National Highways' response to follow up questions from the Environmental Audit Committee

15/12/2021

Q: Firstly, the tables HE helpfully provided (below) only cover two categories, high risk and risk addressed, totalling just 20.1% of outfalls. Please could you provide updated versions of these tables with all of the categories included.

The tables are provided below giving the full breakdown by category.

Table 1: Summary statistics for National Highways Outfalls (based on data from June 2021)

Outfall Risk Category	Number		Percentage of Total	
All categories	**18,432**		**100%**	
Risk Addressed (Category X)	2,515		13.6%	
Very High Risk (Category A)	364	Category A&B combined = 1,194	2%	Category A&B combined = 6.5%
High Risk (Category B)	830		4.5%	
Moderate Risk (Category C)	4,256		23.1%	
Low Risk (Category D)	8,344		45.3%	
Not Determined* (Category ND)	2,123		11.5%	

** Not Determined outfalls are newly identified outfalls which have been added to the Drainage Data Management System (DDMS) since the baseline assessment was undertaken. In the vast majority of cases these are not newly constructed outfalls but existing outfalls which have been recently mapped and added to the digital register following surveys undertaken on the network. We periodically undertake a review of all "not determined" outfalls to provide a baseline risk classification. We will be undertaking the next review in 2022.*

Table 2: Summary statistics for National Highways Soakaways (based on data from June 2021)

Soakaway Risk Category	Number		Percentage of Total	
All categories	**7,969**		**100%**	
Risk Addressed (Category X)	1,476		18.52%	
Very High Risk (Category A)	53	Category A&B combined = 132	0.7%	Category A&B combined = 1.7%
High Risk (Category B)	79		1.0%	
Moderate Risk (Category C)	248		3.1%	
Low Risk (Category D)	5,390		67.6%	
Not Determined* (Category ND)	723		9.1%	

** Not Determined soakaways are newly identified soakaways which have been added to the Drainage Data Management System (DDMS) since the baseline assessment was undertaken. In the vast majority of cases these are not newly constructed soakaways but existing soakaways which have been recently mapped and added to the digital register following surveys undertaken on the network. We periodically undertake a review of all "not determined" soakaways to provide a baseline risk classification. We will be undertaking the next review in 2022.*

Q: We were also interested in the definitions for these categories and who has been responsible for determining them? In particular, who decides on whether they are 'high risk', what water quality/ ecological qualifications do they have, and on what criteria is the categorisation based on? Does it matter what rivers/habitats the road is next to?

National Highways has an ongoing programme whereby outfalls and soakaways on the Strategic Road Network (SRN) are evaluated with respect to the pollution risk they represent to receiving watercourses and groundwater. The priority outfalls programme classifies the risk from highway outfalls as: A (Very High); B (High); C (Moderate); D (Low); X (Risk Addressed). The risk categories for outfalls and soakaways are based on a two-step process.

The first step was a triage undertaken centrally by National Highways using asset inventory data from our drainage data management system (DDMS) and applying established principles drawn from our research into pollutants in road runoff and assessment tools. It optimised available resources to establish an initial risk classification for each of the many thousands of outfalls and soakaways held on DDMS. This then enabled more detailed actions to be prioritised in Step 2 allowing targeted effort on locations of greatest potential risk. This was done using a Geographic Information System (GIS) based prioritisation method and scoring system developed to determine a baseline risk category. The method was developed in line with pollution risk criteria described in the Design Manual for Roads and Bridges (DMRB) LA113: Road Drainage and the Water Environment.[1][2]

The criteria for outfall assessments were:

- road catchment area[3];
- river size;
- traffic volume;
- proximity to sensitive sites (SACs, SSSIs etc.); and
- the presence of existing treatment systems.

The full methodology is described in the 'GIS Prioritisation of Outfalls' report (Gifford 2010)[4]. An additional check was carried out against the Water Framework Directive (WFD) database which detailed the Reasons for Not Achieving Good (RNAG).

For soakaways a Hazard Ranking Score (HRS) was used to inform the risk category. The criteria used to determine the HRS were:

- presence and type of Source Protection Zone;
- depth to groundwater;
- aquifer vulnerability;
- intergranular flow type;
- rainfall characteristics;
- traffic volume;
- presence of sensitive sites (SACs, SSSIs etc.); and
- the presence of existing treatment systems.

[1] https://www.standardsforhighways.co.uk/dmrb/search/d6388f5f-2694-4986-ac46-b17b62c21727

[2] Standards and guidance in LA113 were developed based on the outcomes of collaborative research undertaken with the Environment Agency and developed by water/environment sector experts. LA113 contains risks assessments for the risk of pollution arising from accidental spillages and routine road runoff for application on new road projects. The guidance has been adapted to retrospectively review the stock of existing highway outfalls and soakaways and their potential pollution risk developed to old design practices over the last 60 years.

[3] The area of impermeable road surface (i.e. tarmac) that contributes to runoff that would collect and discharge at a specific outfall.

[4] HA Priority Registers, GIS Prioritisation of Outfalls, Report No. 16718/GE/R01, Gifford, October 2010

The full methodology is set out in the 'Priority Soakaways Verification User Guide, Appendix B' (Highways Agency 2010)[5] .

This first step, both for outfalls and soakaways, was undertaken in a one-off process by specialist environmental consultants under the supervision and direction of National Highways' Principal Water Environment Specialist[6].

In the second step, the baseline risk category is verified using site-specific desk-based data and field-derived information. The key objective is to determine the need for any intervention. Step 1 was a precautionary process and so this verification stage is essential to determine the need for any intervention and ensure a sustainable approach to mitigating any high-risk locations. Without Step 2 the potential risk was the unnecessary deployment of interventions on the environment and use of resources causing potentially negative environmental impacts, for example on biodiversity. Parameters used for outfalls in the detailed assessments included:

- road catchment area;
- river flow rate (specifically the Q_{95} low summer flow);
- river dimensions;
- river gradient;
- water hardness;
- base-flow index;
- climatic region;
- traffic volume;
- proximity to sensitive sites (SACs, SSSIs etc.); and
- the presence of existing treatment and flow-attenuation systems.

These parameters are entered into National Highways' Water Risk Assessment Tool (formerly HEWRAT) and, if necessary, the Environment Agency's Metal Bioavailability Assessment Tool (M-BAT).[7] [8] These tools determine which, if any, of the prescribed environmental thresholds in LA113/HEWRAT and M-BAT are exceeded.

For soakaways, the second step requires a verification of the baseline Hazard Ranking Score and risk category using site specific information. The parameters used are the same as in the first step, but verified on a soakaway-by-soakaway basis.

For outfalls, HEWRAT and M-BAT determine the pass/fail outcome for acute soluble contaminant concentrations, sediment accumulation/dispersal and annual average soluble concentrations for comparison with Environmental Quality Standards (EQS). The risk of spillage resulting in a pollution incident is also calculated. The combination of pass/fail results for each of 'Spillage risk', 'EQS', 'Soluble pollution' and 'Sediment pollution' then determine the overall risk category based on the criteria set out in the matrix below. The matrix is an extract from DMRB CD535: Drainage Asset Data and Risk Management[9].

[5] This document is available online at www.haddms.com in the downloads section.
[6] Mike Whitehead MA, MSc, MCIWEM, CWEM, CSci, CEnv.
[7] This is an Environment Agency tool. The M-BAT test is the final test undertaken for detailed assessment when a HAWRAT assessment fails for soluble copper & zinc pollutants against established environmental quality standards for the receiving waterbody. This assesses, based on field measurements taken from the waterbody, whether the soluble copper and zinc is bioavailable for uptake by aquatic fauna in the waterbody.
[8] https://www.wfduk.org/sites/default/files/Media/Environmental%20standards/m-BAT%20tool%2020150206%20with%20test%20data.xlsm
[9] https://www.standardsforhighways.co.uk/dmrb/search/e0b6eaa6-b5ec-4e3f-a54f-93bd20fdf5db

Figure E/3.37 Outfall pollution risk assessment criteria matrix

Risk criterion	Risk criterion assessment outcome					
Spillage Risk	Fail	(any)	Pass			
EQS	(any)	Fail	Pass			
Soluble pollution	(any)	(any)	Fail	Fail	Pass	Pass
Sediment pollution	(any)	(any)	Fail	Pass	Fail	Pass
Overall outfall risk status	A (Very High)	A (Very High)	B (High)	C (Moderate)	C (Moderate)	X (Risk Addressed)

For soakaways, the routine runoff risk category (A to D) is determined by criteria in Table 3 below.

Table 3: Routine runoff risk categorisation for soakaways

Description	Routine runoff risk category
Within Source Protection Zone 1 Depth to groundwater = ≤5m	A (Very High)
Within Source Protection Zone 1 Depth to groundwater = >5m	B (High)
Not Within Source Protection Zone 1 Hazard Ranking Score ≥175	C (Moderate)
Hazard Ranking Score <175	D (Low)

The risk of spillage resulting in a pollution incident to groundwater is also calculated. The combination of pass/fail results for 'Routine runoff' and 'Spillage risk' then determine the overall risk category based on the criteria set out in the matrix below. The matrix is an extract from DMRB CD535: Drainage Asset Data and Risk Management.

Figure E/3.32 Soakaway pollution risk assessment criteria matrix

		Overall soakaway risk status			
		Routine runoff risk category			
		A	B	C	D
Spillage risk	Fail	A (Very High)			
	Pass	A (Very High)	B (High)	C (Moderate)	X (Risk Addressed)

The second step is undertaken by qualified environmental practitioners from within National Highways and/or our supply chain. DMRB LA 101: Introduction to Environmental Assessment, requires that assessments, including those using HEWRAT and M-BAT, are done by competent experts. The definition of a competent expert is stated as "Individuals who can demonstrate that they have relevant: 1) qualifications; and 2) expertise, in the environmental assessment of infrastructure projects or related environmental factor(s)."

Once the risk category of any outfall or soakaway is verified, records are updated on Drainage Data Management System (DDMS). They are prioritised for further action which may include, for example, identifying and implementing mitigation actions. “Verified” means that the baseline risk assessment has been reviewed and the risk classification confirmed (be it the risk is upgraded, downgrade or confirmed). This is done via a combination of desk study and when required site visit.

Q. Was microplastic pollution included in its risk register?

When we designed our standards in LA113, microplastics was not a known pollutant of concern. When the microplastics issue became prominent, we began researching to understand the implications for operating the Strategic Road Network. As set out in previous correspondence 13 August 2021, we have published initial research and are doing further investigations.

Whilst the existing outfalls prioritisation programme therefore does not currently include the risk of pollution arising from microplastics, we believe it may be covered by our approach to managing suspended solids, so it is potentially included within our current management processes. Our sustainable drainage systems are also thought to be effective and removing microplastics. We are carrying on with research to further develop our and the wider sector’s understanding.

Q. We were also told in the session that the high risk outfalls were monitored on a monthly basis. How many of these outfalls are monitored each month? Is that all of them or just a percentage of them on a rolling basis? How is the monitoring carried out? And again, who carries these inspections out and on what basis are they qualified to assess the water quality impact of the outfalls?

Nick Harris, CEO of National Highways, wrote to the Committee on 12 July 2021 to clarify this one element of his testimony relating to monthly monitoring.

[ends]