

WASTEWATER TREATMENT PLANT OPERATOR GRADE 1 & 2 EXAMINATION STUDY GUIDE

The following is a general outline to serve as a study guide in preparing for the Grade 1&2 Wastewater Treatment Plant Operators Certification Exam. All subjects may not be covered on every exam but the exam will contain the number of questions in each broad category shown in **bold** type.

1. **General Need to Know - 25 questions**

- | | |
|--|---|
| A Sources of Wastewater - Identification | E General Laboratory and Chemical Knowledge |
| B Wastewater Characteristics - physical, chemical, biological | F Common Parameters and Conversion between them |
| C Wastewater Treatment Processes - sequence, purpose, goals, and impact of each process on wastewater. | G Electrical Concepts |
| D Basic and Applied Math/Safety | H Hydraulics |

2. **Support Systems - 20 questions**

- | | |
|---------------------------------------|--|
| A Mechanical Equipment | F Control Systems |
| B Electrical Equipment | G Chemical Feeders |
| C Engines | H Heating/Ventilation/Air Conditioning |
| D Plumbing | I Preventive Maintenance - Pumps |
| E Measuring Systems & Instrumentation | J Preventive Maintenance - Motors |

3. **Treatment Unit Processes & Process Control - 45 questions**

- | | |
|--|--|
| A Flow Equalization | L Sludge Treatment - Aerobic and Anaerobic Digestion |
| B Preliminary Treatment | M Sludge Treatment - Conditioning |
| C Chemical Pretreatment/Treatment | N Sludge Treatment - Thickening |
| D Primary Treatment - Sedimentation | O Sludge Treatment - Dewatering |
| E Secondary Treatment - Lagoons | P Sludge Treatment - Land Application |
| F Secondary Treatment - Activated Sludge | Q Cross Connections/Collection Systems |
| G Secondary Treatment - Trickling Filters/RBC's | R Flow Measurement |
| H Disinfection | S Sampling & Analysis/ Laboratory Tests |
| I Advanced Treatment - Nitrification/Nitrogen Removal | T Record Keeping |
| J Advanced Treatment General - Filtration/Phosphorous Removal/etc. | |
| K Effluent Disposal and Reuse | |

4. **Supervision & Management - 10**

- | | |
|---|--|
| A Master Planning including Strategies, Objectives, Financial Support and Presentation to Key Personnel | E Process Control Management Systems |
| B Maintenance Management Systems | F Rules and Regulations (Clean Water Act, National Pollution Discharge Elimination System Permits, Maine Wastewater Discharge License Requirements, Occupational Safety and Health Administration rules, etc.) |
| C Emergency Response Systems | |
| D Safety Systems | |

There are several publications which you may find useful as you study for the exam. It is not necessary to study all of these publications to do well on the test. This is by no means a complete list of publications which might help your studies.

Operation of Wastewater Treatment Plants, Volume 1 (The *Sacramento* Course)

Water Environment Federation (formerly the Water Pollution Control Federation) Manuals of Practice #'s 1,4,9,11,16,18,20
Standard Methods for the Examination of Water and Wastewater 16th edition (or later)

MWWCA Laboratory Manual

The NPDES Permit and Maine Wastewater Discharge License for a Wastewater Treatment Facility

WASTEWATER TREATMENT PLANT OPERATOR GRADE 3 EXAMINATION STUDY GUIDE

The following is a general outline to serve as a study guide in preparing for the Grade 3 Wastewater Treatment Plant Operators Certification Exam. All subjects may not be covered on every exam but the exam will contain the number of questions in each broad category shown in **bold** type.

1. General Need to Know - 20 questions

- A. Sources of Wastewater - Identification
- B. Wastewater Characteristics - physical, chemical, biological
- C. Wastewater Treatment Processes - sequence, purpose, goals, and impact of each process on wastewater.
- D. Basic and Applied Math
- E. Safety
- F. General Laboratory and Chemical Knowledge
- G. Common Parameters and Conversion between them
- H. Electrical Concepts
- I. Hydraulics

2. Support Systems - 17 questions

- A. Mechanical Equipment
- B. Electrical Equipment
- C. Engines
- D. Plumbing
- E. Measuring Systems & Instrumentation
- F. Control Systems
- G. Chemical Feeders
- H. Heating/Ventilation/Air Conditioning
- I. Preventive Maintenance - Pumps
- J. Preventive Maintenance - Motors

3. Treatment Unit Processes & Process Control - 48 questions

- A. Flow Equalization
- B. Preliminary Treatment
- C. Chemical Pretreatment/Treatment
- D. Primary Treatment - Sedimentation
- E. Secondary Treatment - Lagoons
- F. Secondary Treatment - Activated Sludge
- G. Secondary Treatment - Trickling Filters/RBC's
- H. Disinfection
- I. Advanced Treatment - Nitrification/Nitrogen Removal
- J. Advanced Treatment General - Filtration/Phosphorous Removal/etc.
- K. Effluent Disposal and Reuse
- L. Sludge Treatment - Aerobic and Anaerobic Digestion
- M. Sludge Treatment - Conditioning
- N. Sludge Treatment - Thickening
- O. Sludge Treatment - Dewatering
- P. Sludge Treatment - Land Application
- Q. Cross Connections/Collection Systems
- R. Flow Measurement
- S. Sampling & Analysis/ Laboratory Tests
- T. Record Keeping

4. Supervision & Management - 15

- A. Master Planning including Strategies, Objectives, Financial Support and Presentation to Key Personnel
- B. Maintenance Management Systems
- C. Management Information Systems
- D. Emergency Response Systems
- E. Safety Systems
- F. Process Control Management Systems
- G. Rules and Regulations (Clean Water Act, National Pollution Discharge Elimination System Permits, Maine Wastewater Discharge License Requirements, Occupational Safety and Health Administration rules, etc.)

There are several publications which you may find useful as you study for the exam. It is not necessary to study all of these publications to do well on the test. This is by no means a complete list of publications which might help your studies.

Operation of Wastewater Treatment Plants, Volume 1 & Volume 2 (The *Sacramento* Course)
Water Environment Federation (formerly the Water Pollution Control Federation) Manuals of Practice #'s 1,4,9,11,16,18,20
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WASTEWATER TREATMENT PLANT OPERATOR GRADE 4 EXAMINATION STUDY GUIDE

The following is a general outline to serve as a study guide in preparing for the Grade 4 Wastewater Treatment Plant Operators Certification Exam. All subjects may not be covered on every exam but the exam will contain the number of questions in each broad category shown in **bold** type.

1. General Need to Know - 15 questions

- A. Sources of Wastewater - Identification
- B. Wastewater Characteristics - physical, chemical, biological
- C. Wastewater Treatment Processes - sequence, purpose, goals, and impact of each process on wastewater.
- D. Basic and Applied Math
- E. Safety
- F. General Laboratory and Chemical Knowledge
- G. Common Parameters and Conversion between them
- H. Electrical Concepts
- I. Hydraulics

2. Support Systems - 14 questions

- A. Mechanical Equipment
- B. Electrical Equipment
- C. Engines
- D. Plumbing
- E. Measuring Systems & Instrumentation
- F. Control Systems
- G. Chemical Feeders
- H. Heating/Ventilation/Air Conditioning
- I. Preventive Maintenance - Pumps
- J. Preventive Maintenance - Motors

3. Treatment Unit Processes & Process Control - 50 questions

- A. Flow Equalization
- B. Preliminary Treatment
- C. Chemical Pretreatment/Treatment
- D. Primary Treatment - Sedimentation
- E. Secondary Treatment - Lagoons
- F. Secondary Treatment - Activated Sludge
- G. Secondary Treatment - Trickling Filters/RBC's
- H. Disinfection
- I. Advanced Treatment - Nitrification/Nitrogen Removal
- J. Advanced Treatment General - Filtration/Phosphorous Removal/etc.
- K. Effluent Disposal and Reuse
- L. Sludge Treatment - Aerobic and Anaerobic Digestion
- M. Sludge Treatment - Conditioning
- N. Sludge Treatment - Thickening
- O. Sludge Treatment - Dewatering
- P. Sludge Treatment - Land Application
- Q. Cross Connections/Collection Systems
- R. Flow Measurement
- S. Sampling & Analysis/ Laboratory Tests
- T. Record Keeping

4. Supervision & Management - 21

- A. Master Planning including Strategies, Objectives, Financial Support and Presentation to Key Personnel
- B. Personnel Systems
- C. Maintenance Management Systems
- D. Management Information Systems
- E. Emergency Response Systems
- F. Safety Systems
- G. Industrial Pretreatment Management
- H. Process Control Management Systems
- I. Direction & Control
- I. Rules and Regulations (Clean Water Act, National Pollution Discharge Elimination System Permits, Maine Wastewater Discharge License Requirements, Occupational Safety and Health Administration rules, etc.)

There are several publications which you may find useful as you study for the exam. It is not necessary to study all of these publications to do well on the test. This is by no means a complete list of publications which might help your studies.

Operation of Wastewater Treatment Plants, Volume 1 & Volume 2 (The *Sacramento* Course)
Water Environment Federation (formerly the Water Pollution Control Federation) Manuals of Practice #'s 1,4,9,11,16,18,20
Standard Methods for the Examination of Water and Wastewater 16th edition (or later)
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WASTEWATER TREATMENT PLANT OPERATOR GRADE 5 EXAMINATION STUDY GUIDE

The following is a general outline to serve as a study guide in preparing for the Grade 5 Wastewater Treatment Plant Operators Certification Exam. All subjects may not be covered on every exam but the exam will contain the number of questions in each broad category shown in **bold** type.

1. General Need to Know - 10 questions

- A. Sources of Wastewater - Identification
- B. Wastewater Characteristics - physical, chemical, biological
- C. Wastewater Treatment Processes - sequence, purpose, goals, and impact of each process on wastewater.
- D. Basic and Applied Math
- E. Safety
- F. General Laboratory and Chemical Knowledge
- G. Common Parameters and Conversion between them
- H. Electrical Concepts
- I. Hydraulics

2. Support Systems - 8 questions

- A. Mechanical Equipment
- B. Electrical Equipment
- C. Engines
- D. Plumbing
- E. Measuring Systems & Instrumentation
- F. Control Systems
- G. Chemical Feeders
- H. Heating/Ventilation/Air Conditioning
- I. Preventive Maintenance - Pumps
- J. Preventive Maintenance - Motors

3. Treatment Unit Processes & Process Control - 52 questions

- A. Flow Equalization
- B. Preliminary Treatment
- C. Chemical Pretreatment/Treatment
- D. Primary Treatment - Sedimentation
- E. Secondary Treatment - Lagoons
- F. Secondary Treatment - Activated Sludge
- G. Secondary Treatment - Trickling Filters/RBC's
- H. Disinfection
- I. Advanced Treatment - Nitrification/Nitrogen Removal
- J. Advanced Treatment General - Filtration/Phosphorous Removal/etc.
- K. Effluent Disposal and Reuse
- L. Sludge Treatment - Aerobic and Anaerobic Digestion
- M. Sludge Treatment - Conditioning
- N. Sludge Treatment - Thickening
- O. Sludge Treatment - Dewatering
- P. Sludge Treatment - Land Application
- Q. Cross Connections/Collection Systems
- R. Flow Measurement
- S. Sampling & Analysis/ Laboratory Tests
- T. Record Keeping

4. Supervision & Management - 30

- A. Master Planning including Strategies, Objectives, Financial Support and Presentation to Key Personnel & Public Relations
- B. Personnel Systems
- C. Maintenance Management Systems
- D. Management Information Systems
- E. Emergency Response Systems
- F. Safety & Plant Security Systems
- G. Industrial Pretreatment Management
- H. Process Control Management Systems
- I. Direction & Control
- I. Rules and Regulations (Clean Water Act, National Pollution Discharge Elimination System Permits, Maine Wastewater Discharge License Requirements, Occupational Safety and Health Administration rules, etc.)

There are several publications which you may find useful as you study for the exam. It is not necessary to study all of these publications to do well on the test. This is by no means a complete list of publications which might help your studies.

Advanced Waste Treatment for California State University

Industrial Waste Treatment for California State University

Water Environment Federation (formerly the Water Pollution Control Federation) Manuals of Practice #'s 1,4,9,11,16,18,20
Standard Methods for the Examination of Water and Wastewater 16th edition (or later)

MWWCA Laboratory Manual

The NPDES Permit and Maine Wastewater Discharge License for a Wastewater Treatment Facility

EXAMINATION STUDY GUIDE FOR CERTIFICATION OF PERSONS SERVICING AND REPAIRING SANITARY WASTE TREATMENT FACILITIES

The following is a general outline to serve as a study guide in preparing for the examination for certification of persons servicing and repairing sanitary waste treatment facilities. All subjects may not be covered on every exam but the exam will contain the number of questions in each broad category shown in **bold type**.

1. General Need to Know - 13 questions

- A. Wastewater Characteristics - physical, chemical, biological
- B. Wastewater Treatment Processes - sequence, purpose, goals, and impact of each process on wastewater.
- D. Basic and Applied Math
- E. Common Parameters and Conversion between them
- F. Electrical Concepts
- G. Hydraulics

2. Support Systems - 10 questions

- A. Plumbing
- B. Pumps, valves and piping
- C. Aeration Systems
- D. Preventive Maintenance - Pumps
- E. Preventive Maintenance - Motors

3. Treatment Unit Processes & Process Control - 18 questions

- A. Preliminary Treatment
- B. Secondary Treatment - Mechanical Package Units
- C. Secondary Treatment - Sand Filters
- D. Disinfection
- E. Effluent Disposal and Reuse
- F. Flow Measurement

4. Regulatory Compliance - 9 questions

- A. Sampling & Analysis / Laboratory Tests
- B. Record Keeping
- C. Reporting
- D. Inspections

There are several publications which you may find useful as you study for the exam. It is not necessary to study all of these publications to do well on the test. This is by no means a complete list of publications which might help your studies.

Maine DEP Overboard Discharge Rules, Guidance Documents, and Newsletters: Available from the Maine DEP, Bureau of Land and Water Quality, Division of Water Resource Regulation Overboard Discharge Program.

Operation of Wastewater Treatment Plants, Volume 1 (The *Sacramento* Course)

Water Environment Federation (formerly the Water Pollution Control Federation) Manuals of Practice #'s 1,4,9,11,16,18,20
Standard Methods for the Examination of Water and Wastewater 16th edition (or later)

MWWCA Laboratory Manual