it cuts through the ickness of the aquifer and prevents coundwater flow across the cutting condivater flow across the cutting rainage measures will be designed pillowing ground investigation and ittoring to ensure groundwater flow is intained. There are no surface water sees in proximity to the cutting which would be effected.	coundwater level not known at this location but is roundwater is expected to provide some baseflow that for localised mounting of groundwater or go low paths around viaduct piers. CoCP and best action and operations reduce risk and potential be minor and localised around piers.	isses HS2. Potential for localised mounding of groundwater or changing of coundwater flow paths around viaduct piers. CoCP and best practice for ign, construction and operations reduce risk and potential impacts would in	Crosses HS2. Potential for localised mounding of groundwater or changi groundwater flow paths around viaduct piers. CoCP and best practice! design, construction and operations reduce risk and potential impacts w e minor and localised around piers. Not in proximity to surface water co	Crosses a tributary of Mere Gutter at Gonsley Drop Inle Culvert. Groundwater level not known at this location b is expected to be shallow and groundwater is expected if provide some baseflow to the minor tributary. Potential for localised mounding of groundwater or changing of groundwater flow paths around viaduct piers. CoCP an best practice for design, construction and operations reduce risk and potential impacts would be minor and localised around piers.	crosses H52. Potential for localised mounding of groundwater or changing of groundwater flow paths around viaduct piers. CoF and best practice for design, octorstruction and operations reduce risk and potential impacts would be minor and localised around piers. Not in proximity to surface water courses.	The exact thickness of the Glaciofluvial c saturated zone is not known. There is pot retaining wall to create a damming effit through the thickness of the aquifer an groundwater flow. The length of the retayn, which is considered insignificant in the extent of the aquifer. Drainage me however be designed if necessary, following the control of the standard monitoring to ensure of flow is maintained. There are no surface in proximity to the retaining wall which effected.	tt if it cuts prevents ring wall is econtext of some sures will ing ground oundwater after courses	The exact thickness of the Glaciofluvial Deposits and saturated zone is not known. There is potential for the retaining wall to create a damming effect if it cuts through the thickness of the aquifer and prevents groundwater flow. The length of the retaining wall is growthich is considered insignificant in the context of the extent of the aquifer. Drainage measures will however be designed in fancessary, following ground investigation and monitoring to ensure groundwater flow is maintained. There are no surface water courses in proximity to the retaining wall which would be effected.	No impacts identified as a result of scheme element.	The exact thickness of the Glaciofluvial Deposits an saturated zone is not known. There is potential for the retaining wall to create a damming effect if it cuts through the thickness of the aquifer and prevents groundwater flow. Drainage measures will be designe if necessary, following ground investigation and monitoring to ensure groundwater flow is maintained. There are no surface water courses in proximity to the retaining wall which would be effected.	The portal cutting may intersect the saturated zone of the aquifer and some dewatering may be required during construction. Dewatering radius of influence has been assessed as a maximum of 81.5 m, however a retaining structure will be used so dewatering requirements will be much smaller. There are no surface water bodies within this distance of the cutting therefore there will be no impact.	age measures will be designed following	ed as a result of scheme element. No nearby surfa water receptors.	The borrow pit will not be excavated below the groundwater table. Once the sand and gravel has been excavated, if the creessary, groundwater drainage measures will be included in the restoration design which will ensure no changes to groundwater infiltration or flow and therefore there will be negligible impact on local surface water courses which currently receive baseflow. The borrow pit will not be excavated below the groundwater table. Once the sand and gravel has be excavated, it will be replaced with material that is like to have a lower permeability and restored to current or groundwater table. Once the sand and gravel has be excavated, it will be replaced with material that is like to have a lower permeability and restored to current or some control of the provided in the restoration design which will ensure on changes to groundwater table. Once the sand and gravel has be excavated, it will be replaced with material that is like to have a lower permeability and restored to current or some control of the provided in the restoration or groundwater table. Once the sand and gravel has be excavated, it will be replaced with material that is like to have a lower permeability and restored to current or some control or some c	Potential localised impacts identified, negligible impact Remains Good 9 with embedded mitigation.	atus None required	Remains Good Status	Compliant - no change in status
reneatial cosystems (CWO 12 sy	Good by 2015	No	io impacts identified as a result of scheme element. Betley Mere SSSI is significantly outside of the radius of influence of this cutting.	No impacts identified as a result of scheme element. Betley Mere SSSI is significantly outside of the impact radius of this cutting.	with the day are sult of scheme by Mere SSSI is significantly a radius of influence of this cutting. No impacts identified as a result of scheme element. Betley Mere SSSI is significantly outside of the impact radius of this cutting.	ne No impacts identified as a result of scheme element. Betley Mere SSSI is significantly outside of the g. radius of influence of this cutting.	No impacts identified as a result of scheme element. Betley Mere SSSI is significantly outside of the impact radius of this cutting.	pacts identified as a result of scheme No impacts identified as a result of sc element. element.	neme No impacts identified as a result of scheme No im element.	npacts identified as a result of scheme No impacts iden element.	tified as a result of scheme element.	No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element. No impacts identified as a result of scheme	ne element. No impacts identified as a result of scheme elk	ement. No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element	:. No impacts identified as a result of scheme element. No impacts iden	dentified as a result of scheme element. No impacts		Approximately half of the borrow pit area is within the catchment of Betley Mere SSI however, the borrow pit will not be excavated below the groundwater table. Once the sand and gravel has been excavated, if necessity, groundwater drainage measures will be included in the restoration design which will ensure no changes to aquifer recharge, therefore there will be negligible impact on quantity groundwater flow Betley Mere SSI.	No impacts identified Remains Good \$	atus None required	Remains Good Status	Compliant - no change in status
4. Water balance Good Very Certain	Good by 2015	TT aqu cc c bb ff fr	The cutting may intersect the saturated zone of the quifer and some dewatering may be required during construction. There may be local impacts on water palance however any water which may be removed from the aquifer during construction (dewatering), would where reasonably practicable, be discharged back to ground using \$UDS or to the catchment. Dewatering and discharge arrangements would be designed in detail following site investigation in onsultation with, and ensuring appropriate permits are in place with the Environment Agency.	The exact thickness of the aquifer and saturated zone is not known. There is potential for the cutting to create a damming effect if it cuts through the thickness of the aquifer and prevents groundwater flow across the cutting, altering the local water balance. Dewatering, drainage and discharge arrangements would be designed in detail following site investigation in consultation with, and ensuring appropriate permits are including the control of the analysis of the across the control of the across the cont	In any intersect the saturated purifer and some dewatering of during construction. There impacts on water balance after which may be removed unifer during construction in would where reasonably discharged back to ground to the catchment. Dewatering a rangements would be designed and discharge in detail following site in consultation with, and only appropriate permits are in place Environment Agency.	The cutting may intersect the saturated zone of the aquifer and some dewatering may be required during construction. There may be local impacts on a during construction from the aquifer during construction (dewatering), would where reasonably practicable, be discharged back to ground using SuDS or to the lide catchment. Dewatering and discharge arrangements would be designed in detail following site investigation in consultation with, and ensuring appropriate permits are in place with the Environment Agency.	saturated zone is not known. There is potential for the cutting to create a damming effect if it cuts through the thickness of the aquifer and prevents groundwater flow across the cutting, altering the local water balance. Dewatering, drainage and discharge arrangements would be designed in detail sing 52 million or in consultation with, and ensuring appropriate permits are dispersionally the fourteenance of the consultation of the consultation with the fourteenance are consultation.	cutting may intersect the saturated of the aquifer and some dewatering er equired during construction. There be local impacts on water balance wer any water which may be removed mute aquifer during construction watering), would where reasonably includes the discharged back to ground jubble of the catchment. Dewatering, discharge arrangements would be designed in detail following site sitingation in consultation with, and ring appropriate permits are in place with the Environment Agency.	may be required during construction. There may be local impacts on water balance however any water which may be removed from the aquifer during construction (dewatering), would where reasonably practicable, be discharged back to ground using 5uDS or to the catchment. Dewatering atton and discharge arrangements would be designed in detail following site investigation in constitution with, in the constitution of the constitu	turated zone is not known. There is otential for the cutting to create a imming effect. If it cuts through the ickness of the aquifer and prevents condwater flow across the cutting, altering the local water balance. we watering, drainage and discharge gements would be designed in detail wing site investigation in constitutation and ensuring appropriate permits are	reduce risk and potential impacts would be minor CoCP and best practice for design, construction bral attenuation of any turbidity resulting from cons	sses HS2. Potential for localised mounding of groundwater or changing of roundwater flow paths around viaduct piers. CoCP and best practice for ign, construction and operations reduce risk and potential impacts would eminor and localised around piers. CoCP and best practice for design, truction and operations, and natural attenuation of any turbidity resulting of from construction, will reduce impact on water balance to negligible.	design, construction and operations reduce risk and potential impacts w be minor and localised around piers. CoCP and best practice for desig onstruction and operations, and natural attenuation of any turbidity resu	g of piers. CoCP and best practice for design, construction and operations reduce risk and potential impacts would be minor and localised around piers. CoCP and best practice for design, construction and operations, and natural attenuation of any turbidity resulting from	Crosses HS2. Potential for localised mounding of groundwater or changing of groundwater flow paths around viaduct piers. CoCP and best practice for design, d construction and operations reduce risk and potential impacts would be minor and localised around piers. CoCl and best practice for design, construction and operation and natural attenuation of any tubridity resulting from construction, will reduce risk and potential impacts to negligible.	The exact thickness of the Glaciofluvial I saturated zone is not known. There is pot retaining wall to create a damming efft through the thickness of the aquifer and groundwater flow. The length of the retay, which is considered insignificant in it the extent of the aquifer. Drainage me however be designed if necessary, follow investigation and monitoring to ensure flow and water balance is maintated.	ning wall is e context of sures will sures will no impacts identified as a result of scheme electron with the sures will no ground oundwater	The exact thickness of the Glaciofluvial Deposits and saturated zone is not known. There is potential for the retaining wall to create a damming effect if it cuts through the thickness of the aquifer and prevents groundwater flow. The length of the retaining wall is gru, which is considered insignificant in the context of the extent of the aquifer. Drainage measures will however be designed if necessary, following ground investigation and monitoring to ensure groundwater flow and water balance is maintained.	No impacts identified as a result of scheme element.	The exact thickness of the Glaciofluvial Deposits and saturated zone is not known. There is potential for the retaining wall to create a damming effect if it cuts through the thickness of the aquifer and prevents groundwater flow. Drainage measures will be design if necessary, following ground investigation and monitoring to ensure groundwater flow and water balance is maintained.	The cutting may intersect the saturated zone of the aquifer and some dewatering may be required during construction. Dewatering radius of influence has been assessed as a maximum of 8.5. m, however a retaining structure will be used so dewatering requirements will be much smaller. There may be local impacts on water balance however any water which may be removed from the aquifer during described to the construction (dewatering), would where reasonably practicable, be discharged back to ground using 5uDs for to the catchment. Dewatering and discharge arrangements would be designed in detail following site investigation in consultation with, and ensuring appropriate permits are in place with the Environment Agency.	angements would be designed in detail investigation in consultation with, and	ential localised impacts on flow regime	The borrow pit will not be excavated below the groundwater table therefore there will be no lowering of the local groundwater balle and negligible impact on water balance. The borrow pit will not be excavated below the groundwater table. Once the sand and gravel has bee excavated, if necessary, groundwater drainage measures will be included in the restoration design which will ensure negligible changes to aquifer rechargand therefore no impact on water balance.	Potential localised impacts identified, negligible impact Remains Good swith embedded mitigation.	atus None required	Remains Good Status	Compliant - no change in status
Overall Quantitative Status Good Uncertain	Good by 2015					Cuttings		<u>'</u>			·		Viadurts	•			•	Retaining Walls			Tunnel		Overbridge	Rorrow Pit				
Groundwater body: Weaver and Dane Quaternary Sand and Gravel A	Aquifers (GB41202G991700)	Scheme Component: Phase:	Crewe South o WFD-GW-WD Temporary and Perman		Blakenhall Northbound spur cutting WFD-GW-WDQ-C-02 Temporary and Permanent Construction	Blakenhall cu WFD-GW-WDI Temporary and Permano		Choriton cutting WFD-GW-WDQ-C-04 Temporary and Permanent Construction	Basford cutting WFD-GW-WDQ-G Temporary and Permanent		neckley Brook viaduct VFD-GW-WDQ-VF-01 y and Permanent Construction	Den Lane east viaduct WFD-GW-WDQ-VF-02 Temporary and Permanent Construction	Den Lane west viaduct WFD-GW-WDQ-VF-03 Temporary and Permanent Construction	Blakenhall viaduct WFD-GW-WDQ-VF-04 Temporary and Permanent Construction	Chorlton viaduct WFD-GW-WDQ-VF-o5 Temporary and Permanent Construction	Chorlton retaining wall 4 WFD-GW-WDQ-RT-046 Temporary and Permanent Construction		rtton retaining wall 5 FD-GW-WDQ-RT-07 and Permanent Construction	Choriton reta WFD-GW-W Temporary and Perm		Crewe south portal WFD-GW-WDQ-BT-01 Temporary and Permanent Construction		Newcastle Road overbridge WFD-GW-WDQ-OF-01 porary and Permanent Construction	Borrow pit north of Checkley Lane WFD-GW-WDQ-BP-01 Temporary and Permanent Construction				WFD compliance outcome -
Current Status Confidence	Status objective	ldentified potential chemcial impacts: der	Disturbing or mobilising existing poor quality groundwater by temporary dewatering or epressurisation and permanent groundwater control	Creating or altering of pathways along which existing poor quality groundwater can migrate Disturbing or n groundwater can depressu groundwater groundwater can migrate	nobilising existing poor quality by temporary dewatering or risation and permanent undwater control Creating or altering of pathways along which existing poor quality groundwater ca migrate	Disturbing or mobilising existing poor quality groundwater by temporary dewatering or depressurisation and permanent groundwater control	which existing poor quality groundwater can	bing or mobilising existing poor quality ndwater by temporary dewatering or depressurisation and permanent groundwater control Groundwater control	Disturbing or mobilising existing poor quality groundwater by temporary dewatering or depressurisation and permanent groundwater control	eating or altering of pathways along existing poor quality groundwater can migrate Creating or altering of gro	pathways along which existing poor quality oundwater can migrate	Creating or altering of pathways along which existing poor quality groundwater can migrate	Creating or altering of pathways along which existing poor quality groundwater can migrate		Creating or altering of pathways along which existing poor quality groundwater can migrate		ich existing aroundwater by temporary dewatering depressurisation and permanent groundwater	Creating or altering of pathways along which existing poor quality groundwater can migrate	Disturbing or mobilising existing poor quality groundwater by temporary dewatering or depressurisation and permanent groundwater control	Creating or altering of pathways along which existing poor quality groundwater can migrate	g Disturbing or mobilising existing poor quality groundwater by temporary dewatering or depressurisation and permanent groundwater control	tering of pathways along which existing Creating or alterin	ng of pathways along which existing poor quality groundwater can migrate	Disturbing or mobilising existing poor quality groundwater by temporary dewatering or depressurisation and permanent groundwater control Creating or altering of pathways along which existing poor quality groundwater can migrate	Overall Effect Impact on Current V	D Status Additional Mitigation Requirement	ents Residual Effect on Current WFD Element Stat	potential for deterioration of current status
Saline or other intrusions Good Very Certain	Good by 2015	, w	No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element		e or other intrusion of poor as no sources of poor water iffied in vicinity of scheme element No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme	No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element	No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element	kely saline or other intrusion of poor ty water as no sources of poor water lity identified in vicinity of scheme element No likely saline or other intrusion of quality water as no sources of poor quality identified in vicinity of sche element	No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element	ikely saline or other intrusion of poor ity water as no sources of poor water ality identified in vicinity of scheme element	usion of poor quality water as no sources of poor No Notified in vicinity of scheme element	likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element	No likely saline or other intrusion of poor quality water as no sources of p water quality identified in vicinity of scheme element	No likely saline or other intrusion of poor quality water a no sources of poor water quality identified in vicinity of scheme element	as No likely saline or other intrusion of poor quality water a f no sources of poor water quality identified in vicinity of scheme element	s No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element of scheme element	uality water No likely saline or other intrusion of poor qualit ed in vicinity as no sources of poor water quality identified in of scheme element	y water No likely saline or other intrusion of poor quality water vicinity as no sources of poor water quality identified in vicinity of scheme element	No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element	No likely saline or other intrusion of poor quality wate as no sources of poor water quality identified in vicinit of scheme element		e or other intrusion of poor quality water of poor water quality identified in vicinity of scheme element	er intrusion of poor quality water as no sources of ity identified in vicinity of scheme element	No likely saline or other intrusion of poor quality water as no sources of poor water quality identified in vicinity of scheme element of scheme element	No impacts identified Remains Good \$	atus None required	Remains Good Status	Compliant - no change in status
2. Surface water Poor Uncertain	Good by 2027	No No di o	io impacts identified as a result of scheme element. o existing poor quality groundwater expected to be isturbed or mobilised in the vicinity of the cutting or potential dewatering radius of influence. CoCP and best practice for design, construction and operation reduce risks to surface water quality.	erement. No poor quainty groundwater expected in the vicinity of the cutting, or connection with surface water. CoCP and best practice for design, construction and operation reduce risks to water quality due cock the control of the	nntified as a result of scheme No existing poor quality expected to be disturbed or he vicinity of the cutting or attering radius of influence. The process of the cutting or connection with surface water. CoCP and best practice for design, and operation reduce risks to acce water quality.	d disturbed or mobilised in the vicinity of the cutting or potential dewatering radius of influence. CoCP and best practice for design, construction and	element. No poor quality groundwater expected in the vicinity of the cutting, or connection with surface water. CoCP and best practice for design, construction and connection reduce elements.	The existing WCML area will contain made ound and land with potential for mination. There is potential for poor try groundwater to be disturbed or oilised in the vicinity of the cutting the dewatering radius of influence sects the existing WCML. CoCP and reactive for design, construction and ation reduce risks to surface water quality.	The existing WCML area will contain made ground and land with potential for containination. There is potential for poor quality groundwater to be disturbed or mobilised in the vicinity of the cutting where the dewatering radius of influence intersects where the existing WCML. CoCP and best practice for design, construction and operation const	amination. There is potential for poor lity groundwater to be disturbed or sed in the vicinity of the cutting where watering radius of influence intersects existing WCML, and the cutting could wide a preferential pathway for flow. In COCP and best practice for design,	attenuation of any turbidity resulting from cons	ential creation of preferential flow pathways into the aquifer due to piling, ugh not in proximity to surface water. CoCP and best practice for design, truction and operations, and natural attenuation of any turbidity resulting of from construction, will reduce risk and potential impacts to negligible.	onstruction and operations, and natural attenuation of any turbidity resu		Potential creation of preferential flow pathways into the agolfer due to piling, though not in proximity to surface water. GOFP and best practice for design, construction and operations, and natural attenuation of any turbidity resulting from construction, will reduce risk and potential impacts to negligible.	No impacts identified as a result of scheme element. No impacts identified as a result of scheme element.	ne element. No impacts identified as a result of scheme ele	rment. No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element	The existing WCML area will contain made ground and land with potential for contamination. There is potential for poor quality groundwater to be disturbed or mobilised in the vicinity of the cutting where the dewatering radius of influence intersects the existing WCML. CoCP and best practice for design, construction and operation reduce risks to surface water quality at Basford Brookwhich is approximately soom from the Scheme.	for poor quality groundwater to be mobilised in the vicinity of the cutting watering radius of influence intersects VCML, and the cutting could provide a preferential pathways or the cutting	rea will contain made ground and land with poter here is potential for poor quality groundwater to if overbridge foundations come into contact, the would be highly localised and not providing path to CP and best practice for design, construction an risks to water quality due to preferential pathway:	ntial be be to be	Potential localised impacts identified, negligible impact No significant dete with embedded mitigation.	oration None required	No significant deterioration	Compliant - no change in status
3. Groundwater Dependent Terrestrial Ecosystems (GWDTE's) Uncertain		No	io impacts identified as a result of scheme element.	No impacts identified as a result of scheme Ro impacts identified as a result of scheme Roughland Roughlan	ntified as a result of scheme No impacts identified as a result of schem element.	ne No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element.	pacts identified as a result of scheme No impacts identified as a result of sc element. element.	neme No impacts identified as a result of scheme element.	npacts identified as a result of scheme No impacts iden element. No impacts iden	tified as a result of scheme element.	No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element. No impacts identified as a result of scheme	se element. No impacts identified as a result of scheme ele	rment. No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element.	No impacts identified as a result of scheme element.	:. No impacts identified as a result of scheme element. No impacts iden	dentified as a result of scheme element. No impacts	ts identified as a result of scheme element.	The borrow pit will be excavated and restored above the groundwater table. Therefore no poor quality groundwater will be disturbed or mobilised. The borrow pit will be excavated and restored above the groundwater table, therefore no pathways for migration of existing poor quality groundwater will be created.	No impacts identified No significant dete	oration None required	No significant deterioration	Compliant - no change in status
4. Drinking Water Protected Areas (DrWPAs) Good Uncertain		No. t	to existing poor quality groundwater is expected in the vicinity of the cutting, and the element is not within an SPZ. CoCP and best practice for design, construction and operation reduce risks to water quality.	No impacts identified as a result of scheme element. No poor quality groundwater expected in the vicinity of the cutting, and the element is not within an SPZ.	oor quality groundwater is evicinity of the cutting, and not within an SPZ. CoCP and or design, construction and duce risks to water quality.	No existing poor quality groundwater is expected in the vicinity of the cutting, and the element is not within an SPZ. GoCP and best practice for design, construction and operation reduce risks to water quality.	No impacts identified as a result of scheme element. No poor quality groundwater expected in the vicinity of the cutting, and the element is not within an SPZ.	ement is not within an SPZ. CoCP and best practice for design, construction and ration reduce risks to water quality.	P and The element is not within an SPZ. CoCP and and best practice for design, construction and operation reduce risks to water quality.	rement is not within an SPZ. CoCP and practice for design, construction and construction and construction and o	n an SPZ. CoCP and best practice for design, peration reduce risks to water quality.	The element is not within an SPZ. CoCP and best practice for design, construction and operation reduce risks to water quality.	The element is not within an SPZ. CoCP and best practice for design construction and operation reduce risks to water quality.		ce The element is not within an SPZ. CoCP and best practic for design, construction and operation reduce risks to water quality.	The element is not within an SPZ. CoCP and best practice for design, construction and operation reduce risks to water quality. The element is not within an SPZ. CoCP and best practice for design, construction and operation reduce risks to water quality.	ation reduce practice for design, construction and operation	The element is not within an SPZ. CoCP and best practice for design, construction and operation reduce risks to water quality.	The element is not within an SPZ. CoCP and best practice for design, construction and operation reduce risks to water quality.	practice for design, construction and operation reduc	re construction and operation reduce risks to water quality.	it is not within an SPZ. CoCP and best sign, construction and operation reduce risks to water quality.	t within an SPZ. CoCP and best practice for design and operation reduce risks to water quality.	The borrow pit will be excavated and restored above the groundwater table. Therefore no poor quality groundwater will be disturbed or mobilised. The borrow pit will be excavated and restored above the groundwater table, therefore no pathways for migration of existing poor quality groundwater will be created.	No impacts identified Remains Good 5	atus None required	Remains Good Status	Compliant - no change in status
ç. General quality assessment Poor Uncertain	Good by 2027	I Pc d d	Potentially little or no unsaturated zone therefore a greater potential impact to groundwater qualiburing construction in this area. Application of the CoCP will ensure materials and fluids used during construction are managed so that there is no	therefore a greater potential impact to groundwater quality during construction in this area. Application of the CoCP will this area. Application of the CoCP will ensure materials and fluids used during ensure mate onstruction are managed so that there is no construction are	No existing poor quality groundwater expected. Little or no unsaturated zone reater potential impact to groundwater quality during construction in plication of the CoCP will ensure managed so that there is no ext on general groundwater quality. No existing poor quality groundwater expected. Little or no unsaturated zone to groundwater quality during construction. Application of the CoCP will ensure materials and fluids used uring construction are managed so that there is no significant effect on general groundwater quality.	No existing poor quality groundwater expected. Little or no unsaturated zone therefore a greater potential impact to groundwater quality during er construction in this area. Application of the CoCP will ensure materials and fluids used during	therefore a greater potential impact to groundwater quality during construction in this area and the cutting could proide a preferential pathway for poor quality water during construction. Application of the COCP will ensure materials and fluids used during construction are managed so that reduce the construction are managed so	visting WCML area will contain made round and land with potential for miniation. There is potential for poor lity groundwater to be disturbed or sed in the vicinity of the cutting watering radius of influence intersects construction. Application of the Coc design, construction and operation ce impacts on general groundwater quality to negligible.	ater ground and land with potential for a land contamination. There is potential for poor tial quality groundwater to be disturbed or mobilised in the vicinity of the cutting where will the dewatering radius of influence intersects in g the existing WCML. CoCP and best practice is no for design, construction and operation.	ter potential impact to groundwater ty during construction in this area and cutting could provide a preferential thway for poor quality water during truction. Application of the CoC P will ure materials and fluids used during uction are managed so that there is no finant effect on general groundwater	P and best practice for design, construction and extenuation of any turbidity resulting from	tion of new preferential pathways into the aquifer due to piling, therefore of the control of th	expected in this area. CoCP and best practice for design, construction a operations, and natural attenuation of any turbidity resulting from	due to piling, therefore potential to impact general water quality. No existing poor water quality expected in this area. CoCP and best practice for design, construction an operations, and natural attenuation of any turb	s quality. No existing poor water quality expected in this nd area. CoCP and best practice for design, construction and operations, and natural attenuation of any turbidity	Little or no unsaturated zone therefor potential impact to groundwater qual construction in this area and the retaining provide a preferential pathway for poor during construction, or a pathway for poor during construction, or a pathway for contamination if present near the exist Application of the CoCP will ensure matter used during construction are managed so no significant effect on general groundwater.	y during ywall could uality water existing No impacts identified as a result of scheme ele g WCML. Is and fluids that there is	Little or no unsaturated zone therefore a greater potential impact to groundwater quality during construction in this area and the retaining wall could provide a preferential pathway for poor quality water puring contamination if present near the existing WCML. Application of the CCP will ensure materials and fluids used during construction are managed so that there is no significant effect on general groundwater quality.	potential for poor quality groundwater to be disturbed or mobilised in the vicinity of the retaining wall and associated cutting. CoCP and best practice for design,	construction in this area and the retaining wall could provide a preferential pathway for poor quality wate furing construction. Application of the CoCP will ensu	d potential for contamination. There is potential for poor quality groundwater to be disturbed or mobilised in the vicinity of the cutting where the dewatering radius of influence intersects the existing wCML. CoCP and best practice for design, construction and operation reduce impacts on general groundwater quality to negligible.	mpact to groundwater quality during Little or no unsatur, this area and the cutting could provide a potential pollution du pathway for por quality water during could provide a preferent. Application of the CoCP will ensure	rrated zone in the aquifer to provide attenuation o during construction and the overbridge foundatio rential pathway for poor quality water. Applicatio re materials and fluids used during construction a nere is no significant effect on general groundwate quality.	The borrow pit will be excavated and restored on of above the groundwater table. Therefore no poor requality groundwater will be disturbed or mobilised. The borrow pit will be excavated and restored above the groundwater table, therefore no pathways for migration of existing poor quality groundwater will be created.	Potential localised impacts identified, negligible impact No significant dete with embedded mitigation.	oration None required	No significant deterioration	Compliant - no change in status

Overall Chemical Status Poor Uncertain Good by 2027