



SEWER IMPACT STUDY

X4503 – 793

SMG 1651

**PROPOSED CONNECTION AT
NORTH OF GREEN LANE, CHESTERTON, BICESTER**

FOUL SYSTEM

V2.0 Feb 2016

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- A Site Plan
- B Plan Showing Local Sewers
- C Project Inputs Provided by the Developer

1.0 Introduction

The following report was commissioned by Thames Water's Developer Services to investigate the capacity within the existing foul network and to ascertain the impact of a proposed new connection on the foul network at North of Green Lane, Chesterton, Bicester, OX26 1TN.

The scope of the study is to undertake a preliminary desktop study based upon an existing hydraulic model.

The scope of the study includes:

- Check the current performance of the existing network during both dry and wet weather events.
- Add development flows to the model and check the impact of additional flow to the sewer network during both dry and wet weather events.
- Suggest possible options to allow flows to be accepted into the existing network with no detriment to existing levels of service. It should be noted that these options are indicative and are likely to be subject to change based on site conditions, other utilities and requirements of third parties. However, the options indicate the feasibility of connecting the site to the sewerage system and the ability of the sewerage system to accept the development.

2.0 Background

The proposed new development is on a Greenfield site and the Developer proposes to accommodate 45 new housing units. The development area is situated in the village of Chesterton, Oxfordshire, approximately 2.5km to the south west of Bicester.

The development area is bounded by Green Lane to the south and a path to the west.

The foul flow from the residential properties in the development area has been calculated, using the latest Thames Water guidelines, as an average gravity flow 0.43l/s, with a calculated diurnal peak of 0.72l/s.

The preferred connection point was specified by the developer to be to the south of the development site along 'The Woodlands'. Foul flows were connected to manhole SP55218206.

A plan showing the location of the development and connection point is provided in Appendix A.

3.0 Existing Sewerage System and Treatment Works

The area in the vicinity of the development site is served by a separate foul and surface water sewer network.

From the development site, flows would gravitate in a south-easterly direction towards Audley House Sewage Pumping Station (SPS), from where they are pumped to the gravity network draining to Fire Station (Chesterton) SPS. From here, flows are lifted directly to Bicester Sewage Treatment Works (STW), located approximately 3.2km downstream of the development site.

Flows travel through sewers ranging from 150mm diameter to 250mm diameter from the development area towards Bicester STW.

The local foul sewers are shown in the plan provided in Appendix B.

4.0 Thames Water Drainage Requirements

It is necessary to provide separate foul and surface water drainage systems and to ensure that each system is connected to an appropriate drainage system.

As the Developer proposes to connect only foul flows into the existing network, this report only covers the impact of the foul sewage flows from the proposed development on the existing foul sewer networks adjacent to and downstream of the proposed development. Surface water flows from the proposed development are not considered in this report and should not be connected to the foul sewer network.

Additional development flows should not cause new or additional flood risk to the existing system in either dry or wet weather.

5.0 Sewer Impact Assessment

Assessment of the hydraulic loading of the foul network was carried out by means of an existing hydraulic model.

The proposed new development area and connection point details were added to the model and the assessment completed to identify the impact of the proposed new development.

The analysis of the catchment indicates that the foul network is responsive to rainfall, with flooding being a risk in the catchment.

The impact of the proposed foul connection was assessed based on the design flows detailed in Section 2.0.

5.1 Foul Sewers

5.1.1 Assessment of Existing Catchment

The hydraulic model indicates that the existing foul network has limited available capacity downstream of the proposed connection manhole. The hydraulic model has been used to assess wet weather scenarios of various durations. During these wet weather events, the hydraulic model predicts network surcharge and flooding to occur.

5.1.2 Assessment of Development Catchment

An analysis has been completed to assess the impact of connecting the flows from the development into the public sewer.

Table 1: Proposed Development Connection Details

Connection	Manhole	Diameter of Outgoing Sewer
Development Site	SP55218206	150mm

5.1.3 Foul System Improvement Works

The hydraulic model indicates that the foul network has limited available capacity downstream of the proposed connection manhole to accept the proposed development flows. On inclusion of the additional flows from the development site, current levels of service are maintained. As such, no improvements to the existing foul system are required.

6.0 Risks and Issues

The proposed development site is located within the Environment Agency's Risk of Flooding from Surface Water and the drainage of the site is therefore at risk of surface water ingress. The Developer should undertake necessary measures to ensure that the foul sewers are adequately protected against surface water ingress.

The area is known to suffer from a high ground water table, therefore appropriate materials and processes to minimise groundwater ingress should be utilised.

7.0 Conclusions

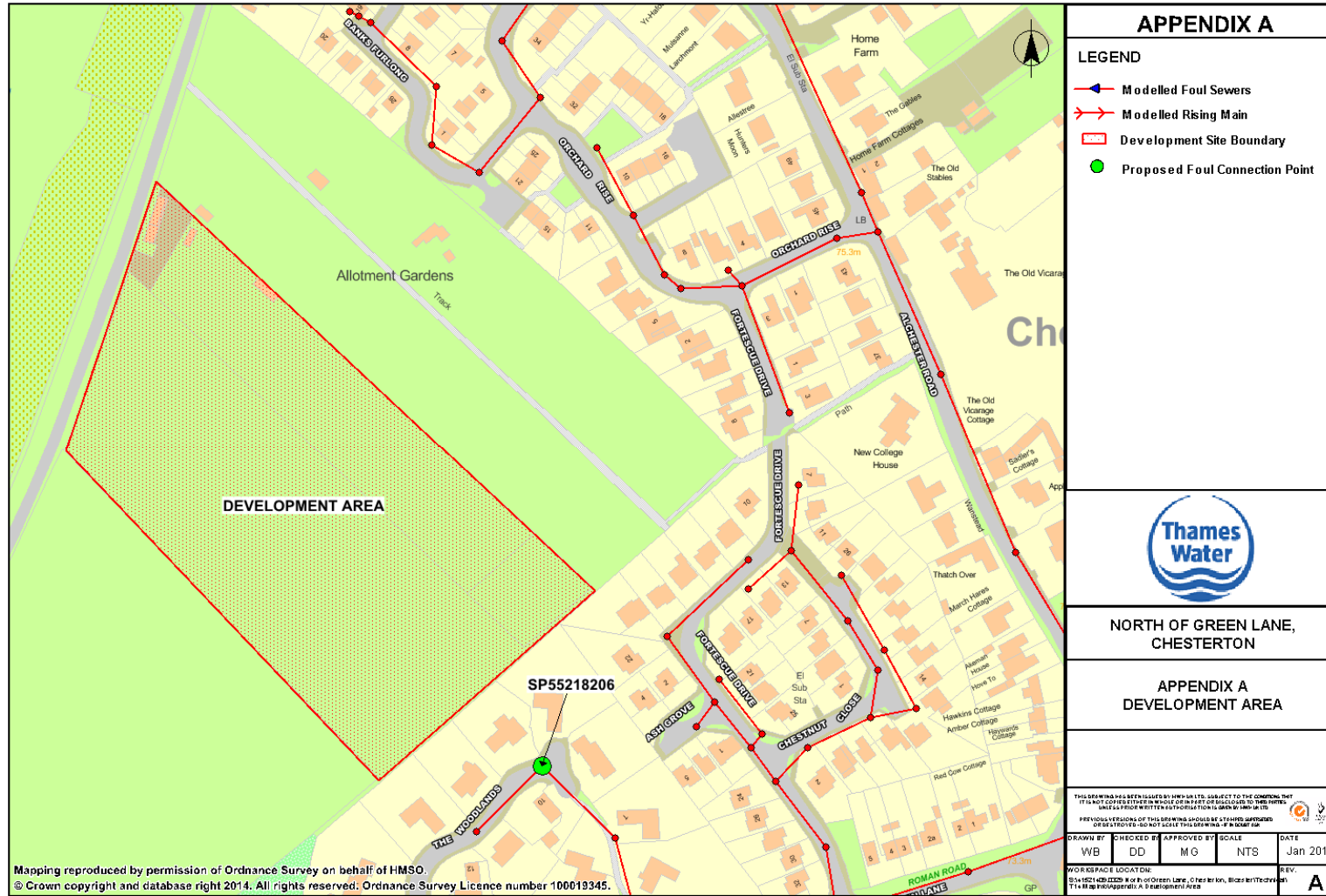
The desktop study has investigated and identified the implications of the proposed new development on a Greenfield site at North of Green Lane, Chesterton, Bicester to the existing foul network.

The hydraulic model indicates that the foul network has limited available capacity downstream of the proposed connection manhole to accept the proposed development flows.

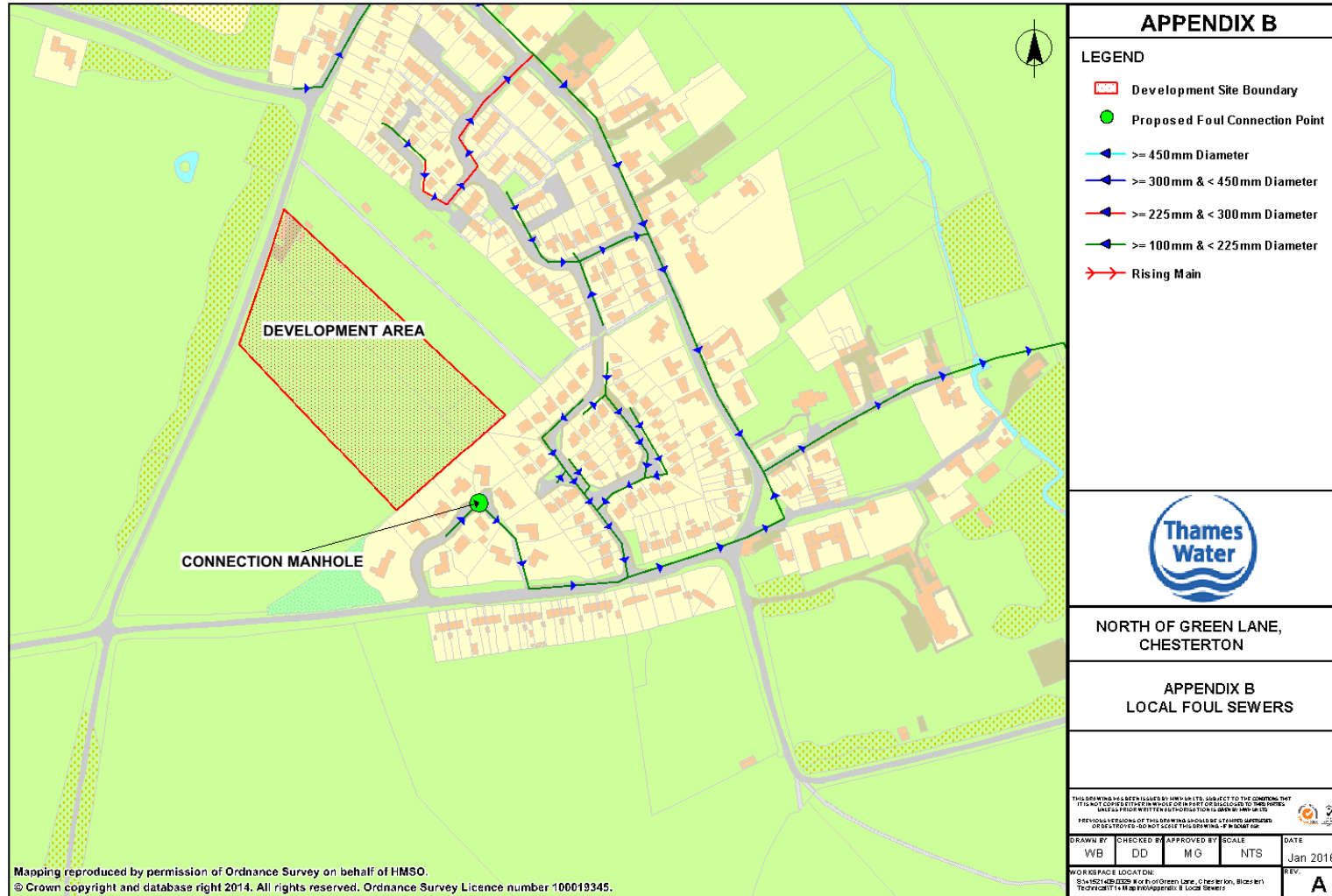
Improvements to the existing foul network are not required to enable the proposed connection to the sewer network, without causing any detriment to the level of service provided.

The issues highlighted and discussed throughout this report are recommendations to Thames Water Utilities and may be altered/added to based upon local operational knowledge of the system.

Appendix A – Site Plan



Appendix B – Local Sewers



Appendix C – Project Inputs Provided by the Developer

