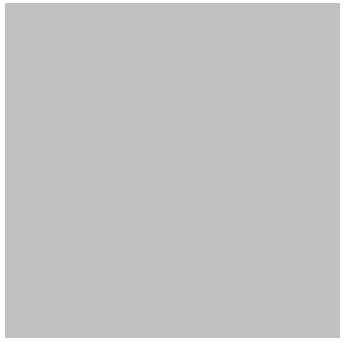
WASTEWATER DEPARTMENT CITY OF MANNHEIM

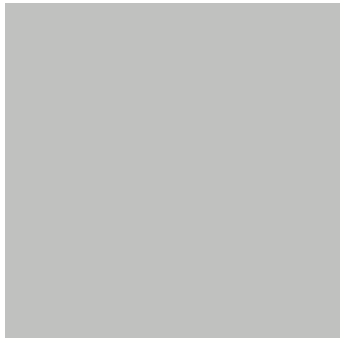
EBS MANNHEIM
Stadtentwässerung

TABLE OF CONTENTS



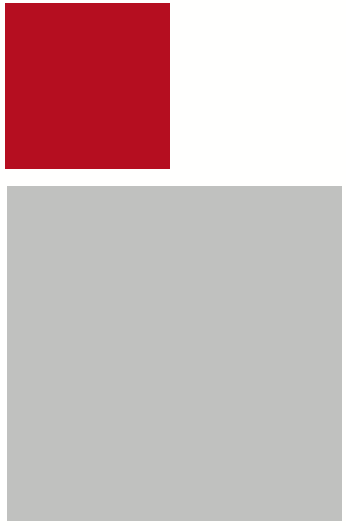
KEY DATES

Foundation	1997-01-01
Employees	240
Fixed assets	367 Mio. €
Investment	11,9 Mio. €
Quality and Environmental Management System Certified according to EN ISO 9001 / EN ISO 14001	since 2003-01

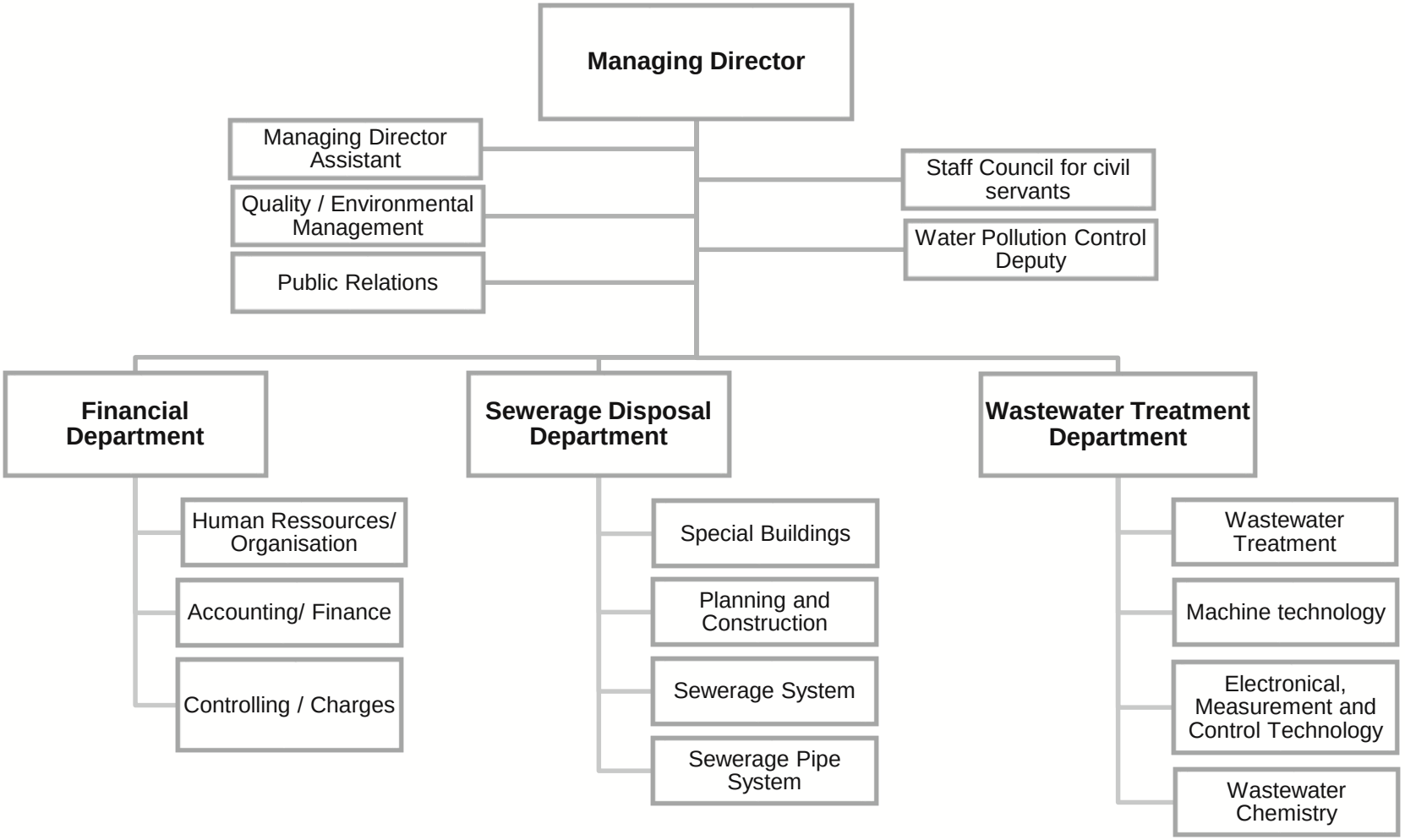


KEY DATES

Sewage treatment plant	725.000 population equivalents (design size) approx. 90.000 m³ flow of wastewater per day
Sewage system	843 km (without house connection sewers) combined discharge 39 pumping stations 32 lifting equipments
Rain-/storm water treatment	8 overflow basins 8 storm water retention tanks 15 storage capacities of sewer 2 rainwater infiltration facilities
Retention volume in total	approx. 170.000 m³



ORGANISATION



LOCATIONS AND EMPLOYEES

Wastewater treatment

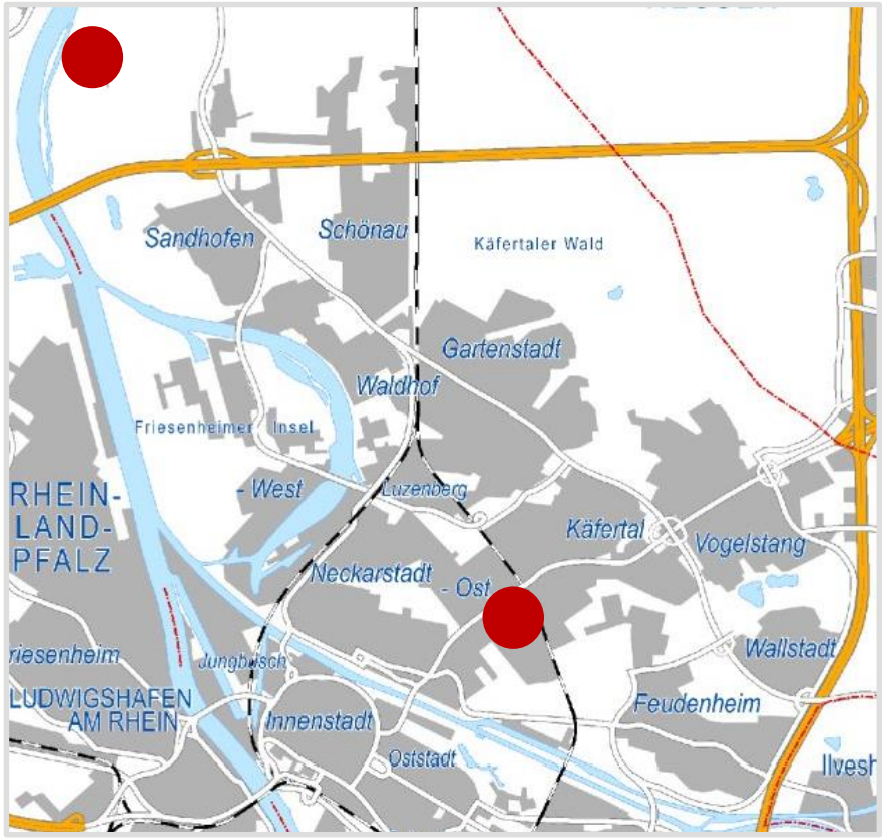
154 employees

Karl-Imhoff-Straße 50
68307 Mannheim

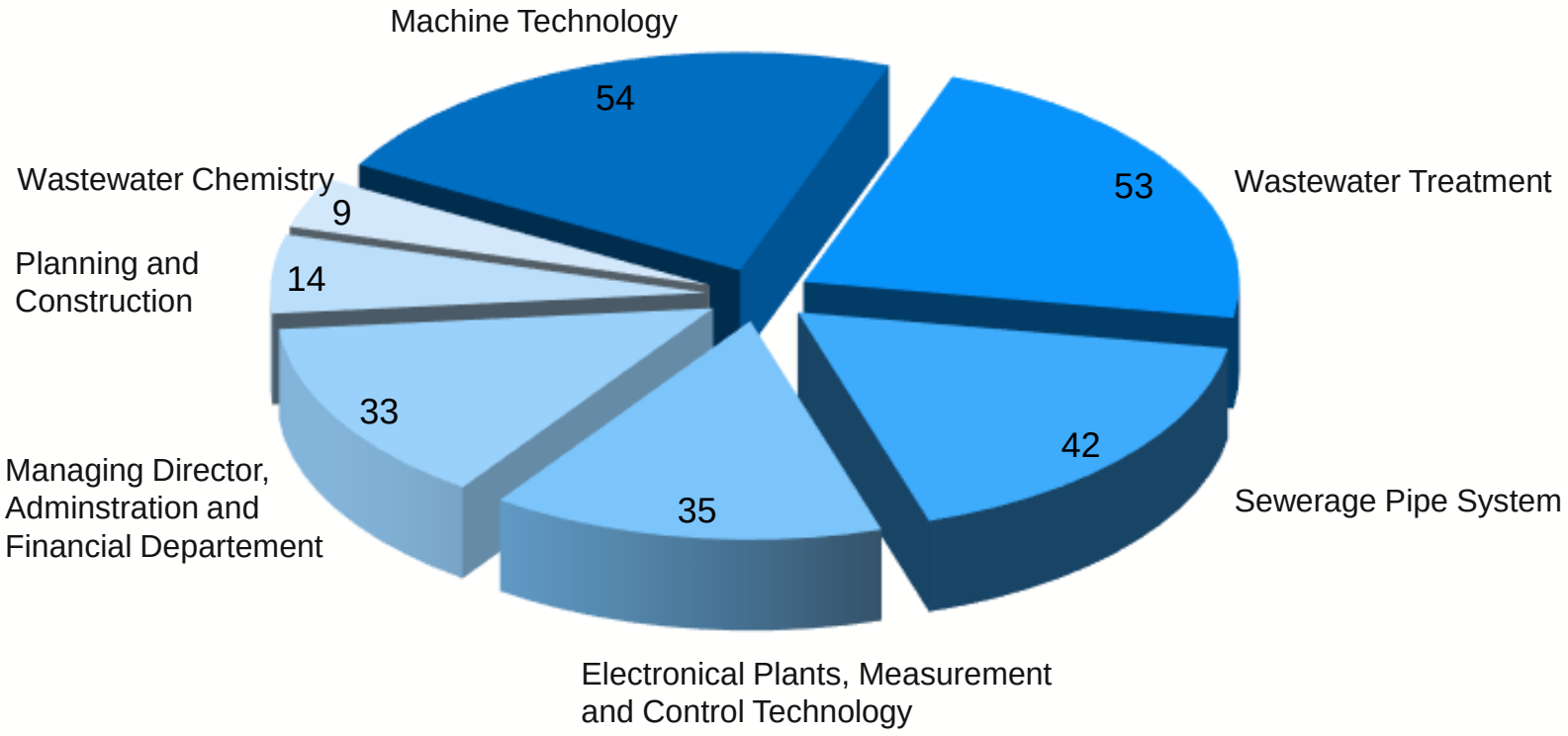
Sewerage disposal and administration

86 employees

Käfertaler Straße 265
68167 Mannheim



DISTRIBUTION OF STAFF



Employees in total: 240

WASTEWATER CHARGES AND EXPENSES

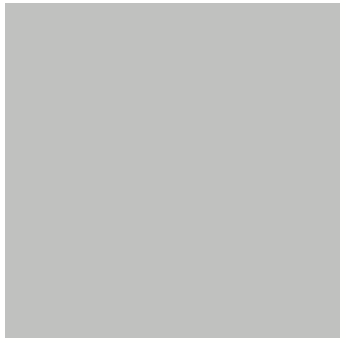
Sewage fees

Per cubic metre of delivered drinking water	1,68 €

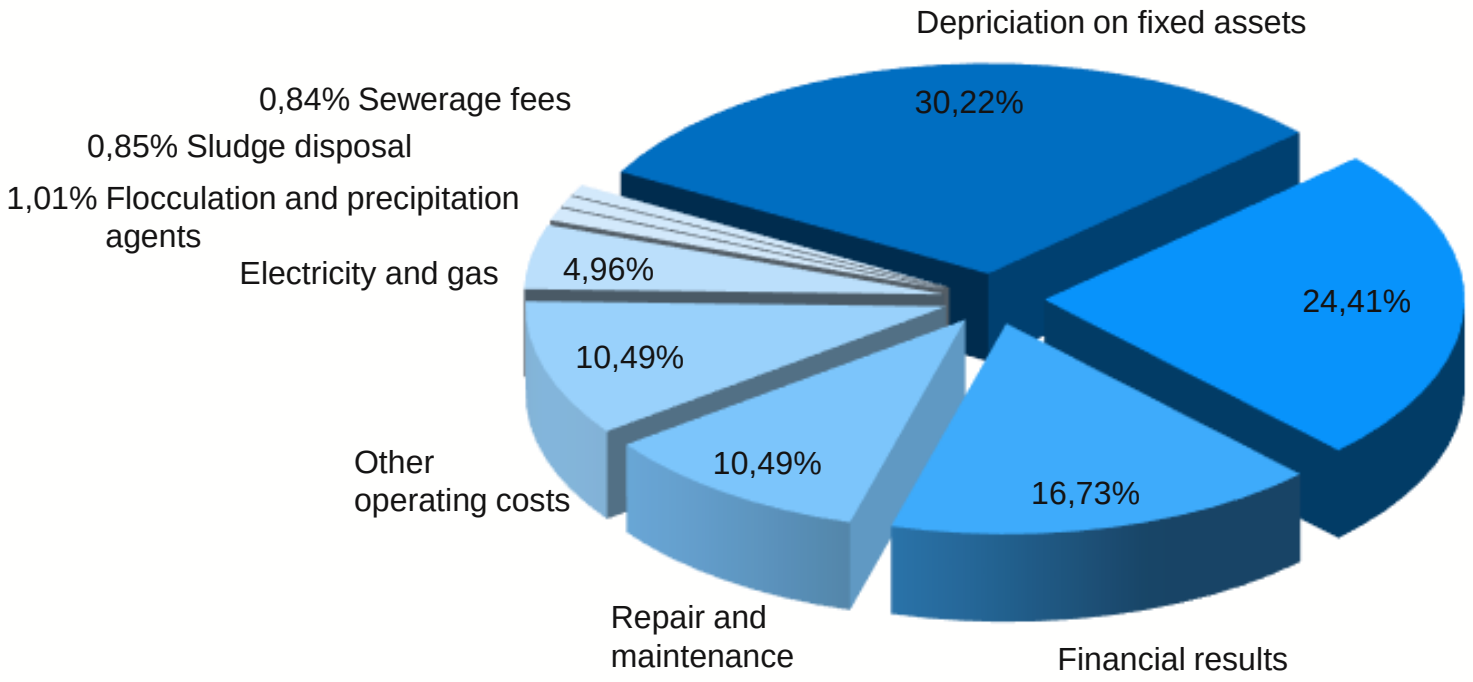
Rain water fees

Per square metre and year of drained surface	0,81 €

Income (Wastewater Charges)	61,2 Mio. €
Material costs	12,7 Mio. €
Personnel costs	15,0 Mio. €
Depreciations	18,6 Mio. €
Financial result	10,3 Mio. €



EXPENSE DISTRIBUTION



SEWERAGE DISPOSAL

Sewerage system length
843 km under the responsibility of EBS Mannheim

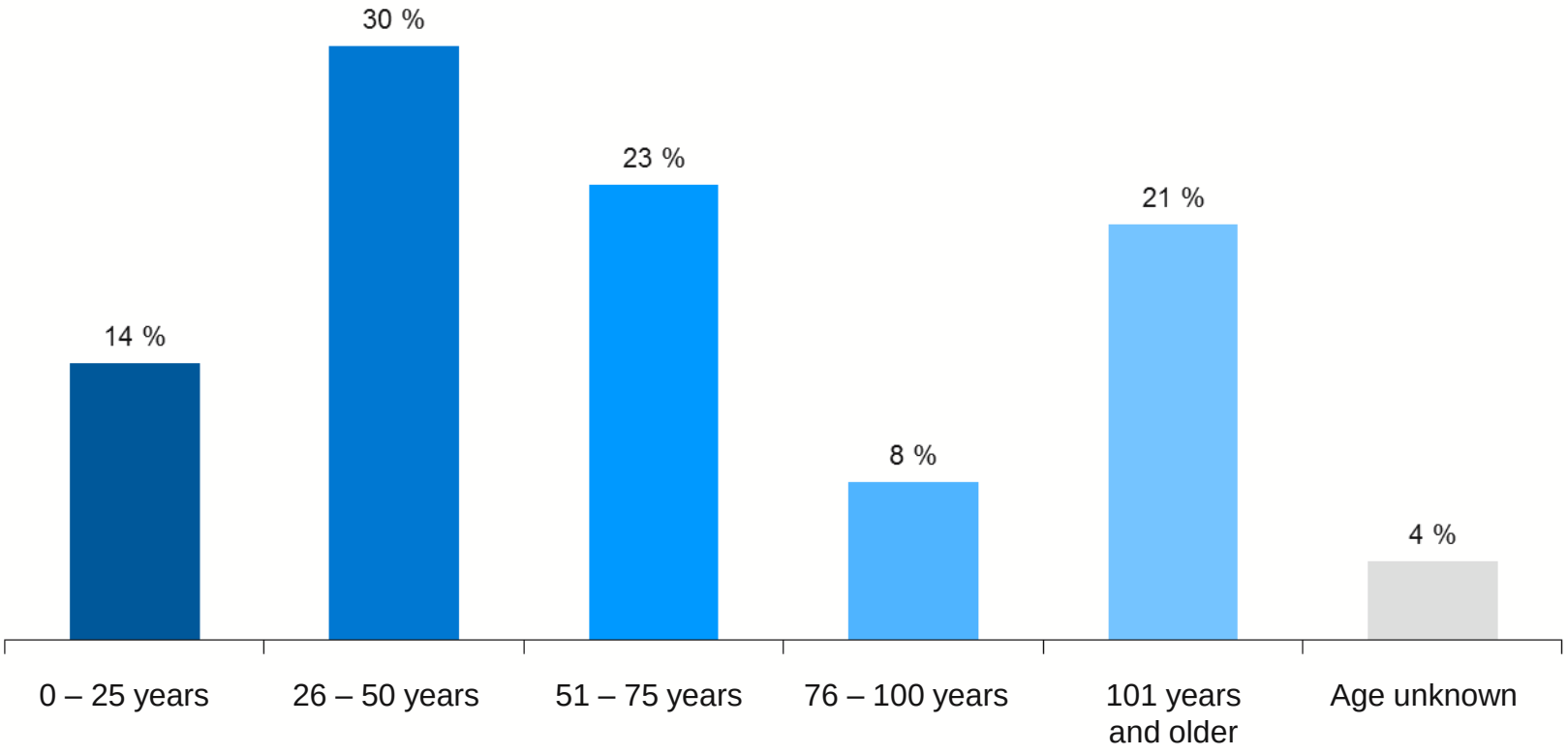
Year of sewerage system construction
Since 1876

Sewer section
250 – 5.200 mm

Canalized area
approx. 7.100 ha

Connection to sewerage system
99,9 %

AGE STRUCTURE OF SEWERS



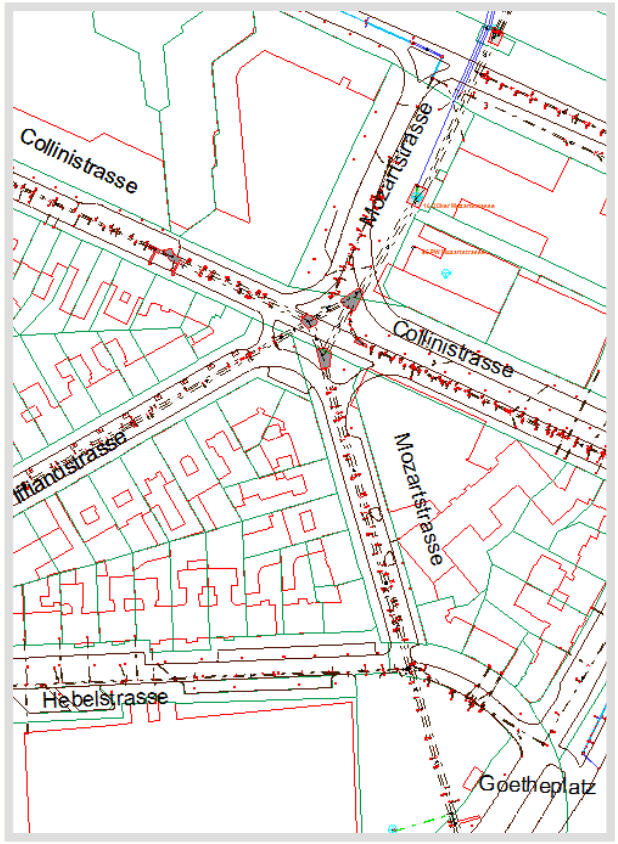
SEWERAGE SYSTM INSPECTON

Digital based on TV examination (since 1986)	92,7 %
Analog based on walking through	7,3 %
Examination in total	100 %

SEWER DATABASE

Administration of the sewer inventory data for the whole urban area

- Survey data (channel geometry and topography)
- Data from the TV-Inspection – Gathering of the sewer conditions
- Gathering of the house connections (noozles)
- Special buildings
- Hydraulic performance of the sewer system
- Indirect discharge
- Data of the plants



RENOVATION AND CONSTRUCTION OF SEWER

Length in total of

repaired sewer:	approx. 4,5 km
renovated sewer:	approx. 1,5 km
renewed sewer:	approx. 1 km

WASTEWATER TREATMENT PLANT

Operation

1973 Wastewater treatment plant

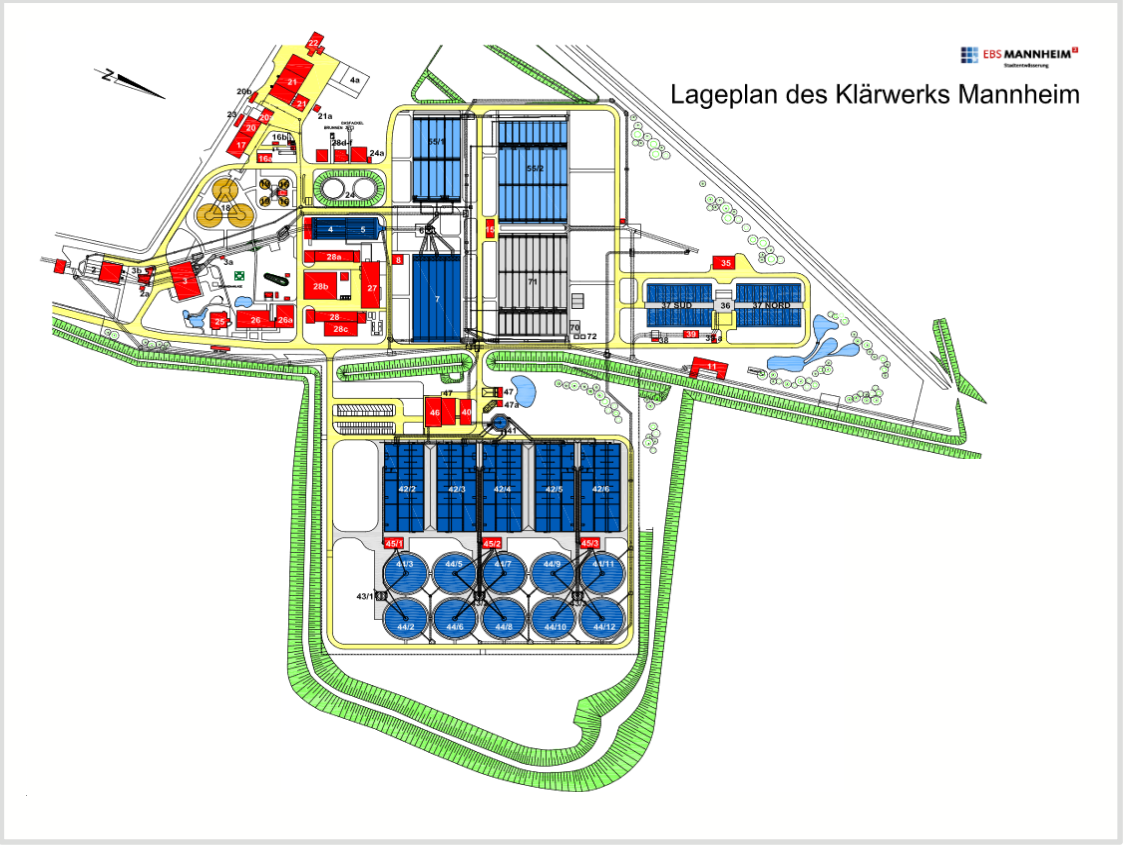
1986 Filtration

1999 New biological plant

2016 Fourth treatment stage (removal of pharmaceuticals, etc.)

Flow of wastewater at dry weather conditions per day: approx. 90.000 m³

725.000 population equivalents (design size), approx. 50% from the industry

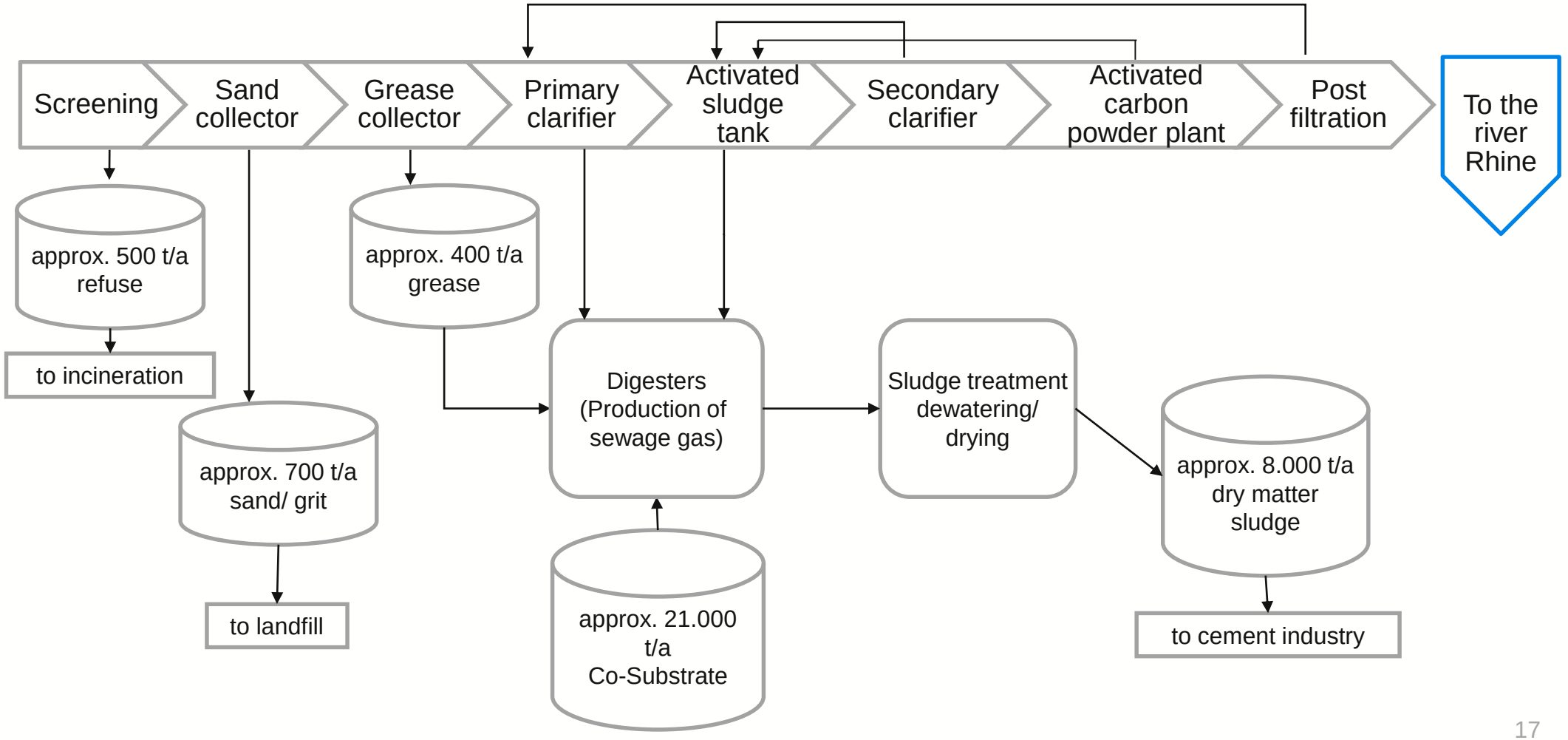


ENVIROMENTAL PERFORMANCE

		Raw waste water	Treated waste water	Effiency level
		mg/l	mg/l	%
Chemical oxygen demand	COD	781	22	97,2
Organic carbon in total	TOC	256	7,3	97,1
Nitrogen in total	N_{tot}	69	4,9	92,9
Phosphor in total	P_{tot}	9,7	0,1	98,9

MATERIAL BALANCE

Raw water: approx. 33 Mio. m³ flow of wastewater per year (approx. 90.000 m³ flow of wastewater per day)



RENEWABLE ENERGIES

Sludge treatment at the digesters

since 1973 Digesters

since 1996 Drying

To generate electricity and heat :

→ Co-generation plant

To generate heat :

→ Sludge drying

Photovoltaic and Waterpower

since 2007

To generate electricity:

→ Solarpanel on top of the filtration plant

→ Water wheel at the outlet to the rhine

Supply of Co-Substrates

since 2012

To generate additional gas:

→ Co-Substrates will be supplying at the digesters in addition

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