



Wastewater Facility & Collection System Class D Exam Description

Introduction:

The Minnesota Pollution Control Agency in conjunction with a Steering Team and Sounding Board has developed a Need to Know (N2K) document to identify the criteria for knowledge and skills which Wastewater Facility & Collection System Operators are expected to know. The N2K document was then cross-referenced the current MPCA operator exams in order to provide a comprehensive description of each exam. The percentages provided in this document are intended to serve solely as a study guide for operator exams and should not be used as a weight of the importance or complexity of each knowledge or skill. As the N2K continues to expand, the exams and their descriptions will also be updated.

How to use this document:

The exam questions are first split into two groups: questions testing your management skills (Table I) or questions testing your treatment process knowledge (Table II). Within these groups, questions are organized by learning objectives identified in the N2K. To provide further description, questions testing your treatment process knowledge are also sorted by the treatment process they reference (Table III).

Suggested Study Materials

Manual of Practice No. 11, Operation of Wastewater Treatment Plants
Operation of Wastewater Treatment Plants, Vol 1 & 2, Sacramento State University
Advanced Waste Treatment, Sacramento State University
Recommended Standards for Wastewater Facilities (10-State Standards)
MPCA Wastewater Math Workbook
MPCA Wastewater Treatment Technology Manual

If you have questions or comments on the Exam Description, please contact Matt Rotz, State Program Administrator, at 651-296-6300 or matthew.rotz@state.mn.us.

Table 1: Management Skills Sorted by Learning Objectives

| | | |
|---|---------------|-----------|
| Address Emergency Situations | TOTAL: | 4% |
| Coordinate mutual aid agreements | | |
| Develop emergency plan | | |
| Direct implementation of emergency plan | | |
| Respond to auto dialers/alarms | | |
| Notify regulatory agencies of public health issues (e.g., MPCA, local health department, DNR) | | |
| Repair broken blocked gravity lines | | |
| Repair broken blocked force mains | | |
| Mitigate chlorine spill | | |
| Coordinate emergency equipment repairs (e.g., generators, blowers, pumps) | | |
| Participate in System Improvements | TOTAL: | 0% |
| Address inflow/infiltration issues | | |
| Plan upgrades to existing infrastructure | | |
| Develop construction contract | | |
| Participate in new construction design process | | |
| Inspect new construction (e.g., mains, lift stations, plant) | | |
| Inspect new service connections | | |
| Test new installations (e.g., vacuum, mandrel, pressure) | | |
| Perform Administrative Functions | TOTAL: | 0% |
| Develop facility/collection system budget | | |
| Address customer issues (e.g., backups, odor complaints) | | |
| Address industry user issues (e.g., contributed load, shock loads) | | |
| Manage resources | | |
| Administer grants & loans | | |
| Participate in employee selection and promotion process | | |
| Maintain personnel timesheets | | |
| Maintain personnel files | | |
| Counsel employees | | |
| Complete employee performance evaluations | | |
| Train subordinates | | |
| Participate in meetings (e.g., public, department) | | |
| Maintain replacement parts inventory | | |
| Maintain plant security | | |
| Schedule contract maintenance | | |
| Conduct plant tours | | |
| Manage public relations | | |
| Prepare expense reimbursement reports | | |
| Purchase operational supplies (e.g., office, lab, chemicals) | | |
| Assist in development of sewer use ordinance | | |
| Assist in development of local wastewater rules & regulations | | |
| Enforce local wastewater rules & regulations | | |
| Enforce state wastewater rules & regulations | | |
| Management Skills TOTAL: | | 4% |

Table II: Treatment Process Knowledge Sorted by Learning Objectives

| | |
|---|-----|
| Understand Purpose of Treatment | 13% |
| Understand Method of Treatment | 12% |
| Identify Advantages and Disadvantages vs Other Treatment Options | 1% |
| Describe Position of Treatment Unit in Treatment Process | 0% |
| Identify Types of Treatment Units | 1% |
| Describe Parts of Treatment Unit | 2% |
| Identify Design Modifications of Treatment Unit | 0% |
| Execute Process Control and Operation of Treatment Unit | 9% |
| Employ Treatment Process Control Formulas | 14% |
| Complete Recommended Maintenance Protocol for Treatment Unit | 11% |
| Describe Flow Patterns of Treatment Process | 4% |
| Analyze Factors which Influence Treatment Process | 6% |
| Describe Biological Life and Processes as Part of Treatment | 7% |
| Execute Sampling Methods, Lab Tests and Protocol of Treatment Process | 9% |
| Identify Personal Health and Safety Hazards of Treatment Process | 6% |
| Describe Methods and Purpose of Keeping Records of Treatment Process | 1% |
| Identify Applicable Regulations of Treatment Process | 2% |
| Treatment Process Knowledge TOTAL: 97% | |

Table III: Treatment Process Knowledge Sorted by Process

| | |
|---|------------|
| Preliminary Treatment TOTAL | 8% |
| Chemical pretreatment | 0% |
| Grinding & disposal | 0% |
| Grit separation & removal | 4% |
| Pre-Aeration | 0% |
| Screening | 2% |
| Primary Treatment TOTAL | 1% |
| Primary clarification | 1% |
| Secondary Treatment TOTAL | 41% |
| Aerated pond stabilization | 5% |
| Biological aerated filtration | 1% |
| Oxidation ditch | 1% |
| Pond stabilization | 26% |
| Rapid infiltration basin | 1% |
| Rotating biological contactors | 1% |
| Secondary clarification | 2% |
| Activated sludge | 1% |
| Submerged batch reaction | 1% |
| Subsurface disposal | 1% |
| Trickling filtration | 1% |
| Tertiary Treatment TOTAL | 0% |
| Filtration | 0% |
| Nutrient Removal TOTAL | 0% |
| Nitrogen removal | 0% |
| Phosphorus removal | 0% |
| Disinfection TOTAL | 8% |
| Chlorination / Dechlorination | 6% |
| UV disinfection | 2% |
| Biosolids Digestion & Handling TOTAL | 0% |
| Aerobic sludge digestion | 0% |
| Anaerobic sludge digestion | 0% |
| Biosolids dewatering | 0% |
| Biosolids removal | 0% |
| Biosolids reuse | 0% |
| Biosolids stabilization | 0% |
| Collection System Pumps & Valves TOTAL | 26% |
| SSTS TOTAL | 8% |
| Spray Irrigation TOTAL | 4% |

Treatment Process Knowledge TOTAL: 97%