

## SIMONA® Double-containment Piping Systems for the “Mittleres Saartal” Wastewater System



SIMONA® PE shaft DN 2000

## The project at a glance

<b>Mittleres Saartal wastewater system</b>
Überherrner Strasse main sewer in Differten, Municipality of Wadgassen
<b>Requirements</b> Protection of drinking water wells in Water Protection Zone II by PE double-containment piping system
<b>Client</b> Municipality of Wadgassen
<b>General contractors</b> Backes Bauunternehmung AG & Co. KG, Tholey-Theley
<b>Project planning and local construction supervision</b> WPW Ingenieure GmbH, Saarbrücken
<b>Project control/Overall project management</b> Kommunale Entsorgung Neunkirchen (KEN) GmbH + Co. KG
<b>Technical support</b> SIMONA AG, Business Unit Piping Systems, Kirn
<b>Products used</b> <ul style="list-style-type: none"><li>■ SIMONA® PE 100 pipes as outer protective pipe</li><li>■ SIMONA® PE 80 CoEx pipes as inner media pipes (double-containment pipes 480 m OD 800/560 and 528 m OD 630/450)</li><li>■ SIMONA® PE shafts DN 1600, DN 1800 and DN 2000 (17 in total)</li></ul>
<b>Project duration</b> May 2011 to November 2011

**In the district of Differten the municipality of Wadgassen was planning to build a main sewer in order to collect sewage from the housing estate north of Überherrner Strasse and to pipe away the sewage influent from higher catchment areas in accordance with acknowledged engineering guidelines. The collecting sewer section is entirely located within Water Protection Zone II. The main sewer was laid through private properties on the valley side of Überherrner Strasse; it connects up to the Differten-Werbeln main sewer system.**

# Location and routing



## Project aims

- Safe drainage of sanitary sewage and combined water through WPZ II
- Protection of the drinking water wells

The district of Differten is located on the southern outskirts of the municipality of Wadgassen. Überherrner Strasse is integrated into the combined system. To date, many of the properties were drained via small sewage treatment plants (multi-chamber pits), discharging directly into a brook, the Bist. A total of approx. 45 service connections had to be integrated and connected to the new main sewer.

Along the Bist there are a number of drinking water wells used by Völklingen municipal utilities. Therefore, the Überherrner Strasse area lies within Water Protection Zone II (WPZ II).

*01\_Double-wall piping system with precisely sized service connections.*

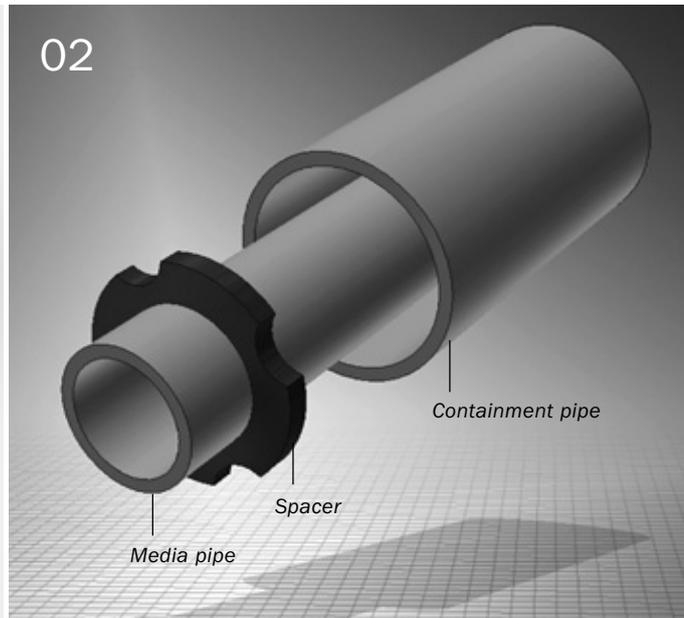
*02\_Laying of SIMONA® Double-containment pipes and shaft installation in supported trench.*

## Construction of the main sewer in WPZ II

01



02



As the main sewer is located within WPZ II, a double-wall piping system was planned for the entire section. Sanitary water and combined water flow through the media pipe. The jacket pipe is used to discharge any leaks.

The jacket pipe is tested with air or water. Any damages can be localised by various technical methods. In shafts the media pipe is taken straight through. Maintenance ports are provided for monitoring and inspections. The sewage is ventilated via the service connection shafts.

Owing to the large number of drains, connection to the main sewer was executed by means of special-purpose branch fittings inside the double-wall piping. The main sewer is constructed in sections of 30 m to 50 m in order to reduce the number of joints in the pipe trench. The double-containment pipe is inserted in the area of the shaft building pits.

### Contingency plan

The separate DN 400 GGG transfer duct (globular grey cast iron) south of Überherrner Strasse is connected to the D 1390 shaft. The influent is separated by a gate valve in the shaft. If necessary, the transfer duct can thus be put back into service (DN 2000).

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01\_SIMONA® PE CoEx double-containment piping system

02\_Diagram of a double-containment piping system

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03\_Leak test on the media pipe section by section

04\_Welding the PE shaft to the double-containment pipe



03



04

## Background information: Water Protection Zones

Water conservation areas are areas where special regulations and prohibitions apply in order to protect bodies of water (groundwater, ground-level waters, coastal waters) against harmful influences. In Germany, various water protection zones can be established for conservation purposes in accordance with Section 19 of the German Water Resources Act ('WHG'), with various restrictions on use. The size of protection zones in terms of area is based on the DVGW Code of Practice entitled "Guidelines for Drinking Water Protection Areas".

### **Water Protection Zone I – Well Area**

This protects the immediate vicinity of the actual catchment structure (well). All activities other than necessary precautions to protect the water supply are prohibited.

### **Water Protection Zone II – Capture Zone**

From the border of the capture zone the time of flow to the wells must be at least 50 days in order to protect water against bacterial contamination. Under highly favourable underground conditions (e.g. perched groundwater table) the boundary must be at least 100 m away from the water intake. Sewage may only pass through this protection zone if local conditions or the technical options available do not allow any alternative.

### **Water Protection Zone III – Contribution Zone**

This is the entire catchment area; it marks the outer limits of the water conservation area.

Source: German Water Resources Act ('WHG'); Section 19

# Conclusion



In view of the risks associated with the drainage of sewage through water conservation areas, the technical requirements for drainage systems are more stringent in order to protect the existing drinking water wells.

The SIMONA® Double-containment piping system ensures that any sanitary sewage leaks are collected in the containment pipe. With a testing device in the shaft structures, the sewage can be located and disposed of safely and efficiently. In addition, leak testing in the cavity (between the containment pipe and the media pipe) can be conducted at any time during operation. Consequently, SIMONA has provided the municipality of Wadgassen with a safe solution for WPZ II, meeting the demanding technical requirements of the specific location.

*01\_Aligning the PE shaft structure to create an effective seam connecting up to the double-containment pipe*

*02\_D 1390 PE shaft with maintenance port and shut-off valve*

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