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Sewer Capacity Assessment

Hydraulic Modelling Summary Report

Rolleston On Dove, Staffordshire

DE-1112-017

Final

04/2012

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Executive Summary

- The site is located to the east of Rolleston on Dove to the south of Twentylands (NGR 424608 327492).
- The site is currently Greenfield and does not drain to the public sewer network. The developer is proposing to construct between 120 and 150 dwellings on site. The developer has not specified a preferred connection location.
- Hydraulic modelling was used to assess the impact of the proposed development. Two possible connections to the public sewerage network were modelled. A connection at Forest Scholl Road has the least impact on the performance of the receiving network
- Severn Trent Water are aware of capacity issues within the existing sewer system and will seek to rectify these issues in line with our priorities and funding covered in our business plan. The addition of this new development has a negligible impact on these issues and therefore we **do not** require additional capacity to cater for the flows from this development.

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1 Introduction

1.1 Site Details

The site is located to the east of Rolleston on Dove to the south of Twentylands (NGR 424608 327492). The site is currently Greenfield and does not drain to the public sewer network.

Rolleston on Dove is within in Hatton Drainage Area Plan. Rolleston on Dove is served by a mixture of foul/combined systems, surface water sewers and soakaway drains.

The site location and boundary are shown in Figure 1-1. There are two separate 225mm diameter public foul sewers close to the site which drain via gravity to the Station Road pumping station (PS) via a 225mm diameter combined sewer in Station Road.

The foul/combined sewers in Rolleston on Dove all gravitate to Station Road PS which serves Rolleston on Dove, north of the site. The Station Road PS delivers flows to Rolleston Green Tank. Rolleston Green Tank receives all pumping flows from Hatton, Rolleston on Dove and Hilton and then conveys the flows to Clay Mills Sewage Treatment Works (STW). South Hill Combined Sewer Overflow (CSO) is located upstream of the development site in Station Road on the east side of Rolleston on Dove.

There are known capacity issues at Rolleston Green Tank during times of high flows.

Severn Trent Water has 14 records of flooding in Rolleston on Dove. One record is in the vicinity of the proposed development site whilst the others are mainly in the west side of Rolleston on Dove.

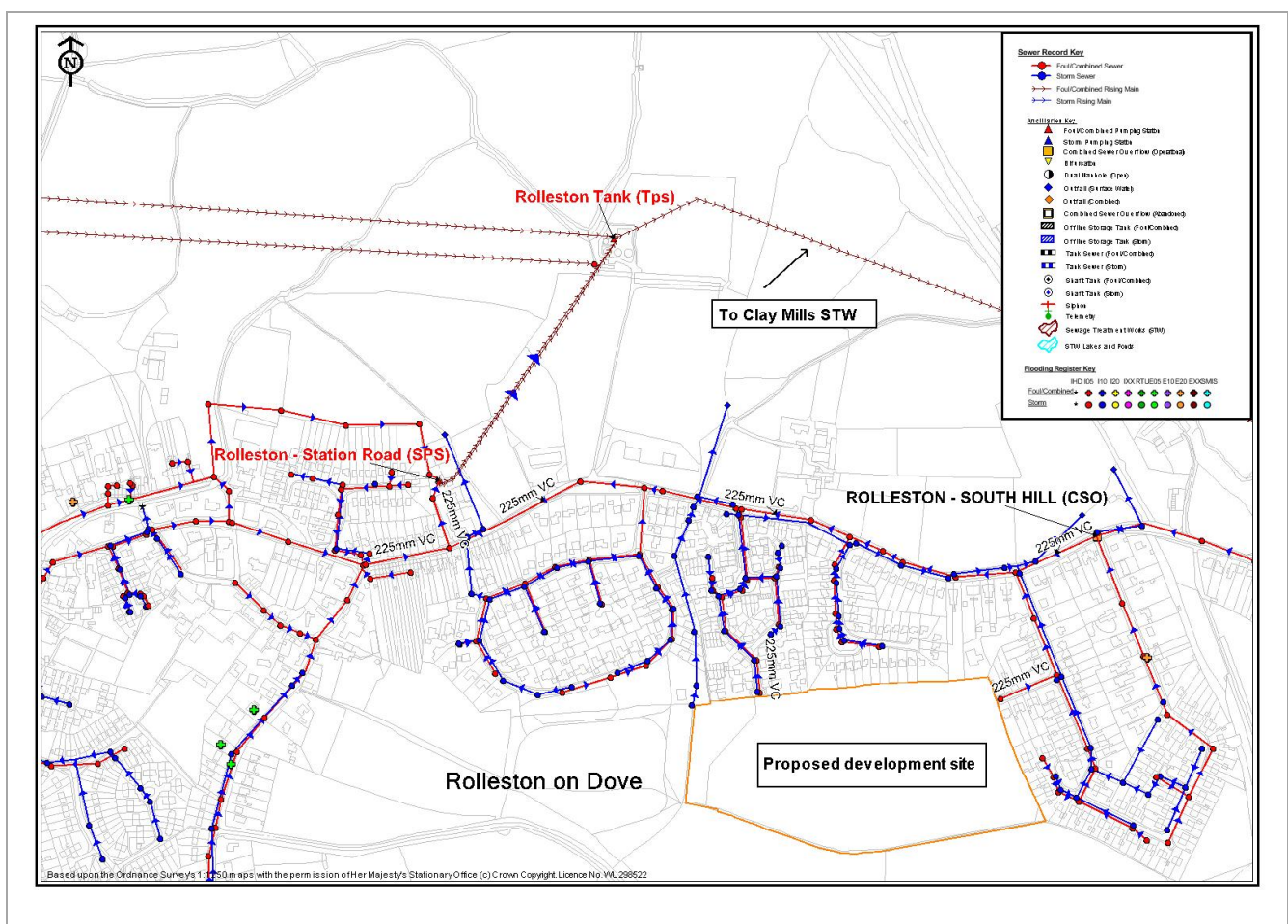


Figure 1-1: Proposed development site location

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1.2 Proposed Development

The site is located to the east of Rolleston on Dove and is currently Greenfield. The developer is proposing to construct between 120 and 150 dwellings on the site. The proposed development is summarised in Table 1-1. Development plans are included in Appendix B.

At this stage the developer has not specified a preferred connection location. The site location plan and relevant correspondence have been received from the developer, and the following plans were used to inform the study:

- 111120 STW Development Enquiry Response.pdf
- DE-1112-017_Rolleston.tab
- 1438.dwg
- Rolleston Housing Sketch Scheme.dwg

Table 1-1: Summary of proposed development

| Development Type | Units |
|--|---------------------|
| Dwellings | 120 - 150 units |
| Employment | 0000 m ² |
| Include additional development as required | 0 |

1.3 Study Aims and Objectives

The aim of the study is to identify potential impact on the sewer system of flows from the proposed development. This will be achieved through modelling the development and assessing the impact at key points on the sewer network.

2 Sewer Capacity Assessment

2.1 Modelling Methodology

The modelling methodology used to assess the impacts of the proposed development is summarised below:

- The development proposals of 150 dwellings were included in the model.
- There are two separate 225mm diameter public foul sewers close to the site where a foul connection from the site may be possible: One is in Forest Scholl Road (SK24274504) and the other is in Fairfield Avenue (SK24277501). Both potential connection locations were modelled to identify the most suitable location.
- The connection in Forest Scholl Road had the least impact on the public sewerage network and a full analysis was undertaken on this connection location.

2.2 Assumptions and Limitations

The Model Review Proforma is included in Appendix C.

2.3 System Performance

Table 2-1: System performance for modelled scenarios (existing and post-development)

| Location | Modelled scenario | |
|---------------------------------|---|-------------------------------------|
| | Existing (baseline) | Post-development |
| Flooding | | |
| South Hill | No freeboard during 20 year 30 min event (<1m ³ flooding predicted) – surcharge during 1 month events. | Negligible change |
| Fairfield Avenue | No freeboard during 1 year 15 min event (1.4m ³ flooding predicted) – surcharge during 6 month events. | Negligible change |
| Station Road at South Hill CSO | No freeboard during 1 year 30 min event (<1m ³ flooding predicted) – surcharge during 1 month events. | Negligible change |
| Station Road near to the PS | Sewer surcharge during 1 month event, No predicted flooding up to 100 year events. | Negligible change |
| Combined Sewer Overflows | | |
| South Hill CSO | Sewer surcharge and spill from CSO during 6 month event | Negligible increase in spill volume |
| Sewer Pumping Stations | | |
| Station Road PS | Satisfactory performance | No change |

3 Conclusions and Recommendations

3.1 Conclusions

- There are known flooding issues in Rolleston on Dove, which was reflected in the hydraulic model. Inclusion of the development proposal is predicted to have no impact on the known capacity issues.
- Two possible connections were tested using hydraulic modelling. Connecting the development to the public sewerage network at Forest Scholl Road provides the best option with regards to post-development performance of the sewerage network.
- Overall, there is limited capacity in the current sewer network. However, the impact of the proposed development on the sewerage network is considered negligible.

3.2 Recommendations

No specific additional capacity will be required to cater for this proposed development. There are existing issues on the sewer network of which Severn Trent Water are aware and will seek to address where appropriate.

Appendix A: Sensitive Information

- Plan 1-2: Reported flooding locations

This information has been removed for external circulation as it contains sensitive information.

Appendix B: Proposed Development Plans

- 1438.dwg
- Rolleston Housing Sketch Scheme.dwg

Appendix C: Model Review Proforma

Sewer Capacity Assessment - Existing Model Review Checklist

| Date of Model | 03/2012 | Date of Model Verification | 25/02/2012 |
|--|---|----------------------------------|-------------------|
| Confirm Name of Model Network Reviewed | 523-039_Clay Mills Current As-Built model#28 | | |
| List Associated Modelling Files | | | |
| Model Status (Verified, Needs, Options) | Verified | | |
| Key factor assessed in vicinity of site | Comments | Impact on Model Accuracy (H/M/L) | |
| Software Suitability – Is model in HydroWorks or non-InfoWorks Software? | No - InfoWorks v10.5 | L | |
| Software Suitability – Does model require upgrading to more recent version of InfoWorks? | No needs. Model was built and verified by InfoWorks v10.5 | L | |
| Suitability of Modelling Specification – Does model require converting to current modelling specification (Procedure 264 – AMP3 Model Conversion Process)? | No needs. Already completed as part of SMP study | L | |
| Is adequate Model Build Documentation available identifying modelling process and any limitations in model? | Yes, previous DAP and current SMP | L | |
| Have all relevant documented limitations been assessed and identified? | Yes, documented limitations do not impact this study | L | |
| Does the model require upgrading to improve the representation of extents, detail or known ancillaries? | Station Road operational regime (staff or instrumentation) | L | |
| Are there any significant changes to the catchment since model build that require including in the model? | No. The model was verified and signed off in 02/2012. | L | |
| Are there any significant changes to the sewer network or ancillaries that need to be included in the model? | No. model is up to date. | L | |
| Is the existing model flow survey and verification adequate? | Yes, the model was verified against 2007 and 2011 flow survey data. | L | |
| Is there a need to combine a number of DAP models to create a single model to assess this site? | No, already completed as part of SMP | L | |
| Other issues? | | | |

