THE PLANNING ACT 2008

M4 (JUNCTIONS 3 TO 12) (SMART MOTORWAY) DEVELOPMENT CONSENT ORDER APPLICATION

TR010019

Environment Agency

Response to Written Representations

Appendix C - Comparative review of 2009 and 2014 baseline surface water data

Deadline III - 5 November 2015

Table 5.1 Rivers WFD baseline data (entries in red indicate WFD failure) (yellow highlighted text is from the 2014 data, indicating a change from the 2009 data as displayed in the WFD Compliance Assessment)

Drawing 15.1 ref. number (if present) Waterbody ID No. and Name[3]	Classified as Heavily modified?	Current Overall Status / Potential	Overall Status Objective	Specific Status Objective(s)	Justification if overall objective is not good by 2015	Protected Area Designation	Information on supporting biological elements	Information on supporting elements (Chemical)	Information on supporting conditions (Hydro-morphological)	Information on chemical status	Mitigation Measures for Waterbodies	Hydrological relationship with site
GB30642622 Ameys Lake or Theale Lakes	Artificial	Good	Good by 2015	Good Ecological Potential by 2015	N/A	Yes – Freshwater Fish Directive, Nitrates Directive	Phytoplankton – Good	Total phosphorus – Good Copper – High Zinc - High	Quantity and Dynamics of Flow – Supports Good	**Current Status: Does not require an assessment** **Current Status: Good**	N/A	South of the M4 corridor near junction 12

20) GB106039023140 Kennet & Holy Brook	Yes	Moderate	Good by 2027	Good Ecological Potential by 2027, Good Chemical Status by 2015	Technically infeasible	Yes - Freshwater Fish Directive, Nitrates Directive,	Fish – Good Invertebrates - Good	Ammonia (Phys Chem) – High Dissolved Oxygen – High pH – High Phosphate – Good Temperature – High Arsenic - High Copper – High Iron – High Permethrin - High Zinc – High Ammonia (annex 8) – High	Quantity and Dynamics of Flow – Supports Good	**Current Status: Good** 1,2-dichloroethane Benzo (a) and (k) fluoranthene Benzo (ghi) perelyene and indeno (123-cd) pyrene Benzo(a)pyrene Cadmium And Its Compounds Fluoranthene Hexachlorobenzene Hexachlorobutadiene Hexachlorocyclohexane Lead And Its Compounds Mercury And Its Compounds Nickel And Its Compounds Pentachlorophenol Tributyltin Compounds Trichlorobenzenes Trichloromethane Aldrin, Dieldrin, Endrin & Isodrin Carbon Tetrachloride para - para DDT Tetrachloroethylene Trichloroethylene **Current status: High (for above)** **Predicted Status: High (for above)** **Current Status: Fail**	Yes	M4 crosses once near junction 12

Drawing 15.1 ref. number (if present) Waterbody ID No. and Name[3]	Classified as Heavily modified?	Current Overall Status / Potential	Overall Status Objective	Specific Status Objective(s)	Justification if overall objective is not good by 2015	Protected Area Designation	Information on supporting biological elements	Information on supporting elements (Chemical)	Information on supporting conditions (Hydro-morphological)	Information on chemical status	Mitigation Measures for Waterbodies	Hydrological relationship with site
19) GB70610180 Kennet & Avon Canal, Copse Lock to Reading (River Kennet and canal sections)	Artificial	Good	Good by 2015	Good Ecological Potential by 2015	N/A	Yes – Nitrates Directive	No data	Ammonia (Phys Chem) – High pH – High Phosphate – Good Temperature – Good Copper – High Zinc – High Ammonia (annex 8) – High	No data	**Current Status: Does not require assessment** **Current Status: Good**	Yes	M4 crosses once near junction 12
17, 18) GB106039023120 Kennet & Foudry Brook and Clayhill Brook	Yes	Moderate	Good by 2027	Good Ecological Potential by 2027, Good Chemical Status by 2015	Disproportionately expensive, Technically infeasible	Yes - Drinking Water Protected Area, Freshwater Fish Directive, Nitrates Directive,	Fish – Moderate (Quite Certain) Invertebrates – Moderate (Quite Certain)	Ammonia (Phys Chem) – High Dissolved Oxygen – High pH – High Phosphate – Moderate (Uncertain) Temperature – High Arsenic - High Copper – High Iron - High Zinc – High Ammonia (annex 8) – High	Quantity and Dynamics of Flow – Supports Good	**Current Status: Good** **Lead and its compounds** Current Status – High Predicted Status – High **Nickel and its compounds** Current Status - High Predicted Status – High **Current Status: Fail**	N/A	M4 crosses once between junctions 11 and 12
16) GB106039017400 Barkham Brook	Not designated	Moderate Poor	Good by 2027	Good Ecological Status by 2027, Good Chemical Status by 2015	Disproportionately expensive	Yes - Nitrates Directive	Invertebrates - Good	Ammonia (Phys Chem) – Good Dissolved Oxygen – High pH – High Phosphate – Poor (Very Certain) Temperature – High Arsenic - High Copper – High Iron - High Zinc – High Ammonia (annex 8) – Good	Quantity and Dynamics of Flow – Supports Good Morphology – Supports Good	**Current Status: Good** **Lead and its compounds** Current Status – High Predicted Status – High **Nickel and its compounds** Current Status - High Predicted Status – High **Current Status: Fail**	N/A	M4 crosses once between junctions 10 and 11 approximately 300m east of the River Loddon

Drawing 15.1 ref. number (if present) Waterbody ID No. and Name[3]	Classified as Heavily modified?	Current Overall Status / Potential	Overall Status Objective	Specific Status Objective(s)	Justification if overall objective is not good by 2015	Protected Area Designation	Information on supporting biological elements	Information on supporting elements (Chemical)	Information on supporting conditions (Hydro-morphological)	Information on chemical status	Mitigation Measures for Waterbodies	Hydrological relationship with site
15) GB106039023160 River Loddon (Swallowfield to River Thames confluence)	Not designated	Moderate	Good by 2027	Good Ecological Status by 2027, Good Chemical Status by 2027	Disproportionately expensive, Technically infeasible	Yes - Freshwater Fish Directive, Nitrates Directive,	Fish – Moderate (Very Certain) Invertebrates - High	Ammonia (Phys Chem) – High Dissolved Oxygen – High pH – High Phosphate – Moderate (Very Certain) Temperature – High Arsenic - High Copper – High Iron – High Permethrin - High Zinc – High Ammonia (annex 8) – High	Quantity and Dynamics of Flow – Supports Good Morphology – Supports Good	**Current Status: Fail (Uncertain)** 1,2-dichloroethane Benzo (a) and (k) fluoranthene Benzo (ghi) perelyene and indeno (123-cd) pyrene Benzo(a)pyrene Cadmium And Its Compounds Fluoranthene Hexachlorobenzene Hexachlorobutadiene Hexachlorocyclohexane Lead And Its Compounds Mercury And Its Compounds Nickel And Its Compounds Pentachlorophenol Tributyltin Compounds - Moderate Trichlorobenzenes Trichloromethane Aldrin, Dieldrin, Endrin & Isodrin Carbon Tetrachloride para - para DDT Tetrachloroethylene Trichloroethylene **Current and Predicted Status: High (for above)** **Current Status: Fail**	N/A	M4 crosses once between junctions 10 and 11

Drawing 15.1 ref. number (if present) Waterbody ID No. and Name[3]	Classified as Heavily modified?	Current Overall Status / Potential	Overall Status Objective	Specific Status Objective(s)	Justification if overall objective is not good by 2015	Protected Area Designation	Information on supporting biological elements	Information on supporting elements (Chemical)	Information on supporting conditions (Hydro-morphological)	Information on chemical status	Mitigation Measures for Waterbodies	Hydrological relationship with site
14) GB106039023130 Emm Brook	Yes	Moderate	Good by 2027	Good Ecological Potential by 2027	Disproportionately expensive, Technically infeasible	Yes - Freshwater Fish Directive, Nitrates Directive,	Invertebrates - Good	Ammonia (Phys Chem) – Moderate (Uncertain) Dissolved Oxygen – High pH – High Phosphate – Poor (Very Certain) Temperature – High Copper – High Zinc – High Ammonia (annex 8) – Moderate (Uncertain)	Quantity and Dynamics of Flow – Supports Good	**Current Status: Does not require assessment** **Current Status: Fail**	Yes	M4 crosses once at junction 10
11, 12, 13) GB106039023510 The Cut (Binfield to River Thames confluence) and Maidenhead Ditch	Yes	Poor Moderate	Good by 2027	Good Ecological Potential by 2027, Good Chemical Status by 2015	Disproportionately expensive, Technically infeasible	Yes - Freshwater Fish Directive, Nitrates Directive, Urban Waste Water Treatment Directive.	Fish – Moderate (Uncertain) Invertebrates – Moderate (Uncertain) Phytobenthos – Poor (Very Certain)	Ammonia (Phys Chem) – Good Dissolved Oxygen – High pH – High Phosphate – Poor (Uncertain) Temperature – High Arsenic - High Copper – High Iron - High Zinc – High Ammonia (annex 8) – Good	Quantity and Dynamics of Flow – Supports Good	**Current Status: Good** Benzo (a) and (k) fluoranthen Benzo (ghi) perelyene and indeno (123-cd) pyrene Benzo(a)pyrene Cadmium And Its Compounds Fluoranthene Lead And Its Compounds Mercury And Its Compounds Nickel And Its Compounds Aldrin, Dieldrin, Endrin & Isodrin para - para DDT **Current Status: High (for above)** **Predicted Status: High (for above)** **Current status: Fail**	Yes	M4 crosses three times, once between junctions 7 and 8/9 and twice close to junction 8/9

Drawing 15.1 ref. number (if present) Waterbody ID No. and Name[3]	Classified as Heavily modified?	Current Overall Status / Potential	Overall Status Objective	Specific Status Objective(s)	Justification if overall objective is not good by 2015	Protected Area Designation	Information on supporting biological elements	Information on supporting elements (Chemical)	Information on supporting conditions (Hydro-morphological)	Information on chemical status	Mitigation Measures for Waterbodies	Hydrological relationship with site
10) GB530603911402 River Thames (Cookham to Egham)	Yes	Moderate	Good by 2027	Good Ecological Potential by 2027, Good Chemical Status by 2015	Disproportionately expensive, Technically infeasible	Yes- Drinking Water Protected Area, Freshwater Fish Directive, Nitrates Directive, Urban Waste Water Treatment Directive.	Invertebrates – High Fish - High	Ammonia (Phys-Chem) – High Dissolved Oxygen – High pH – High Phosphate – Moderate (very certain) Temperature – High Arsenic – High Copper – High Iron – High Zinc – High Ammonia (Annex 8) - High	No data	**Current Status: Good** Benzo (a) and (K) fluoranthene Benzo(ghi) perelyene and indeno (123-cd) pyrene Benzo(a)pyrene Cadmium And Its compounds Fluoranthene Lead And Its Compounds Nickel And Its Compounds Mercury And Its Compounds Aldrin, Dieldrin, Endrin & Isodri para – para DDT **Current Status: High (for above)** **Predicted Status: High (for above)**	Yes	M4 crosses once west of junction 7

Drawing 15.1 ref. number (if present) Waterbody ID No. and Name[3]	Classified as Heavily modified?	Current Overall Status / Potential	Overall Status Objective	Specific Status Objective(s)	Justification if overall objective is not good by 2015	Protected Area Designation	Information on supporting biological elements	Information on supporting elements (Chemical)	Information on supporting conditions (Hydro-morphological)	Information on chemical status	Mitigation Measures for Waterbodies	Hydrological relationship with site
9) GB106039023540 Roundmoor Ditch and Boveney Ditch	Yes	Moderate	Good by 2027	Good Ecological Potential by 2027, Good Chemical Status by 2015	Disproportionately expensive, Technically infeasible	Yes - Freshwater Fish Directive, Nitrates Directive, Urban Waste Water Treatment Directive.	Fish - High	Ammonia (Phys Chem) – High Dissolved Oxygen – High pH – High Phosphate – Moderate (Uncertain) Temperature – High Arsenic - High Copper – High Zinc – High Ammonia (annex 8) – High	Quantity and Dynamics of Flow – Supports Good	**Current Status: Good** 1,2-dichloroethane Hexachlorobenzene Hexachlorobutadiene Hexachlorocyclohexane Lead And Its Compounds Nickel And Its Compounds Pentachlorophenol Trichlorobenzenes Trichloromethane Aldrin, Dieldrin, Endrin & Isodrin Carbon Tetrachloride para - para DDT Tetrachloroethylene Trichloroethylene **Current Status: High (for above)** **Predicted Status: High (for above)**	Yes	M4 crosses once (west of junction 7), then the watercourse follows the direction of the M4 until it joins the Jubilee River
8) Jubilee River	No data available	Good								**Current Status: Does not require an assessment**		M4 crosses once (west of junction 7), then the watercourse flows to the east, approximately 700m west of the motorway centre line up to junction 6 where the river is approximately 200m west of the M4
7) GB106039023530 Salthill Stream	Yes	Poor Moderate	Good by 2027	Good Ecological Potential by 2027	Disproportionately expensive, Technically infeasible	Not designated	Fish – Moderate (Uncertain) Invertebrates – Poor (Very Certain)	No Chemical data	Quantity and Dynamics of Flow – Does not Support Good (Quite Certain)	**Current Status: Does not require assessment** **Current Status: Fail**	Yes	M4 crosses once near junction 6

Drawing 15.1 ref. number (if present) Waterbody ID No. and Name[3]	Classified as Heavily modified?	Current Overall Status / Potential	Overall Status Objective	Specific Status Objective(s)	Justification if overall objective is not good by 2015	Protected Area Designation	Information on supporting biological elements	Information on supporting elements (Chemical)	Information on supporting conditions (Hydro-morphological)	Information on chemical status	Mitigation Measures for Waterbodies	Hydrological relationship with site
6) GB106039023470 Chalvey Ditch	Yes	Moderate	Good by 2027	Good Ecological Potential by 2027	Technically infeasible	Yes - Freshwater Fish Directive, Nitrates Directive, Urban Waste Water Treatment Directive	Fish – High Invertebrates – Good	Ammonia (Phys Chem) – High Dissolved Oxygen – Good pH – High Phosphate – Good Temperature – High Copper – High Zinc – High Ammonia (annex 8) – High	Quantity and Dynamics of Flow – Does not Support Good (Quite Certain)	**Current Status: Does not require assessment** **Current Status: Fail**	Yes	M4 crosses once near junction 6
5) GB106039023520 Datchet Common Brook	Yes	Moderate	Good by 2027	Good Ecological Potential by 2027	Disproportionately expensive, Technically infeasible	Yes - Freshwater Fish Directive	Invertebrates - High	No Chemical data	Quantity and Dynamics of Flow – Supports Good	**Current Status: Does not require assessment** **Current Status: Good**	Yes	M4 crosses once near junction 5
GB30642334 The Queen Mother Reservoir	Artificial	Poor Good	Good by 2027	Good Ecological Potential by 2027	Disproportionately expensive, Technically infeasible	Yes – Drinking Water, Water Storage – non-specific, Wider Environment	Chironom Invertebrates – Poor (Very Certain) Phytoplankton – Good	Total phosphorus – Bad (Very Certain) Copper – High Zinc - High	No data	**Current Status: Does not require an assessment** **Current Status: Good**	N/A	South of the M4 corridor near junction 5
4) GB106039023040 Horton Brook (River Colne)	Not designated	Moderate	Good by 2027	Good Ecological Status by 2027	Technically infeasible	Yes - Freshwater Fish Directive, Natura 2000.	Invertebrates- Moderate (Quite Certain)	Ammonia (Phys Chem) – High Dissolved Oxygen – Good pH – High Phosphate – Good Temperature – High Ammonia (annex 8) – High	Quantity and Dynamics of Flow – Supports Good Morphology – Supports Good	**Current Status: Does not require assessment** **Current Status: Fail**	N/A	M4 crosses once at junction 4b
3) GB106039023010 Colne Brook (from confluence with Alderbourne to confluence with Horton Brook)	Yes	Moderate	Good by 2027	Good Ecological Potential by 2027	Disproportionately expensive, Technically infeasible	Yes – Freshwater Fish Directive, Nitrates Directive	Fish- Moderate (Uncertain) Invertebrates- Good	Ammonia (Phys Chem) – High Dissolved Oxygen – Good pH – High Phosphate – Poor (Very certain) Temperature – High Ammonia (annex 8) – High	Quantity and Dynamics of Flow – Supports Good	**Current Status: Does not require an assessment** **Current Status: Fail**	Yes	M4 crosses once at junction 4b

Drawing 15.1 ref. number (if present) Waterbody ID No. and Name[3]	Classified as Heavily modified?	Current Overall Status / Potential	Overall Status Objective	Specific Status Objective(s)	Justification if overall objective is not good by 2015	Protected Area Designation	Information on supporting biological elements	Information on supporting elements (Chemical)	Information on supporting conditions (Hydro-morphological)	Information on chemical status	Mitigation Measures for Waterbodies	Hydrological relationship with site
2) GB106039023090 River Colne and Grand Union Canal (from confluence with Chess to Ash)	Yes	Moderate	Good by 2027	Good Ecological Potential by 2027, Good Chemical Status by 2027	Disproportionately expensive, Technically infeasible	Yes – Freshwater Fish Directive, Nitrates Directive	Fish – Moderate (Very Certain) Invertebrates – Moderate (Quite Certain)	Ammonia (Phys-Chem) Dissolved Oxygen pH Temperature 2,4-dichlorophenol 2,4-dichlorophenoxyacetic acid Arsenic Copper Diazinon Dimethoate Iron Linuron Mecoprop Permethrin Toluene Zinc Ammonia (Annex 8) All of the above current status: High Predicted status: High **Phosphate.** Current status: Poor (Very Certain) Predicted Status: Poor	Quantity and Dynamics of Flow – Does not Support Good (Uncertain)	**Current Status: Fail (Uncertain)** 1,2-dichloroethane Atrazine Benzene Benzo (a) and (k) fluoranthene Benzo(a)pyrene Cadmium And Its Compounds Chlorfenvinphos Diuron Fluoranthene Hexachlorobenzene Hexachlorobutadiene Hexachlorocyclohexane Isoproturon Lead And Its Compounds Mercury And Its Compounds Napthalene Nickel And Its Compounds Pentachlorophenol Simazine Tributyltin Compounds Trichlorobenzenes Trichloromethane Trifluralin Aldrin, Dieldrin, Endrin & Isodrin Carbon Tetrachloride para - para DDT Tetrachloroethylene Trichloroethylene **Current status: High (for above)** **Predicted status: High (for above)** Benzo (ghi) perelyene and indeno (123-cd) pyrene	Yes	M4 crosses three separate channels at junction 4b

Drawing 15.1 ref. number (if present) Waterbody ID No. and Name[3]	Classified as Heavily modified?	Current Overall Status / Potential	Overall Status Objective	Specific Status Objective(s)	Justification if overall objective is not good by 2015	Protected Area Designation	Information on supporting biological elements	Information on supporting elements (Chemical)	Information on supporting conditions (Hydro-morphological)	Information on chemical status	Mitigation Measures for Waterbodies	Hydrological relationship with site
										Current status: Moderate (uncertain) **Predicted status: Moderate**		
1) GB106039023030 River Crane (including part of the Yeading Brook)	Yes	Poor	Good by 2027	Good Ecological Potential by 2027, Good Chemical Status by 2015	Technically infeasible	Yes – Freshwater Fish Directive, Nitrates Directive	Fish – Poor (Very Certain) Invertebrates-Moderate (Very Certain) Macrophytes – Moderate (Very Certain) Phytobenthos – Poor (Very Certain)	Ammonia (Phys Chem) – Good Dissolved Oxygen – Good pH – High Phosphate – Poor (Very Certain) Temperature – High Arsenic – High Copper – High Iron – High Zinc – High Ammonia (annex 8) – Good	Quantity and Dynamics of Flow – Supports Good	**Current Status: Good** **Lead And Its Compounds** Current Status – High Predicted Status – High **Nickel And Its Compounds** Current Status – High Predicted Status – High **Tributyltin Compounds** Current Status – High Predicted Status – High **Aldrin, Dieldrin, Endrin & Isodrin** Current Status – High Predicted Status – High **para - para DDT** Current Status – High Predicted Status – High **Current Status: Fail**	Yes	M4 crosses once at junction 3

[3] Environment Agency database that holds all WFD information for individual waterbodies.

Table 2 Groundwater WFD baseline data (entries in red indicate WFD failure) (yellow highlighted text is from the 2014 data, indicating a change from the 2009 data as displayed in the WFD Compliance Assessment)

Waterbody ID No.	Name of waterbody	Current Overall Status / Potential	Overall Status Objective	Quantitative elements (and confidence)	Chemical Status (and confidence)	Chemical elements (and confidence)	Pressures and Risks
GB40601G600900	Berkshire Downs Chalk	Poor	Good by 2027	Current Status - Poor (Low) Impact on Wetlands – Good (Low) Impact on Surface waters – Poor (Low) Saline Intrusion – Good (High) Water Balance – Poor (Low)	Poor (High)	Drinking Water Protected – Poor (High) General Chemical Test – Good (Low) Impact on Wetlands – Good (Low) Impact on Surface Waters – Good (Low) Saline Intrusion – Good (High)	At risk Hazardous Substances and other pollutants – Urbanisation Nutrients – Nitrate, Phosphate, Trends in Nitrate Hazardous Substances and other pollutants, Nutrients, Abstraction and other artificial flow pressures – Drinking Water Protected Areas ("DrWPA")

GB40602G601600	Thatcham Tertiaries	Poor Good	Good by 2027	Current Status - Poor (Low) Impact on Wetlands – Good (Low) Impact on Surface waters – Poor	Poor (Low) Good	Drinking Water Protected – Good (Low) General Chemical Test – Poor (Low) Impact on Wetlands – Good (Low)	At risk Hazardous Substances and other pollutants – Urbanisation Nutrients – Nitrate

Waterbody ID No.	Name of waterbody	Current Overall Status / Potential	Overall Status Objective	Quantitative elements (and confidence)	Chemical Status (and confidence)	Chemical elements (and confidence)	Pressures and Risks
				(Low) Saline Intrusion – Good (Low) Water Balance – Good (High) **Current status: Good**		Impact on Surface Waters – Good (Low) Saline Intrusion – Good (Low)	

GB40602G602700	Twyford Tertiaries	Poor Good	Good by 2027	Current Status - Poor (Low) Impact on Wetlands – Good (Low) Impact on Surface waters – Poor (Low) Saline Intrusion – Good (Low) Water Balance – Poor (Low) **Current status: Good**	Good (Low)	Drinking Water Protected – Good (Low) General Chemical Test – Good (Low) Impact on Wetlands – Good (Low) Impact on Surface Waters – Good (Low) Saline Intrusion – Good (Low)	At risk Hazardous Substances and other pollutants – Urbanisation Nutrients – Nitrate Hazardous Substances and other pollutants – Pesticides