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Report Number Ten


WASTEWATER TREATMENT PLANT OPERATOR

EMPLOYER AND TRAINING NEEDS

PREPARED FOR METROPOLITAN TECHNICAL COMMUNITY COLLEGE



Center for Applied Urban Research

university of
nebraska 
at omaha

WASTEWATER TREATMENT PLANT OPERATOR

by

Marian Meier

WASTE WATER TREATMENT PLANT OPERATOR

Purpose of the Study

The purpose of this study is to determine the employer and training needs in the metropolitan Omaha area for the occupation of waste water treatment plant operator. The term "sewage treatment plant operator" is considered to be synonymous.

Study Design and Execution

The 1979 Nebraska Directory of Municipal Officials published by the League of Municipalities, 1335 L Street, Lincoln, Nebraska 68508 was consulted to determine the names and telephone numbers of utilities superintendents, sewer commissioners, mayors, or sewage treatment plant superintendents and operators in Omaha and in first and second class cities in Dodge, Douglas, Washington, and Sarpy Counties. Telephone interviews were then conducted with these persons. At least three callbacks were made in an attempt to contact all municipalities, but four of these, Waterloo, Ft. Calhoun, Elkhorn, and Bennington, could not be reached.

The City of Omaha has two treatment plants, the Missouri River and the Papio, and both of these plant superintendents were contacted. In addition, in Douglas County, the sewer commissioner in Valley was interviewed. Ralston, also in Douglas County, has no treatment plant of its own but sends its waste water to Omaha for treatment.

In Dodge County persons in Scribner, Hooper, Fremont, and North Bend were interviewed. The utilities superintendent in Blair and the plant operator in Arlington in Washington County were contacted. Municipalities in Sarpy County in which interviews were made were Bellevue, Papillion, Gretna, Springfield, and LaVista.

In addition, much information, particularly about training and certification, was obtained from Mr. Francis Hauck of Kirkham, Michael, and Associates, consulting engineers and architects. Mr. Hauck is in

charge of training waste water treatment plant operators for plants designed by this firm. He is on the Nebraska State Certification Board and has had 30 years experience in the field.

A survey instrument constructed for use in previous studies of employer and training needs was adapted for use in this study. The findings are summarized here, together with information about existing methods of training and certification.

Findings of the Study

Number of Employees. The number of waste water treatment plant employees varied from one in several of the smaller communities to 70 including 30 operators at the Missouri River Treatment Plant in Omaha. This latter figure also included persons employed at the packinghouse waste treatment plant. The Omaha Papio Plant employs 23 operators, 15 laborers, six semi-skilled laborers, 14 maintenance people, and 10 persons in supervisory, clerical, and laboratory jobs. In the smaller communities, the waste water treatment plant operator sometimes also runs the water treatment plant or does other city utility work. The communities contacted which employ one operator were Arlington, LaVista, and Hooper. North Bend, Papillion, Springfield, Valley, and Gretna each employ one operator plus one to three part-time persons. Bellevue has six employees at its waste water treatment plant including one full-time chemist, two maintenance persons, and the superintendent. Fremont has 14 persons employed at its plant including ten certified operators and a superintendent.

New Jobs in This Category. Ten of the municipalities contacted did not anticipate any new jobs being created in this category in the next three years. Four of them, Bellevue, Papillion, and the two Omaha plants did. The superintendent at the Missouri River Plant in Omaha said that he would have about 20 new job openings because they are building a new secondary treatment plant. At the Omaha Papio Plant a need is anticipated for three or four more operators and one or two laborers if they go to secondary treatment. Due to attrition this plant employs three or four new people every year. Papillion might be adding some new people because of expansion, and Bellevue anticipates a need for one or two more people because the boundaries of the town might expand through annexation. None of the persons contacted said they had too many qualified applicants when

they did have job openings. Five said they had too few, four said they had about the right number, and five either said they didn't know or the question was not applicable because they hadn't had any job openings since 1976.

Nine of those surveyed said that a great demand existed for trained people in this field, and three of them said that there were more job openings than trained people available. Two felt that the number of trained applicants was about equal to the jobs available, but none said that the number of trained people exceed the number of available jobs.

A special report, "Where Tomorrow's Jobs Will Be," in U. S. News and World Report, November 13, 1978, lists sewer plant operators in the ten fastest growing occupations. In these ten fields the number of jobs is expected to climb by 50 percent or more by 1985. The article states that an increase of 50,000 jobs can be expected in this field. This places the position fifth in the top ten lists, outranked only by industrial-machinery mechanics; emergency medical technicians; air conditioning, refrigeration, and heating mechanics; and health-service administrators.

Skills and Knowledge. The most frequently mentioned skill needed for the job of waste water treatment plant operator was mechanical ability. Ten persons listed this skill in one way or another. Some knowledge of chemistry and laboratory procedures was the next most frequently mentioned with nine persons citing this area. Knowledge of basic mathematics was mentioned by five. Other skills or knowledge areas mentioned by two persons each included electricity, welding, safety procedures, and state certification. Common sense, hydraulics, and a knowledge about E.P.A. requirements were also listed.

The skill most often cited as lacking among job applicants was knowledge of chemistry and laboratory procedures. Five persons listed this area. Two each mentioned a lack of knowledge about what goes on in a sewage treatment plant, machinery, and mathematics. One said applicants were often lacking in knowledge about electronics, and one superintendent covered the field with his reply--"Everything."

Mr. Hauck stated, "One of the biggest causes of the waste water treatment plant's not meeting standards is that the operator either does not apply knowledge or does not have sufficient knowledge." He cited a study, Evaluation of Operators and Maintenance Factors Limiting Municipal

Waste Water Treatment Plant Performance, available from the National Technical Information Service, Springfield, Virginia 22161. "Lots of them just muddle along," Mr. Hauck said. "It's difficult to find good operators," he added.

When asked what type of education/training was appropriate for this job, the majority felt that on-the-job training or an apprenticeship combined with a three- to six-month program at a technical community college would be the best. Other training methods mentioned included seminars or short courses and correspondence courses.

The specific courses that should be included in a training program for waste water treatment operators included chemistry and laboratory procedures (mentioned by seven persons). The next most frequently mentioned were mathematics and a course on the operation and maintenance of pumps and motors with three each. Two persons mentioned electricity and a course on the training manual. Other courses listed were hydraulics and one on certification requirements. Eighty-six percent (12) of those interviewed said Metro Tech should establish a program of studies to prepare individuals to work in this area, and 14 percent (2) said they didn't know. No one felt Metro Tech should not do this.

Salary Scale. Beginning salaries in the field varied from the minimum wage of \$3.50 an hour for persons without any training or experience and who would be working in second class cities to \$17,000 for persons with certification and experience, the only type of employee that one second class city with a new plant would hire. More of the beginning salaries quoted were in the \$9,000 to \$12,000 per year range than any other category. Top salaries in the field averaged \$15,000 or \$16,000 for operators.

The complete salary scale for Omaha follows:

Operator - \$7.35 to \$7.88 per hour

Foreman I - \$1,231 to \$1,484 per month

Shift Foreman - \$1,484 to \$1,783 per month

Plant Superintendent - \$1,768 to \$2,119 per month

Certification of Employees. Salaries and employment are dependent to some degree upon certification. The State of Nebraska has a voluntary program of certification for waste water treatment plant operators set up by the Nebraska Water Pollution Control Association. This program classifies waste water treatment works into four groups, based on the population served,

the type of plant, and the types of waste treated.

Group I

- a. All plants serving 15,000 population or over.
- b. Plants employing activated sludge process serving over 5,000.
- c. Plants employing chemical precipitation or sufficiently complicated processes to warrant this classification.

Group II

- a. Plants with other than activated sludge serving 5,000 to 15,000 population.
- b. Plants employing activated sludge process serving 1,500 to 5,000 population.
- c. Plants employing sufficiently complicated processes to warrant this classification.

Group III

- a. Plants with other than activated sludge serving 1,500 to 5,000 population.
- b. Plants with trickling filter and separate sludge digestion treatment or equivalent in mechanization serving less than 1,500 population.
- c. Plants employing sufficiently complicated processes to warrant this classification.

Group IV

- a. Plants serving less than 1,500 population not included in higher classifications.

Further details are available from the secretary-treasurer, C. Dale Jacobson, P.O. Box 14129, Omaha, Nebraska 68114.

The Nebraska Water Pollution Control Association has also set up requirements for four grades of certification for waste water treatment plant operators and conducts certification examinations.

Grade I

- a. A degree of Bachelor of Science in engineering (with special courses or two years experience in sanitary sciences) and two years in responsible charge and/or operation of wastewater treatment works, or

- b. Four years of college and three years of responsible charge and/or operation of wastewater treatment works or
- c. High School education or equivalent and six years responsible charge of a Group I or Group II plant or eight years operation of wastewater treatment works under the supervision of a person possessing qualifications of a Grade I operator.

Grade II

- a. Two years college, satisfactory completion (or satisfactory progress towards completion) of educational courses available and recognized by the Certification Committee, three years of responsible charge and/or operation of wastewater treatment works, or
- b. High school education or equivalent, satisfactory completion (or satisfactory progress toward completion) of educational courses available and recognized by the Certification Committee, six years responsible charge of a Group III or higher classification plant, or six years operation of a wastewater treatment works under supervision of a person possessing qualifications for Grade I or Grade II operator.

Grade III

- a. High school education or equivalent, satisfactory completion (or satisfactory progress toward completion) of educational courses available and recognized by the Certification Committee, two years responsible charge and/or operation of wastewater treatment works, or
- b. Two years high school or equivalent, satisfactory completion (or satisfactory progress toward completion) of educational courses available and recognized by the Certification Committee, three years responsible charge and/or operation of wastewater treatment works.

Grade IV

- a. Two years high school or equivalent, satisfactory completion (or satisfactory progress toward completion) of educational courses available and recognized by the Certification Committee, one year responsible charge and/or operation of wastewater treatment works.
- b. All applicants will be required to satisfactorily complete the correspondence course for wastewater works operators adopted by the Association, or pass an equivalent examination.

The examination schedule is announced through local newspapers, technical schools, engineers, and major waste water treatment plants. The Association's secretary can also furnish information about certification requirements.

Further information is available from the Nebraska Department of Environmental Control, Box 94877, Statehouse Station, 301 Centennial Mall South, Lincoln, Nebraska 68509.

The neighboring states of Iowa and South Dakota have mandatory certification programs.

Available Training. The Water Pollution Control Federation, comprised of 39 associations in the United States and 24 associations with similar objectives in other countries, acts as a source of education to the general public as well as to individuals engaged in the field of waste water treatment. It publishes a journal, newsletters, and manuals of practice, conducts conferences and exhibitions, and provides technical and educational services. It provides audio-visual materials and other assistance in establishing training programs for waste water treatment personnel. The address of the Water Pollution Control Federation is 2626 Pennsylvania Avenue, N.W., Washington, D.C. 20037.

Another national organization which provides training is the National Environmental Training Association, 158 South Napoleon, Box 346, Valparaiso, Indiana 46383.

The Water and Wastewater Technical School, P.O. Drawer 370, Neosho, Missouri 64850 offers training in waste water operations and maintenance. Specialized programs are conducted by the Neosho school throughout the United States.

Correspondence courses are offered by California State University, Department of Civil Engineering, 6000 Jay Street, Sacramento, California 95819.

In Nebraska training is offered by Southeast Technical Community College, 8800 "O" Street, Lincoln, Nebraska 68520, and by Hastings College.

The Nebraska Department of Environmental Control offers short courses. The address is P.O. Box 94877, 301 Centennial Mall South, Lincoln, Nebraska 68509. The director is Dan T. Drain, and Russ Irwin is the training officer.

No group or institution located in the four-county area served by Metro Tech offers training, as nearly as can be determined.

Miscellaneous Comments. One utilities superintendent interviewed remarked that they cannot afford to take people off the job and send them to a school. Another in a larger community said that they made a practice

of doing this. Several persons mentioned that state and Federal governments are coming out with more regulations all the time so that the need for training of operators will be increasing. A plant superintendent remarked that jobs will always be available in this field even in times of depression.

"The field has a bright future," one plant superintendent stated. "The job has its rewards and satisfactions. It's a unique area, and new equipment and techniques are always coming out," he went on. He would like to see an upgrading of people applying for the jobs.

Summary and Conclusions

Utilities superintendents, sewer commissioners, mayors, and sewage treatment plant superintendents and operators in Omaha and in first and second class cities in Douglas, Washington, Dodge, and Sarpy Counties were contacted by telephone to determine employer and training needs for the occupation of waste water treatment plant operator. One person who conducts training for a consulting engineering firm and is familiar with the field was also contacted.

The number of persons employed at these plants varied from one to 70. While the majority of those contacted did not anticipate any new jobs being created in this category, four of the larger plants did. The majority felt that a great demand exists for trained people in this field.

The most frequently mentioned skill needed for the job of waste water treatment plant operator was mechanical ability. A knowledge of chemistry and mathematics was also frequently mentioned. The skill most often cited as lacking among job applicants was knowledge of chemistry.

A combination of a three- to six-month course at a technical community college plus on-the-job training or an apprenticeship was considered by the majority to be the best type of education/training for this position. Among the courses which should be included were chemistry and laboratory procedures, mathematics, and operation and maintenance of pumps and motors.

An overwhelming majority of those interviewed felt that Metro Tech should establish a program of courses to prepare individuals to work in this area.

Salaries ranged from \$3.50 per hour for persons without any training in the smaller communities to \$2,119 per month for a plant superintendent in Omaha.

The State of Nebraska has a voluntary program of certification for waste water treatment plant operators. Four grades of certification have been set up depending on education, experience, and training.

Training is available through national organizations, the Nebraska Department of Environmental Control, some schools and community colleges, and by correspondence, but no institution located in the four-county area served by Metro Tech offers training.