

Westbury Bypass Public Inquiry

Proof of Evidence Prepared on behalf of the White Horse Alliance
By Robert Sargent, CSci, CEnv, FCIWEM

PERSONAL STATEMENT

My name is Robert Sargent. I am Director of Water Environment at Hyder Consulting and responsible for the production of Environmental Impact Statements for a range of projects, including highway projects.

I am a Chartered Scientist, a Chartered Environmentalist and a Fellow of the Chartered Institution of Water and Environmental Management. I am also a trustee of the Chartered Institution of Water and Environmental Management and its Immediate Past President.

I graduated from Lancaster University with an Honours Degree in Environmental Science in 1974. I have worked as a hydrologist and environmentalist since that date. I was Chief Hydrologist for the Forth River Purification Board in Scotland for 19 years and also worked for the Scottish Environment Protection Agency as Head of Environmental Services before joining Hyder Consulting in 2004.

Since joining Hyder Consulting I have worked on the environmental assessment of several major road schemes, including the M25 London Orbital Motorway rapid widening scheme, the A57/A628 Mottram – Tintwistle bypass, the A120 trunk road scheme and the N8 Cashel to Mitchelstown road in Ireland. I have also co-authored a Construction Industry Research and Information Association technical guidance document “Control of Water Pollution from Linear Construction Projects”, published in 2006.

SCOPE OF EVIDENCE

I have studied the environmental statement and the proposals for the construction of the Westbury Bypass and find that there are a number of weaknesses in them. I have expanded on these weaknesses below and concentrate on the risk to groundwater and the consideration of flood risk.

Groundwater

Groundwater is protected by the European Groundwater Directive (80/68/EEC), implemented by the Environment Agency. The Directive specifies potentially hazardous material that must not be released into groundwater, called list 1 substances, which includes oil and several metals found in highway runoff. Further protection of groundwater sources used in public supply is afforded by the establishment of Source Protection Zones by the Environment Agency.

The link road will pass over a Groundwater Source Protection Zone. This zone has been established by the Environment Agency to protect the Wellhead source of public drinking water, operated by Wessex Water. The road will cross the inner protection zone, or SPZ1, which means that substances released into the groundwater will take less than 50 days to travel to the extraction borehole and that overlying soils are insufficient prevent access of surface pollutants into the aquifer. Current guidance is that no development should take place within SPZ1, and this is acknowledged by the scheme promoters¹.

The scheme represents a potential source of pollutants, both from regular runoff and from accidental spillage. The most common of these pollutants are oils and metals, but potentially any substance could be released following an accident. Oils and heavy metals are classified as List 1 substance in the Groundwater Directive and therefore represent both a source of pollution to the groundwater and a threat to the water abstraction site. Once pollution enters groundwater it is very difficult to remove and could potentially result in the loss of the abstraction source.

The scheme promoters have acknowledged this by the provision of a liner which is intended to place a barrier between the source of pollution, ie the highway, and the groundwater. Given the importance of the abstraction source, it is essential that this liner works faultlessly over the lifetime of the scheme. I have three concerns regarding its ability to so do.

¹ A350 Westbury Bypass Environmental Statement chapter 7, Hydrology, Drainage and Water Quality. February 2007, page 110.

Firstly, liners have been developed largely for use in waste disposal sites where it is acknowledged that no liner installation can be guaranteed to be leakproof.

Secondly, where the fallibility of liners is acknowledged, it is common practice to install a secondary layer of impermeable material such as engineered clay. This is designed to work with the liner in a complementary fashion: the clay will prevent a rapid loss of pollutants through a small leak in the liner fabric. The proposed liner will not incorporate a low permeability clay layer. Indeed, it is specifically stated that the liner will be laid onto sand. Should a leak occur in the liner over the lifetime of the project, this sand layer will rapidly transmit any resultant leakage rapidly and directly into the underlying aquifer.

Thirdly, it is also considered best practice to install a leak detection layer, which will effectively route any leakage to a specific point where it can be monitored and early warning of a failure provided. There is no intention to provide such a layer for the scheme, and so monitoring of the performance of the liner will not be possible.

I conclude from the above points that the liner installation will not follow best practice as established in other industries where avoidance of leakage of polluted water is paramount. It will also not be possible to establish if the liner is leaking or not until pollution of groundwater has already occurred by which time remediation will be prolonged and expensive and lead to the loss of the Wellhead public water abstraction source.

When asked about provision for monitoring, the promoter has stated that it is not recommended by their consultants but that Wessex Water will monitor the water abstraction point. Clearly monitoring at this stage can only detect pollution that has already occurred, by which time it would be too late to prevent discharge of pollutants into the aquifer. The consequent loss of the water supply source, and the long term damage to the aquifer would then be unavoidable.

I therefore conclude that the liner design is inadequate to protect groundwater, and specifically the Wellhead public drinking water source from potentially hazardous pollution.

It is my opinion that the threat to the underlying aquifer in general, and the Wellhead public supply source in particular, is unacceptable. Development is proposed where groundwater protection guidance dictates it should not occur on the fallacious grounds that there is no alternative. The promoters, in an attempt to mitigate this action, are proposing a simplistic liner design which does not follow best practice and which requires a single liner sheet to be leakproof for the lifetime of the project. Finally, no provision is made for detecting any leakage until pollution of the aquifer and the public water source has occurred.

The weaknesses in the liner system, and the reliance placed on it mean that there can be no guarantee that highway drainage, including potential spillage, can be totally isolated from the groundwater and the Wellhead source. There remains a residual risk that leakage could occur, and the magnitude of the potential impact is thus not neutral but slight adverse. Using the DMRB impact assessment system adopted in the Environmental Statement, a slight adverse impact on a feature of very high importance results in an impact of moderate adverse significance. A moderate adverse impact is described in DMRB as “potential low risk (risk score < 150) of pollution to a major aquifer providing a regionally important resource”². In my view this describes the potential situation at Wellhead perfectly.

I believe, therefore, that the impact assessment is incorrect in concluding there is a neutral impact on groundwater and that affect on this attribute should be assessed as moderate adverse.

Flood Risk

The Glenmore link will pass across the flood plain of the Bitham Brook. Flood plains are defined by the Environment Agency which has designated land crossed by the Glenmore Link as Zone 3, “High probability”. This indicates that the flood plain has a 1% or greater probability of flood in any one year. The scheme therefore has to be designed to manage flood risk and comply with the appropriate planning policy.

² Design Manual for Roads and Bridges vol11 Sect 10 part 3, chapter 5, page 17.

Development in flood plains is controlled by Planning Policy Statement 25 (PPS25) Development and Flood Risk. PPS 25 seeks to control development in flood plains to avoid flood risk to the development but also to avoid increasing flood risk elsewhere: development that occupies the flood plain will displace flood water elsewhere and may also block or divert the flow of flood water.

To prevent the increase in flood risk PPS25 stipulates development should be steered towards areas of lower flood risk and only permitted if there is no alternative location of lower risk. This is called the sequential test, and is a fundamental part of development control to minimise flood risk. There is no evidence in the available flood risk assessment that a sequential test has been applied. No alternative routes have been assessed for flood risk to find one of lower risk. The flood risk assessment does not, therefore, comply with the requirements of PPS25.

PPS25 further states that only “water compatible” development, such as docks, water recreational facilities and the like, should be allowed in flood zone 3. Apart from water compatible developments, only “essential infrastructure” should be permitted, and then only if an “exception test” can be passed. The exception test can be applied only if three requirements can be proved. The development must provide wider sustainability benefits, be on previously developed land (unless none is possible) and be developable in a safe manner. All three criteria must be met.

It is questionable whether the Glenmore link can be considered essential infrastructure, but this is outside of my remit. If it is “essential” then the exception test should be considered within the flood risk assessment. This is not the case. The flood risk assessment does not consider the exception test, and no attempt has been made to justify the development on these grounds.

In view of the above it is my opinion that the development does not comply with the requirements of PPS25. The flood risk does not provide any evidence that the sequential test has been applied, and that no suitable routes exist with lower flood risk. Nor is the exception test applied, though strictly this should only be done after the sequential test and one could argue that this is not necessary in the flood risk assessment as it fails before reaching this part of PPS25.

The flood risk assessment does acknowledge that there is a flood risk arising from the development. It proposes to mitigate for these by providing adequate capacity in structures which cross the here channels of the Bitham Brook and compensatory storage for the volume of flood storage occupied by the road. There are weaknesses in both these areas.

The structures have been designed to pass the 1% flood. They have not been tested against any greater flood level.

The policy for compensating for loss of storage volume requires that the compensation is available at the same level at which it is occupied. It is of little use if new storage volume is provided too high, which would be out of reach of flood water, or too low, which would be filled with water before the peak of the flood. This principle is known as “level for level” compensation.

The proposal is to provide compensation volume by widening the river channels. Since this is necessarily below the banks of the watercourses it is not at the same level as the volume above the banks being occupied by the highway structures. It is not, therefore, level for level compensation and therefore inadequate for compensation volume at higher floods.

Furthermore, widening river channels can have significant impacts on ecology and river geomorphology. The most likely response of the watercourse will be to restore its width to the original dimensions by deposition in the widened sections. The long term availability of this compensation volume, inadequate as it is, is therefore extremely questionable without significant and continuing maintenance. There are no provisions for such maintenance, or its funding, within the promoter’s proposals.

I conclude that question of flood risk arising from the Glenmore Link part of the scheme across the flood plain of the Bitham Brook has not been fully addressed. The requirements of PPS25 have not been met, particularly the requirement to direct development to low risk areas (the sequential test), and no evidence has been provided to show that the project should be permitted under the exception test. The provision of

compensatory flood storage volume is inadequate and contrary to the policy of provision of replacement volume at the same level as the development which occupies the flood plain.

CONCLUSIONS

From my assessment of the two areas of groundwater and flood risk I conclude the following.

- The mitigation for the potential impact on groundwater and the Wellhead public water source is inadequate and will not provide the guaranteed total isolation of the highway drainage from the groundwater as stated in the Environmental Statement.
- The potential impact on the groundwater and the Wellhead source, using the promoter's impact assessment methodology, is therefore not neutral but moderate adverse.
- The flood risk assessment is inadequate and does not meet the requirements of Planning Policy Statement 25 "Development and Flooding".
- Proper compensation for occupation of the flood plain is not provided on a "level for level" basis and therefore the occupation of the Bitham Brook flood plain by the Glenmore Link will increase flood risk.