

2 PROPOSED DEVELOPMENT DESCRIPTION

2.1 Introduction

2.1.1 This chapter provides a description of the proposed development for the purposes of identifying and assessing its main environmental impacts.

2.1.2 This chapter provides information on:

- The current site;
- The purpose of the proposed development;
- The physical characteristics of the complete and operational proposed development;
- Typical activities associated with the construction of the proposed development; and
- Typical activities associated with the operation of the proposed development.

2.1.3 This chapter does not include any Technical Appendices.

2.1.4 This chapter refers to the following Figures (refer to Volume 4):

- Figure 2.1: Environmental Site Constraints;
- Figure 2.2: Proposed Junction Design; and
- Figure 2.3: Winchburgh Masterplan Road Network.

2.2 Site Description

2.2.1 The site is located approximately 1 kilometre (km) north of the village of Winchburgh in West Lothian, Scotland; between the existing M9 junctions 1A and 2, surrounding the point where the M9 motorway spans the B8020 (Beatlie Road) at Duntarvie (refer to Figure 1.1 in Volume 4). The site area (approximately 16.73 hectares (ha)) has been defined as the maximum area that would be required to facilitate the development of the motorway junction.

2.2.2 The site is included within the north eastern section of the Winchburgh Masterplan development area, which extends to 352 ha centred on the village of Winchburgh (refer to Figure 1.2 in Volume 4).

Location and Surroundings

2.2.3 The site is centred along an approximate 1.6 km west-east stretch of the M9 motorway, with arable agricultural land adjacent on either side. The B8020 (Beatlie Road) runs through the centre of the site (underneath the existing M9) in a north-south orientation, providing access from both directions. A small area to the south east of the site impinges on a wooded corridor strip.

2.2.4 The most southerly point of the site is bounded by a railway line running in a south east-north west orientation. Semi-natural vegetation/pastures and a man-made lake borders the north easterly section of the M9 motorway.

2.2.5 The site boundary curves around Duntarvie Castle located adjacent north west of the site and immediately west of the B8020. The Castle is a Category A Listed Building and also a Scheduled Monument. Refer to Chapter 5: Cultural Heritage and Archaeology for further information.

- 2.2.6 A residential property (Myreside) lies approximately 250 m to the south west, south of the railway line, with the Myre Farm courtyard buildings located just north of the railway line.
- 2.2.7 Further to the south of Winchburgh village, approximately 2 km at its closest point to the site, is a landmark oil-shale bing, Greendyke Bing (the largest and highest of the distinctive pink-coloured oil shale bings of West Lothian). It reaches a maximum height above sea level of 185 m (95 m above the surrounding landscape). The bing is now in-part a Scheduled Monument. Faucheldean Bing (much smaller in scale) is adjacent north of Greendyke Bing and is also a Scheduled Monument. To the east of Winchburgh village is a smaller bing, Niddry Bing, which is 1.2 km south of the site and is not a Scheduled Monument.
- 2.2.8 Several parcels of semi-natural woodland are located within 1 km of the site, including Swineburn Wood and Burn Craigs within 100 m north of the site. Humbie Reservoir is 500 m east of the site, beyond Muiriehall Wood. Another reservoir is located just under 500 m south of the site with the aqueduct running north and joining the Swine Burn culvert which runs across the east of the site in a south-west to north-east orientation towards Swineburn Wood. An unnamed, dis-used quarry used for fishing is also located 375 m east of the site.
- 2.2.9 Refer to Figure 2.1 in Volume 4 for locations of these features.

Designations

- 2.2.10 There are no designations associated within the site other than pockets of Ancient Woodland on the outer limits of the north east and southern parts of the site. Approximately 899 metres squared (m²) of woodland identified as Ancient Woodland occurs within the site, as shown on Figure 7.2 in Volume 4.
- 2.2.11 As stated, Duntarvie Castle located adjacent north west of the site and immediately west of the B8020 is a Category A Listed Building and a Scheduled Monument.
- 2.2.12 The nearest designated ecological site is Philpstoun Muir Site of Special Scientific Interest (SSSI), approximately 1.6 km to the west, and is approximately 12.45 ha in size.
- 2.2.13 Refer to Figure 2.1 in Volume 4 for environmental constraints within 1 km of the site.

2.3 Environmental Features of the Site

- 2.3.1 The site is primarily made up of agricultural land and road (asphalt), the M9 motorway and B8020 (Beatlie Road). A 0.69 ha parcel of broadleaved woodland is located to the south of the site. The Swine Burn, running in a south west-north easterly orientation, is culverted under the M9 motorway.
- 2.3.2 The site generally slopes from north to the south, with a steeper gradient from the north west corner and a slight upward incline to the south east corner. The M9 motorway in an embankment and is relatively level.
- 2.3.3 There are several surface water features in the vicinity of the site, with the nearest large waterbody (unnamed, dis-used quarry used for fishing) 375 m east of the site at the south of Swineburn Wood¹. A small drainage channel (Swine Burn), connected to the unnamed fishing waters, runs west-east and flows directly underneath the B8020 (Beatlie Road) approximately

¹ SEPA, 2014. River Basin Management Planning – Water Environment Hub.

315 m south of the proposed junction. To the west (approximately 590 m) of the site is Edinburgh and Glasgow Union Canal ('Union Canal').

- 2.3.4 The eastern area of the site is recorded to be at 'High' risk of fluvial flooding²; however, the M9 motorway is not recorded to be at risk of fluvial flooding given it is raised on an embankment. Sections of the M9 motorway within the site are mapped by SEPA as being at 'Medium' risk of surface water flooding with a very small area at 'High' risk. This flood risk mapping information indicated that a site-specific Flood Risk Assessment (FRA) is required in order to establish the actual risk of flooding at the site. The site-specific FRA has been prepared as part of this EIA process and the findings have confirmed that the site is not at risk of additional flooding as a consequence of the proposed development (see Chapter 6: Road Drainage and Water Environment).
- 2.3.5 The site is underlain by made ground along the M9 motorway overlying predominantly Lacustrine Deposits (clay, silt and sand). There is also Till, Devensian Deposits (glacigenic in origin) to the north west and south east of the site. It is further underlain by predominantly Binny Sandstone to the south east and Hopetoun Member to the north west.

Current Use

- 2.3.6 The majority of the site is occupied by the operational M9 motorway and B8020 (Beatlie Road). The site extends beyond the boundaries of these roads to allow for the construction of slip road embankments and access tracks.

2.4 Proposed Development Description

Purpose of the Proposed Development

- 2.4.1 The proposed development comprises a new dumbbell grade separated junction (four slip roads) on the existing M9 motorway, incorporating the existing B8020 (Beatlie Road) where it passes beneath the M9 motorway at Duntarvie. The purpose of the proposed development is to provide access to the M9 motorway in all directions to serve the proposed Winchburgh Masterplan and other settlements in the area.
- 2.4.2 Refer to Figure 2.2 in Volume 4 for the layout of the proposed development and Figure 4.8 in Volume 4 for the proposed landscape design.
- 2.4.3 Figure 2.3 in Volume 4 illustrates the wider Winchburgh Masterplan road network showing how the proposed development will integrate with a core road running through the new settlement.

Key Design Considerations

- 2.4.4 The process by which the proposed development was established, having regard for environmental issues is described in Chapter 3: Site Evolution and Alternatives.
- 2.4.5 In summary, key considerations integral to the proposed development have taken account of the Winchburgh Masterplan consent and subsequent advice given to date by Transport

² SEPA, 2018. Flood Maps [online]. Available at: <https://www.sepa.org.uk/environment/water/flooding/flood-maps/> (Accessed 19/08/19).

Scotland, Scottish Natural Heritage (SNH), Historic Environment Scotland (HES), Scottish Environment Protection Agency (SEPA), West Lothian Council (WLC) and other consultees.

2.4.6 These considerations include:

- Provision of a strategic road access to/from the expanded Winchburgh settlement;
- Providing acceptable junction spacing between existing M9 motorway junctions 1A and 2; and
- Maintaining the integrity, setting and significance of the Category A listed building and Scheduled Monument at Duntarvie Castle to the north of the site.

2.5 Components of the Proposed Development

Design Overview

- 2.5.1 The proposed development would be located entirely within the 16.73 ha site and comprise a new dumbbell grade separated junction (four slip roads) on the existing M9 motorway, incorporating the existing B8020 where it passes beneath the M9 at Duntarvie. Apart from forming suitable slip-road tie-ins, no works are proposed to be undertaken to the M9 itself through the site area.
- 2.5.2 The proposed development would include the realignment of the B8020 (Beatlie Road) to the north, to tie in to the proposed northern roundabout and local amendments of the B8020 (Beatlie Road) to the south, to tie in to the proposed southern dumbbell roundabout. Connecting the two roundabouts the existing B8020 (Beatlie Road) would be retained with minor carriageway modifications at the existing M9 motorway underbridge. The existing M9 motorway embankment would be extended on either side of the proposed junction to accommodate the new slip road alignments.
- 2.5.3 The construction of the proposed development would incorporate the following elements:
- provision of an appropriate road drainage and sustainable drainage systems (SUDS) comprising filter drains, pre-earthworks ditches and swales;
 - road signage, road restraint systems and intelligent transport systems;
 - the realignment of an existing access track along the foot of the M9 motorway embankment on the Winchburgh side (running along the south eastern extent of the proposed junction) that will include construction or a new culvert for the Swine Burn;
 - a new access track along the edge of the north-east slip road embankment;
 - non-motorised user provision at the roundabout and connecting road;
 - delivery of a landscaping strategy; and
 - mitigation measures proposed in this EIAR (such as ecological protection measures).
- 2.5.4 Road users' safety during construction and when operational is a key consideration for the proposed development. Designs to address this will comply with the Design Manual for Roads

and Bridges (DMRB)³ and will be fulfilled by the appointed Contractor during construction and the road maintenance team when operational where necessary.

2.6 Construction

Typical Construction Activities

Site Preparation

2.6.1 These activities would include general site clearance, such as topsoil stripping and tree felling activities.

Earthworks

2.6.2 Earthworks activities anticipated include:

- Excavation of cutting material, and the disposal of any unsuitable material off-site and storage of suitable reusable material;
- Import and compaction of fill material to form embankments, including any required capping layer for the road pavement; and
- Excavation of materials for the SUDS detention basins and pre-earthworks ditches.

Road Drainage

2.6.3 Anticipated road drainage construction activities include the following:

- Trench construction, laying and compacting pipe bedding material, laying drainage pipes, backfilling with appropriate material and installation of road gullies where applicable;
- Installation of precast chamber units;
- Installation of pre-cast concrete box culvert proposed under the southern access track, including construction of concrete headwalls, scour protection and temporary watercourse diversion during construction; and
- Construction of detention basins, including concrete headwalls, etc.

Public Utility Diversion

2.6.4 Public utility diversion works are anticipated which will include the protection and/or diversion of BT, Scottish Water and Scottish Power apparatus.

Landscaping

2.6.5 Landscaping activities anticipated include:

- Installation of appropriate SUDS features; and
- Delivery of the proposed landscape design

2.6.6 Refer to Figure 4.8 in Volume 4 for the proposed landscape design, including details of the measures to be implemented in delivery of this design to ensure the end results envisaged by the landscape design are achieved (e.g. measures to ensure identification and eradication of invasive plant species, measures to ensure establishment of planting).

³ Department for Transport (DfT), 2020. Design Manual for Roads and Bridges (DMRB): Volume 5 Section 1 Assessment of Road Schemes GG 119 Road safety audit revision 2.

Roadworks

2.6.7 The following roadworks anticipated would include:

- Installation of road restraint systems and associated terminal units;
- Installation of precast concrete kerbs including haunching/foundations; and
- Cabling, ducting and column installation for road lighting.

Motorway Communication Works

2.6.8 Traffic counting loop layout including cabling, ducting and cabinet installation would be anticipated during construction.

Erection of Traffic Signs

2.6.9 Construction activities would include foundations, sign posts and sign face installation.

Road Pavement Works

2.6.10 Construction activities would include laying of appropriate road pavement layers, including compaction of sub-base material and rolling of flexible material.

Road Markings

2.6.11 Road marking activities will be undertaken as one of the final stages of construction.

Construction Traffic and Plant

2.6.12 In addition to construction staff transport movements, construction traffic would consist of heavy goods vehicles (HGVs) delivering construction materials and plant and removing materials from the site. No abnormal load deliveries are proposed. A Transport Management Plan would be developed by the appointed Contractor as part of the proposed Environmental Management Plan (EMP) (including detailed information regarding routes for construction traffic and measures to minimise the risk of traffic congestion). Wherever possible, routes would be chosen to minimise disturbance to users and occupiers of nearby buildings as well as pedestrians and other road users. In addition, the passage of vehicular traffic to and from the site would adhere to the environmental procedures applicable to all contractors involved in the works.

2.6.13 Hard landscape materials removed during construction would be carefully stockpiled and protected for re-use on the site.

Environmental Considerations during Construction

2.6.14 Prior to commencement of the works the contractor will be required to prepare and implement an EMP to ensure that all potential environmental effects during the construction phase are addressed and appropriate controls set in place. Method statements for construction activities will need to be prepared in accordance with the objectives and mitigation measures contained in the EMP.

2.7 Site Operation and Management

Life of the Project

- 2.7.1 The road pavements associated with the proposed development will be designed in accordance with the DMRB, giving them a lifespan of 40 years. The expected operational life of the overall elements of the proposed development has not been defined but, with regular maintenance and minor defect repair, is expected to be over 100 years.

Principles of Expansion

- 2.7.2 The proposed development was designed on the main principle that it would provide access to the M9 motorway in all directions to primarily serve the Winchburgh Masterplan development.

Environmental Considerations in Operation

- 2.7.3 This section addresses environmental considerations, including operational residues and emissions, and how they have been considered in the proposed development. The incorporation of these considerations into the design evolution is described in Chapter 3: Site Evolution and Alternatives.

Access and Transport

- 2.7.4 Transport Scotland's operating company will be responsible for operating and maintaining new slip roads in a safe and efficient manner. WLC will be the roads authority for the roundabouts and B8020 elements of the proposed development.

Air Quality

- 2.7.5 Air quality impacts arising from operational transport has been addressed within the Winchburgh Masterplan ES.
- 2.7.6 Impacts on air quality at the site from the resulting traffic re-distribution when the motorway junction is fully operational are considered unavoidable. The proposed development would however reduce congestion on smaller roads and in residential areas, thereby contributing to local improvement in air quality at residential receptors which may otherwise have larger volumes of traffic passing en-route to access the M9 motorway (the assessment is provided in Chapter 8: Air Quality).

Ecology

- 2.7.7 Ecological impacts arising from operational transport and temporary site facilities would be minimised through landscaping and habitat restoration measures implemented following construction.
- 2.7.8 Vegetation clearance prior to construction would have to occur outwith breeding bird season (March – August) to minimise risk of disturbance to nesting birds.
- 2.7.9 During and post-construction mitigation measures will be in place to minimise impacts to protected species, such as appropriate storage of materials to prevent/ minimise spillages and appropriate ecological fencing for the junction.

- 2.7.10 The proposed lighting would ensure there are unlit areas of the site where birds and bats would not be disturbed, and lighting would not spill into the surrounding areas.

Cultural Heritage

- 2.7.11 The considerations made during design evolution are discussed in Chapter 3: Site Evolution and Alternatives in relation to developing sensitive modifications, maintaining the integrity, setting and significance of Duntarvie Castle, which neighbours the site. In addition, consideration was given to preserving key views from and across the site.
- 2.7.12 The proposed development would enhance public cultural benefit through improving access to Duntarvie Castle.

Noise and Vibration

- 2.7.13 Traffic would be an inherent part of the proposed development and the associated/resultant impacts on noise would be unavoidable.

Landscape and Visual

- 2.7.14 The landscape and visual effect of the proposed development was addressed through its design, as outlined in Chapter 3 Section 3.6 and Figure 4.8 in Volume 4. The proposed development would be sited in a location where there are few sensitive residential receptors in close proximity.
- 2.7.15 The extension of the existing M9 motorway embankment on either side of the proposed junction to accommodate the new slip road alignments would reduce the visual impact in views compared to existing conditions. In addition, the height of the proposed development is not exceeding that of the existing M9 motorway and will therefore not invade on the horizon.
- 2.7.16 The landscape works would be maintained and managed in order to ensure establishment and long-term presence of the necessary integration and function of the proposed development along with the described screening it would provide.
- 2.7.17 Road lighting would be focused on the road and the minimum appropriate column height would be implemented in order to reduce light pollution.

Waste

- 2.7.18 Waste from construction would be minimised through the application of the EMP. Site material suitable for re-use will be used for any landscaping fill within the proposed development works, with the remainder of the material stored/stock piled within the Winchburgh Masterplan area for future use.
- 2.7.19 The EMP would also minimise the impact from traffic associated with removal of waste.

Water Resources and Flood Risk

- 2.7.20 The FRA⁴ prepared for the Winchburgh Masterplan describes the potential flood risk across the full Winchburgh Development Masterplan Area. An updated FRA⁵ was undertaken for the

⁴ FRA Carl Bro Winchburgh Future Urban Expansion (2005).

⁵ Sweco. 20/12/2019. M9 Winchburgh Junction Flood Risk Assessment. Technical Appendix 6.2 in Volume 3.

proposed development which is discussed in Chapter 6: Road Drainage and Water Environment.

- 2.7.21 Surface water flood attenuation measures would be provided via the implementation of SUDS including detention basins, which would be designed to attenuate and store the 1 in 200-year return period flood event discharge (with 35 % climate uplift), and outfall at the 1 in 2 year greenfield (pre-development) runoff rate – refer to Chapter 6: Road Drainage and Water Environment for further information.
- 2.7.22 The road drainage network and treatment systems would be maintained and periodically inspected by Transport Scotland and West Lothian Council respectively to avoid failure and reduce the risk of sub-optimal performance, blockage and flooding.

2.8 Summary

- 2.8.1 The proposed development forms a critical part of fulfilling the wider Winchburgh Masterplan scheme in its entirety and has been designed to maximise the use of the new junction (both motor and non-motorised users) for the existing and future Winchburgh residents.