

Water Operations
Diploma | 33 credits

Campus: Vermilion

FALL SEMESTER 2026 – 17 Credits	Prerequisites	Credits	Hr Lc/Lb
BIOL 1561 – General Biology of Cells (MnTC Goal 3)	(CLR)	4	(3/2)
CHEM 1200 – Introduction to Chemistry (MnTC Goals 3 & 10)	(MATH 0200)	4	(3/2)
OR CHEM 1521 – General Chemistry 1 (MnTC Goal 3)	(MATH 1220)		
WQAL 1651 – Water Treatment	(CLR, CLW, MATH 0100)	3	
WQAL 1652 – Wastewater Treatment	(CLR, CLW, MATH 0100)	3	
WQAL(WSHD) 1656 – Environmental Compliance	(CLR, CLW, MATH 0100)	3	

SPRING SEMESTER 2027 – 14 Credits	Prerequisites	Credits	Hr Lc/Lb
BIOL 1562 – General Biology of Organisms (MnTC Goals 3 & 10)	(BIOL 1561)	4	(3/2)
WQAL(WSHD) 1255 – Water Resource Field Visits		2	(0/4)
WQAL 1257 – System Hydraulics	(CLR, CLW, MATH 0200)	3	(2/2)
WQAL(WSHD) 2265 – Water & Wastewater Analysis 1	(CHEM 1200 or CHEM 11521)	5	(2/6)

SPRING or SUMMER 2027 – 2 Credits	Prerequisites	Credits	Hr Lc/Lb
WQAL 2220 – Water Resources Internship*	(WQAL 1651, WQAL 1652, WQAL 2265; 2.0 GPA)	2	

*Internship requirement may be completed outside of class as early as the first spring semester, allowing for Class D Exam qualification following graduation.

Additional Recommended Courses:

Students planning to transfer are advised to complete both CHEM 1521 General Chemistry 1 and CHEM 1522 General Chemistry 2.

Program Description

The Water Operations diploma is designed to prepare students for entry-level positions with the potential and skills to advance to supervisory and management positions in water operations, wastewater treatment, environmental laboratory work, equipment maintenance, public health work, and environmental engineering technical work. Upon completion of this program, students are eligible to take the Minnesota Department of Health (MDH) Water Supply System Operator and Minnesota Pollution Control Agency (MPCA) Wastewater Operator Certification Class D examinations. Graduates will have completed the first year of the Water Quality Science AAS degree program, and may be interested in continuing for one more academic year to complete that degree program.

To accommodate a variety of schedules and learning preferences, students can choose course sections that are either online (asynchronous or synchronous) or in person for the first fall semester. The internship and other program courses require in-person attendance to gain valuable practical experience in water operations. The campus's Water Resource and Research Facility at the Outdoor Learning Center supports the program's hands-on curriculum. The Outdoor Learning Center is also a student housing option – lakeside cabins provide a unique and immersive living experience.

Employment Opportunities

Careers focus on providing clean public drinking water, and on reclaiming that water, appropriately disposing of contaminants, and increasingly extracting nutrients (such as phosphorus) and energy capture during water reclamation processes. Occupational titles include Water Treatment Operator, Drinking Water Production Facility Operator, Wastewater Treatment Facility Operator, Water Consultant, and various specialist titles with infrastructure departments such as pump, pipe, and control system servicers.

Demands for skilled operators continue to increase, driven by the essential need for clean water. Graduates of this program are eligible to take Class D Water and Wastewater Operator exams. This certification increases employment options in water operations industries, where employment opportunities currently exceed qualified personnel availability. Water / Wastewater Operators have extraordinary job security, with the vast majority of professionals in the industry working straight through to retirement. Current industry pay typically starts at or above \$50K per year, plus benefits. Minnesota North College has an approximate 100% placement rate for students graduating from this program and desiring a career in water operations.

Students desiring a career in a different industry, yet focused on water resource management, can pursue positions with regulatory agencies such as Minnesota Pollution Control Agency (MPCA), Minnesota Department of Health (MDH), and Minnesota Department of Natural Resources (MN DNR), and support organizations such as Minnesota Rural Water Association (MRWA) and Minnesota Wastewater Operators Association (MWOA). Employment may be as a field scientist, entry-level hydrologist, or water resource specialist. Positions are also available in chemical / process manufacturing, education, and research.

Program Learning Outcomes

Graduates of this program will:

1. Demonstrate principles and responsibilities of managing water resources.
2. Know and understand drinking / potable water production processes, and 'wastewater' treatment processes as they are relevant to water operations industry careers.
3. Acquire knowledge and abilities necessary to pass Class D Water and Wastewater Operator Exams following program completion.
4. Learn and understand laboratory and field analytical procedures necessary for water / wastewater operator careers, and how they are used for facility functionality and permit compliance.
5. Learn, understand, and apply industry regulatory components to maintain permit compliance and efficient and effective operations.
6. Work independently and in teams to collect information, identify possible problem alternatives, and select the better solution to hydrologic / hydraulic situations.
7. Describe important concepts relating to laboratory analyses, water / wastewater operations, hydraulic principles, and environmental law and policy.
8. Apply technology and fundamental principles of water resource management through research reports, laboratory procedures, and field applications.
9. Know, understand, and use the scientific method: hypothesize, test, evaluate, and select an appropriate solution through theory and practical applications.

Program Faculty Contact

Dr. O'Niell Tedrow, Ph.D. (oniell.tedrow@minnesotanorth.edu, preferred; or 218-235-2133, seldom used)