



STATE OF HAWAII
DEPARTMENT OF HEALTH
SAFE DRINKING WATER BRANCH
ULUAKUPU BLDG. 4
2385 WAIMANO HOME ROAD, SUITE 110
PEARL CITY, HI 96782-1400

In reply, please refer to:
File: SDWB
Agenda 2-23-2021

BOARD OF CERTIFICATION OF PUBLIC WATER SYSTEM OPERATORS
MEETING AGENDA

DATE: February 23, 2021

TIME: 1:00 p.m.

VIDEO-TELECONFERENCE LINK:

Please contact jodi.yamami@doh.hawaii.gov of the Safe Drinking Water Branch by February 22, 2020 for a video-teleconference link on Microsoft Teams.

This meeting will be conducted by video-teleconference in accordance with the Seventeenth Proclamation Related to the COVID-19 Emergency provisions.

AGENDA

A. Call to Order

B. Old Business

- Comment on minutes of the previous meeting held on November 24, 2020.

C. New Business

- Review applications for Distribution System Operator (DSO) certification.
 1. Costales, Jimmy, DSO 1
 2. Carias, Gabriel, DSO 1
 3. Huffine, Christopher, DSO 1
 4. Pontin, Keal, DSO 1
 5. Silva, Patrick, DSO 1
 6. Melchor, Florendo, DSO 2
 7. Shigematsu, Tyrus, DSO 2
 8. Gibson, Steven, DSO 1 Reciprocity
 9. Stevens, Richard, DSO 2 Reciprocity
 10. Morris, Timothy, DSO 4 Reciprocity
- Review applications for Water Treatment Plant Operator (WTPO) certification.

1. Hale, Devin, WTPO 1
 2. Willett, Koree, WTPO 1
 3. Winfrey, David, WTPO 1
 4. Gibson, Steven, WTPO 4 Reciprocity
 5. Morris, Timothy, WTPO 4 Reciprocity
 6. Stevens, Richard, WTPO 4 Reciprocity
- Review requests for Continuing Education Unit (CEU) approval.
 1. Communicating Major Water Quality Concerns to the Press and the Public
 2. State of Technology: Cleaning and Coating UAV Systems
 3. Effectiveness of Granular Activated Carbon for the Removal of PFAS Precursor Compounds
 4. Improving Revenue Collections for Utilities
 5. Nitrification/Denitrification
 6. Rural and Municipal Water Quality: Inside and Out
 7. Water & Wastewater Safety
 8. EPA Regulatory Update
 9. Recommended Installation and Application Techniques for Waterworks Service Material
 10. Preparing for a Sanitary Survey
 11. Maintaining Water Service
 12. 2021 Pacific Water Annual Conference (additional session)
 13. Water Distribution Math Techniques
 14. Basic Electricity for Water System Operators Part 1
 15. Basic Electricity for Water System Operators Part 2
 16. Lead and Copper
 17. Pumps & Motors Troubleshooting Part 1 of 2
 18. Pumps & Motors Troubleshooting Part 2 of 2
 19. Setting Effective Rates for Small Systems
 20. Optimization and Accessing Funding
 21. Cybersecurity
 22. Sustainable Management of Rural and Small Systems Workshop
 23. Water Treatment Fundamentals
 24. Pumping Principles
 - Review results of the DSO certification exam.
 1. Aki, Harry, DSO 1
 2. Augustiro, Franklin, DSO 1
 3. Besmar, Zachary, DSO 1
 4. Bush, Cody, DSO 1
 5. Gomes, Derrick, DSO 1
 6. Hale, Devin, DSO 1

7. Lima-English, Anoi, DSO 1
 8. Agtarap, Elmer, DSO 2
 9. Alfante-Tabil, Michelle, DSO 2
 10. Crutchfield, Michael, DSO 2
 11. Kansana, Rhinehardt, DSO 2
 12. Rita, Selwyn, DSO 2
 13. Seumalo, Vaai, DSO 2
 14. Victorino, Matthew, DSO 2
 15. Belanio, Rory, DSO 3
 16. Bush, David, DSO 3
 17. Dudoit, Mervin, DSO 3
 18. Humphrey, Kevin, DSO 3
 19. Mollena, Elroy, DSO 3
 20. Naungayan, Darroll, DSO 3
 21. Hirata, Ray, DSO 4
 22. Kainoa, John, DSO 4
 23. Pang Kee, Adrian, DSO 4
 24. Paulino, Alfred, DSO 4
- Review results of the WTPO certification exam.
 1. Bartlett, Sean, WTPO 1
 2. Gannon, Joy, WTPO 1
 3. Hendershot, Kalei, WTPO 1
 4. Kamanu, Blane, WTPO 1
 5. Murashige, Keiven, WTPO 2
 6. Paman, Daniel, WTPO 2
 7. Perry, Daniel, WTPO 2
 8. Rosenthal, Christian, WTPO 2
 9. Mukai, Miki, WTPO 4

D. Announcements

- Next board meeting is scheduled for May 25, 2021.

E. Adjournment

ATTACHMENT 1
DSO RECOMMENDATIONS
2-23-2021

- | | | |
|---|---|-------------------------------|
| <p>1 Costales, Jimmy S. Grade 1
430 PMRF
Supervisor Leila Kamakele
Senior Plumber
3 yrs</p> | <p>Assist lead operator on water system requirements: daily chlorination residual/fluoride concentrations, monthly bacteriological sampling, repair water main leaks/breaks</p> | <p>Approve Grade 1</p> |
| <p>2 Carias, Gabriel V. Grade 1
360 Joint Base Pearl Harbor
Hickam
Supervisor Alfred Paulino
Industrial Equipment Mechanic
1 yr/7 mos</p> | <p>Install, maintain, repair equipment involved with pumping, treating and distributing of four separate water systems delivering fresh water to facilities of the Navy</p> | <p>Approve Grade 1</p> |
| <p>3 Huffine, Christopher S. Grade 1
315 Kahuku Airbase
Supervisor Greg Hunter
Operator in Training
2 yrs/8 mos</p> | <p>Maintain HDPE lines, read and replace meters, replace lines with leaks, put fittings on lines, replace valves</p> | <p>Approve Grade 1</p> |
| <p>4 Pontin, Keal T. Grade 1
315 Kahuku Airbase
Supervisor Greg Hunter
Operator in Training
5 yrs</p> | <p>Replace check valves meters, HDPE lines, pick up bleach from BEI, tracking and replacing pipes due to leaks, learned how to dose, daily checks</p> | <p>Approve Grade 1</p> |
| <p>5 Silva, Patrick H. Grade 1
251 Launiupoko Water
Supervisor Dave Minami
Laborer
1 yr/2 mos</p> | <p>Repair leaking service laterals and distribution mains, install new service laterals, meters and backflow preventers, check chlorine residuals in system, read meters, check and maintain tanks and reservoirs</p> | <p>Approve Grade 1</p> |
| <p>6 Melchor, Florendo B. Grade 2
400 Lihue-Kapaa
Supervisor Ryan Smith
Pipefitter Helper
1 yr/1 mo</p> | <p>Assist in treating drinking water with hypochlor and soda ash, check SCADA for problems within system, assist in maintenance, repair, replacement of site equipment such as well pumps, booster pumps, chlorination pumps, cla-valves, repair and upgrade services and main lines as needed, hot tap and install services to customers, replace or add valves, flush hydrants, exercise valves</p> | <p>Approve Grade 1</p> |
| <p>State DOT
Supervisor Sheldon Moniz
Maintenance Worker
5 yrs/5 mos</p> | <p>On irrigation system: maintenance on PVC, repair and install new laterals, repair and install gate, ball valves, fittings, risers and sprinklers</p> <ul style="list-style-type: none">• Irrigation system experience does not qualify as drinking water system experience
• Applicant has 1 yr/1mo of applicable experience, approve DSO grade 1 only | |

ATTACHMENT 1
DSO RECOMMENDATIONS
2-23-2021

- | | | | |
|---|--|--|--|
| 7 | Shigematsu, Tyrus I. Grade 2
400 Lihue-Kapaa
Supervisor Darren Lizama
Pipefitter Helper
2 yrs/8 mos | | Approve Grade 2
Repair/install/maintain main lines & services, locate pipes, disinfect lines after installation, repair/maintain valves, install & maintain/repair hydrants, flush every week |
| 8 | Gibson, Steven E.L. Grade 1 Reciprocity
331 Honolulu-Windward-Pearl Harbor
Supervisor Ramona Kaito-Haasenritter
Water System Operator
8 mos | | Deny Reciprocity, Approve Grade 1 Regular
Monitor island-wide water distribution system from the Control Center, operate pump stations and wells as needed, compile reports, and handle customer service duties |
| | City of Asheville
Supervisor Brendan Kelley
Water Maintenance Worker
7 mos | | Complete maintenance work on water distribution system, repair and replace broken water mains, hydrants, valves, and other fixtures, install new taps and service lines, operate vacor vacuum truck for excavation <ul style="list-style-type: none">• Applicant has no current distribution certification• With 15 months distribution experience, approve DSO grade 1 regular (via examination) |
| 9 | Stevens, Richard M. Grade 2 Reciprocity
Groton Utilities
Supervisor Herb Cummings
Chief Plant Operator
33 yrs | | Approve Grade 2 Reciprocity
Cover 100 miles of piping for distribution system including new installation, repair and maintenance, oversee daily operations for main/service breaks <ul style="list-style-type: none">• Applicant held a Hawaii DSO Grade 2 certification via reciprocity but let it lapse in 2014• Current Connecticut Distribution System Operator Class II # 187073-C2 expires 12/31/23• Connecticut Distribution System Operator Class II is the middle level out of 3 levels• Connecticut Distribution System Operator Class II requires<ul style="list-style-type: none">○ 2 years of experience○ Passing of a Connecticut Class II exam• Connecticut Class II is equivalent to Hawaii DSO Grade 3 exam on the ABC Equivalency Chart |

ATTACHMENT 1
DSO RECOMMENDATIONS
2-23-2021

- 10 **Morris, Timothy W. Grade 4 Reciprocity** **Approve Grade 2 Reciprocity, Grade 4 Regular**
- IL American Water
Supervisor Kevin Hillen
Operator
13 yrs
- Daily reporting and verification of well and chemical equipment operations, inspected motors, well houses, feeders, pumps, towers, tanks, PLCs, did basic electrical and mechanical troubleshooting of equipment, ran testing to determine feed rates and chemical levels in finished water, conduct maintenance on distribution system, check hydrant and valve operation, completed regulatory testing and reporting
- Current Illinois Public Water Supply Operator Class A #237308438 expires 7/1/2023
 - Illinois Public Water Supply Operator Class A is the highest out of 4 combined water treatment/distribution classes
 - Illinois Public Water Supply Operator Class A requires
 - 5340 hours combined hands-on experience and/or educational experience
 - 5340 hours hands-on experience OR
 - 2670 hours hands-on experience + 2670 hours college coursework OR
 - 3560 hours hands-on experience + 1780 hours non-college coursework
 - passing of the Class A exam (200 questions, 70% pass)
 - Illinois creates their own exams which combine water treatment and distribution
 - Illinois requirement of 5340 hours (2.57 years) hands-on experience best matches Hawaii's DSO 2 requirement
 - Operator meets 4 years of experience to qualify for DSO 4 exam

ATTACHMENT 2
WTPO RECOMMENDATIONS
2-23-2021

- | | | | |
|---|---|--|--|
| 1 | Hale, Devin Grade 1
135 Waikoloa
Chlorination
Supervisor Abe Takushi
1 yr/3 mos | | Approve Grade 1
Take chlorine readings, adjust flows, repair chlorine valves, exchange chlorine tanks, troubleshoot, make adjustments on liquid sodium hypochlorite |
| 2 | Willett, Koree K. Grade 1
345 Schofield
Chlorination/Fluoridation, Air Stripping Tower
Supervisor Wayde Nakai
1 yr/6 mos | | Approve Grade 1
Test water samples for chlorine and fluoride residuals, make adjustments to chlorine/fluoride feed rate depending on results, calibrate fluoride equipment, inspect air stripping tower, check flow rate of AST, backwash AST, replace fiber-glass filter medias in AST, check chlorine vat level, check chlorine equipment/pumps/lines/valves for leaks, change feed rate tubing as needed |
| 3 | Winfrey, David L. Grade 1
100 Hawaii County
Chlorination, Microfiltration
Supervisor William Oneil
3 yrs/7 mos | | Approve Grade 1
Operate and maintain water chlorination stations testing water for chlorine residual and adjusting the chlorine feed rate, mixes chlorine solution, checks chlorinator operating pressure, pumps, chlorine leaks, safely transports chlorine cylinders and changes cylinders, repairs chlorinating equipment |
| 4 | Gibson, Steven E.L. Grade 4 Reciprocity
City of Asheville
Conventional Treatment
Supervisor Brendan Kelley
Water Plant Operator
2 yrs/3 mos | | Approve Grade 1 Reciprocity, Grade 2 Regular
At conventional treatment plant, backwash filters, dial in the coagulant dosage for coagulation and sedimentation, adjust ozone system for disinfection, adjust raw water pumps, control valves, performed lab work such as pH, chlorine residual, ozone residual, temperatures, alkalinity, replace hoses and diaphragms on chemical feed pumps, fill chemical bulk tanks, check and reset VFDs for water pumps <ul style="list-style-type: none">• Current North Carolina Grade B-Surface Water Treatment Facility Operator #180204 expires 12/31/2020• North Carolina Grade B-surface Water Treatment Facility Operator is the middle out of 3 surface water treatment grades• North Carolina Grade B-Surface requires<ul style="list-style-type: none">○ High school diploma○ 1 ½ years of experience at a surface water facility○ Completion of B-Surface school approved by the Board○ Passing of a B-Surface exam• North Carolina creates their own surface water treatment exams• North Carolina requirement of 1 ½ years of experience best matches Hawaii WTPO 1 requirement for reciprocity• Operator meets 2 years of experience with conventional treatment to qualify for WTPO 2 exam |

ATTACHMENT 2
WTPO RECOMMENDATIONS
2-23-2021

- 5 **Morris, Timothy W. Grade 4 Reciprocity** **Approve Grade 2 Reciprocity, Grade 4 Regular**
- IL American Water
Conventional Treatment
Supervisor Kevin Hillen
Operator
13 yrs
- At a conventional treatment plant using alum sulphate and multi-media filtration, handled daily reporting and verification of boosters and SCADA, inspected motors, boosters, VFDs, feeders, pumps, towers, tanks, PLCs, did basic electrical and mechanical troubleshooting of equipment, ran testing for turbidity, completed regulatory testing and reporting, cleaned contact tanks, checked levels of alum and caustic, worked with solution calculations, checked and maintained filter media, operated GAC, monitored and adjusted levels for disinfection and corrosion control, maintained proper pH levels.
- Current Illinois Public Water Supply Operator Class A #237308438 expires 7/1/2023
 - Illinois Public Water Supply Operator Class A is the highest out of 4 combined water treatment/distribution classes
 - Illinois Public Water Supply Operator Class A requires
 - 5340 hours combined hands-on experience and/or educational experience
 - 5340 hours hands-on experience OR
 - 2670 hours hands-on experience + 2670 hours college coursework OR
 - 3560 hours hands-on experience + 1780 hours non-college coursework
 - hands-on experience must be with conventional treatment
 - passing of the Class A exam (200 questions, 70% pass)
 - Illinois creates their own exams which combine water treatment and distribution
 - Illinois requirement of 5340 hours (2.57 years) hands-on experience best matches Hawaii WTPO 2 requirement for reciprocity
 - Operator meets 4 years of experience with conventional treatment to qualify for WTPO 4 exam
- 6 **Stevens, Richard M. Grade 4 Reciprocity** **Approve Grade 4 Reciprocity**
- Groton Utilities
Conventional Treatment
Supervisor Herb Cummings
Chief Plant Operator
33 yrs
- Chief plant operator covers source treatment (coagulation/flocculation/sedimentation/chemical oxidation of iron and manganese/GAC/fluoridation/corrosion control/chlorination
- Applicant previously held a Hawaii WTPO Grade 4 certification
 - Current Connecticut Water Treatment Plant Operator Class IV # 183015-C4 expires 6/30/2022
 - Connecticut Water Treatment Plant Operator Class IV is the highest out of 4 levels
 - Connecticut Water Treatment Plant Operator Class IV requires
 - 4 years of experience
 - Passing of a Connecticut Class IV exam
 - Connecticut Class IV is equivalent to Hawaii WTPO Grade 4 exam on the ABC Equivalency Chart

ATTACHMENT 3
CEU RECOMMENDATIONS
2-23-2021

Hawaii Courses

- 1 **Communicating Major Water Quality Concerns to the Press and the Public**
9/14/20 The presentation will detail the successful communications strategies that lead to thoughtful, reasoned reactions to exceedances from the press and public. It will also address the revisions to the Lead and Copper Rule and PFAS that will dramatically impact how utilities must communicate about future exceedances.
NRWA
1.0 Contact Hours
0.1 CEUs

- 2 **State of Technology: Cleaning and Coating UAV Systems**
9/14/20 Cleaning, coating, and the nondestructive testing (NDT) of corrosion-susceptible surfaces requires extensive manual labor, often at vertical heights that create a dangerous occupational environment. Drones, also known as unmanned aerial systems (UAS), unmanned aerial vehicles (UAV), or small unmanned aerial vehicles (SUAV) can be leveraged to perform some of these tasks, including cleaning and coating, while keeping workers safely on the ground. An introduction to the current state of coating and cleaning drones will be discussed, along with limitations and benefits the system can provide to the coatings industry.

- 3 **Effectiveness of Granular Activated Carbon for the Removal of PFAS Precursor Compounds**
9/15/20 With the goal of identifying the characteristics that control the selectivity of GACs toward precursor compounds, five types of GAC were examined via rapid small-scale column tests (RSSCTs) for the removal of a suite of several of the most commonly reported PFAS precursor compounds, as well as PFOA and PFOS from ground water. Pertinent characteristics of these GACs, such as activity level and pore volume distribution, were measured and then compared statistically to their performance in the RSSCTs. For utilities and industries facing the need to treat for PFAS precursor compounds, knowledge of the relative importance of these GAC characteristics can be used to guide GAC selection and maximize treatment performance.

- 4 **Improving Revenue Collections for Utilities**
9/15/20 In this session, participants will learn how policies and procedures at various stages of the customer cycle – application for service, billing, delinquent processing, and final bills – can impact collections. They will learn what policies and procedures other utilities have implemented to improve collection rates and reduce bad debt and write-offs.
NRWA
1.0 Contact Hours
0.1 CEUs

- 5 **Nitrification/Denitrification**
9/15/20 This presentation will cover the Nitrification/Denitrification cycle critical for nitrogen removal in wastewater systems. Key operational conditions for wastewater system will also be covered. You will become familiar with key bacteria doing all the work in your activated sludge or lagoon systems. We will also review trouble shooting procedures to find where inefficiencies and issues are impacting the Nitrification/Denitrification process.
NRWA
1.0 Contact Hours
No CEUs

 - No credit for wastewater content

ATTACHMENT 3
CEU RECOMMENDATIONS
2-23-2021

- 6 **Rural and Municipal Water Quality: Inside and Out**
9/16/20
NRWA
1.0 Contact Hours
No CEUs
This presentation will discuss the Municipal Separate Stormwater Sewer System (MS4) permits covering six minimum control measures: Public Education, Public Participation, Illicit Discharge, Construction Activities, Post Constructions, & Pollution Prevention
- No credit for stormwater content
- 7 **Water & Wastewater Safety**
9/16/20
NRWA
1.0 Contact Hours
0.1 CEUs
Whether it is biological, chemical, or physical, the water and wastewater profession has more hazards than most professions. This class covers those potential hazards, confined spaces, mitigating hazards, personal protection equipment, and more making your workplace a safer place to be.
- 8 **EPA Regulatory Update**
9/17/20
NRWA
1.0 Contact Hours
0.1 CEUs
This presentation will discuss the current and future regulatory issues and challenges from EPA.
- 9 **Recommended Installation and Application Techniques for Waterworks Service Material**
9/17/20
NRWA
1.0 Contact Hours
0.1 CEUs
This session will highlight the recommended practices of installing and applying new technology and techniques in service material for water systems.
- 10 **Preparing for a Sanitary Survey**
12/7/20
EFCN
1.0 Contact Hours
0.1 CEUs
This webinar will provide attendees with an overview of sanitary surveys and how to prepare for one. Attendees will learn the essential elements of a sanitary survey and what things the surveyor will look for at your water system.
- 11 **Maintaining Water Service**
1/26/21
RCAP
1.0 Contact Hours
0.1 CEUs
This webinar will describe how you can assess the risks your utility faces from both natural disasters and man-made threats. The webinar will explain what steps you can take to mitigate these potential threats. The webinar will also summarize how to establish strategies, plans, and procedures to respond to an incident when it occurs.
- 12 **2021 Pacific Water Annual Conference**
2/3-4/21
AWWA Hi/HWEA
0.5 Contact Hours
0.05 CEUs
Drinking Water topic (0.5 contact hours):
- Field Testing High-Accuracy Asset Locates on Oahu Using GNSS
 - This session is in addition to the sessions approved at the 11-24-20 board meeting.

ATTACHMENT 3
CEU RECOMMENDATIONS
2-23-2021

- 13 **Water Distribution Math Techniques**
2/18/21 This workshop will help the treatment operator master the following formulas
RCAC while utilizing a conversion sheet. Participants will learn: volumes, pressure,
2.0 Contact Hours chlorine dosage, pumping rates, & pipe velocity.
0.2 CEUs

- 14 **Basic Electricity for Water System Operators Part 1**
2/23/21 Topics include:
RCAC
 - Discover what electricity is
 - Terms and definitions
 - Define AC/DC power
 - Methods of converting energy into electricity
 - What is electricity
2.0 Contact Hours

The Board approved a 4-hour course including part 1 and part 2 at the 11/24/2020 meeting. This request split the course into 2 parts.

- 15 **Basic Electricity for Water System Operators Part 2**
2/23/21 Topics include:
RCAC
 - Power production and distribution
 - Types of motor controllers and their functions
 - Types of power
 - Equipment definitions
 - Theory of operations
2.0 Contact Hours

The Board approved a 4-hour course including part 1 and part 2 at the 11/24/2020 meeting. This request split the course into 2 parts.

- 16 **Lead and Copper**
2/23/21 Topics include:
US EPA
 - Lead and copper rule revision
 - Chemistry of lead corrosion and release
1.5 Contact Hours
0.15 CEUs Copper corrosion, copper release to pitting attack

- 17 **Pumps & Motors Troubleshooting Part 1 of 2**
3/3/21 Topics include:
RCAC
 - Electric motor troubleshooting and common issues
 - Basic types of centrifugal pumps and their characteristics
 - How to calculate TDH in a fluid pumping system
2.0 Contact Hours
0.2 CEUs

- 18 **Pumps & Motors Troubleshooting Part 2 of 2**
3/3/21 Topics include:
RCAC
 - How to calculate friction loss
 - How to read pump curves
 - Centrifugal pump performance testing and troubleshooting techniques
2.0 Contact Hours
0.2 CEUs

ATTACHMENT 3
CEU RECOMMENDATIONS
2-23-2021

19 Setting Effective Rates for Small Systems

3/16/21

AWWA/USDA

3.0 Contact Hours

0.3 CEUs

Topics include:

- Assessing your system
- Identify core financial objectives
- Evaluate customer base
- Building rates that fit your situation and objectives

20 Optimization and Accessing Funding

3/17/21, 5/19/21

AWWA/USDA

3.0 Contact Hours

0.3 CEUs

Topics include:

- Overview of AWWA Partnership for Safe Water Programs
- How to conduct a self-assessment in order to optimize your operations
 - General Management/Administration
 - Finance
 - Asset Management
 - Source Water Protection
 - Distribution System Operations
- How to apply for low interest funding through USDA

21 Cybersecurity

5/18/21

AWWA/USDA

3.0 Contact Hours

0.3 CEUs

Topics include:

- Why is cybersecurity important
- Self-assessment questionnaire using the Tool

Cybersecurity controls for small systems

Repeating Courses

22 Sustainable Management of Rural and Small Systems Workshop

HRWA

6.0 Contact Hours

0.6 CEUs

This interactive workshop will focus on ten key management areas of effectively managed utilities, which make up a framework for a complete and well-rounded management approach. By making operational improvements in any of these areas, utilities will be able to deliver increasingly efficient, higher quality services to its community.

Correspondence/Online Courses

23 Water Treatment Fundamentals

Technical Learning College

40.0 Contact Hours

4.0 CEUs

This course will cover various and commonly found water treatment processes, methods and chemistry fundamentals starting at the source of water and ending with disinfection to delivery through distribution.

24 Pumping Principles

Technical Learning College

16.0 Contact Hours

1.6 CEUs

This course will cover the science pertaining to liquid pressure, flow and pumping dynamics. It will cover the basics of hydraulic fundamentals commonly related to the study of the mechanical properties of water.