

**Ordinance on Vocational Training in Environmental Technology Occupations<sup>\*</sup>**  
**of 17 June 2002**

On the basis of Section 25 (1) in conjunction with Section 2 first sentence of the Vocational Training Act of 14 August 1969 (Federal Law Gazette I p. 1112), last amended by Article 212 no. 2 of the Ordinance of 29 October 2001 (Federal Law Gazette I p. 2785), the Federal Ministry of Economics and Technology and the Federal Ministry for the Environment, Nature Conservation and Reactor Safety (BMU), in agreement with the Federal Ministry of Education and Research (BMBF) and the Federal Ministry of the Interior (BMI), decree:

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\* This ordinance is a set of training regulations within the meaning of Section 25 of the Vocational Training Act. The training regulations, along with the pertinent framework curriculum for part-time vocational schools that has been approved by the Standing Conference of the Ministers of Education and Cultural Affairs of the Länder in the Federal Republic of Germany, and coordinated with those regulations, will soon be published as a supplement to the Federal Gazette.

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**Part 1**  
**Common provisions**

Section 1

**State recognition of training occupations**

The training occupations

1. water supply engineering technician,
2. sewage engineering technician,
3. recycling and waste management technician,
4. pipe, sewer and industrial service technician

are recognized by the state. Where relevant training takes place in the public service, the training occupation shall be a training occupation in the public service. Where relevant training takes place in the industry and trade sector, the training occupation shall be a training occupation in the industry and trade sector.

Section 2

**Duration of training**

The training shall have a duration of three years.

Section 3

**Structure and aims of initial vocational training**

(1) The training is divided into the following categories:

1. core qualifications that are common to all training occupations, and that are to be taught in an integrative manner, pursuant to Section 4 Nos. 1 through 12, Section 10 Nos. 1 through 12, Section 16 Nos. 1 through 12 and Section 22 Nos. 1 through 12;
2. specific professional qualifications for each training occupation:
  - a) for the occupation of water supply engineering technician, pursuant to Section 4 Nos. 13 through 24,
  - b) for the occupation of sewage engineering technician, pursuant to Section 10 Nos. 13 through 22,
  - c) for the occupation of recycling and waste management technician, pursuant to Section 16 Nos. 13 through 22,
  - d) for the occupation of pipe, sewer and industrial service technician, pursuant to Section 22 Nos. 13 through 18,

(2) The skills and knowledge referred to in this Ordinance shall be imparted in such a manner that, in each case, the trainee is enabled to carry out a recognized training occupation within the meaning of Section 1 (2) of the Vocational Training Act – in particular, an occupation that calls for independent planning and execution of tasks, and for monitoring of their proper completion. The vocational competence described in sentence 1 shall be demonstrated in the examinations pursuant to Sections 8, 9, 14, 15, 20, 21, 26 and 27.

**Part 2**  
**Provisions applying to the**  
**training occupation of**  
**water supply engineering technician**

Section 4

**Training occupation profile**

The vocational training shall cover at least the following skills and knowledge:

1. vocational training, labour law and collective bargaining law,
2. the structure and organisation of a training company,
3. safety and health protection in the workplace,
4. environmental protection,
5. business processes, organisation of work,
6. information and documentation, quality assurance measures,
7. environmental protection technology, ecological cycles and hygiene,
8. fundamentals of machinery and process engineering, and of measurement, control and regulation technology,
9. management of electrical hazards,
10. application of scientific principles,
11. relevant materials, including production and process materials, hazardous substances, materials processing,
12. relevant storage, implements and facilities,
13. safety of persons and protection of facilities,
14. water resources management,
15. water extraction,
16. water quality, water processing,
17. water transport, storage and distribution,
18. water analysis,
19. measurement, control and regulation,
20. electrical systems and equipment used in water supply,
21. documentation,
22. protection of drinking-water supplies, and customer systems,
23. orientation to customers,
24. relevant legal provisions and technical regulations.

Section 5

## **Overall training plan**

The skills and knowledge pursuant to Section 4 shall be imparted in keeping with the guideline, contained in Annex 1, for the syllabus and timetable for the vocational training (overall training plan). The syllabus and timetable for the training content may depart from the overall training plan if special practical operational circumstances so require.

### Section 6

#### **Training plan**

The training employer shall prepare a training plan for the trainee, on the basis of the overall training plan.

### Section 7

#### **Report book**

The trainee shall keep a report book, a written record of his initial training. The trainee must be given the opportunity to keep such a report book during the period of initial training. The training employer shall review the report book regularly.

### Section 8

#### **Interim examination**

(1) An interim examination shall be administered in order to determine the level of competence the trainee has attained. It shall take place prior to the end of the second year of training.

(2) The interim examination shall cover the skills and knowledge listed, in Section 1 of Annex 1, for the first 15 months, as well as the subjects to be covered in instruction in part-time vocational school, pursuant to the framework curriculum, to the extent such subjects are of central importance for the relevant initial vocational training.

(3) In the practical section of the examination, the examinee shall be required to complete a practical task, which may consist of several parts, within a total of no more than seven hours. In the process, the examinee shall demonstrate that he or she can cost-effectively plan relevant work processes, choose suitable work tools, equipment, resources etc., keep proper records of his or her work results and take proper measures for safety and health protection in his or her work, for environmental protection and for quality assurance. The following types of practical tasks are especially suitable for this purpose:

processing of materials; assembly, disassembly and maintenance of components or tools and implements; taking of samples; measuring of physical quantities; execution of tests; and use of communications equipment.

(4) In the written section of the examination, the examinee shall solve problems of practical relevance, in a maximum of 180 minutes. Such problems shall involve descriptions of proper measures for safety and health protection in the workplace, for environmental protection and for quality assurance. The examination problems involved may cover especially the following areas, including relevant scientific relationships and occupationally relevant calculations:

1. environmental protection technology, ecological cycles and hygiene,
2. plant engineering and machine technology,
3. measurement and analytical technology,
4. relevant materials, production and process materials and hazardous substances.

## Section 9

### Final examination

(1) The final examination shall cover the skills and knowledge listed in Annex 1, as well as the subjects covered in instruction in part-time vocational school, to the extent such subjects are of central importance for the relevant vocational training.

(2) In the practical section of the examination, the examinee shall be required to complete a practical task, which may consist of several parts, within a total of no more than ten hours. The following types of practical tasks are especially suitable for this purpose:

operation, monitoring and maintenance of water supply facilities, including testing of quality parameters and execution of electro-technical tasks involving use of measurement, control and regulation technology.

In carrying out the practical task, the examinee shall demonstrate that he or she can cost-effectively plan relevant work processes, recognize relationships of relevance to the work, check his or her work results and keep proper records of such results and take proper measures for safety and health protection in the workplace, for environmental protection and for quality assurance. In addition, the examinee shall demonstrate that he or she can recognize potential electrical hazards, can assess electrical work and carry out such work in accordance with applicable safety criteria.

(3) In the written section of the examination, the examinee shall be tested in the examination areas water supply, electrical installation work and economics and social sciences. In the examination areas water supply and electrical installation work, the examinee shall demonstrate that he or she can solve practically oriented problems involving aspects of organisation of work, and technological, mathematical and scientific aspects, while observing relevant technical regulations and legal foundations. Such problems shall involve descriptions of proper measures for safety and health protection in the workplace and for quality assurance. Problems in the following areas are especially suitable for this purpose:

1. in the examination area water supply:

- a) operation, monitoring and maintenance of facilities,
- b) control of water-treatment processes,
- c) sampling; measurement, recording and analysis of quality parameters,
- d) pipeline networks and pipelines;

2. in the examination area electrical installation work:

- a) foundations of electrical engineering:
- b) electrical systems and components,
- c) electrical measuring instruments and safety equipment;

3. in the examination area economics and social sciences:

general economic and societal interrelationships of relevance in careers and in the workplace.

(4) The written section of the examination shall have the following maximum durations:

1. in the examination area

water supply 180 minutes,

2. in the examination area

electrical installation work 60 minutes,

3. in the examination area

economics and social sciences 60 minutes.

(5) At the request of the examinee, or by decision of the examination committee, the written section of the examination shall be complemented, in various individual areas, by an oral examination if such an examination can be a deciding factor in the examinee's ability to pass the examination. In the determination of the results for the orally tested examination areas, the results prior to such oral testing and the results of the complementary oral examination shall be weighted as a ratio of 2 :1.

(6) Within the written section of the examination, the examination areas shall be weighted as follows:

1. the examination area  
water supply 60 percent,
2. the examination area  
electrical installation work 20 percent,
3. the examination area  
economics and social sciences 20 percent.

(7) The examination shall have been passed if at least satisfactory answers/solutions have been provided in both the practical and the written sections of the examination. As part of this criterion, at least satisfactory answers/solutions must be provided within the examination area electrical installation work, within the practical section of the examination, and within the examination area water supply within the written section of the examination.

### **Part 3**

#### **Provisions applying to the training occupation of sewage engineering technician**

##### Section 10

##### **Training occupation profile**

The vocational training shall cover at least the following skills and knowledge:

1. vocational training, labour law and collective bargaining law,
2. the structure and organisation of a training company,
3. safety and health protection in the workplace,
4. environmental protection,
5. business processes, organisation of work,
6. information and documentation, quality assurance measures,
7. environmental protection technology, ecological cycles and hygiene,
8. fundamentals of machinery and process engineering, and of measurement, control and regulation technology,
9. management of electrical hazards,
10. application of scientific principles,
11. relevant materials, production and process materials, hazardous substances, materials processing,
12. relevant storage, implements and facilities,
13. security regulations and operational instructions,
14. operation and maintenance of drain systems,
15. monitoring of indirect dischargers,



16. operation and maintenance of wastewater treatment facilities,
17. treatment of sewage sludge, and recycling of waste from wastewater systems,
18. sampling and analysis of wastewater and sludge,
19. record-keeping, quality management and environmental management,
20. electrical systems used in wastewater facilities,
21. relevant legal provisions and technical regulations.
22. in-depth phase: operation of sewer systems or of wastewater-treatment facilities.

#### Section 11

### **Overall training plan**

The skills and knowledge pursuant to Section 10 shall be imparted in keeping with the guideline, contained in Annex 2, for the syllabus and timetable for the vocational training (overall training plan). The syllabus and timetable for the training content may depart from the overall training plan if special practical operational circumstances so require.

#### Section 12

### **Training plan**

The training employer shall prepare a training plan for the trainee, on the basis of the overall training plan.

#### Section 13

### **Report book**

The trainee shall keep a report book, a written record of his initial training. The trainee must be given the opportunity to keep such a report book during the period of initial training. The training employer shall review the report book regularly.

#### Section 14

### **Interim examination**

(1) An interim examination shall be administered in order to determine the level of competence the trainee has attained. It shall take place prior to the end of the second year of training.

(2) The interim examination shall cover the skills and knowledge listed, in Section 1 of Annex 2, for the first 15 months, as well as the subjects to be covered in vocational-school instruction, pursuant to the framework curriculum, to the extent such subjects are of central importance for the relevant vocational training.

(3) In the practical section of the examination, the examinee shall be required to complete a practical task, which may consist of several parts, within a total of no more than seven hours. In the process, the examinee shall demonstrate that he or she can cost-effectively plan relevant work processes, choose suitable work tools, equipment, resources etc., keep proper records of his or her work results and take proper measures for safety and health protection in his or her work, for environmental protection and for quality assurance. The following types of practical tasks are especially suitable for this purpose:

processing of materials; assembly, disassembly and maintenance of components or tools and implements; taking of samples; measuring of physical quantities; execution of tests; and use of communications equipment.

(4) In the written section of the examination, the examinee shall solve practically oriented problems in a maximum of 180 minutes. Such problems shall involve descriptions of proper measures for safety and health protection in work, for environmental protection and for quality



2. in the examination area

electrical installation work                      60 minutes,

3. in the examination area

economics and social sciences                      60 minutes.

(5) At the request of the examinee, or by decision of the examination committee, the written section of the examination shall be complemented, in various individual areas, by an oral examination if such an examination can be a deciding factor in the examinee's ability to pass the examination. In the determination of the results for the orally tested examination areas, the results prior to such oral testing and the results of the complementary oral examination shall be weighted as a ratio of 2 :1.

(6) Within the written section of the examination, the examination areas shall be weighted as follows:

1. the examination area

wastewater technology                      60 percent,

2. the examination area

electrical installation work                      20 percent,

3. the examination area

economics and social sciences                      20 percent.

(7) The examination shall have been passed if at least satisfactory answers/solutions have been provided in both the practical and the written sections of the examination. As part of this criterion, at least satisfactory answers/solutions must be provided within the examination area electrical installation work, within the practical section of the examination, and within the examination area wastewater technology within the written section of the examination.

## **Part 4**

### **Provisions applying to the training occupation of recycling and waste management technician**

#### **Section 16**

##### **Training occupation profile**

The vocational training shall cover at least the following skills and knowledge:

1. vocational training, labour law and collective bargaining law,
2. the structure and organisation of a training company,
3. safety and health protection in the workplace,
4. environmental protection,
5. business processes, organisation of work,
6. information and documentation, quality assurance measures,
7. environmental protection technology, ecological cycles and hygiene,
8. fundamentals of machinery and process engineering, and of measurement, control and regulation technology,
9. management of electrical hazards,
10. application of scientific principles,
11. relevant materials, production and process materials, hazardous substances, materials processing,

12. relevant storage, implements and facilities,
13. safety regulations and operational instructions,
14. customer-oriented actions,
15. proper business dealings,
16. waste and waste acceptance,
17. waste-management procedures,
18. operation and maintenance,
19. material and substance flows, logistics and scheduling,
20. quality assurance measures,
21. information technology,
22. relevant legal provisions and technical regulations.

#### Section 17

##### **Overall training plan**

The skills and knowledge pursuant to Section 16 shall be imparted in keeping with the guideline, contained in Annex 3, for the syllabus and timetable for the vocational training (overall training plan), and with inclusion of focuses on "logistics, collection and distribution", "waste recovery and treatment" and "waste disposal and treatment". The syllabus and timetable for the training content may depart from the overall training plan if special practical operational circumstances so require.

#### Section 18

##### **Training plan**

The training employer shall prepare a training plan for the trainee, on the basis of the overall training plan.

#### Section 19

##### **Report book**

The trainee shall keep a report book, a written record of his initial training. The trainee must be given the opportunity to keep such a report book during the period of initial training. The training employer shall review the report book regularly.

#### Section 20

##### **Interim examination**

(1) An interim examination shall be administered in order to determine the level of competence the trainee has attained. It shall take place prior to the end of the second year of training.

(2) The interim examination shall cover the skills and knowledge listed, in Section 1 of Annex 3, for the first 15 months, as well as the subjects to be covered in vocational-school instruction, pursuant to the framework curriculum, to the extent such subjects are of central importance for the relevant vocational training.

(3) In the practical section of the examination, the examinee shall be required to complete a practical task, which may consist of several parts, within a total of no more than seven hours. In the process, the examinee shall demonstrate that he or she can cost-effectively plan relevant work processes, choose suitable work tools, equipment, resources etc., keep proper

records of his or her work results and take proper measures for safety and health protection in his or her work, for environmental protection and for quality assurance. The following types of practical tasks are especially suitable for this purpose:

processing of materials; assembly, disassembly and maintenance of components or tools and implements; taking of samples; measuring of physical quantities; execution of tests; and use of communications equipment.

(4) In the written section of the examination, the examinee shall solve practically oriented problems in a maximum of 180 minutes. Such problems shall involve descriptions of proper measures for safety and health protection in work, for environmental protection and for quality assurance. Examination problems in the following areas, including relevant scientific relationships and occupationally relevant calculations, are especially suitable for this purpose:

1. environmental protection technology, ecological cycles and hygiene,
2. plant engineering and machine technology,
3. measurement and analytical technology,
4. relevant materials, production and process materials and hazardous substances.

## Section 21

### Final examination

(1) The final examination shall cover the skills and knowledge listed in Annex 3, as well as the subjects covered in the vocational-school instruction, to the extent such subjects are of central importance for the relevant vocational training.

(2) In the practical section of the examination, the examinee shall be required to complete three practical tasks, including two joint tasks and one focus task, within a total of no more than ten hours. The following types of tasks are especially suitable as joint tasks:

identification, declaration and analysis of waste; assignment of waste to the proper waste-management pathways; and operation and maintenance of waste-treatment facilities.

The following types of tasks are especially suitable as focus tasks:

1. in the focus area logistics, collection and distribution: execution of a logistical task;
2. in the focus area waste recovery and treatment: execution of a task in the area of waste recovery and treatment;
3. in the focus area waste disposal and treatment: execution of a waste disposal and treatment task.

In carrying out such tasks, the examinee shall demonstrate that he or she can cost-effectively plan relevant work processes, recognize relationships of relevance to the work, check his or her work results and keep proper records of such results and take proper measures for safety and health protection in his or her work, for environmental protection and for quality assurance. The two joint practical tasks shall be given a total weighting of 70 percent, while the focus task shall be given a weighting of 30 percent.

(3) In the written section of the examination, the examinee shall be tested in the examination areas waste-management processes, sound business dealings and business law and economics and social sciences. In the examination areas waste-management processes, sound business dealings and business law, the examinee shall demonstrate that he or she can solve practically oriented problems involving aspects of organisation of work, and technological, mathematical and scientific aspects. Such problems shall involve descriptions of proper measures for safety and health protection in work and for quality assurance. Problems in the following areas are especially suitable for this purpose:

1. in the examination area waste-management processes:
  - a) hygiene,
  - b) waste composition,

- c) waste collection and transport,
  - d) recycling, disposal,
  - e) relevant scientific processes,
  - f) operation and maintenance,
2. in the examination area sound business dealings and business law:
- a) information technology,
  - b) customer-oriented actions,
  - c) relevant legal provisions and technical regulations,
  - d) waste-relevant planning;
3. in the examination area economics and social sciences:  
 general economic and societal interrelationships of relevance in careers and in the workplace.
- (4) The written section of the examination shall have the following maximum durations:
- 1. in the examination area
 

waste-management processes	180 minutes,
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  - 2. in the examination area
 

sound business dealings and business law	60 minutes,
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  - 3. in the examination area
 

economics and social sciences	60 minutes.
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- (5) At the request of the examinee, or by decision of the examination committee, the written section of the examination shall be complemented, in various individual areas, by an oral examination if such an examination can be a deciding factor in the examinee's ability to pass the examination. In the determination of the results for the orally tested examination areas, the results prior to such oral testing and the results of the complementary oral examination shall be weighted as a ratio of 2 :1.
- (6) Within the written section of the examination, the examination areas shall be weighted as follows:
- 1. the examination area
 

waste-management processes	60 percent,
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  - 2. the examination area
 

sound business dealings and business law	20 percent,
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  - 3. the examination area
 

economics and social sciences	20 percent.
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- (7) The examination shall have been passed if at least satisfactory answers/solutions have been provided in both the practical and the written sections of the examination and, within the written section of the examination, in the examination area waste-management processes.

## **Part 5**

### **Provisions applying to the training occupation of pipe, sewer and industrial service technician**

## Section 22

### **Training occupation profile**

The vocational training shall cover at least the following skills and knowledge:

1. vocational training, labour law and collective bargaining law,
2. the structure and organisation of a training company,
3. safety and health protection in the workplace,
4. environmental protection,
5. business processes, organisation of work,
6. information and documentation, quality assurance measures,
7. environmental protection technology, ecological cycles and hygiene,
8. fundamentals of machinery and process engineering, and of measurement, control and regulation technology,
9. management of electrical hazards,
10. application of scientific principles,
11. relevant materials, production and process materials, hazardous substances, materials processing,
12. relevant storage, implements and facilities,
13. work preparations, securing and clearing of the work area,
14. respiratory protection, fire prevention and explosion prevention,
15. quality assurance measures, safety technology and environmental protection,
16. waste management,
17. cleaning machines and equipment,
18. relevant legal provisions and technical regulations.
19. cleaning,
20. maintenance and servicing.

## Section 23

### **Overall training plan**

The skills and knowledge pursuant to Section 22 shall be imparted in keeping with the guideline, contained in Annex 4, for the syllabus and timetable for the vocational training (overall training plan), and with inclusion of focuses on "pipe and sewer services" and "industrial services". The syllabus and timetable for the training content may depart from the overall training plan if special practical operational circumstances so require.

## Section 24

### **Training plan**

The training employer shall prepare a training plan for the trainee, on the basis of the overall training plan.

## Section 25

### **Report book**

The trainee shall keep a report book, a written record of his initial training. The trainee must be given the opportunity to keep such a report book during the period of initial training. The training employer shall review the report book regularly.

## Section 26

### **Interim examination**

(1) An interim examination shall be administered in order to determine the level of competence the trainee has attained. It shall take place prior to the end of the second year of training.

(2) The interim examination shall cover the skills and knowledge listed, in Section 1 of Annex 4, for the first 15 months, as well as the subjects to be covered in vocational-school instruction, pursuant to the framework curriculum, to the extent such subjects are of central importance for the relevant vocational training.

(3) In the practical section of the examination, the examinee shall be required to complete a practical task, which may consist of several parts, within a total of no more than seven hours. In the process, the examinee shall demonstrate that he or she can cost-effectively plan relevant work processes, choose suitable work tools, equipment, resources etc., keep proper records of his or her work results and take proper measures for safety and health protection in his or her work, for environmental protection and for quality assurance. The following types of practical tasks are especially suitable for this purpose:

processing of materials; assembly, disassembly and maintenance of components or tools and implements; taking of samples; measuring of physical quantities; execution of tests; and use of communications equipment.

(4) In the written section of the examination, the examinee shall solve practically oriented problems in a maximum of 180 minutes. Such problems shall involve descriptions of proper measures for safety and health protection in work, for environmental protection and for quality assurance. Examination problems in the following areas, including relevant scientific relationships and occupationally relevant calculations, are especially suitable for this purpose:

1. environmental protection technology, ecological cycles and hygiene,
2. plant engineering and machine technology,
3. measurement and analytical technology,
4. relevant materials, production and process materials and hazardous substances.

## Section 27

### **Final examination**

(1) The final examination shall cover the skills and knowledge listed in Annex 4, as well as the subjects covered in the vocational-school instruction, to the extent such subjects are of central importance for the relevant vocational training.

(2) In the practical section of the examination, the examinee shall be required to complete two practical tasks, including one joint task and one task in his or her relevant focus, within a total of no more than ten hours. The joint task may consist especially of the following types of tasks:

cleaning of a wastewater facility, including proper measures for work preparation and work safety.

The following types of tasks are especially suitable as focus tasks:

1. in the focus area pipe and sewer services:
  - execution of a maintenance and service task;
2. in the focus area industrial services:



selection and checking of implements, and execution of an industrial service task.

In carrying out such tasks, the examinee shall demonstrate that he or she can cost-effectively plan relevant work processes, recognize relationships of relevance to the work, check his or her work results and keep proper records of such results and take proper measures for safety and health protection in his or her work, for environmental protection and for quality assurance. The two practical tasks shall each receive a weighting of 50 percent.

(3) In the written section of the examination, the examinee shall be tested in the examination areas work safety, health protection, relevant legal aspects, process engineering and economics and social sciences. In the examination areas work safety, health protection, relevant legal aspects and process engineering, the examinee shall demonstrate that he or she can solve practically oriented problems involving aspects of organisation of work, and technological, mathematical and scientific aspects. Such problems shall involve descriptions of proper measures for safety and health protection in work and for quality assurance. Problems in the following areas are especially suitable for this purpose:

1. in the examination area work safety, health protection and legal aspects:

- a) handling of hazardous substances; hygiene,
- b) technical and personal work-safety equipment,
- c) relevant legal provisions and technical regulations relative to the occupation.

2. in the examination area process engineering:

- a) cleaning processes,
- b) maintenance and service procedures,
- c) machines and equipment;

3. in the examination area economics and social sciences:

general economic and societal interrelationships of relevance in careers and in the workplace.

(4) The written section of the examination shall have the following maximum durations:

1. in the examination area work safety,

health protection and legal aspects                      120 minutes,

2. in the examination area

process engineering    120 minutes,

3. in the examination area

economics and social sciences                              60 minutes.

(5) At the request of the examinee, or by decision of the examination committee, the written section of the examination shall be complemented, in various individual areas, by an oral examination if such an examination can be a deciding factor in the examinee's ability to pass the examination. In the determination of the results for the orally tested examination areas, the results prior to such oral testing and the results of the complementary oral examination shall be weighted as a ratio of 2 :1.

(6) Within the written section of the examination, the examination areas shall be weighted as follows:

1. the examination area work safety,

health protection and legal aspects                      40 percent,

2. the examination area

process engineering    40 percent,

3. the examination area

economics and social sciences                              20 percent.

(7) The examination shall have been passed if at least satisfactory answers/solutions have been provided in both the practical and the written sections of the examination. The examination shall not have been passed if unsatisfactory answers/solutions have been provided in one of the examination areas.

## **Part 6**

### **Transitional and final provisions**

#### Section 28

##### **Transitional provision**

Apprenticeships in force upon the entry into force of this ordinance shall continue to be subject to existing provisions, unless the contracting parties agree that the provisions of this ordinance shall be applied.

#### Section 29

##### **Entry into force, expiry**

This ordinance shall enter into force on 1 August 2002. At the same time, the Ordinance on training of suppliers and disposers (Ver- und Entsorger-Ausbildungsverordnung) of 30 May 1984 (Federal Law Gazette I p. 731) shall cease to be effective.

Berlin, 17 June 2002

For the Federal Minister of Economics and Technology

Tacke

For the Federal Minister for the Environment, Nature Conservation and Nuclear Safety

Rainer Baake

**Annex 1**

(to Section 5)

**Overall training plan  
for vocational training for water supply engineering technicians**

**Section 1: Common core qualifications pursuant to Section 3 (1) No. 1**

Seq. no.	Training occupation profile: sections to be covered	Skills and knowledge that are to be imparted, in a framework that supports the trainee's own independent planning, execution and checking	Durational guidelines, in weeks within the relevant training month	
			1st – 15th month	16th – 36th month
1	2	3	4	
1	Vocational training, labour law and collective bargaining law (Section 4 No. 1)	<ul style="list-style-type: none"> <li>a) Explain the meaning of the training contract, including especially how it is concluded, its duration and its termination</li> <li>b) Name the reciprocal rights and obligations under the training contract</li> <li>c) Name possibilities for obtaining further vocational training</li> <li>d) Name the main parts of the employment contract</li> <li>e) Name key provisions of the collective agreements applying to the training company</li> </ul>	To be imparted throughout the entire training period	
2	Structure and organisation of the training company (Section 4 No. 2)	<ul style="list-style-type: none"> <li>a) Describe the structure and tasks of the training company</li> <li>b) Describe the basic functions of the training company, such as the nature of its operations, its production, its sales and its administration</li> <li>c) Name applicable relationships between a) the training company and its workforce and b) industry/economic organisations, professional and trade associations and unions</li> <li>d) Describe the basic aspects, tasks and functioning of the training company's bodies under the Works Constitution Act and workers' representations under the Works Constitution Act</li> </ul>		
3	Safety and health protection in the workplace (Section 4 No. 3)	<ul style="list-style-type: none"> <li>a) Be able to identify safety and health hazards in the workplace, and take measures to prevent such hazards</li> <li>b) Apply occupationally relevant work-safety and accident-prevention provisions</li> <li>c) Describe proper procedures to follow in case of accidents, and be able to initiate suitable initial measures</li> <li>d) Be able to apply rules and regulations for preventive fire protection; describe the proper actions to take in case of fire, and be able to take initial fire-fighting measures</li> </ul>		

4	Environmental protection (Section 4 No. 4)	Help prevent operationally related environmental pollution and stresses within one's sphere of influence in the workplace; in particular,  a) Using examples, describe the environmental pollution and stresses that the training company could cause, and illustrate the company's environmental protection contributions b) Apply the environmental protection provisions applying to the training company c) Be able to use energy and materials in cost-effective, environmentally compatible ways d) Avoid waste; ensure that substances and materials are disposed of in environmentally compatible ways	
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Seq . no.	Training occupation profile: sections to be covered	Skills and knowledge that are to be imparted, in a framework that supports the trainee's own independent planning, execution and checking	Durational guidelines, in weeks within the relevant training month	
			1st – 15th month	16th – 36th month
1	2	3	4	
5	Business processes, organisation of work (Section 4 No. 5)	<ul style="list-style-type: none"> <li>a) Ensure that company services are provided cost-effectively</li> <li>b) Be able to differentiate cost types and cost centres</li> <li>c) Carry out one's own work in a customer-oriented manner</li> <li>d) Use work implements and resources, organisational resources and work methods properly</li> <li>e) Work constructively in a team in planning, executing and coordinating tasks; evaluate, check and describe relevant results</li> <li>f) Contribute to measures to improve the manner in which work is organised and work areas are set up</li> </ul>	4	
6	Information and documentation, quality assurance measures (Section 4 No. 6)	<ul style="list-style-type: none"> <li>a) Obtain, process and assess information; use information and communications systems</li> <li>b) Read technical documents and plans; make sketches</li> <li>c) Apply organisational instructions</li> <li>d) Produce work records and reports</li> <li>e) Conform with data privacy provisions</li> <li>f) Carry out, record and check quality assurance measures</li> </ul>	4	
7	Environmental protection technology, ecological cycles and hygiene (Section 4 No. 7)	<ul style="list-style-type: none"> <li>a) Describe relevant ecological cycles</li> <li>b) Become familiar with, and describe, the causes and interactions of environmental pollution and stresses in the air, water, soil and surroundings</li> <li>c) Observe principles and applicable provisions relative to hygiene in operation of networks, systems and facilities</li> <li>d) Describe the risks presented by pathogens in raw water, wastewater, sludges and waste</li> <li>e) Describe relevant networks and facilities</li> <li>f) Describe the possibilities for preventing and minimising the environmental pollution and stresses caused by facilities and technical systems</li> <li>g) Be able to apply relevant legal provisions and technical regulations</li> </ul>	8	
8	Fundamentals of machinery and process engineering, and of measurement, control and regulation technology (Section 4 No. 8)	<ul style="list-style-type: none"> <li>a) Apply proper methods for combining substances and for separating substances in mixtures</li> <li>b) Apply proper methods for transporting solids, liquids and gases</li> <li>c) Assemble and disassemble fittings</li> <li>d) Use and operate powered units, especially pumps, blowers, compressors, electric motors, combustion engines and devices for heating, cooling and thermoregulation</li> <li>e) Explain the differences between different methods for measurement, control and regulation, and explain the structure and function of operationally relevant equipment</li> <li>f) Carry out measurement, control and regulation processes in accordance with specifications</li> <li>g) Select and use different fuels and energy forms, taking</li> </ul>	19	

		account of cost-effectiveness, efficiency aspects and any potential hazards h) Describe methods for energy transformation		
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Seq. no.	Training occupation profile: sections to be covered	Skills and knowledge that are to be imparted, in a framework that supports the trainee's own independent planning, execution and checking	Durational guidelines, in weeks within the relevant training month	
			1st – 15th month	16th – 36th month
1	2	3	4	
9	Management of electrical hazards (Section 4 No. 9)	<ul style="list-style-type: none"> <li>a) Describe basic values and their interrelationships</li> <li>b) Be able to identify electrical hazards at both permanent and changing work sites</li> <li>c) Carry out and initiate protective measures to prevent and guard against electrical hazards</li> <li>d) Describe the proper procedures for responding to accidents involving electricity, and be able to initiate initial measures</li> </ul>	4	
10	Application of scientific principles (Section 4 No. 10)	<ul style="list-style-type: none"> <li>a) Measure and analyse physical quantities; determine the properties of substances</li> <li>b) Collect, prepare, label, preserve and store samples, using various suitable procedures</li> <li>c) Explain the interrelationships between the structures and compositions of substances and their characteristic properties</li> <li>d) Prepare mixtures of substances, after making the necessary calculations, and separate substances in mixtures; check pertinent results</li> <li>e) Describe the reactive behaviour of substances, especially their precipitation reactions, acid-base reactions and redox reactions</li> <li>f) Carry out qualitative and quantitative determinations, and assess the pertinent results</li> <li>g) Discuss the relevant types of microorganisms, and explain how they are structured and the conditions under which they live; also explain the significance of such microorganisms for operations within the company</li> <li>h) Describe relevant substance cycles and methods of microbiological analysis</li> </ul>	10	
11	Relevant materials, production and process materials, hazardous substances, materials processing (Section 4 No. 11)	<ul style="list-style-type: none"> <li>a) Select and use production and process materials, taking account of their properties and suitabilities</li> <li>b) Identify and recognize hazardous substances, including hazardous chemical agents, and use them in conformance with applicable safety regulations, taking all necessary precautions</li> <li>c) Use tools, machines and equipment for materials processing</li> <li>d) Make metal and plastic workpieces</li> <li>e) Describe relevant joining and bonding techniques</li> <li>f) Shape, join and separate metals and plastics, using both cutting and non-cutting processes</li> </ul>	12	

12	Relevant storage, implements and facilities (Section 4 No. 12)	a) Store and transport materials and goods in ways that are suitable in light of their condition and characteristics b) Carry out inventories, and initiate necessary corrections c) Operate lifting devices and transport equipment d) Use, inspect, service and clean implements and facilities e) Detect malfunctions of implements and facilities, and take measures to eliminate them	4	
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**Section 2: Specific professional qualifications pursuant to Section 3 (1) No. 2 letter a**

Seq. no.	Training occupation profile: sections to be covered	Skills and knowledge that are to be imparted, in a framework that supports the trainee's own independent planning, execution and checking	Durational guidelines, in weeks within the relevant training month	
			1st – 15th month	16th – 36th month
1	2	3	4	
13	Safety of persons and protection of facilities (Section 4 No. 13)	<ul style="list-style-type: none"> <li>a) Comply with occupationally specific regulations relative to work safety and health protection</li> <li>b) Take measures to protect facilities and equipment from external influences</li> </ul>		2
14	Water resources management (Section 4 No. 14)	<ul style="list-style-type: none"> <li>a) Describe key overall interrelationships in the water resources sector</li> <li>b) Describe and differentiate the different types of water resources there are</li> <li>c) Describe the different ways to use water resources</li> <li>d) Determine and justify water requirements</li> </ul>		2
15	Water extraction (Section 4 No. 15)	<ul style="list-style-type: none"> <li>a) Describe processes for water extraction</li> <li>b) Describe and be able to apply measures to protect water resources</li> <li>c) Be able to operate and maintain facilities for water extraction</li> </ul>		4
16	Water quality, water processing (Section 4 No. 16)	<ul style="list-style-type: none"> <li>a) Describe the properties of water and the substances found in it</li> <li>b) Observe water-quality requirements</li> <li>c) Apply principles of proper hygiene in operation of water-supply facilities</li> <li>d) Describe processes for water processing and treatment</li> <li>e) Operate and maintain facilities for water processing and treatment</li> </ul>		12

17	Water transport, storage and distribution (Section 4 No. 17)	<ul style="list-style-type: none"> <li>a) Operate and maintain facilities for water transport</li> <li>b) Describe the different types of water-storage facilities</li> <li>c) Operate and maintain water-storage facilities</li> <li>d) Know the differences between the different components and systems found in pipeline networks</li> <li>e) Select and use tools and materials needed for the construction and operation of pipelines</li> <li>f) Secure construction sites on public roads</li> <li>g) Supervise civil engineering works, lay pipelines</li> <li>h) Operate and maintain pipeline networks</li> <li>i) Describe the available possibilities for refurbishing pipeline networks</li> </ul>		24
18	Water analysis (Section 4 No. 18)	<ul style="list-style-type: none"> <li>a) Explain the need for water analysis</li> <li>b) Operate and maintain sampling equipment</li> <li>c) Collect water samples, and carry out on-site analysis</li> <li>d) Carry out, evaluate and keep proper records of physical and chemical analyses</li> </ul>		9

Seq. no.	Training occupation profile: sections to be covered	Skills and knowledge that are to be imparted, in a framework that supports the trainee's own independent planning, execution and checking	Durational guidelines, in weeks within the relevant training month	
			1st – 15th month	16th – 36th month
1	2	3	4	
19	Measurement, control and regulation (Section 4 No. 19)	<ul style="list-style-type: none"> <li>a) Describe procedures for measuring water levels, water quantities, water flow and water-quality parameters</li> <li>b) Determine and adjust technical parameters and processes</li> <li>c) Explain relevant remote control methods</li> <li>d) Use, check and maintain measurement, control and regulation equipment and systems</li> <li>e) Detect process disruptions, and take proper measures to eliminate them</li> </ul>		8
20	Electrical systems and equipment used in water supply (Section 4 No. 20)	<ul style="list-style-type: none"> <li>a) Select and use measuring instruments and tools</li> <li>b) Read operationally relevant circuit diagrams</li> <li>c) Check and replace fuses, sensors, measuring equipment, lighting and signal lamps</li> <li>d) Assess operational disruptions, and replace and restart relevant parts of facilities – especially pumps and motors</li> <li>e) Replace directly activatable electrical components outside of switch cabinets</li> <li>f) Use and operate emergency generators</li> <li>g) Install, check and service battery systems</li> </ul>		16
21	Documentation (Section 4 No. 21)	<ul style="list-style-type: none"> <li>a) Prepare installation plans for pipelines</li> <li>b) Determine and request required materials</li> <li>c) Keep and evaluate operational records, prepare reports</li> </ul>		4
22	Protection of drinking-water supplies, and customer systems (Section 4 No. 22)	<ul style="list-style-type: none"> <li>a) Detect water-quality hazards posed by customer systems, and initiate relevant measures</li> <li>b) Describe and assess components, devices and materials in building installations</li> </ul>		4
23	Orientation to customers (Section 4 No. 23)	<ul style="list-style-type: none"> <li>a) Understand and observe the legal aspects of relationships between companies and customers</li> <li>b) Conduct discussions and negotiations with customers in a customer-oriented manner, and make use of possibilities for fostering customer loyalty</li> </ul>		4

24	Relevant legal provisions and technical regulations (Section 4 No. 24)	Apply relevant legal provisions and technical regulations.		2)
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**Annex 2**  
(to Section 11)

Overall training plan for vocational training for specialists for wastewater technology

**Section 1: Common core qualifications pursuant to Section 3 (1) No. 1**

Seq. no.	Training occupation profile: sections to be covered	Skills and knowledge that are to be imparted, in a framework that supports the trainee's own independent planning, execution and checking	Durational guidelines, in weeks within the relevant training month	
			1st – 15th month	16th – 36th month
1	2	3	4	
1	Vocational training, labour law and collective bargaining law (Section 10 No. 1)	<ul style="list-style-type: none"> <li>a) Explain the meaning of the training contract, including especially how it is concluded, its duration and its termination</li> <li>b) Name the reciprocal rights and obligations under the training contract</li> <li>c) Name possibilities for obtaining further vocational training</li> <li>d) Name the main parts of the employment contract</li> <li>e) Name key provisions of the collective agreements applying to the training company</li> </ul>	To be imparted throughout the entire	
2	Structure and organisation of the training company (Section 10 No. 2)	<ul style="list-style-type: none"> <li>a) Describe the structure and tasks of the training company</li> <li>b) Describe the basic functions of the training company, such as the nature of its operations, its production, its sales and its administration</li> <li>c) Name applicable relationships between a) the training company and its workforce and b) industry/economic organisations, professional and trade associations and unions</li> <li>d) Describe the basic aspects, tasks and functioning of the training company's bodies under the Works Constitution Act and workers' representations under the Works Constitution Act</li> </ul>		

\* To be taught in connection with other training content.

3	Safety and health protection in the workplace (Section 10 No. 3)	<ul style="list-style-type: none"> <li>a) Be able to identify safety and health hazards in the workplace, and take measures to prevent such hazards</li> <li>b) Apply occupationally relevant work-safety and accident-prevention provisions</li> <li>c) Describe proper procedures to follow in case of accidents, and be able to initiate suitable initial measures</li> <li>d) Apply rules and regulations for preventive fire protection; describe the proper actions to take in case of fire, and take initial fire-fighting measures</li> </ul>	training period
4	Environmental protection (Section 10 No. 4)	<p>Help prevent operationally related environmental pollution and stresses within one's sphere of influence in the workplace; in particular,</p> <ul style="list-style-type: none"> <li>a) Using examples, describe the environmental pollution and stresses that the training company could cause, and illustrate the company's environmental protection contributions</li> <li>b) Apply the environmental protection provisions applying to the training company</li> <li>c) Use energy and materials in cost-effective, environmentally compatible ways</li> <li>d) Avoid waste; ensure that substances and materials are disposed of in environmentally compatible ways</li> </ul>	

Seq. no.	Training occupation profile: sections to be covered	Skills and knowledge that are to be imparted, in a framework that supports the trainee's own independent planning, execution and checking	Durational guidelines, in weeks within the relevant training month	
			1st – 15th month	16th – 36th month
1	2	3	4	
5	Business processes, organisation of work (Section 10 No. 5)	<ul style="list-style-type: none"> <li>a) Ensure that company services are provided cost-effectively</li> <li>b) Differentiate cost types and cost centres</li> <li>c) Carry out one's own work in a customer-oriented manner</li> <li>d) Use work implements and resources, organisational resources and work methods properly</li> <li>e) Work constructively in a team in planning, executing and coordinating tasks; evaluate, check and describe relevant results</li> <li>f) Contribute to measures to improve the manner in which work is organised and work areas are set up</li> </ul>	4	
6	Information and documentation, quality assurance measures (Section 10 No. 6)	<ul style="list-style-type: none"> <li>a) Obtain, process and assess information; use information and communications systems</li> <li>b) Read technical documents and plans; make sketches</li> <li>c) Apply organisational instructions</li> <li>d) Produce work records and reports</li> <li>e) Conform with data privacy provisions</li> <li>f) Carry out, record and check quality assurance measures</li> </ul>	4	
7	Environmental protection technology, ecological cycles and hygiene (Section 10 No. 7)	<ul style="list-style-type: none"> <li>a) Describe relevant ecological cycles</li> <li>b) Become familiar with, and describe, the causes and interactions of environmental pollution and stresses in the air, water, soil and surroundings</li> <li>c) Observe principles and applicable provisions relative to hygiene in operation of networks, systems and facilities</li> <li>d) Describe the risks presented by pathogens in raw water, wastewater, sludges and waste</li> <li>e) Describe relevant networks and facilities</li> <li>f) Describe the possibilities for preventing and minimising the environmental pollution and stresses caused by facilities and technical systems</li> <li>g) Be able to apply relevant legal provisions and technical regulations</li> </ul>	8	

8	Fundamentals of machinery and process engineering, and of measurement, control and regulation technology (Section 10 No. 8)	<ul style="list-style-type: none"> <li>a) Apply proper methods for combining substances and for separating substances in mixtures</li> <li>b) Apply proper methods for transporting solids, liquids and gases</li> <li>c) Assemble and disassemble fittings</li> <li>d) Use and operate powered units, especially pumps, blowers, compressors, electric motors, combustion engines and devices for heating, cooling and thermoregulation</li> <li>e) Explain the differences between different methods for measurement, control and regulation, and explain the structure and function of operationally relevant equipment</li> <li>f) Carry out measurement, control and regulation processes under supervision</li> <li>g) Select and use different fuels and energy forms, taking account of cost-effectiveness, efficiency aspects and any potential hazards</li> <li>h) Describe methods for energy transformation</li> </ul>	19	
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Seq. no.	Training occupation profile: sections to be covered	Skills and knowledge that are to be imparted, in a framework that supports the trainee's own independent planning, execution and checking	Durational guidelines, in weeks within the relevant training month	
			1st – 15th month	16th – 36th month
1	2	3	4	
9	Management of electrical hazards (Section 10 No. 9)	<ul style="list-style-type: none"> <li>a) Describe basic values and their interrelationships</li> <li>b) Be able to identify electrical hazards at both permanent and changing work sites</li> <li>c) Carry out and initiate protective measures to prevent and guard against electrical hazards</li> <li>d) Describe the proper procedures for responding to accidents involving electricity, and be able to initiate initial measures</li> </ul>	4	
10	Application of scientific principles (Section 10 No. 10)	<ul style="list-style-type: none"> <li>a) Measure and analyse physical quantities; determine the properties of substances</li> <li>b) Collect, prepare, label, preserve and store samples, using various suitable procedures</li> <li>c) Explain the interrelationships between the structures and compositions of substances and their characteristic properties</li> <li>d) Prepare mixtures of substances, after making the necessary calculations, and separate substances in mixtures; check pertinent results</li> <li>e) Describe the reactive behaviour of substances, especially their precipitation reactions, acid-base reactions and redox reactions</li> <li>f) Carry out qualitative and quantitative determinations, and assess the pertinent results</li> <li>g) Discuss the relevant types of microorganisms, and explain how they are structured and the conditions under which they live; also explain the significance of such microorganisms for operations within the company</li> <li>h) Describe relevant substance cycles and methods of microbiological analysis</li> </ul>	10	
11	Relevant materials, production and process materials, hazardous substances, materials processing (Section 10 No. 11)	<ul style="list-style-type: none"> <li>a) Select and use production and process materials, taking account of their properties and suitabilities</li> <li>b) Identify and recognize hazardous substances, including hazardous chemical agents, and use them in conformance with applicable safety regulations, taking all necessary precautions</li> <li>c) Use tools, machines and equipment for materials processing</li> <li>d) Make metal and plastic workpieces</li> <li>e) Describe relevant joining and bonding techniques</li> <li>f) Shape, join and separate metals and plastics, using both cutting and non-cutting processes</li> </ul>	12	



12	Relevant storage, implements and facilities (Section 10 No. 12)	a) Store and transport materials and goods in ways that are suitable in light of their condition and characteristics b) Check inventory levels, and initiate necessary corrections c) Operate lifting devices and transport equipment d) Use, inspect, service and clean implements and facilities e) Detect malfunctions of implements and facilities, and take measures to eliminate them	4	
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**Section 2: Specific professional qualifications pursuant to Section 3 (1) No. 2 letter b**

Seq. no.	Training occupation profile: sections to be covered	Skills and knowledge that are to be imparted, in a framework that supports the trainee's own independent planning, execution and checking	Durational guidelines, in weeks within the relevant training month	
			1st – 15th month	16th – 36th month
1	2	3	4	
13	Safety regulations and operational instructions (Section 10 No. 13)	<ul style="list-style-type: none"> <li>a) Select and use personal safety equipment</li> <li>b) Use safety equipment in the workplace, and maintain its proper function</li> <li>c) Describe relevant explosion hazards, and take explosion-prevention measures</li> <li>d) Take account of risks presented by pathogens in wastewater and sludges, and observe rules for proper occupational hygiene</li> <li>e) Observe rules for proper behaviour during work in enclosed spaces</li> </ul>		2
14	Operation and maintenance of drain systems (Section 10 No. 14)	<ul style="list-style-type: none"> <li>a) Describe relevant drain systems</li> <li>b) Operate and maintain relevant facilities, especially special structures and pumping stations</li> <li>c) Using control systems, monitor, control and regulate operational procedures</li> <li>d) Plan, execute and check measures for cleaning, inspection and leakage testing, taking account of the characteristics of relevant materials and of any required remedial measures</li> <li>e) Detect disruptions and malfunctions, and take proper measures to eliminate them</li> <li>f) Use network information systems</li> <li>g) Secure work areas in and along roads</li> </ul>		18
15	Monitoring of indirect dischargers (Section 10 No. 15)	<ul style="list-style-type: none"> <li>a) Carry out site inspections</li> <li>b) Monitor indirect-discharge sites; carry out mobile sampling and on-site measurements</li> <li>c) Use the indirect-discharger cadastre</li> </ul>		3

16	Operation and maintenance of wastewater treatment facilities (Section 10 No. 16)	<ul style="list-style-type: none"> <li>a) Describe procedures for mechanical wastewater treatment, and use and maintain relevant facilities</li> <li>b) Describe procedures for chemical-biological wastewater treatment, and use and maintain relevant facilities</li> <li>c) Observe relevant relationships between different stages of wastewater treatment</li> <li>d) Describe special procedures for wastewater treatment</li> <li>e) Detect disruptions and malfunctions, and take proper measures to eliminate them</li> <li>f) Using control systems, monitor, control and regulate operational procedures</li> </ul>		20
17	Treatment of sewage sludge, and recycling of waste from wastewater systems (Section 10 No. 17)	<ul style="list-style-type: none"> <li>a) Operate and maintain facilities for sludge treatment</li> <li>b) Operate and maintain facilities for gas treatment, recovery and utilisation</li> <li>c) Monitor, control and regulate operational procedures</li> <li>d) Properly allocate waste for recycling and disposal</li> <li>e) Detect disruptions and malfunctions, and take proper measures to eliminate them</li> </ul>		6

Seq. no.	Training occupation profile: sections to be covered	Skills and knowledge that are to be imparted, in a framework that supports the trainee's own independent planning, execution and checking	Durational guidelines, in weeks within the relevant training month	
			1st – 15th month	16th – 36th month
1	2	3	4	
18	Sampling and analysis of wastewater and sludge (Section 10 No. 18)	<ul style="list-style-type: none"> <li>a) Carry out sensory evaluation of various types of wastewater and sludge</li> <li>b) In wastewater collection and treatment, carry out and evaluate the standard physical tests, including the relevant sampling, and, in particular, determine such aspects as settleable solids, dry matter in sludge, loss on ignition, sludge volume index, depth of visibility and turbidity</li> <li>c) Measure relevant quantities, fill levels, flows and concentrations</li> <li>d) Carry out wastewater and sludge analyses for purposes of operational and quality control; determine relevant individual and sum parameters, especially phosphorous, nitrogen, carbon dioxide, methane, TOC, BOD<sub>5</sub>, COD and acid capacity</li> <li>e) Carry out microbiological tests</li> <li>f) Know the differences, in terms of their functions and applications, between the different types of laboratory devices needed for analysis of wastewater and sludge, and select and use such equipment</li> <li>g) Use and maintain online measuring instruments</li> </ul>		14
19	Record-keeping, quality management and environmental management (Section 10 No. 19)	<ul style="list-style-type: none"> <li>a) Apply the legal and operationally relevant provisions given by the areas of quality and environmental management</li> <li>b) Check, record and assess work procedures and work results</li> <li>c) Record results, especially by adding them to operational logs and databases, and make necessary backups</li> </ul>		2*)
20	Electrical systems used in wastewater facilities (Section 10 No. 20)	<ul style="list-style-type: none"> <li>a) Select and use measuring instruments and tools</li> <li>b) Read operationally relevant circuit diagrams</li> <li>c) Check and replace fuses, sensors, measuring equipment, lighting and signal lamps</li> <li>d) Assess operational disruptions, and replace and restart relevant parts of facilities – especially pumps and motors</li> <li>e) Replace directly activatable electrical components outside of switch cabinets</li> <li>f) Use and operate emergency generators</li> <li>g) Install, check and service battery systems</li> </ul>		16

21	Relevant legal provisions and technical regulations (Section 10 No. 21)	Apply relevant legal provisions and technical regulations.		2 <sup>*</sup> )
22	In-depth phase: operation of sewer systems or of wastewater-treatment facilities (Section 10 No. 22)	The vocational training should be continued, taking account of operationally relevant emphases, by refining/deepening skills and knowledge pursuant to sequential numbers 14 and 15, for operation of sewer systems, or pursuant to 16 and 17, for operation of wastewater-treatment facilities.		8

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\* To be taught in connection with other training content.

Overall training plan for vocational training for recycling and waste management technicians

**Section 1: Common core qualifications pursuant to Section 3 (1) No. 1**

Seq. no.	Training occupation profile: sections to be covered	Skills and knowledge that are to be imparted, in a framework that supports the trainee's own independent planning, execution and checking	Durational guidelines, in weeks within the relevant training month	
			1st – 15th month	16th – 36th month
1	2	3	4	
1	Vocational training, labour law and collective bargaining law (Section 16 No. 1)	<ul style="list-style-type: none"> <li>a) Explain the meaning of the training contract, including especially how it is concluded, its duration and its termination</li> <li>b) Name the reciprocal rights and obligations under the training contract</li> <li>c) Name possibilities for obtaining further vocational training</li> <li>d) Name the main parts of the employment contract</li> <li>e) Name key provisions of the collective agreements applying to the training company</li> </ul>	To be imparted throughout the entire training period	
2	Structure and organisation of the training company (Section 16 No. 2)	<ul style="list-style-type: none"> <li>a) Describe the structure and tasks of the training company</li> <li>b) Describe the basic functions of the training company, such as the nature of its operations, its production, its sales and its administration</li> <li>c) Name applicable relationships between a) the training company and its workforce and b) industry/economic organisations, professional and trade associations and unions</li> <li>d) Describe the basic aspects, tasks and functioning of the training company's bodies under the Works Constitution Act and workers' representations under the Works Constitution Act</li> </ul>		
3	Safety and health protection in the workplace (Section 16 No. 3)	<ul style="list-style-type: none"> <li>a) Identify safety and health hazards in the workplace, and take measures to prevent such hazards</li> <li>b) Apply occupationally relevant work-safety and accident-prevention provisions</li> <li>c) Describe proper procedures to follow in case of accidents, and be able to initiate suitable initial measures</li> <li>d) Apply rules and regulations for preventive fire protection; describe the proper actions to take in case of fire, and take initial fire-fighting measures</li> </ul>		

4	Environmental protection (Section 16 No. 4)	Help prevent operationally related environmental pollution and stresses within one's sphere of influence in the workplace; in particular,  a) using examples, describe the environmental pollution and stresses that the training company could cause, and illustrate the company's environmental protection contributions  b) apply the environmental protection provisions applying to the training company  c) use energy and materials in cost-effective, environmentally compatible ways  d) avoid waste; ensure that substances and materials are disposed of in environmentally compatible ways	
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Seq. no.	Training occupation profile: sections to be covered	Skills and knowledge that are to be imparted, in a framework that supports the trainee's own independent planning, execution and checking	Durational guidelines, in weeks within the relevant training month	
			1st – 15th month	16th – 36th month
1	2	3	4	
5	Business processes, organisation of work (Section 16 No. 5)	<ul style="list-style-type: none"> <li>a) Ensure that company services are provided cost-effectively</li> <li>b) Differentiate cost types and cost centres</li> <li>c) Carry out one's own work in a customer-oriented manner</li> <li>d) Use work implements and resources, organisational resources and work methods properly</li> <li>e) Work constructively in a team in planning, executing and coordinating tasks; evaluate, check and describe relevant results</li> <li>f) Contribute to measures to improve the manner in which work is organised and work areas are set up</li> </ul>	4	
6	Information and documentation, quality assurance measures (Section 16 No. 6)	<ul style="list-style-type: none"> <li>a) Obtain, process and assess information; use information and communications systems</li> <li>b) Read technical documents and plans; make sketches</li> <li>c) Apply organisational instructions</li> <li>d) Produce work records and reports</li> <li>e) Conform with data privacy provisions</li> <li>f) Carry out, record and check quality assurance measures</li> </ul>	4	
7	Environmental protection technology, ecological cycles and hygiene (Section 16 No. 7)	<ul style="list-style-type: none"> <li>a) Describe relevant ecological cycles</li> <li>b) Become familiar with, and describe, the causes and interactions of environmental pollution and stresses in the air, water, soil and surroundings</li> <li>c) Observe principles and applicable provisions relative to hygiene in operation of networks, systems and facilities</li> <li>d) Describe the risks presented by pathogens in raw water, wastewater, sludges and waste</li> <li>e) Describe relevant networks and facilities</li> <li>f) Describe the possibilities for preventing and minimising the environmental pollution and stresses caused by facilities and technical systems</li> <li>g) Apply relevant legal provisions and technical regulations</li> </ul>	8	



8	<p>Fundamentals of machinery and process engineering, and of measurement, control and regulation technology (Section 16 No. 8)</p>	<ul style="list-style-type: none"> <li>a) Apply proper methods for combining substances and for separating substances in mixtures</li> <li>b) Apply proper methods for transporting solids, liquids and gases</li> <li>c) Assemble and disassemble fittings</li> <li>d) Use and operate powered units, especially pumps, blowers, compressors, electric motors, combustion engines and devices for heating, cooling and thermoregulation</li> <li>e) Explain the differences between different methods for measurement, control and regulation, and explain the structure and function of operationally relevant equipment</li> <li>f) Carry out measurement, control and regulation processes under supervision</li> <li>g) Select and use different fuels and energy forms, taking account of cost-effectiveness, efficiency aspects and any potential hazards</li> <li>h) Describe methods for energy transformation</li> </ul>	19	
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Seq. no.	Training occupation profile: sections to be covered	Skills and knowledge that are to be imparted, in a framework that supports the trainee's own independent planning, execution and checking	Durational guidelines, in weeks within the relevant training month	
			1st – 15th month	16th – 36th month
1	2	3	4	
9	Management of electrical hazards (Section 16 No. 9)	<ul style="list-style-type: none"> <li>a) Describe basic quantities and their interrelationships</li> <li>b) Be able to identify electrical hazards at both permanent and changing work sites</li> <li>c) Carry out and initiate protective measures to prevent and guard against electrical hazards</li> <li>d) Describe the proper procedures for responding to accidents involving electricity, and be able to initiate initial measures</li> </ul>	4	
10	Application of scientific principles (Section 16 No. 10)	<ul style="list-style-type: none"> <li>a) Measure and analyse physical quantities; determine the properties of substances</li> <li>b) Collect, prepare, label, preserve and store samples, using various suitable procedures</li> <li>c) Explain the interrelationships between the structures and compositions of substances and their characteristic properties</li> <li>d) Prepare mixtures of substances, after making the necessary calculations, and separate substances in mixtures; check pertinent results</li> <li>e) Describe the reactive behaviour of substances, especially their precipitation reactions, acid-base reactions and redox reactions</li> <li>f) Carry out qualitative and quantitative determinations, and assess the pertinent results</li> <li>g) Discuss the relevant types of microorganisms, and explain how they are structured and the conditions under which they live; also explain the significance of such microorganisms for operations within the company</li> <li>h) Describe relevant substance cycles and methods of microbiological analysis</li> </ul>	10	
11	Relevant materials, production and process materials, hazardous substances, materials processing (Section 16 No. 11)	<ul style="list-style-type: none"> <li>a) Select and use production and process materials, taking account of their properties and suitabilities</li> <li>b) Identify and recognize hazardous substances, including hazardous chemical agents, and use them in conformance with applicable safety regulations, taking all necessary precautions</li> <li>c) Use tools, machines and equipment for materials processing</li> <li>d) Make metal and plastic workpieces</li> <li>e) Describe relevant joining and bonding techniques</li> <li>f) Shape, join and separate metals and plastics, using both cutting and non-cutting processes</li> </ul>	12	

12	Relevant storage, implements and facilities (Section 16 No. 12)	a) Store and transport materials and goods in ways that are suitable in light of their condition and characteristics b) Check inventory levels, and initiate necessary corrections c) Operate lifting devices and transport equipment d) Use, inspect, service and clean implements and facilities e) Detect malfunctions of implements and facilities, and take measures to eliminate them	4	
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**Section 2: Specific professional qualifications pursuant to Section 3 (1) No. 2 letter c**

Seq. no.	Training occupation profile: sections to be covered	Skills and knowledge that are to be imparted, in a framework that supports the trainee's own independent planning, execution and checking	Durational guidelines, in weeks within the relevant training month	
			1st – 15th month	16th – 36th month
1	2	3	4	
13	Safety regulations and operational instructions (Section 16 No. 13)	Take proper occupational safety measures in collection, transport and treatment of waste, hazardous substances and special waste		4
14	Customer-oriented actions (Section 16 No. 14)	<ul style="list-style-type: none"> <li>a) Describe the tasks to be carried out in field service and office work, and describe the importance of the two work categories</li> <li>b) Conduct discussions and negotiations with customers in a customer-oriented manner, and make use of possibilities for fostering customer loyalty</li> <li>c) Understand and observe the legal aspects of relationships between companies and customers</li> <li>d) Take customer-satisfaction analyses and supplier assessments into account</li> </ul>		4
15	Sound business dealings (Section 16 No. 15)	<ul style="list-style-type: none"> <li>a) Describe the applicable principles in the waste-management sector, the competition situation prevailing in the section and the bases for structuring prices in the sector</li> <li>b) Explain the concept of supply and demand</li> </ul>		4
16	Waste and waste acceptance (Section 16 No. 16)	<ul style="list-style-type: none"> <li>a) Know the differences between products, waste for recovery and waste for disposal</li> <li>b) Provide relevant information about waste origins, waste-production sites, quantities of produced waste and types of waste</li> <li>c) Monitor and keep records of waste quantities</li> <li>d) Differentiate and allocate waste in terms of relevant characteristics, especially in terms of hazardousness (i.e. monitoring requirements)</li> <li>e) Identify and declare waste, and categorize waste in accordance with the European Waste Catalogue</li> <li>f) Accept and collect waste at facilities and premises of waste producers, separate the waste properly and prepare it for the relevant material flows and their further processing</li> <li>g) Name materials and products that can be recovered and recycled, and name materials and products that have to be disposed of; describe the relevant materials' and products' characteristics and applicable quality requirements</li> <li>h) Describe the processing criteria for various types of</li> </ul>		9

		waste, along with the potential reactions the waste can undergo		
17	Waste-management procedures (Section 16 No. 17)	<ul style="list-style-type: none"> <li>a) Describe relevant physical, chemical and biological processes</li> <li>b) Describe the different types of equipment used in relevant facilities, and describe relevant combinations of facility components</li> <li>c) Describe the requirements pertaining to relevant processes and facility equipment</li> <li>d) Detect environmental pollution and stresses, describe possibilities for preventing such pollution and stresses and initiate countermeasures as necessary</li> </ul>		11

Seq. no.	Training occupation profile: sections to be covered	Skills and knowledge that are to be imparted, in a framework that supports the trainee's own independent planning, execution and checking	Durational guidelines, in weeks within the relevant training month	
			1st – 15th month	16th – 36th month
1	2	3	4	
18	Operation and maintenance (Section 16 No. 18)	<ul style="list-style-type: none"> <li>a) Commission and decommission parts of facilities, and keep relevant records</li> <li>b) Keep records of normal operation of facilities</li> <li>c) Operate, monitor and maintain relevant equipment, devices and facilities</li> <li>d) Detect and keep records of operational disruptions, and initiate countermeasures as necessary</li> </ul>		8
19	Material and substance flows, logistics and scheduling (Section 16 No. 19)	<ul style="list-style-type: none"> <li>a) Describe relevant types of vehicles, containers and collection systems, and combine such equipment in keeping with customer requirements and operation areas</li> <li>b) Use tools and resources for managing assignments</li> <li>c) Plan assignments of vehicles, personnel and containers</li> <li>d) Describe available options for carrying out waste-management-capacity provision, waste transport, waste storage and interim waste storage</li> </ul>		7
20	Quality assurance measures (Section 16 No. 20)	<ul style="list-style-type: none"> <li>a) Explain the basic principles of quality management and environmental management, and explain how specialised waste-management companies are important</li> <li>b) Apply procedural and work instructions for systems, and make records of relevant changes</li> <li>c) Describe the requirements pertaining to recyclable, recoverable and disposable waste and materials, and carry out relevant quality inspections</li> <li>d) Carry out sampling, and prepare samples, for purposes of analysis</li> <li>e) Apply measurement and analytical procedures to incoming and outgoing materials</li> <li>f) Assess analytical results in light of acceptance criteria</li> <li>g) Observe requirements pertaining to labelling of waste and products</li> </ul>		6
21	Information technology (Section 16 No. 21)	<ul style="list-style-type: none"> <li>a) Use operationally specific programmes for closed-cycle economies and waste management</li> <li>b) Prepare bar and circle diagrams, hydrographs, summation curves and tables relative to waste-management issues and documentation</li> <li>c) Use the relevant company's forms</li> </ul>		4

22	Relevant legal provisions and technical regulations (Section 16 No. 22)	<ul style="list-style-type: none"> <li>a) Apply relevant legal provisions and technical regulations</li> <li>b) Carry out proper record-keeping relative to waste recovery and disposal</li> <li>c) Discuss relevant waste-management concepts and records, and prepare data for such concepts and records</li> </ul>		4*)
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\* To be taught in connection with other training content.

**Focus area of logistics, collection and distribution**

Seq. no.	Training occupation profile: sections to be covered	Skills and knowledge that are to be imparted, in a framework that supports the trainee's own independent planning, execution and checking	Durational guidelines, in weeks within the relevant training month	
			1st – 15th month	16th – 36th month
1	2	3	4	
1	Sound business dealings (Section 16 No. 15)	<ul style="list-style-type: none"> <li>a) Analyse and compile customer requirements; accept and carry out customer orders</li> <li>b) Order waste and assign it to suitable recovery and disposal pathways</li> <li>c) Prepare accompanying documents and invoices</li> <li>d) Record expenses incurred in providing services, determine relevant costs and calculate the resulting prices of services</li> <li>e) Take part in preparing specifications and bids</li> <li>f) Process complaints</li> <li>g) Keep records of processes and operations in accordance with applicable legal and operational requirements</li> </ul>		9
2	Material and substance flows, logistics and scheduling (Section 16 No. 19)	<ul style="list-style-type: none"> <li>a) Accept waste at interim storage sites and transfer stations</li> <li>b) Compile records of storage inputs and outputs, taking account of applicable quality and quantity specifications</li> <li>c) Operate stationary and mobile collection sites, and provide hazardous-waste-collection services</li> <li>d) Describe "bring-it-yourself" systems and collection systems</li> <li>e) Describe the different types of containers used for collecting different types of waste, including swap-body, discharge-system and other waste-collection containers, and describe the applications for which each type is used</li> <li>f) Use transport systems for pasty, liquid and other waste</li> <li>g) Describe various types of relevant vehicle equipment, including collection, filling, identification and weighing systems, and describe the various possible uses for such equipment</li> <li>h) Schedule deployments of personnel, vehicles and containers</li> <li>i) Plan assignments and help optimise routing</li> <li>j) Determine the expenses related to the various relevant systems, and determine actual costs and monitor performance</li> </ul>		19



3	Safety regulations and operational instructions (Section 16 No. 13)	<ul style="list-style-type: none"><li>a) Apply safety regulations in connection with hazardous substances, hazardous waste and biological agents</li><li>b) Apply occupational safety guidelines relative to storage, collection and transport</li><li>c) Apply relevant provisions of laws pertaining to hazardous materials</li><li>d) Apply relevant provisions of traffic laws, including laws pertaining to goods transports, in waste collection and transport</li><li>e) Apply operational instructions oriented to specific tasks</li></ul>		2
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**Focus area of waste recovery and treatment:**

Seq. no.	Training occupation profile: sections to be covered	Skills and knowledge that are to be imparted, in a framework that supports the trainee's own independent planning, execution and checking	Durational guidelines, in weeks within the relevant training month	
			1st – 15th month	16th – 36th month
1	2	3	4	
1	Waste-management procedures (Section 16 No. 17)	<ul style="list-style-type: none"> <li>a) Accept, treat and provide waste</li> <li>b) Put waste and products into interim storage and longer-term storage</li> <li>c) Describe the basic operations involved in processing, recovering and treating waste</li> <li>d) Describe the process steps involved in making products from waste</li> <li>e) Carry out processes for cleaning secondary raw materials</li> <li>f) Use combinations of procedures for processing and recovery</li> <li>g) Eliminate contaminants and foreign matter in processing and recovery</li> <li>h) Identify pollutants, be familiar with their potential hazards and assign them to the proper disposal pathways</li> </ul>		17
2	Operation and maintenance (Section 16 No. 18)	<ul style="list-style-type: none"> <li>a) Control, regulate and monitor processing and recovery procedures</li> <li>b) Operate measurement, control and regulation equipment</li> <li>c) Operate, monitor and maintain facilities and their components</li> <li>d) Detect malfunctions of units, machines and equipment, and relevant operational disruptions, and initiate measures to eliminate such malfunctions and disruptions</li> <li>e) Detect shortcomings in process equipment, and initiate improvements</li> <li>f) Plan and initiate inspections, and help carry out relevant modifications and conversions</li> <li>g) Keep records of ongoing operations and of maintenance and servicing work</li> </ul>		6
3	Material and substance flows, logistics and scheduling (Section 16 No. 19)	<ul style="list-style-type: none"> <li>a) Track and keep records of material and substance flows in facilities</li> <li>b) Carry out sampling and sample preparation, keep records of sampling and monitor relevant quality levels and values</li> <li>c) Check recovery (recycled) products in terms of quality, and keep pertinent records, and initiate any required quality-improvement measures</li> <li>d) Make recovery (recycled) products and secondary raw materials available for sale, and distribute such products and materials</li> <li>e) Allocate residual waste to proper disposal pathways</li> <li>f) Plan and keep records of personnel, vehicle and equipment assignments</li> </ul>		5

4	Safety regulations and operational instructions (Section 16 No. 13)	a) Describe the hazards presented by biological substances and hazardous substances b) Apply safety regulations pertaining to facilities and processes c) Describe and operate fire-prevention and fire-safety equipment d) Take proper measures to prevent explosions e) Apply operational instructions oriented to specific tasks		2
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### Focus area of waste disposal and treatment

Seq. no.	Training occupation profile: sections to be covered	Skills and knowledge that are to be imparted, in a framework that supports the trainee's own independent planning, execution and checking	Durational guidelines, in weeks within the relevant training month	
			1st – 15th month	16th – 36th month
1	2	3	4	
1	Waste-management procedures (Section 16 No. 17)	<ul style="list-style-type: none"> <li>a) Accept, process, pre-treat and provide waste</li> <li>b) Describe methods for treating and disposing of waste, including the pertinent process steps</li> <li>c) Carry out two of the five waste-treatment processes listed below <ul style="list-style-type: none"> <li>aa) waste storage</li> <li>bb) thermal treatment of waste</li> <li>cc) composting of waste</li> <li>dd) mechanical-biological waste treatment</li> <li>ee) treatment of special waste</li> </ul> </li> </ul>		17
2	Operation and maintenance (Section 16 No. 18)	<ul style="list-style-type: none"> <li>a) Control, regulate and monitor treatment and disposal procedures</li> <li>b) Operate measurement, control and regulation equipment</li> <li>c) Operate, monitor and maintain facilities and their components</li> <li>d) Detect malfunctions of units, machines and equipment, and relevant operational disruptions, and initiate measures to eliminate such malfunctions and disruptions</li> <li>e) Plan and initiate inspections, and help carry out relevant modifications and conversions</li> <li>f) Keep records of ongoing operations and of maintenance and servicing work</li> </ul>		6
3	Material and substance flows, logistics and scheduling (Section 16 No. 19)	<ul style="list-style-type: none"> <li>a) Describe operational procedures for waste treatment and waste disposal</li> <li>b) Carry out sampling and sample preparation, keep records of sampling and carry out relevant testing</li> <li>c) Track material flows within facility systems, and keep pertinent records, within regard to quantities, quality and relevant characteristics</li> <li>d) Carry out measurements relative to control of facilities and to immissions analysis</li> <li>e) Keep records of outputs of materials, substances and energy</li> <li>f) Collect waste for disposal in properly separated form, place it in temporary storage and prepare it for disposal</li> <li>g) Plan and keep records of personnel, vehicle and equipment assignments</li> </ul>		5

4	Safety regulations and operational instructions (Section 16 No. 13)	a) Describe the hazards presented by biological substances and hazardous substances b) Apply safety regulations pertaining to facilities and processes c) Describe and operate fire-prevention and fire-safety equipment d) Take proper measures to prevent explosions e) Apply operational instructions oriented to specific tasks		2
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Overall training plan for vocational training for pipe, sewer and industrial service technicians

**Section 1: Common core qualifications pursuant to Section 3 (1) No. 1**

Seq. no.	Training occupation profile: sections to be covered	Skills and knowledge that are to be imparted, in a framework that supports the trainee's own independent planning, execution and checking	Durational guidelines, in weeks within the relevant training month	
			1st – 15th month	16th – 36th month
1	2	3	4	
1	Vocational training, labour law and collective bargaining law (Section 22 No. 1)	<ul style="list-style-type: none"> <li>a) Explain the meaning of the training contract, including especially how it is concluded, its duration and its termination</li> <li>b) Name the reciprocal rights and obligations under the training contract</li> <li>c) Name possibilities for obtaining further vocational training</li> <li>d) Name the main parts of the employment contract</li> <li>e) Name key provisions of the collective agreements applying to the training company</li> </ul>	To be imparted throughout the entire training period	
2	Structure and organisation of the training company (Section 22 No. 2)	<ul style="list-style-type: none"> <li>a) Describe the structure and tasks of the training company</li> <li>b) Describe the basic functions of the training company, such as the nature of its operations, its production, its sales and its administration</li> <li>c) Name applicable relationships between a) the training company and its workforce and b) industry/economic organisations, professional and trade associations and unions</li> <li>d) Describe the basic aspects, tasks and functioning of the training company's bodies under the Works Constitution Act and workers' representations under the Works Constitution Act</li> </ul>		
3	Safety and health protection in the workplace (Section 22 No. 3)	<ul style="list-style-type: none"> <li>a) Be able to identify safety and health hazards in the workplace, and take measures to prevent such hazards</li> <li>b) Apply occupationally relevant work-safety and accident-prevention provisions</li> <li>c) Describe proper procedures to follow in case of accidents, and be able to initiate suitable initial measures</li> <li>d) Apply rules and regulations for preventive fire protection; describe the proper actions to take in case of fire, and take initial fire-fighting measures</li> </ul>		

4	Environmental protection (Section 22 No. 4)	Help prevent operationally related environmental pollution and stresses within one's sphere of influence in the workplace; in particular,  a) Using examples, describe the environmental pollution and stresses that the training company could cause, and illustrate the company's environmental protection contributions b) Apply the environmental protection provisions applying to the training company c) Use energy and materials in cost-effective, environmentally compatible ways d) Avoid waste; ensure that substances and materials are disposed of in environmentally compatible ways	
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Seq. no.	Training occupation profile: sections to be covered	Skills and knowledge that are to be imparted, in a framework that supports the trainee's own independent planning, execution and checking	Durational guidelines, in weeks within the relevant training month	
			1st – 15th month	16th – 36th month
1	2	3	4	
5	Business processes, organisation of work (Section 22 No. 5)	<ul style="list-style-type: none"> <li>a) Ensure that company services are provided cost-effectively</li> <li>b) Differentiate cost types and cost centres</li> <li>c) Carry out one's own work in a customer-oriented manner</li> <li>d) Use work implements and resources, organisational resources and work methods properly</li> <li>e) Work constructively in a team in planning, executing and coordinating tasks; evaluate, check and describe relevant results</li> <li>f) Contribute to measures to improve the manner in which work is organised and work areas are set up</li> </ul>	4	
6	Information and documentation, quality assurance measures (Section 22 No. 6)	<ul style="list-style-type: none"> <li>a) Obtain, process and assess information; use information and communications systems</li> <li>b) Read technical documents and plans; make sketches</li> <li>c) Apply organisational instructions</li> <li>d) Produce work records and reports</li> <li>e) Conform with data privacy provisions</li> <li>f) Carry out, record and check quality assurance measures</li> </ul>	4	
7	Environmental protection technology, ecological cycles and hygiene (Section 22 No. 7)	<ul style="list-style-type: none"> <li>a) Describe relevant ecological cycles</li> <li>b) Become familiar with, and describe, the causes and interactions of environmental pollution and stresses in the air, water, soil and surroundings</li> <li>c) Observe principles and applicable provisions relative to hygiene in operation of networks, systems and facilities</li> <li>d) Describe the risks presented by pathogens in raw water, wastewater, sludges and waste</li> <li>e) Describe relevant networks and facilities</li> <li>f) Describe the possibilities for preventing and minimising the environmental pollution and stresses caused by facilities and technical systems</li> <li>g) Apply relevant legal provisions and technical regulations</li> </ul>	8	



8	Fundamentals of machinery and process engineering, and of measurement, control and regulation technology (Section 22 No. 8)	<ul style="list-style-type: none"> <li>a) Apply proper methods for combining substances and for separating substances in mixtures</li> <li>b) Apply proper methods for transporting solids, liquids and gases</li> <li>c) Assemble and disassemble fittings</li> <li>d) Use and operate powered units, especially pumps, blowers, compressors, electric motors, combustion engines and devices for heating, cooling and thermoregulation</li> <li>e) Explain the differences between different methods for measurement, control and regulation, and explain the structure and function of operationally relevant equipment</li> <li>f) Carry out measurement, control and regulation processes under supervision</li> <li>g) Select and use different fuels and energy forms, taking account of cost-effectiveness, efficiency aspects and any potential hazards</li> <li>h) Describe methods for energy transformation</li> </ul>	19	
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Seq. no.	Training occupation profile: sections to be covered	Skills and knowledge that are to be imparted, in a framework that supports the trainee's own independent planning, execution and checking	Durational guidelines, in weeks within the relevant training month	
			1st – 15th month	16th – 36th month
1	2	3	4	
9	Management of electrical hazards (Section 22 No. 9)	<ul style="list-style-type: none"> <li>a) Describe basic quantities and their interrelationships</li> <li>b) Be able to identify electrical hazards at both permanent and changing work sites</li> <li>c) Carry out and initiate protective measures to prevent and guard against electrical hazards</li> <li>d) Describe the proper procedures for responding to accidents involving electricity, and be able to initiate initial measures</li> </ul>	4	
10	Application of scientific principles (Section 22 No. 10)	<ul style="list-style-type: none"> <li>a) Measure and analyse physical quantities; determine the properties of substances</li> <li>b) Collect, prepare, label, preserve and store samples, using various suitable procedures</li> <li>c) Explain the interrelationships between the structures and compositions of substances and their characteristic properties</li> <li>d) Prepare mixtures of substances, after making the necessary calculations, and separate substances in mixtures; check pertinent results</li> <li>e) Describe the reactive behaviour of substances, especially their precipitation reactions, acid-base reactions and redox reactions</li> <li>f) Carry out qualitative and quantitative determinations, and assess the pertinent results</li> <li>g) Discuss the relevant types of microorganisms, and explain how they are structured and the conditions under which they live; also explain the significance of such microorganisms for operations within the company</li> <li>h) Describe relevant substance cycles and methods of microbiological analysis</li> </ul>	10	
11	Relevant materials, production and process materials, hazardous substances, materials processing (Section 22 No. 11)	<ul style="list-style-type: none"> <li>a) Select and use production and process materials, taking account of their properties and suitabilities</li> <li>b) Identify and recognize hazardous substances, including hazardous chemical agents, and use them in conformance with applicable safety regulations, taking all necessary precautions</li> <li>c) Use tools, machines and equipment for materials processing</li> <li>d) Make metal and plastic workpieces</li> <li>e) Describe relevant joining and bonding techniques</li> <li>f) Shape, join and separate metals and plastics, using both cutting and non-cutting processes</li> </ul>	12	

12	Relevant storage, implements and facilities (Section 22 No. 12)	a) Store and transport materials and goods in ways that are suitable in light of their condition and characteristics b) Check inventory levels, and initiate necessary corrections c) Operate lifting devices and transport equipment d) Use, inspect, service and clean implements and facilities e) Detect malfunctions of implements and facilities, and take measures to eliminate them	4	
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**Section 2: Specific professional qualifications pursuant to Section 3 (1) No. 2 letter d**

Seq. no.	Training occupation profile: sections to be covered	Skills and knowledge that are to be imparted, in a framework that supports the trainee's own independent planning, execution and checking	Durational guidelines, in weeks within the relevant training month	
			1st – 15th month	16th – 36th month
1	2	3	4	
13	Work preparations, securing and clearing of the work area (Section 22 No. 13)	<ul style="list-style-type: none"> <li>a) Assess the work area, and detect any hazards emanating from it</li> <li>b) Take proper account of the structures and function of industrial facilities and drain systems</li> <li>c) Know the differences between the different types of control components</li> <li>d) Read inventory plans and flow diagrams for processes, and apply pertinent information in selection of work methods and procedures</li> <li>e) Select and define work methods and procedures in light of environmental protection criteria</li> <li>f) Obtain and use workslips and permits</li> <li>g) Check proper activation of facility equipment</li> <li>h) Carry out safety measures in connection with service and maintenance work</li> <li>i) Hand over a cleared work area</li> </ul>		16
14	Respiratory protection, fire prevention and explosion prevention (Section 22 No. 14)	<ul style="list-style-type: none"> <li>a) Select, use and maintain work-safety equipment, including equipment for personal safety, and especially including breathing apparatus</li> <li>b) Use ventilation systems</li> <li>c) Explain occupationally relevant principles applying to fire safety and explosion prevention</li> <li>d) Pinpoint and identify fire and explosion hazards</li> <li>e) Use devices for measuring gas levels and potential explosion hazards</li> <li>f) Select and use equipment for areas with explosion hazards</li> </ul>		12
15	Quality assurance measures, safety technology and environmental protection (Section 22 No. 15)	<ul style="list-style-type: none"> <li>a) Apply relevant elements of operational safety, quality-assurance and environmental protection systems</li> <li>b) Systematically search for, and record, the causes of errors and defects, and help eliminate them</li> <li>c) Contribute to the ongoing improvement of work procedures within one's own work area</li> <li>d) Implement customer-specific specifications relative to safety, quality and environmental protection</li> <li>e) Conduct discussions and negotiations with customers in a customer-oriented manner, and make use of possibilities for fostering customer loyalty</li> </ul>		4

16	Waste management (Section 22 No. 16)	a) In cleaning and maintenance, properly identify residues and impurities from one's own work and initiate proper measures b) Properly package, collect and transport residues, mixtures and pure substances c) Clean transport units, packaging and equipment		4
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Seq. no.	Training occupation profile: sections to be covered	Skills and knowledge that are to be imparted, in a framework that supports the trainee's own independent planning, execution and checking	Durational guidelines, in weeks within the relevant training month	
			1st – 15th month	16th – 36th month
1	2	3	4	
17	Cleaning machines and equipment (Section 22 No. 17)	a) Explain the structure, function and working principles of relevant machines and tools b) Carry out maintenance and care for equipment c) Ready equipment for use, and carry out functional tests prior to working with equipment d) Detect any malfunctions of equipment, and initiate measures to limit damage and eliminate the problems e) Carry out hydrodynamic, mechanical and electro-mechanical procedures for cleaning equipment and facilities used in the wastewater sector		19
18	Relevant legal provisions and technical regulations (Section 22 No. 18)	Apply relevant legal provisions and technical regulations.		4 <sup>*</sup>

**Focus area pipe and sewer services:**

Seq. no.	Training occupation profile: sections to be covered	Skills and knowledge that are to be imparted, in a framework that supports the trainee's own independent planning, execution and checking	Durational guidelines, in weeks within the relevant training month	
			1st – 15th month	16th – 36th month
1	2	3	4	
1	Cleaning (Section 22 No. 19)	a) Clean pipelines, wastewater structures, sewage lines and conduits, and separators, using various procedures b) Inspect pipelines, wastewater structures, sewage lines and conduits, and separators, using various procedures – especially camera-aided inspections, on-site inspections and endoscopy c) Check pipelines, wastewater structures, sewage lines and conduits, connections, supports, and separators for proper function and leak-tightness d) Detect any defects and connection errors e) Determine the position of wastewater lines and conduits		16

\* To be taught in connection with other training content.

2	Maintenance and servicing (Section 22 No. 20)	<ul style="list-style-type: none"> <li>a) Service pipelines, wastewater structures, and sewage lines and conduits, taking account of the materials involved and of measures needed to ensure trouble-free operation</li> <li>b) Detect foreign objects and obstructions in pipelines, wastewater structures, and sewage lines and conduits, and separators, and initiate measures to remove and eliminate them</li> <li>c) Explain the differences between different types of relevant measuring systems</li> <li>d) Carry out repairs of locally confined damages, and explain the differences between additional types of repair/refurbishment procedures</li> </ul>		16
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**Focus area of industrial services**

Seq. no.	Training occupation profile: sections to be covered	Skills and knowledge that are to be imparted, in a framework that supports the trainee's own independent planning, execution and checking	Durational guidelines, in weeks within the relevant training month	
			1st – 15th month	16th – 36th month
1	2	3	4	
1	Cleaning (Section 22 No. 19)	<ul style="list-style-type: none"> <li>a) Use machines and systems for removal of residual quantities, especially vacuuming equipment, air-mover equipment, screening equipment and filling equipment</li> <li>b) Remove production rejects from systems and system components, using high-pressure-water-jet equipment, vacuuming equipment, air-mover equipment, screening equipment and filling equipment</li> <li>c) Clean the interiors of systems and system components, using high-pressure-water-jet equipment, vacuuming equipment, air-mover equipment, screening equipment and filling equipment</li> <li>d) Remove surface impurities, using abrasive, vacuuming and chemical processes, in systems and system components</li> <li>e) Treat surfaces using physical procedures, especially procedures involving high-pressure water jets and abrasive processes</li> <li>f) Remove system components for cleaning purposes, and reinstall them, in keeping with specifications and instructions</li> </ul>		16
2	Maintenance and servicing (Section 22 No. 20)	<ul style="list-style-type: none"> <li>a) Detect any divergences from planned processes</li> <li>b) Replace solid and liquid processing aids in systems</li> <li>c) Remove system components for exchange of processing aids, and reinstall them, in keeping with specifications and instructions</li> </ul>		16