

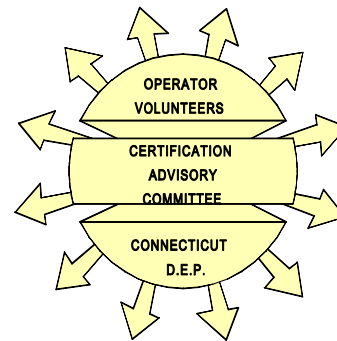
CONNECTICUT WASTEWATER OPERATOR CERTIFICATION GUIDELINES

March 2005



DEPARTMENT OF
ENVIRONMENTAL PROTECTION
79 Elm Street
Hartford, Connecticut, 06106-5127

Gina McCarthy, Commissioner



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Wastewater Operator Certification Guidelines

by
The State of Connecticut Certification Advisory Committee

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prepared and distributed by
The State of Connecticut Certification Advisory Committee
and
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Connecticut Wastewater Operator Certification Guidelines

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Connecticut Wastewater Operator Certification Guidelines

In 1969, the qualifications of operators of “volume reduction plants” (wastewater treatment plants) were subject to approval by the Commissioner of the State Department of Health. The statutes have essentially been amended three times since then, on June 6, 1974, to shift the burden of approval of operators qualifications to the Department of Environmental Protection (DEP), on June 25, 1984, to change to the four levels of plant classifications, and on June 5, 2000 to add direct responsible charge (DRC) opportunities and educational requirements.

This booklet has been assembled to answer the questions asked most often by wastewater treatment plant operators. The information within this booklet is intended to be a supplement to the Department of Environmental Protection Regulations 22a-416-1 to 10 (attached as Appendix C).

If you wish to have a question answered that this booklet does not address, please contact the DEP Wastewater Operator Certification Section at the address below or any of the members of the Connecticut Wastewater Operator Certification Advisory Committee at their number below:

Wastewater Operator Certification Section (860) 424-3755

Bureau of Water Management
Planning and Standards Division
79 Elm Street
Hartford, Connecticut 06106-5127

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GENERAL OVERVIEW OF WASTEWATER CERTIFICATION PROGRAM

Throughout the United States, there are three types of Wastewater Certification programs: Operator, Collection System and Lab Analyst. Currently in Connecticut, Wastewater Operator Certification is the only type required by regulation, however, the other two are strongly recommended. Certification is obtained by meeting certain experience, education and exam criteria.

There are four levels of Operator Certification, Classes I through IV (lowest to highest). In order to qualify to take a Connecticut DEP-sponsored exam, an applicant must fully complete an application detailing how they meet the experience and education requirements appropriate for that particular class of exam. Once an exam is passed, a certificate is then issued, except in the case of an operator-in-training. In the case of an operator-in-training, a certificate is issued when the operator provides documentation of having fulfilled the experience requirement. In some instances, extra education may be applied toward a portion of the experience requirement, and extra direct responsible charge experience may be applied toward a portion of the education requirement. While the regulations require that exams be given once per year, the practice has been that exams are given in January and July of each year.

The original intent of the certification program was to assure competent superintendents and shift operators for wastewater treatment plants of various types and complexities. By being certified in a particular class, you are also legally qualified to be a superintendent of ANY plant of that class or lower. Therefore, stringent criteria were developed for each class. Due to the increasing complexity of new facilities, the intent has now grown to certification of all operators in the field at the minimum of Class I. The requirements for each class of certification are based on the different levels of sophistication of each plant. Operators are also encouraged to become certified at levels above their job requirements to plan for future advancement and for personal gratification.

OIT applicants may apply to take the Class I, II or III exam without meeting the experience requirements. A successful applicant that passes the exam is required to present to the DEP proof of having fulfilled the experience requirements prior to being issued the appropriate certificate. A valid certificate must be issued before the applicant is able to assume duties requiring that Class of certification.

An out-of-state operator who holds a comparable certification from another state may apply for reciprocity. The minimum requirements on page 8 must be met and documented.

The certificate of an operator who has been away from the biological wastewater treatment field for more than two years shall become inactive. Reissuance of the certificate shall be made after the operator meets the minimum requirements on page 8 including the passing of the applicable class exam.

The Certification Advisory Committee (CAC) is made up of operators, educators and State DEP personnel. The major functions of the CAC are to review the classification of WWTFs, encourage all operators to become certified, promote regular wastewater treatment plant operator training schools and programs, review exam questions, assist with revision and development of regulations, assist with reciprocity review and revocation of certificates.

Any operator with questions or concerns about certification issues may contact any member of the CAC. The CAC meetings are public meetings and are typically held monthly.

COMMON APPLICATION MISTAKES

Please be sure to follow **all** of the application instructions **exactly** as stated.

Mail your application in **early**. If you send in an incomplete application close to the deadline you are not allowing us any time to review the application and notify you of deficiencies that you can correct prior to the deadline. You will lose the application fee if your application is deficient and not corrected prior to the deadline.

Do **not** mail or deliver your application after the deadline as you may lose the application fee and your application will not be reviewed.

Please read the application instructions carefully to determine whether or not you can successfully apply for the certification you want. There is a condensed list of the educational and experience requirements in the application as well as on pages 8 and 12 of this guidance document. You may call the DEP Wastewater Operator Certification Section at (860) 424-3755 or 424-3704 to discuss application details.

Make sure you include transcripts for all college courses taken and certificates for all other training or courses you have taken. The certificates must include the CEUs or total contact hours (TCHs) as part of the certificate as originally printed. If you cannot document CEUs or TCHs we cannot grant you CEUs.

Make sure that you have fulfilled and properly documented the CEUs that must be directly related to the operation of a WPCF.

If you are relying on direct responsible charge experience (DRC) in your application, make sure that you have proper documentation (original signature on letterhead) from the **owner** of the facility where you earned the DRC.

OVERVIEW OF TRAINING

Wastewater Treatment Facilities (WWTFs) must establish high standards for their staffs. New operational hires must have a minimum of a high school degree, nine CEUs of DEP approved wastewater courses, the ability to perform simple math and geometric calculations, be able to continuously learn throughout their career and become at least Class I certified within 24 months of their date of hire. Employers must hire operating staff who are capable of mastering the complexity of a modern Wastewater Treatment Plant and the higher-level training required for acquiring and maintaining certification. In order to support the above, the employer must pay wages adequate to attract and retain such staff.

It is the responsibility of the individual to acquire whatever training is required to meet the educational requirements to take and pass the certification exams. In as much as it is the employer's responsibility to hire and retain competent and well-trained staff, this requires the employer to provide in-house training and/or adequately fund out-of-house training. The Department of Environmental Protection will encourage the availability of appropriate training in the State and has provided a partial listing of pre-approved training programs, correspondence, post-high school and college courses beginning on page 15. The Department of Environmental Protection will not provide or encourage courses designed to merely "pass" the certification exams.

Continuing Education Unit (CEU's) can be made up of post-high school education, both formal and informal. Personnel are encouraged to accumulate the majority of CEU's through formal college education and formal training programs with exams. However, correspondence courses and contact hours at seminars, local and plant training programs are valuable and may also be used if previously approved by the Department of Environmental Protection. While it is likely that the applicant will need college course work to meet the CEU requirements for Class III and IV certification levels, a college degree is not required.

If you are not able to home study very well or are unsure of learning on your own, the community college approach may be better because with the college program you can get help from either your instructor and/or other operators in your class on the chapters covered and not covered in class. Another benefit observed by Department staff in the review of the exam results was that the pass rate was typically higher amongst those operators that went through the trainer taught courses.

CEUs for a "Sac" course given at a college or adult education facility are usually less than the CEUs available from California State University at Sacramento (CSUS). This may be because the "Sac" courses taught at colleges may not cover all chapters in the "Sac" manual. In addition, credit is given only for classroom time and not for homework time. Three (3) college credits is equivalent to 4.8 CEUs ($1.6 \text{ CEUs/credit} \times 3 \text{ credits} = 4.8 \text{ CEUs}$).

CSUS concluded that after extensive testing that a "Sac" manual typically takes 90 contact or training hours to complete including "homework". Please note that based upon a national educational standard, 1 CEU equals 10 contact or training hours, therefore a 90 hour "Sac" course is worth 9.0 CEUs.

If you want to receive 9.0 CEUs for the class you only need to complete the entire textbook i.e. those chapters not completed in class and submit it to CSUS for certificate accreditation.

Please be aware that the DEP will not maintain training records, therefore, it is the responsibility of the applicant to provide DEP with satisfactory documentation of his or her education and training, complete with course description, hours, source, teachers' names, grades, etc. See page 9 for more details.

OVERVIEW OF MINIMUM EDUCATIONAL AND EXPERIENCE REQUIREMENTS FOR WASTEWATER CERTIFICATION

Evidence of having met the following minimum requirements are necessary for a successful application for examination at the level indicated.

| | <u>Educational Requirements</u> | <u>Experience Requirements</u> | <u>Substitution of Education for Experience & Substitution of Experience for Education</u> |
|------------------|--|--|--|
| Class I | High school diploma (or GED) and 9 CEUs in a DEP approved WWTF operation course.* | One year in the operation of a Class I or higher WWTF. | No substitution for experience. |
| Class II | High school diploma (or GED) and 30 CEUs of post-high school education in a field DEP determines is related to the operation of a WWTF.* | Three years in the operation of a Class I or higher WWTF. | Post-high school education may be substituted for up to a maximum of one and a half years (50%) of the experience required by using 45 CEUs as being equivalent to one year of full time post-high school education. |
| Class III | High school diploma (or GED) and 90 CEUs or two years of post-high school education in a field DEP determines is related to the operation of a WWTF.* | Four years in the operation of a Class II or higher WWTF. | A maximum of four months of experience as Chief Operator of a Class II WWTF or four months of DRC experience at a Class III WWTF may be substituted for up to 15 CEUs of post-high school education. Post-high school education may be substituted for up to two years (50%) of the experience required. In all cases, 45 CEUs is equivalent to one year of post-high school education. |
| Class IV | High school diploma (or GED) and 135 CEUs or three years of post-high school education in a field DEP determines is related to the operation of a WWTF.* | Four years in the operation of a Class III or IV WWTF, of which two of those years must be as Chief Operator or as a Shift or Process Control Operator of a Class IV WWTF. | A maximum of eight months of experience as Chief Operator of a Class III WWTF or eight months of DRC experience at a Class IV WWTF may be substituted for up to 30 CEUs of post-high school education. Post-high school education may be substituted for up to two years (50%) of the experience required. In all cases, 45 CEUs is equivalent to one year of post-high school education. Education cannot be substituted for direct responsible charge time. |

IMPORTANT!!! Education substituted for operating experience **cannot** be used to fulfill the education requirement **nor** can experience substituted for post-high school education be used to fulfill the experience requirement.

*Please refer to page 12 and Appendix C: DEP Regulations Section 22a-416-4 for more details.

OVERVIEW OF CONTINUING EDUCATION UNITS (CEUs)

What are CEUs?

CEUs are a nationally recognized unit of measuring one's educational accomplishments. There is a relationship between CEUs, contact hours and credit hours.

How to calculate CEUs:

- 48 contact hours equals 4.8 CEUs equals 3 credit hours (a typical college course).

This means that 10 contact hours equal 1 CEU. You can determine the number of CEUs from credit hours by multiplying by a factor of 1.6. Therefore, a 3 credit hour course equals 4.8 CEUs.

Where and how can CEUs be earned?

Some of the many ways Continuing Education Units (CEU's) in wastewater related topics can be accumulated by wastewater personnel are through in-service training, correspondence courses, manufacturers' training, training from federal, state and local governmental agencies, post-high school courses and college level courses.

A listing of pre-approved training, correspondence, post-high school and college level courses and programs are included beginning on page 15. If an operator wants to take any training or course not pre-approved, it is strongly suggested that the operator request that the **instructor** or sponsoring group obtain prior approval by submitting all of the following information to the DEP Certification Section (a sample letter is on page 14):

- Course name,
- subject(s) to be covered,
- lesson plan or agenda of training or course content,
- handouts, lecture materials and other documentation of a curriculum,
- instructors' qualifications for teaching the training or course and
- indicate whether or not some testing is done at the end or throughout the training or course.

As you secure CEUs, make certain that they fit an educational plan for you. A **suggested** educational program outline is included on page 12.

Training Records

The DEP does not keep individual training records of each of the more than 750 operators in the state, only records of certification. It is the applicant's responsibility to keep complete, accurate and detailed records of all satisfactorily completed training and course work so as to avoid confusion if questions arise when an application to be tested for higher certification is submitted.

The following information must be submitted with those applications in the form of a certificate or letter signed by the instructor:

- Date, location and subject(s) covered by the training or course,
- total contact hours or CEUs completed and
- verification that the applicant satisfactorily completed the training or course.

For training where CEUs or contact hours are not listed, DEP will award 0.6 CEUs or 6 contact hours for any course listed as a full day.

Not recognized for CEUs:

- Review, refresher and repeated (other than the original one) courses,
- any courses with a D or F for a final grade,
- the time instructors spend teaching any course and
- attendance at a conference or product show.

SUGGESTED EDUCATIONAL PROGRAM FOR WASTEWATER CERTIFICATION

Background

The State of Connecticut Department of Environmental Protection (DEP) is required to oversee the wastewater operator certification program as defined under Sections 22a-416-1 through 22a-416-10 of the Regulation of Connecticut State Agencies. In addition to defining the minimum operating experience requirement for each Class, the regulations define the educational requirement for operators in terms of Continuing Education Units (CEUs). Under the existing regulations, all operators seeking certification must meet the CEU requirement for all Classes prior to applying for the exam as shown in Table 1 on the next page.

The regulations further stipulate that the CEUs must be in wastewater treatment related course work. Since there can be confusion as to what courses are available and what may be approved by DEP, we have prepared Table 1 on the next page to provide an example of a suggested educational program.

Year after year of certification exams has shown that there is a general weakness in mathematics for many operators. Other apparent weaknesses have led the DEP to look for a balanced curriculum that includes a combination of courses and training. In the past, operators with educational backgrounds following a balanced curriculum have performed better on all levels of examination than operators with educational backgrounds that are limited to one or two subjects. For additional information, contact Joe Nestico, DEP Certification Coordinator, at (860) 424-3755.

What is a DEP-Approved Wastewater Technology Course?

The DEP recognizes a variety of formalized wastewater courses. These include courses, such as the wastewater treatment-specific courses administered by Gateway Community College and possibly other Connecticut Community Colleges, NEIWPC, Michigan State University, University of California - Sacramento, WEF or through a **well-documented** in-house formal training program taught by a qualified instructor. A partial list of DEP pre-approved training, correspondence, post-high school and college courses and programs are included beginning on page 15.

Please note that it is up to the applicant to provide satisfactory documentation to the DEP as part of the application to be admitted to the exam. Please make sure that all training received is well documented to allow DEP to evaluate whether the training meets the criteria defined in the regulations. One “smart” method to ensure that the applicant receives the proper training is for the applicant to request that the instructor or sponsoring group seek DEP approval **prior to taking that course**. See page 9 for more details.

What does a curriculum “Related to Wastewater Treatment” contain?

Table 1 presents a general idea of curricula that the DEP most likely would approve as “related to wastewater treatment”. Refer to pages 15 on for training, correspondence, post-high school and college courses related to Wastewater Treatment.

Table 1

Suggested DEP-Approvable Curricula for WWTF Operator Certification

| Curricula | Description | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|------------------------------------|-------------------------------|---|-------------------------|---|-------------------|--|----------------------------|--|-------------------------------------|--|-----|--|-----|---|-----|---|-----|---|-----|---|------------|-------------------|-------------|
| Class I required <u>minimum</u> 9 CEUs | Basic Wastewater Technology courses that equal or exceed 9 CEUs such as the WEF Activated Sludge Process Control (2 CEUs) combined with the WEF Operations Training Wastewater Treatment course (4 CEUs) WEF Pumps: Operation and Maintenance (2 CEUs) and WEF Solids Handling course (1.5 CEUs) or the University of California - Sacramento "Operation of Wastewater Treatment Plants - Vol 1" (9 CEUs). However, for those operators who plan to obtain higher certification, we highly recommend that they enroll in the Wastewater Treatment Certificate Program at Gateway Community College and other Connecticut Community Colleges. | | | | | | | | | | | | | | | | | | | | | | | | |
| Class II required <u>minimum</u> 30 CEUs | Out of the total 30 CEUs required, operators should include basic courses and one or more advanced courses to meet a required 18 CEUs in Wastewater Technology. Suggested Wastewater Technology courses are those in the Wastewater Treatment Certificate Program at Gateway Community College, the University of California - Sacramento "Operation of Wastewater Treatment Plants - Vol 1 and Vol 2" (9 CEUs each) or other wastewater courses from the list starting on page 15. Other CEUs to achieve the minimum of 30 could include elements under the "90 CEU" or "135 CEU" Curriculums described below. It is highly recommended that math courses be included as it is a recurring area of weakness. | | | | | | | | | | | | | | | | | | | | | | | | |
| Class III required <u>minimum</u> 90 CEUs of which 27 CEUs shall be directly related to the operation of a WPCF | <p>The following combination of course work is an example of what will meet with DEP approval for the 90 CEU requirement:</p> <table border="0"> <thead> <tr> <th align="left"><u>Course Type</u></th> <th align="right"><u>Total CEUs</u></th> </tr> </thead> <tbody> <tr> <td>5 Wastewater technology courses (9 CEUs each)</td> <td align="right">45.0</td> </tr> <tr> <td>2 College English courses (e.g., Composition & Technical Writing)</td> <td align="right">9.6</td> </tr> <tr> <td>2 College mathematics courses (e.g., Algebra and Geometry)</td> <td align="right">9.6</td> </tr> <tr> <td>2 College biology courses (e.g., Basic and Microbiology)</td> <td align="right">9.6</td> </tr> <tr> <td>1 College chemistry course (including lab)</td> <td align="right">6.4</td> </tr> <tr> <td>1 Adult education computer course (e.g., Use of Windows)</td> <td align="right">2.4</td> </tr> <tr> <td>8 Different topics of in-house training programs (4 Contact Hours each)</td> <td align="right">3.2</td> </tr> <tr> <td>4 Documented attendances at seminars (0.6 CEU each)</td> <td align="right">2.4</td> </tr> <tr> <td>3 Documented attendances at manufacturer's training courses (0.4 CEUs each)</td> <td align="right">1.2</td> </tr> <tr> <td>1 Safety course (e.g., Basic First Aid)</td> <td align="right"><u>1.6</u></td> </tr> <tr> <td>TOTAL CEUs</td> <td align="right">91.0</td> </tr> </tbody> </table> | <u>Course Type</u> | <u>Total CEUs</u> | 5 Wastewater technology courses (9 CEUs each) | 45.0 | 2 College English courses (e.g., Composition & Technical Writing) | 9.6 | 2 College mathematics courses (e.g., Algebra and Geometry) | 9.6 | 2 College biology courses (e.g., Basic and Microbiology) | 9.6 | 1 College chemistry course (including lab) | 6.4 | 1 Adult education computer course (e.g., Use of Windows) | 2.4 | 8 Different topics of in-house training programs (4 Contact Hours each) | 3.2 | 4 Documented attendances at seminars (0.6 CEU each) | 2.4 | 3 Documented attendances at manufacturer's training courses (0.4 CEUs each) | 1.2 | 1 Safety course (e.g., Basic First Aid) | <u>1.6</u> | TOTAL CEUs | 91.0 |
| <u>Course Type</u> | <u>Total CEUs</u> | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 Wastewater technology courses (9 CEUs each) | 45.0 | | | | | | | | | | | | | | | | | | | | | | | | |
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| 1 Safety course (e.g., Basic First Aid) | <u>1.6</u> | | | | | | | | | | | | | | | | | | | | | | | | |
| TOTAL CEUs | 91.0 | | | | | | | | | | | | | | | | | | | | | | | | |
| Class IV required <u>minimum</u> 135 CEUs of which 27 CEUs shall be directly related to the operation of a WPCF | <p>A formalized Wastewater Technology degree program that includes the following courses:</p> <table border="0"> <tbody> <tr> <td>- Basic and advanced WW Technology</td> <td>- Basic and applied chemistry</td> </tr> <tr> <td>- General and applied mathematics</td> <td>- Sanitary microbiology</td> </tr> <tr> <td>- Composition</td> <td>- Applied physics</td> </tr> <tr> <td>- Applied hydraulics</td> <td>- Technical report writing</td> </tr> <tr> <td>- WWTF cooperative</td> <td>- Blueprint reading and/or drafting</td> </tr> <tr> <td>- Basic electrical and/or maintenance</td> <td></td> </tr> </tbody> </table> | - Basic and advanced WW Technology | - Basic and applied chemistry | - General and applied mathematics | - Sanitary microbiology | - Composition | - Applied physics | - Applied hydraulics | - Technical report writing | - WWTF cooperative | - Blueprint reading and/or drafting | - Basic electrical and/or maintenance | | | | | | | | | | | | | |
| - Basic and advanced WW Technology | - Basic and applied chemistry | | | | | | | | | | | | | | | | | | | | | | | | |
| - General and applied mathematics | - Sanitary microbiology | | | | | | | | | | | | | | | | | | | | | | | | |
| - Composition | - Applied physics | | | | | | | | | | | | | | | | | | | | | | | | |
| - Applied hydraulics | - Technical report writing | | | | | | | | | | | | | | | | | | | | | | | | |
| - WWTF cooperative | - Blueprint reading and/or drafting | | | | | | | | | | | | | | | | | | | | | | | | |
| - Basic electrical and/or maintenance | | | | | | | | | | | | | | | | | | | | | | | | | |
| AS/BS Degrees | AS and BS Degrees in a science-related field including biology, chemistry, engineering, physics, oceanography or other earth sciences will be reviewed to determine what coursework is in a field related to the operation of a wastewater treatment facility as well as what coursework fulfills the 27 CEUs <u>directly</u> related to the operation of a wastewater treatment facility. | | | | | | | | | | | | | | | | | | | | | | | | |

OVERVIEW OF RECIPROCITY OF WASTEWATER TREATMENT PLANT OPERATOR CERTIFICATES

If one wishes to be considered for a Connecticut Wastewater Treatment Plant Operator Certificate based on certification from another state, a completed application must be submitted to the Department of Environmental Protection by the operator prior to being employed at a Connecticut WWTF. If such application is approved then a certificate of the appropriate class will be issued once the applicant provides evidence of being offered (**not begun**) employment at a Connecticut wastewater treatment plant.

The applicant must meet the following three requirements and provide evidence of such along with the application:

1. meet all of the present educational requirements for the requested Class (see pages 8, 12 and DEP Regulations Section 22a-416-4 for more details),
2. meet all of the present experience requirements for the requested Class (see pages 8, 12 and DEP Regulations Section 22a-416-4 for more details):

Summary of educational and experience requirements:

Class I High school diploma (or GED) and 9 CEUs of post-high school education in wastewater operations. One year in the operation of a Class I or higher WWTF.

Class II High school diploma (or GED) and 30 CEUs of post-high school education in a wastewater related field 18 CEUs of which shall be directly related to the operation of a WWTF. Three years in the operation of a Class I or higher WWTF.

Class III High school diploma (or GED) and 90 CEUs (two years) of post-high school education in a wastewater related field, 27 CEUs of which shall be directly related to the operation of a WWTF. Four years in the operation of a Class II or higher WWTF.

Class IV High school diploma (or GED) and 135 CEUs (three years) of post-high school education in a wastewater related field, 27 CEUs of which shall be directly related to the operation of a WWTF. Four years in the operation of a Class III or higher WWTF of which two years shall be as Chief Operator of a Class III WWTF or DRC at a Class IV WWTF.

3. provide evidence of having passed an appropriate written examination proctored by the state that certification is presently from.

All applications are reviewed in a consistent manner against the three requirements above. The Department of Environmental Protection conducts an initial review on each reciprocity application submitted. If the applicant **clearly** does not meet all of the minimum requirements during the initial review, the request is rejected and the applicant notified.

If it is certain that the applicant meets the minimum requirements, the application is brought up to a subcommittee of the CAC for a decision. If it is uncertain whether the applicant meets the minimum requirements, the application is brought up to the full CAC for a decision. In both cases, once a decision is reached, the applicant is notified.

SAMPLE PREAPPROVAL REQUEST LETTER

Wastewater Operator Certification Section
Department of Environmental Protection
Bureau of Water Management
Planning and Standards Division
79 Elm Street
Hartford, Connecticut 06106-5127

June 20, 2005

The OSDS Sewer District is sponsoring a wastewater process control class beginning on September 3. The details on the course are as follows:

Name: Wastewater Process Control

Sponsor: CWPAA

Instructor: Bob Trainer, qualifications can be found in an attached letter.

Subjects: Activated sludge process control.

Materials: Lesson plan and course materials are attached.

Time: The course will be given for 1 day a week for 8 weeks for a total of 32 hours.

Exam: There will be an exam given at the end of the class.

Certificates: Certificates will be issued to those who successfully complete the course.

Please review the above information and assign the appropriate CEUs. If you have any questions or require any other information, please call me at (203) 555-5555.

Sincerely,

Bob Superintendent
OSDS Sewer District

AVAILABLE EDUCATIONAL RESOURCES

The following list of educational programs are available to you for your current and future endeavors in achieving wastewater operator certification in Connecticut. Please note that the order in which the courses are presented to you are not indicative of an endorsement or preference by the Department of Environmental Protection. In addition, please note the following:

Course guidance

The course(s) that you choose may or may not solve your particular educational need, therefore, attain help in developing an effective course program before you enroll. A **suggested** educational program outline is included on page 12.

Choosing a course

Whether you have post-high school education or not, you shouldn't choose a course **just** because it is of short duration (1 or 2 days) and deals directly with wastewater (e.g., math refresher or process control). You first may need to work on the fundamental courses (e.g., English, math, science, wastewater) to be able to fully understand the material taught in an intensive short duration course.

Effective use of your exam results

If you are unable to pass or come close to passing a wastewater exam within the first or second attempts, you may need to change the direction of your educational program toward solving your examination needs. An educational program needs to be designed to help you to **learn the concepts** of wastewater and not just the answers to specific problems in wastewater.

Satisfying the educational requirements

The Connecticut regulations require CEUs for all the Class certificates, not just the Class III & IV. It may best benefit you to enroll in or develop an educational program that not only achieves a balance to your wastewater needs but also does it in an effective and timely manner. In brief, you may have to go to school after work hours to do this.

Appendix A - Listing of **pre-approved** programs and courses.

Appendix B - Listing of programs, courses and training **not approved** as of this date. The addition of any program, course or training in this list to the pre-approved list in Appendix A may require more documentation as outlined on page 9.

APPENDIX A

PRE-APPROVED

PROGRAMS AND COURSES

PRE-APPROVED

BOARD OF TRUSTEES
CONNECTICUT COMMUNITY COLLEGES
61 Woodland Street
Hartford, CT 06504
Phone # (860) 725-6612, Fax # (860) 566-1308

In collaboration with the Department of Environmental Protection, the Community Colleges developed two Wastewater Certificate Programs that prepare students for certification as a Wastewater Operator. [Capital](#), [Gateway](#), [Naugatuck Valley](#), Northwestern, and [Three Rivers](#) Community Colleges also offer an Environmental Science Associate Degree with a Wastewater Option.

Enrollment in a structured educational program is highly recommended for wastewater treatment plant operators intending to advance to higher levels of certification.

For a schedule of classes and current course offerings, contact your local Community College. Updated contacts are available on the web at www.commnet.edu/colleges.

The following is an outline of the Wastewater Certificate Programs:

WASTEWATER CERTIFICATE PROGRAM

| | <u>COURSE TITLE</u> | <u>HOURS</u> | | <u>CREDITS</u> | <u>CEUs</u> |
|--------------------------------------|---------------------------|--------------|------------|----------------|-------------|
| | | <u>LEC</u> | <u>LAB</u> | | |
| <u>SEMESTER I</u> | College Algebra | 3 | 0 | 3 | 4.8 |
| | Biology | 3 | 2 | 4 | 6.4 |
| | Introduction to Computers | 3 | 0 | 3 | 3.2 |
| | Wastewater I | 3 | 0 | 3 | 4.8 |
| | Wastewater II | <u>3</u> | <u>0</u> | <u>3</u> | <u>4.8</u> |
| Semester Total | | 15 | 2 | 16 | 25.6 |
| <u>SEMESTER II</u> | English Composition | 3 | 0 | 3 | 4.8 |
| | Chemistry I | 3 | 2 | 4 | 6.4 |
| | Wastewater III | 3 | 0 | 3 | 4.8 |
| | Wastewater IV | <u>3</u> | <u>0</u> | <u>3</u> | <u>3.2</u> |
| Semester Total | | <u>12</u> | <u>2</u> | <u>13</u> | <u>20.8</u> |
| WASTEWATER CERTIFICATE TOTALS | | 27 | 4 | 29 | 46.4 |

ADVANCED WASTEWATER CERTIFICATE PROGRAM

| <u>SEMESTER I</u> | <u>COURSE TITLE</u> | <u>CREDITS</u> | <u>CEUs</u> |
|--------------------------------------|-------------------------------|----------------|-------------|
| | Trigonometric Functions | 3 | 4.8 |
| | Electrical Applications & Lab | 3 | 4.8 |
| | General Psychology | 3 | 4.8 |
| | Adv. Wastewater I | 3 | 4.8 |
| | Directed Elective | <u>3</u> | <u>4.8</u> |
| Semester Total | | 15 | 25.6 |
| | | | |
| <u>SEMESTER II</u> | <u>COURSE TITLE</u> | <u>CREDITS</u> | <u>CEUs</u> |
| | Environmental Regulations | 3 | 4.8 |
| | Directed Elective | 3 | 4.8 |
| | Adv. Wastewater II | 3 | 4.8 |
| | Directed Elective | <u>3</u> | <u>4.8</u> |
| Semester Total | | <u>12</u> | <u>20.8</u> |
| WASTEWATER CERTIFICATE TOTALS | | 27 | 43.2 |

ENVIRONMENTAL SCIENCE ASSOCIATES DEGREE

Wastewater Option

| <u>COURSE TITLE</u> | <u>CREDITS</u> | <u>CEUs</u> |
|---------------------------------------|----------------|--------------|
| Composition | 3 | 4.8 |
| College Algebra | 3 | 4.8 |
| Environmental Regulations | 3 | 4.8 |
| Introduction to Hazardous Materials | 3 | 4.8 |
| General Chemistry I | 4 | 6.4 |
| Statistics with Technology | 3 | 4.8 |
| Electrical Applications | 3 | 4.8 |
| Introduction to Software Applications | 3 | 4.8 |
| General Chemistry II | 4 | 6.4 |
| Environmental Science | 4 | 6.4 |
| Literature and Composition | 3 | 4.8 |
| Communications | 3 | 4.8 |
| Wastewater I | 3 | 4.8 |
| Wastewater II | 3 | 4.8 |
| Arts and Humanities | 3 | 4.8 |
| Social Science | 3 | 4.8 |
| Wastewater III | 3 | 4.8 |
| Wastewater IV | 3 | 4.8 |
| Behavioral Science | 3 | 4.8 |
| Directed | 3 | 4.8 |
| Directed | <u>3</u> | <u>4.8</u> |
| TOTAL FOR A.A.S. DEGREE | 66 | 105.6 |

PRE-APPROVED

New England Interstate Water Pollution Control

Boott Mills South
100 Foot of John Street
Lowell, MA 01852
978-323-7929
www.neiwpcc.org

Many of the courses that NEIWPCCC provides are pre-approved for Connecticut operators. A partial list follows:

| | |
|--|---------|
| Activated Sludge w/ Math | 12 TCHs |
| Basic Wastewater Treatment w/applied math | 12 TCHs |
| Care of Emergency Generators | 6 TCHs |
| Instrument Measurement & Control w/ Intro to SCADA | 6 TCHs |
| Laboratory Procedures | 9 TCHs |
| O&M of Wastewater Collection Systems | 15 TCHs |
| Sampling Procedures | 6 TCHs |

For complete information on training programs and the current course schedules, contact NEIWPCCC at 978-323-7929, on-line at www.neiwpcc.org or via email at training@neiwpcc.org.

PRE-APPROVED CORRESPONDENCE COURSES

WATER ENVIRONMENT FEDERATION (WEF)
601 Wythe Street
Alexandria, VA 22314-1994
(703) 684-2400
www.wef.org

| <u>COURSE NAME</u> | <u>CEUs</u> |
|--|-------------|
| Activated Sludge Process Control | 2.0 |
| Operations Training Wastewater Treatment | 4.0 |
| Pumps: Operation & Maintenance | 2.0 |
| Solids Handling | 1.5 |

PRE-APPROVED CORRESPONDENCE COURSES

CALIFORNIA STATE UNIVERSITY
SACRAMENTO
Office of Water Programs
CSU, Sacramento
6000 J Street
Sacramento, California
(916) 278-6142
www.owp.csus.edu

| <u>COURSE TITLE</u> | <u>CEUs</u> |
|--|-------------|
| Small Wastewater System O/M, Vol. 1 | 9.0 |
| Small Wastewater System O/M, Vol. 2 | 9.0 |
| Operation of Wastewater Treatment Plant, Vol. 1 | 9.0 |
| Operation of Wastewater Treatment Plants, Vol. 2 | 9.0 |
| Advanced Waste Treatment | 9.0 |
| Industrial Waste Treatment, Vol. 1 | 9.0 |
| Industrial Waste Treatment, Vol. 2 | 9.0 |
| Pretreatment Facility Inspection | 9.0 |
| Treatment of Metal Wastestreams | 4.5 |
| O/M of Wastewater Collection Systems, Vol. 1 | 9.0 |
| O/M of Wastewater Collection Systems, Vol. 2 | 9.0 |
| Water Treatment Plant Operation, Vol. 1 | 9.0 |
| Water Treatment Plants Operation, Vol. 2 | 9.0 |
| Utility Management | 9.0 |

PRE-APPROVED CORRESPONDENCE COURSES

MICHIGAN STATE UNIVERSITY
Self-Study Course Coordinator
424 Eppley Center
Michigan State University
East Lansing, Michigan 48824-1047
www.msu.edu

| <u>COURSE TITLE</u> | <u>CEUs</u> |
|---|-------------|
| *Supervisory Management in the Water/Wastewater Field-Basic Management | 6.0 |
| *Maintenance Management in the Water/Wastewater Field-Basic Management Principles Related to Maintenance | 6.0 |
| *Effective Communication in the Municipal Environment-Practical Application of Time Tested Communication Principles | 4.0 |

APPENDIX B

PROGRAMS, COURSES AND TRAINING NOT PRE-APPROVED

These programs, courses and training **may** be eligible for CEUs if sufficient documentation is submitted to the DEP for review.

SHORT COURSES/SEMINARS ELIGIBLE FOR CEUs OR CONTACT HOURS UPON CT DEP APPROVAL

ATLANTIC STATES RURAL WATER & WASTEWATER ASSOCIATION
12 New London Turnpike
PMB # 275
Norwich, CT 06360
www.asrwwa.org
(860) 889-6373

Atlantic States is a non-profit organization with a simple goal--to help rural water and wastewater systems protect the environment. Their staff of trained professionals is able to assist with process control, safety programs, and budgeting along with what ever else may arise.

Atlantic States is available for technical assistance in the field and also training classes.

Atlantic States provides training in all aspects of wastewater treatment, such as operation and maintenance, process control, mathematics and problem solving safety programs and certification. They are also a clearinghouse of information pertaining to the wastewater industry.

Contact the association for further information.

**SHORT COURSES/SEMINARS ELIGIBLE FOR CEUs OR
CONTACT HOURS UPON CT DEP APPROVAL**

BULLARD-HAVENS TECHNICAL SCHOOL
500 Palisade Ave.
Bridgeport, CT 06610

ADULT
EDUCATION
COURSES

General information:
(203) 579-6314 or (203) 579-6315
www.cttech.org/bullard-havens

SHORT COURSES/SEMINARS ELIGIBLE FOR CEUs OR CONTACT HOURS UPON CT DEP APPROVAL

LOSS CONTROL SERVICES, INC.

P.O. Box 811
Cheshire, CT 06410
(203) 271-2690

To develop a Confined Space Entry program and procedures. This consists of identifying the confined spaces, classifying the spaces and writing the program and entry procedures for both confined spaces and permit required confined spaces. There are 15 hours of class scheduled. This would equal **1.5 CEUs** per person. Some of the time will be spent with hands-on-training.

The topics to be covered and their estimated length of time are:

| | |
|---|--------|
| <u>The OSHA 1910.146 Regulation:</u> | 2.5hr |
| <u>Hazard Communication OSHA 1910.1200:</u> | 2.5hr. |
| <u>Respirator Training OSHA 1910.134:</u> | 2.0hr |
| <u>Lockout-Tagout Training OSHA 1910-147:</u> | 1.5hr |
| <u>Fall Protection and Retrieval:</u> | 3.0hr |

The ANSI Z359.1-1992 Safety Requirements For Fall Arrest System will be used as the reference for this session. The session will include the selection of harnesses, lifelines, lanyards, fall arrestors, anchorages, retrieval, fittings and connectors, inspection of equipment and the actual individual attendee wearing the equipment.

| | |
|---------------------------------------|-------|
| <u>Personal Protective Equipment:</u> | 3.5hr |
|---------------------------------------|-------|

**SHORT COURSES/SEMINARS ELIGIBLE FOR CEUs OR
CONTACT HOURS UPON CT DEP APPROVAL**

PSG

Professional Services Group
14950 Heathrow Forest Parkway, Suite 200
Houston, Texas 77230-3842
PHONE: (713) 449-1500, FAX: (713)449-5970

The Training Department of Professional Services Group, Inc., has designed, developed and implemented the following programs. These courses are designed and developed using the National Environmental Training Association Instructional Design and Development criteria:

| <u>COURSE</u> | <u>LENGTH</u> |
|--------------------------------------|---------------|
| Fundamentals of Supervision | 24 HOURS |
| Project Managers' Leadership Program | 40 HOURS |
| Train-the-Trainer | 24 HOURS |
| Math I | 12 HOURS |
| Introduction to Waste Water | 24 HOURS |
| Introduction to Water | 24 HOURS |

CORRESPONDENCE COURSES ELIGIBLE FOR CEUs OR CONTACT HOURS UPON CT DEP APPROVAL

THE UNIVERSITY OF FLORIDA
Division of Continuing Education
Dept. Of Independent Study by
Correspondence and Distance Education
2209 N.W. 13th Street
Gainesville, Florida 32609-3444
1-800-327-4218
www.correspondencestudy.ufl.edu/water.asp
www.treeo.ufl.edu/water

**SHORT COURSES/SEMINARS ELIGIBLE FOR CEUs OR
CONTACT HOURS UPON CT DEP APPROVAL**

OCT

OPERATOR CERTIFICATION TRAINING, INC.

Training Sessions

Workshops and Certification Preparation

For Operator Classes I-IV

Training at Your Facility for the Entire Staff of ten or more

Water Treatment

Mathematics
Disinfection
Pumping
Water Plant Technology Processes
Grade 4 Supervisor Training
Certification Preparation

Wastewater Treatment

Mathematics
Disinfection
Wastewater Plant Technology Processes
Certification Review
Lift Pumps
Grade 4 Supervisor Training
Activated Sludge
Sequencing Batch Reactors
(SBRs)
Solids Handling

Instrumentation

Telemetry
Motor Control Troubleshooting
Supervisor Control and Data
Acquisition (SCADA)

Water Distribution

Mathematics
Disinfection
Distribution Technology Review
Pumps and Pumping
Certification Preparation

Collection Systems

Mathematics
Collection O & M
Lift Pumps
Design, Construction & Safety
Certification Preparation

OCT, Inc.

PO Box 332
Gladstone, OR 97027
Call (888) 863-8916 for a catalog of classes
www.octinc.com

APPENDIX C

WASTEWATER TREATMENT FACILITY OPERATOR CERTIFICATION REGULATIONS

WASTEWATER TREATMENT FACILITY OPERATOR CERTIFICATION
(Effective June 5, 2000)
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State of Connecticut
REGULATION OF
Department of Environmental Protection
concerning
Wastewater Treatment Facility Operator Certification
(Effective June 5, 2000)

Sec. 22a-416-1. GENERAL

(a) Sections 22a-416-1 to 22a-416-10, inclusive, of the Regulations of Connecticut State Agencies shall be known as the Wastewater Treatment Operator Regulations.

(b) Definitions

For purposes of Sections 22a-416-1 to 22a-416-10, inclusive of the Regulations of Connecticut State Agencies:

- (1) "Advisory committee" means the advisory committee appointed under section 22a-416-10 of the Regulations of Connecticut State Agencies;
- (2) "Applicant" means an individual who files an application;
- (3) "Application" Means an application for operator certification under the Wastewater Treatment Operator Regulations;
- (4) "Biological wastewater treatment process" means the process by which metabolic activities of bacteria and other microorganisms break down complex organic materials into simple, more stable substances;
- (5) "BOD5" means the amount of oxygen utilized by bacteria in the biochemical oxidation of organic matter over five days;
- (6) "Certificate" means a certificate issued by the commissioner stating that the operator named therein has met the minimum requirements for the operator classification specified in such certificate;
- (7) "Certification" means the issuance of a certificate;
- (8) "Class" and "Classification" are interchangeable;
- (9) "Commissioner" means the commissioner of environmental protection as defined in subsection (b) of section 22a-2 of the general statutes;
- (10) "Chief Operator" means the operator who has ultimate supervisory responsibility for the operation and maintenance of a wastewater treatment facility, is responsible for signing the discharge monitoring reports and is responsible for the daily on-site supervision, process control direction and overall performance of such facility;
- (11) "Contact hour" means one hour of instruction on a topic determined by the commissioner to be related to wastewater treatment facility operation;
- (12) "Continuing education unit" (CEU) means ten contact hours of participation in an organized higher education program approved by the commissioner for wastewater treatment operators;
- (13) "Day" means calendar day;

- (14) “Department” means the Connecticut Department of Environmental Protection;
- (15) “Direct responsible charge experience” for a chief operator or shift operator means experience as an on-site daily supervisor of the operation of a wastewater treatment facility with responsibility for, without limitation, process control direction. Operation of individual process units alone does not constitute direct responsible charge experience. “Direct responsible charge experience” for a process control operator means experience as on-site daily responsibility for process control direction of a wastewater treatment facility;
- (16) “Discharge monitoring report” means the monthly report required by subsection (j) of section 22a-430-3 of the Regulations of Connecticut State Agencies;
- (17) “Domestic wastewater” means wastewater discharged from residences or from employee or public washrooms in institutions, businesses, or industrial establishments;
- (18) “Domestic wastewater process” means any process of treating any volume of wastewater consisting wholly or partially of domestic wastewater;
- (19) “Examination” means an examination for operator certification under subsection (b) of section 22a-416-5 of the Regulations of Connecticut State Agencies;
- (20) “Foreign certificate” means a certificate issued by a state, territory or possession of the United States other than Connecticut, stating that the holder thereof has met the minimum qualifications for a wastewater treatment facility operator required by such state, territory, or possession;
- (21) “G.E.D. ” means a general equivalency diploma obtained by passing a general educational development test or its equivalent as recognized by the issuing state board of education;
- (22) “Higher education” means post-high school education or training, including but not limited to training courses, seminars, workshops, conferences, and college level courses, related, in the commissioner’s sole judgement, to wastewater treatment facility operation;
- (23) “Industrial wastewater” means wastewater other than domestic wastewater, discharged from institutions, businesses, or industrial establishments that is amenable to treatment by means of biological wastewater treatment;
- (24) “In the field” refers to employment at a wastewater treatment facility or employment which, in the commissioner’s sole judgement, is related to the operation of a wastewater treatment facility; examples of such employment include start-up services, technical assistance, operator training or the administration of a wastewater treatment facility;
- (25) “MGD” means million gallons per day;
- (26) “Misconduct” means behavior by an applicant in the course of an operator certification examination which conduct interferes with administration of such examination including but not limited to, talking or otherwise making noise during examination, cheating, and use of unauthorized material;
- (27) “Monthly operating report” means the monthly report required by subsection (j) of section 22a-430-3 of the Regulations of Connecticut State Agencies;
- (28) “Operator” means any individual who operates, is contracted to operate, or is employed by an entity or contractor to operate equipment at a wastewater treatment facility so as to affect treatment processes;
- (29) “Operator experience” means an individual’s experience of satisfactorily performing the duties of an operator at a wastewater treatment facility while employed at any such facility;

- (30) “Operator-in-training” means an applicant who has satisfied all of the requirements for certification under the wastewater treatment operator regulations except for the minimum experience requirements of subdivision (c)(5) of section 22a-416-4 of the Regulations of Connecticut State Agencies;
- (31) “Operating shift” means a regular period of time at a wastewater treatment facility when operators are present and make process control changes;
- (32) “Owner” means the owner in fee simple of a wastewater treatment facility, provided that if the owner contracts with another person to operate such facility, the contractor shall be deemed the owner for the purposes of the wastewater treatment operator regulations;
- (33) “Population equivalent” means the estimated population that contributes or will contribute a given amount of BOD5 or suspended solids to wastewater. For the purpose of determining a population equivalent, estimated population shall be calculated assuming 0.17 pounds of BOD5 per capita per day or 0.20 pounds of suspended solids per capita per day;
- (34) “Process control direction” means direction of the operation of the biological wastewater treatment process at a wastewater treatment facility;
- (35) “Process control operator” means the operator who, subject to the authority of the chief operator, is responsible for process control direction;
- (36) “Reciprocal certificate” means a certificate issued pursuant to subdivision (c)(5) of section 22a-416-5 of the Regulations of Connecticut State Agencies;
- (37) “Satisfactory evidence” means certified copies of official transcripts, diplomas, course descriptions, foreign certificates, or other documents acceptable to the commissioner;
- (38) “Shift operator” means the operator, subject to the authority of the chief operator, who has supervisory responsibility for the operation and maintenance of a wastewater treatment facility during any operating shift;
- (39) “Supervisory responsibility” means daily routine responsibility for managing personnel and operations at a wastewater treatment facility;
- (40) “Wastewater” means domestic or industrial wastewater;
- (41) “Wastewater treatment facility” means an arrangement of structures and equipment, including solids handling equipment, whose purpose is to treat domestic wastewater or industrial wastewater by means of a biological wastewater treatment process. A domestic wastewater disposal system for a category I or II discharge as defined in subparagraphs (b)(2)(A) and (b)(2)(B) of section 22a-430-1 of the Regulations of Connecticut State Agencies is not a wastewater treatment facility; and
- (42) “Watchman shift” means a regular period of time at a wastewater treatment facility during which one or more operators are present but do not make any independent process control changes or conduct any other independent activities which could affect the quality of air, solids, or liquids discharged from the facility.

Section 22a-416-2 of the Regulations of Connecticut State Agencies is Repealed

Sec. 22a-416-3. Classification of Wastewater Treatment Facilities

(a) Classes of Wastewater Treatment Facilities

There shall be four Classes of wastewater treatment facilities: Class I, Class II, Class III, and Class IV.

(b) Determination of Class

The commissioner classifies each wastewater treatment facility in Connecticut by calculating points therefore in accordance with appendix A and applying the following chart:

| Facility Class | I | II | III | IV |
|----------------|------------|-------|-------|------------|
| Points | 30 or less | 31-55 | 56-75 | 76 or more |

(c) List of wastewater treatment facilities by class.

The commissioner maintains a list of wastewater treatment facilities in Connecticut which identifies the class of each such facility.

(d) Notification of a change in class

The commissioner shall notify the owner of a wastewater treatment facility in writing if the commissioner determines under subsection (b) of this section that the class of such facility should be revised as a result of equipment or treatment process modifications thereat. Within 30 days of receiving such notice, the owner may request in writing a consultation with the commissioner concerning the proposed change of class. Within 45 days of such consultation the commissioner will provide the owner with a written decision as to whether he or she will retain the existing facility class or revise it in accordance with the commissioner’s prior notice.

Sec. 22a-416-4 Classes and Qualifications of Wastewater Treatment Facility Operators

(a) Classification of Operators

There shall be four classes of operator certification: Class I, Class II, Class III, and Class IV.

(b) Language requirement for certification

An applicant for operator certification shall be able to speak, read and write the English language to the extent deemed necessary to perform the duties thereof.

(c) Minimum requirements for operator certification

(1) Class I Operator

An applicant for Class I Operator certification shall (A) submit satisfactory evidence of (i) at least one year of experience in the operation of a wastewater treatment facility of Class I or higher; (ii) a high school diploma or G.E.D.; and (iii) successful completion of a basic wastewater treatment facility operation course, approved by the commissioner, equaling at least nine CEU’s; and (B) pass the Class I examination. No substitutions for the requirements of this subdivision shall be permitted.

(2) Class II Operator

An applicant for Class II operator certification shall (A) submit satisfactory evidence of (i) at least three years of experience in the operation of a wastewater treatment facility of Class I or higher; (ii) a high school diploma or G.E.D.; and (iii) successful completion of higher education equivalent to at least 30 CEUs in a field determined by the commissioner to be related to the operation of a wastewater treatment facility, of which at least 18 CEUs are directly related to the operation of a wastewater treatment facility; and (B) pass the Class II examination.

(3) Class III Operator

An applicant for Class III operator certification shall (A) submit satisfactory evidence of (i) at least four years of experience in the operation of a wastewater treatment facility of Class II or higher; (ii) a high school diploma or G.E.D.; and (iii) successful completion of higher education equivalent to at least 90 CEUs in a field determined by the commissioner to be related to the operation of a wastewater treatment facility; and (B) pass the Class III examination.

(4) Class IV Operator

An applicant for Class IV operator certification shall (A) submit satisfactory evidence of (i) at least four years of experience in the operation of a Class III or IV wastewater treatment facility, of which experience at least two years are direct responsible charge experience as a chief operator at a Class III wastewater treatment facility or shift or process control operator at a Class IV wastewater treatment facility; (ii) a high school diploma or G.E.D.; and (iii) successful completion of higher education equivalent to at least 135 CEUs in a field determined by the commissioner to be related to the operation of a wastewater treatment facility; and (B) pass the Class IV examination.

(5) Operator-in-training

(A) An applicant for Class I, II or III operator certification shall be designated by the commissioner, in writing, to become an operator-in-training in Class I, II, or III, respectively, if such applicant meets all the requirements for such certification except for the minimum operating experience requirement under subdivisions (c)(1), (c)(2), or (c)(3) of this section, respectively. Except as provided in subparagraph (B) of this subdivision, when the owner of the wastewater treatment facility at which an operator-in-training is employed notifies the commissioner in writing that such operator-in-training has satisfied the minimum experience requirements for the certification at issue, the commissioner shall issue said certificate.

(B) An operator-in-training who, within five years after passing the certification examination does not obtain the required minimum experience for the certificate applied for shall not be awarded such certificate unless he or she reapplies therefor, takes the certification exam and passes such examination, and satisfies the minimum experience requirement.

(d) Substitution of higher education for minimum operating experience requirements

(1) General

(A) There shall be no substitution for the minimum operating experience requirement for Class I operator certification prescribed in subdivision (c)(1) of this section.

(B) Higher education may be substituted for up to fifty per cent of the minimum operating experience requirement for Classes II, III, and IV operator certification prescribed in subdivisions (c)(2), (c)(3), and (c)(4) of this section.

(C) Higher education shall not be substituted for the required direct responsible charge experience prescribed in subdivision (c)(4) of this section.

(D) Higher education which is substituted for any operating experience requirement prescribed in subsection (c) of this section shall not also be applied to any minimum education requirement prescribed by such subsection.

(2) Higher education equivalents

For the purposes of the Wastewater Treatment Operator Regulations:

(A) Forty-five CEUs are equivalent to one year of higher education. One semester hour is equivalent to 1.6 CEUs.

(B) Forty-five CEUs are equivalent to one year of operating experience.

(3) Operator training courses

Any course, seminar, workshop, conference or college course which the commissioner determines in his sole judgement to be related to wastewater treatment facility operation may be used to meet the higher education requirements of subparagraphs (c)(1)(A), (c)(2)(A), (c)(3)(A), and (c)(4)(A) of this section. The commissioner shall determine in his sole judgement the number of CEUs to which particular hours of higher education are equivalent.

(e) Substitution of other experience for minimum operating experience requirements

(1) For up to 50 percent of the minimum operating experience requirement for Class I, II, III, or IV certification the commissioner may, in his discretion, allow an applicant to substitute operating experience from the maintenance operation of a wastewater treatment facility, from operations of a drinking water treatment facility, from the laboratory operation of a drinking water treatment facility, or from a wastewater treatment facility which does not utilize biological treatment processes, provided that the commissioner determines that the proposed substitute experience is sufficiently related to the operation of a wastewater treatment facility.

(2) There shall be no substitution for direct responsible charge experience.

(f) Substitution of direct responsible charge experience for higher education CEU requirements

(1) For up to fifteen CEUs of the higher education requirement in subdivision (c)(3) of this section, the commissioner may in his discretion allow an applicant to substitute up to four months of direct responsible charge experience in a Class II wastewater treatment facility as the chief operator or up to four months of direct responsible charge experience in a Class III wastewater treatment facility.

(2) For up to thirty CEUs of the higher education requirement in subdivision (c)(4) of this section, the commissioner may in his discretion allow an applicant to substitute up to eight months of direct responsible charge experience in a Class III wastewater treatment facility as the chief operator or up to eight months of direct responsible charge experience in a Class IV wastewater treatment facility.

(3) Direct responsible charge experience substituted for any education requirement in subsection (c) of this section shall not also be applied to any minimum experience requirement thereunder.

(g) Direct responsible charge accumulation.

For purposes of subsections (d) and (f) of this section:

(1) Direct responsible charge experience for a chief operator shall accumulate at the rate of 100% of time as a chief operator.

(2) Direct responsible charge experience for a shift operator shall accumulate at the rate of 100% of time as a shift operator.

(3) Direct responsible charge experience for a process control operator shall accumulate at the rate of 50% of time as a process control operator.

(4) Any certified operator acting as chief or shift operator for a minimum period of 2 consecutive working days under subdivisions (b)(8) and (b)(9) of section 22a-416-6 of the Regulations of Connecticut State Agencies during the absence of the permanent chief operator or shift operator may accrue direct responsible charge experience for that time.

Sec. 22a-416-5. Application and Certification Procedures

(a) Applications

(1) An application shall be made on a form furnished by the commissioner. Unless a completed application is received by the commissioner no later than 45 days before the date of a scheduled examination, the applicant shall not take that examination.

(2) Unless by no later than 45 days before a scheduled examination the applicant has satisfied either (A) the minimum experience and education requirements for the operator certification sought, or (B) the minimum requirements for operator-in-training status for such classification under subparagraph (c)(5)(A) of section 22a-416-4 of the Regulations of Connecticut State Agencies, he or she shall not take that examination.

(3) Unless on the date he or she submits the application the applicant is actually employed as an operator at a Connecticut wastewater treatment facility or meets the minimum requirements for operator-in-training status under subparagraph (c)(5)(A) of section 22a-416-4 of the Regulations of Connecticut State Agencies, he or she shall not take an examination for any class of certification; provided, if the applicant is not so employed at a Connecticut wastewater treatment facility at such time, the commissioner may allow him or her to take the next scheduled examination for operator certification if the owner of a Connecticut wastewater treatment facility (A) intends to hire such applicant as an operator when he or she succeeds in obtaining such certification, and (B) notifies the commissioner in writing of such intent no later than 45 days before such examination.

(4) Each application shall be accompanied by an application fee of \$ (changed to \$190 by statute in 2003). Any application submitted without such fee shall be considered incomplete and shall not be processed until such fee has been paid in full. Such fee shall be paid by certified bank check, money order or personal check made payable to the "Department of Environmental Protection". The check or money order shall state on its face "Wastewater Operator Certification Examination".

(5) The application fee is non-refundable, provided, if an applicant pays such fee but fails to take the next scheduled examination, the commissioner will apply such fee toward a future application which such applicant may file.

(b) Examinations

(1) The commissioner shall, for each class of operator certification, hold at least one examination per year at a place and time prescribed by the commissioner.

(2) At least 90 days before a scheduled examination, the commissioner will provide notice thereof to each wastewater treatment facility in Connecticut.

(3) At least 30 days before a scheduled examination, the commissioner shall notify each applicant whether he or she meets the minimum requirements in section 22a-416-4 of the Regulations of Connecticut State Agencies for the operator certification sought and is therefore eligible to take such examination.

(4) No applicant shall be allowed to take an examination without first showing to the examination proctor a valid photographic identification and the notice of eligibility provided under subsection (3) of this section.

(5) An applicant shall not have any programmable calculator or any written documents or papers during the examination. At the end of the examination, the applicant shall return to the examination proctor all examination documents.

(6) The commissioner shall notify each applicant of his or her results on such examination but shall not return the examination answer sheets or questions to the applicant. At an applicant's request and upon payment of the regrading fee required by the applicable testing service, the commissioner shall submit the applicant's answer sheet to such testing service for regrading. Under no circumstances shall the commissioner allow the applicant to review examination questions before or after the examination.

(7) The examination proctor may immediately expel an applicant from the examination room for misconduct. The results of an examination taken by an applicant expelled for misconduct shall be voided. Expulsion for misconduct shall disqualify the applicant from taking an examination for one year from the date of such expulsion.

(c) Issuance of Certificates

(1) Upon fulfillment by an applicant of the requirements of section 22a-416-4 of the Regulations of Connecticut State Agencies and this section, the commissioner shall issue a certificate of the appropriate class to him or her.

(2) A certificate shall be active until it is:

- (A) revoked under subsection (d) of this section;
- (B) replaced by a certificate of a higher class; or
- (C) inactivated under subdivision (c)(3) of this section.

(3) The certificate of an operator who ceases to be employed in the field of wastewater treatment shall become inactive two years after the date his or her last such employment terminated.

(4) An operator whose certificate has become inactive pursuant to subdivision (c)(3) of this section may apply for reissuance of a certificate. Upon fulfillment by such operator of the requirements of section 22a-416-4 of the Regulations of Connecticut State Agencies and this section, the commissioner shall reissue a certificate to such operator.

(5) An individual who:

- (A) is not employed as an operator in Connecticut;
- (B) holds a current foreign certificate; and
- (C) wishes to accept employment as an operator in Connecticut may obtain a certificate upon application therefor without examination if:

- (i) such foreign certificate represents an operator certification class which the commissioner deems equivalent to the Connecticut class for which such individual seeks certification;

- (ii) the individual meets the requirements of subsections (b) and (c) of section 22a-416-4 of the Regulations of Connecticut State Agencies;

- (iii) to obtain such foreign certificate, the individual passed a written examination proctored under the authority of the applicable state, territory or possession of the United States;

- (iv) the owner of the Connecticut wastewater treatment facility at which such individual seeks employment as an operator verifies to the commissioner in writing that such owner has offered employment to the individual conditioned upon the individual's receipt of a certificate under this section; and

- (v) the individual submits with his or her application an application fee in accordance with subdivision (a)(4) of this section.

(6) An operator who obtains a reciprocal certificate to take employment as a chief, shift, or process control operator at a Connecticut wastewater treatment facility shall continue in such position for at least one year or such certificate shall be deemed null and void on the date such employment terminates.

(7) Any individual who is employed at a Connecticut wastewater treatment facility and seeks higher class certification than his or her current certification may not obtain such higher certification without passing the applicable examination in Connecticut.

(d) Revocation of Certificates

The commissioner may, in accordance with chapter 54 of the general statutes and sections 22a-3a-5 and 22a-3a-6 of the Regulations of Connecticut State Agencies, revoke an operator's certificate if such operator:

(1) obtained such certificate through fraud or misrepresentation or by submitting inaccurate, misleading, or incomplete information;

(2) has engaged in fraud or misrepresentation, including but not limited to the falsification of any discharge monitoring report or monthly operating report;

- (3) did not exercise reasonable care, judgement, or ability in the performance of his or her duties as an operator;
- (4) fails to properly perform his or her duties as an operator; or
- (5) was previously issued a certificate when in fact he or she did not meet the requirements for that certificate.

Sec. 22a-416-6. Requirements For Owners of Wastewater Treatment Facilities

(a) General

(1) Upon the commissioner’s request, the owner of a wastewater treatment facility shall provide in writing to the commissioner the name of each chief operator, shift operator, and process control operator employed at such facility.

(2) The owner of a wastewater treatment facility shall notify the commissioner in writing prior to any additions or deletions of unit processes or unit operations listed in appendix A.

(b) Requirements for employing qualified operators, including chief, shift, and process control operators.

The owner of a wastewater treatment facility shall assure compliance with the following requirements:

(1) Except as provided in subdivision (b)(2) of this section, the owner shall employ a chief operator certified at the class of such facility or higher, determined in accordance with subsection (b) of section 22a-416-3 of the Regulations of Connecticut State Agencies, and such operator shall be present at such facility for the following minimum numbers of hours each day of a five-day work-week:

| Class of facility | Design flow rate of facility (Million Gallons/Day) | Minimum number of hours of the chief operator for on-site operations |
|-------------------|--|--|
| I | 0.20 | 2 |
| II | 0.20 | 2 |
| III | 0.15 | 3 |
| I, II | >0.20 | 7* |
| III | >0.15 | 7* |
| IV | any | 7* |

*The Commissioner may give credit to a chief operator for hours of on-site operations for reasonable time he or she spends in training, conferences, meetings, and other administrative duties related to wastewater treatment, and in activities related to operation and maintenance of the collection system, if the collection system is under the chief operator’s supervision.

(2) At a wastewater treatment facility with a design flow rate of less than 0.025 mgd, a chief operator may be present for fewer than the minimum number of hours required by subdivision (b)(1) of this section only with the prior written approval of the commissioner. To obtain such approval, the owner shall demonstrate to the satisfaction of the commissioner that the owner would be able to properly operate such facility and comply with all pertinent requirements of chapter 446k of the general statutes if the chief operator were present for fewer than such required hours. A request for approval under this subdivision shall include, without limitation, a description of duties and tasks performed by each operator during a typical workday and class of the operator certification of each operator employed at the facility.

(3) At a wastewater treatment facility where the chief operator is not normally present during any operating shift, the owner shall employ a shift operator who is certified no lower than one class below the classification of the facility during such shift.

(4) Within 24 months of the adoption of the wastewater treatment operator regulations, at a wastewater treatment facility with a design flow rate greater than or equal to 150,000 gallons per day, the owner shall employ a shift operator certified no lower than one class below the classification of the facility during every shift when the chief operator is normally present.

(5) The owner of a wastewater treatment facility may employ a process control operator certified no lower than one class below the classification of the facility.

(6) An owner shall not employ as an operator any individual who has not been certified at a minimum of Class I as required in subsection (a) of section 22a-416-7 of the Regulations of Connecticut State Agencies.

(7) Within 14 days after a chief operator, shift operator, or process control operator begins or terminates employment in such capacity at a wastewater treatment facility, the owner thereof shall notify the commissioner in writing of such fact. Direct responsible charge experience shall not start to accumulate for such chief operator, shift operator, or process control operator until the date the commissioner receives such notification from the owner.

(8) If either the chief operator or shift operator of a wastewater treatment facility:

(A) ceases to be employed by such facility or

(B) is or will be absent from such facility for more than 30 consecutive days,

The owner of such facility shall notify the commissioner in writing of the designation of an acting chief operator or shift operator within 14 days. An individual may act as chief operator under the wastewater treatment operator regulations only if such individual is certified at no lower than one class below the class of the facility. An individual may act as a shift operator under the wastewater treatment operator regulations only if such individual is certified at no lower than two classes below the class of the facility. The owner of such facility may continue to operate such facility without a chief operator or shift operator for no longer than 90 days, except that upon good cause shown in writing by such owner, the commissioner may extend in writing such 90 day limit for no more than an additional 275 days.

(9) If either the chief operator or shift operator of a wastewater treatment facility is or will be absent from such facility for less than 30 consecutive days, the owner may continue to operate the facility provided that the owner designates an acting chief operator or acting shift operator, as applicable, during such absence. An individual may act as chief operator under the wastewater treatment operator regulations only if such individual is certified at no lower than one class below the class of the facility. An individual may act as a shift operator under the wastewater treatment regulations only if such individual is certified at no lower than two classes below the class of the facility. If the owner does not employ an individual qualified under this subdivision to act as chief operator or shift operator in the event that the regularly employed chief operator or shift operator is absent for a period of up to 29 days, the owner may continue operating the facility during such absence only if the owner designates the operator with the highest available certification at the facility to act as chief or shift operator during such absence.

(10) Within three years of the adoption of the Wastewater Treatment Operator Regulations, owners of wastewater treatment facilities utilizing biological processes to treat exclusively industrial wastewater shall comply with the requirements of this section.

(11) If the adoption of section 22a-416-3 of the Wastewater Treatment Operator Regulations results in reclassification of a wastewater treatment facility to a higher classification, within three years of such adoption the owner of such facility shall comply with the requirements of this section.

Sec. 22a-416-7. Requirements For Operators of Wastewater Treatment Facilities

(a) Any individual initially employed after the effective date of the wastewater treatment operator regulations as an operator other than a chief operator, shift operator, or process control operator at a wastewater treatment facility shall obtain a Class I certificate or higher within 24 months of beginning employment at such facility. Any individual who fails to obtain at least a Class I certificate within such time shall be ineligible to act as an operator after such time.

(b) Any individual whose employment as a chief operator, shift operator, or process control operator at a wastewater treatment facility commences or terminates after the effective date of the Wastewater Treatment Operator Regulations shall notify the commissioner in writing of such commencement or termination within 14 days thereof.

(c) Operator-in-training status for the applied class does not qualify an applicant to be a certified operator within that class.

Sec. 22a-416-8. Requirements For Chief Operators of Wastewater Treatment Facilities

(a) A chief operator may not perform the duties of a chief operator during a single shift at more than one Class IV facility, at more than one Class I or II facility with a design flow greater than 0.20 mgd, or at more than one Class III facility with a design flow greater than 0.15 MGD.

(b) A chief operator may perform the duties of a chief operator at more than one wastewater treatment facility only in accordance with the table below and only with the written approval of the commissioner. To obtain such approval, a chief operator shall submit a detailed operations and maintenance plan demonstrating to the commissioner’s satisfaction that such chief operator could properly perform his or her other duties at each of the subject facilities and assure compliance with all pertinent requirements of chapter 446k of the general statutes if the approval sought were granted.

| Class of facility | Daytime Shift | | | Other Than Daytime Shift |
|-------------------|--|---|--|--|
| | Design flow rate (Million Gallons/Day) | Minimum number of hours during which the chief operator shall be present at each facility on each day of a five-day work week | Number of facilities at which chief operator is employed | Number of Class I or II facilities with a design flow rate of ≤ 0.20 MGD and/or Class II facilities at which a chief operator may be employed during one non-daytime shift |
| I | 0.20 | 2 | 3 | 1 |
| II | 0.20 | 2 | 3 | 1 |
| III | 0.15 | 3 | 2 | 1 |
| I, II | >0.20 | 7* | 1 | 1 |
| III | >0.15 | 7* | 1 | 1 |
| IV | any | 7* | 1 | 1 |

*The Commissioner may give credit to a chief operator for hours of on-site operations for reasonable time he or she spends in training, conferences, meetings, and other administrative duties related to wastewater treatment, and in activities related to operation and maintenance of the collection system, if the collection system is under the chief operator’s supervision.

(c) A chief operator may work at more Class I, Class II, or Class III wastewater treatment facilities, with design flow rates of < 0.15 mgd, than allowed under subsection (b) of this section only with the commissioner’s written approval. To obtain such approval a chief operator shall demonstrate to the commissioner’s satisfaction that such chief operator could properly perform his or her duties at each of the subject facilities and assure compliance with all pertinent requirements of chapter 446k of the general statutes if the approval sought were granted. A request for approval under this subdivision shall include, without limitation, a description of each workday during a workweek, including the times during which the said chief operator is or would be present at each of the subject facilities, and information about the travel times between such facilities.

(d) With the exception of a Class IV chief operator who seeks approval to operate both a Class IV facility during a daytime shift and operating a Class I or II facility with a design flow rate of ≤ 0.20 mgd or a Class III facility with a design flow of ≤ 0.15 mgd during a non-daytime shift, the commissioner shall not grant approval under subsections (b) or (c) of this section unless the chief operator seeking such approval is certified under section 22a-416-4 of the Regulations of Connecticut State Agencies at least one class higher than the highest class of wastewater treatment facility of which he or she is chief operator at the time he or she requests such approval.

(e) The commissioner shall not grant a request for approval under subsections (b) or (c) of this section unless such request is accompanied by a statement, on a form supplied by the commissioner, by the owner of each wastewater treatment facility which is the subject of such request certifying that such owner employs or wants to employ the requester as a chief operator at such facility.

(f) The commissioner shall review any approval under this section at least once every five years and may withdraw such approval at any time if, the chief operator does not properly perform his or her duties at each of the subject facilities or assure compliance with pertinent requirements of chapter 446k of the general statutes.

Section 22a-416-9 of the Regulations of Connecticut State Agencies is Repealed.

Sec. 22a-416-10. Advisory committee

(a) Committee Appointment and Makeup

The commissioner shall appoint an advisory committee composed of no less than eight and no more than twelve members as follows: two shall be employees of the department whose regular duties involve the planning, design and construction of wastewater treatment facilities, at least one shall be an educator experienced in the training of wastewater treatment facility operators, and the remaining members shall be operators certified at the time of such appointment under section 22a-416-4 of the Regulations of Connecticut State Agencies.

(b) Term of Appointment

The department employees and educator members of the advisory committee shall be appointed for an unlimited period of time. All other members of the advisory committee shall be appointed for a term of up to three years. The commissioner may reappoint any such member to a second term of up to three years, but in no case shall such member serve more than six consecutive years. The commissioner may revoke any individual's appointment as a member for failure to attend a majority of the scheduled meetings of the advisory committee or for failure to provide assistance in performing the duties of the committee as described in subsection (d) of this section.

(c) Compensation

The advisory committee shall serve without compensation and shall convene at the discretion of the commissioner.

(d) Duties of the Committee

The advisory committee shall advise and assist the commissioner in administering the certification program by:

- (1) reviewing the classifications of particular wastewater treatment facilities;
- (2) reviewing applications for certification and for revalidation of certificates under subsection (c) of section 22a-416-5;
- (3) making recommendations to the commissioner on the evaluation and classification of new and modified wastewater treatment facility equipment and processes;
- (4) encouraging qualified individuals to become certified;
- (5) encouraging owners of wastewater treatment facilities to promote and facilitate advanced certification of their employees;

- (6) promoting wastewater treatment facility operator training programs;
- (7) commenting on the proposed revocation of a certificate;
- (8) reviewing reciprocal certification requests by operators from other states;
- (9) reviewing the proposed examinations;
- (10) performing related duties as requested by the commissioner;
- (11) reviewing operations and maintenance plans under section 22a-416-6 and section 22a-416-8; and
- (12) Reviewing extension of the 90 (ninety) day limit under subdivision (b)(8) of section 22a-416-6.

STATEMENT OF PURPOSE:

The regulations set forth the classes of wastewater treatment facilities and wastewater treatment facility operators; qualifications of wastewater treatment facility operators; and the technical and administrative procedures and requirements for operator certification as required by subsection (d) of section 22a-416 of the general statutes.

APPENDIX A: Classification of Wastewater Treatment Facilities

| <u>Size of facility</u> (2-20 points) | | <u>Points</u> |
|---|---|---------------|
| Maximum population equivalent (P.E.) served on peak day | 1 point per 10,000 P.E. or part thereof, for a maximum of 10 points | _____ |
| Design flow | 1 point per MGD or part thereof, for a maximum of 10 points | _____ |
| <u>Land disposal</u> (evaporation) | 2 | _____ |
| <u>Subsurface disposal</u> | 4 | _____ |
| <u>Variation in strength and/or flow of raw wastewater</u> (slight to extreme) (0-6 points) | | |
| Variations do not exceed those normally present | 0 | _____ |
| Recurring variations of 100% to 200% from norm | 2 | _____ |
| Recurring variations of more than 200% from norm | 4 | _____ |
| Raw wastes that impair biological treatment processes | 6 | _____ |
| <u>Pretreatment plant processes utilized</u> | | |
| Pumping of main flow other than recycle flows at any point within the facility | 3 | _____ |
| Screening or comminution | 1 | _____ |
| Grit removal | 3 | _____ |
| Equalization | 1 | _____ |
| Effluent pumping when receiving infiltration (e.g. stream flooding) | 3 | _____ |

Combined Sewer Overflow

| | | |
|-----------|---|-------|
| Storage | 1 | _____ |
| Treatment | 3 | _____ |

Primary treatment utilized

| | | |
|---|---|-------|
| Primary clarifiers | 5 | _____ |
| Combined sedimentation/digestion (Imhoff tanks) | 5 | _____ |
| Micro screening or other physical treatment | 3 | _____ |
| Trickling filters used as roughing filters with recycle and intermediate clarifiers | 5 | _____ |
| Trickling filters used as roughing filters with recycle or intermediate clarifiers | 3 | _____ |

SCADA

| | | |
|-------------|---|-------|
| Operational | 6 | _____ |
| Monitoring | 2 | _____ |

Secondary treatment utilized

| | | |
|--|----|-------|
| Trickling filter or rotating biological contractor with secondary clarifiers | 10 | _____ |
| Activated sludge with secondary clarifiers | 15 | _____ |
| Activated sludge without primary clarifiers including extended aeration, sequential batch reactors and oxidation ditches | 18 | _____ |
| Stabilization ponds without aeration | 5 | _____ |
| Aerated lagoon | 8 | _____ |

Advanced treatment utilized

| | | |
|--|----|-------|
| Post aeration (mechanical) | 2 | _____ |
| Direct recycle and reuse | 6 | _____ |
| Polishing pond | 2 | _____ |
| Chemical phosphorus removal | 4 | _____ |
| Biological phosphorus removal | 6 | _____ |
| Nitrification processes | 6 | _____ |
| Nitrification and denitrification processes | 9 | _____ |
| Denitrification filter | 6 | _____ |
| Ion exchange | 10 | _____ |
| Reverse osmosis or electrodialysis | 15 | _____ |
| Chemical recovery or carbon regeneration | 4 | _____ |
| Mechanical filtration | 10 | _____ |
| Intermittent sand filters with gravity underdrains | 5 | _____ |

Solids Handling

| | | |
|--|----|-------|
| Solids conditioning with polymers, ferric chloride or alum | 2 | _____ |
| Thickening by means of: | | |
| Gravity | 2 | _____ |
| Mechanical (dissolved air flotation, gravity belt or centrifuge) | 5 | _____ |
| Anaerobic digestion | 10 | _____ |
| Aerobic digestion | 6 | _____ |
| Evaporative sludge drying | 2 | _____ |
| Mechanical dewatering | 5 | _____ |
| Incineration, wet oxidation, or other solids reduction | 12 | _____ |

| | | |
|--|----|-------|
| On-site disposal | 2 | _____ |
| Composting (In vessel) | 10 | _____ |
| Composting (static pile) | 5 | _____ |
| Sludge storage | 1 | _____ |
| Sludge pumping offsite | 2 | _____ |
| <u>Disinfection</u> | | |
| Chlorination or comparable disinfection | 5 | _____ |
| Chlorination/Dechlorination | 8 | _____ |
| On-site generation and application of disinfectant | 5 | _____ |
| Ultraviolet light | 5 | _____ |
| <u>Odor control</u> | | |
| Biofilter | 3 | _____ |
| Adsorption with activated carbon or equal | 3 | _____ |
| Wet scrubber | 6 | _____ |
| Thermal destruction with catalytic process | 6 | _____ |
| Odor reducing sprays | 2 | _____ |
| <u>Chemical Additives</u> | | |
| Septage treatment system | 3 | _____ |
| Sedimentation additives | 2 | _____ |
| Nutrient removal | 2 | _____ |
| <u>Biological laboratory analysis</u> | | |
| Laboratory analysis performed outside the facility | 0 | _____ |
| Laboratory analysis performed at the facility: | | |
| Membrane filter | 2 | _____ |
| Use of fermentation tubes or any dilution method using a fecal coliform bacteria determination | 3 | _____ |
| Identification and counts of biota by percent relative abundance | 3 | _____ |
| <u>Chemical and/or Physical laboratory analysis</u> | | |
| Laboratory analysis performed outside the facility | 0 | _____ |
| Laboratory analysis performed at the facility: | | |
| Push-button or visual methods for simple analysis (e.g. settleable solids) | 2 | _____ |
| Additional analysis including dissolved oxygen, biological oxygen demand, chemical oxygen demand, gas analysis, titration, solids, and volatile content | 3 | _____ |
| More advanced analyses including specific constituents, nutrients, total oils, phenols, or use of highly sophisticated instrumentation including atomic absorption, gas chromatography | 3 | _____ |
| Total points: | | _____ |