



Hydrographer

ROLE OVERVIEW

As a hydrographer, your duties will be intrinsically connected to offshore and nearshore operations. You are expected to be specialized in data acquisition, precise positioning, and processing in both offshore and nearshore marine environments, mainly for the safety of navigation.

Nearshore operations include measuring, analyzing, and maintaining the flow of stormwater and sewage, to ensure that estuaries are upkept and prevent them from posing threats to navigation or accumulating harmful material to human life and surrounding environments. Offshore operations are mostly related to evaluating the nature and shape of the seabed. Most of this research occurs aboard vessels and with the use of sophisticated technology such as satellite positioning systems, echo sounders and computer-aided design packages.

You are expected to have full and complete knowledge about the equipment required for the purpose of conducting a hydrographic survey. Because all the data collection occurs with computerized instruments, you are also required to be fully aware of the methods of operations of all required instruments. You will have to prove working knowledge in underwater environments and openness to work in a multidisciplinary and multi-industry position since the proper completion of projects will most likely require knowledge sharing.

Most positions are in the field of electricity and gas, or any other industry that requires extensive knowledge of the seabed to lay cables. Public administration and safety also require hydrographic surveys and research for the building and maintenance of structures such as bridges and docks. Lastly, as a hydrographer, you will also have the possibility to work as a professional researcher or in other related technical positions.

STRATA LEVEL: 3B – Technical Specialist

Also Known as:

- Hydrographic Surveyor
- Hydrographic Researcher
- Field Hydrographer
- Hydrographic Research Analyst

Education and Experience:

- Diploma or certificate from a technical institute for hydrological surveyor.
- Undergraduate degree in civil or survey engineering.
- Undergraduate or graduate degree in areas such as hydrography, geomatics, environmental science or geography.

Associated NOC(s):

- **2113** – Geoscientists and Oceanographers



TECHNICAL



Technical Software

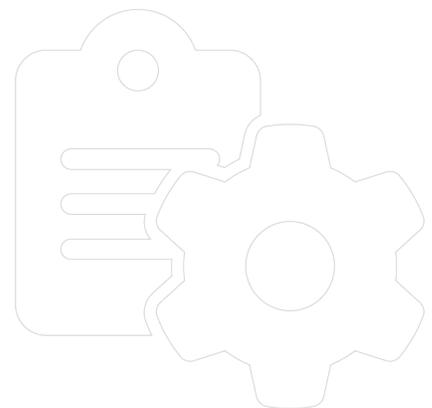
Uses specialized software to carry out hydrographic research and analyze and store data to generate innovation and increase organizational competitiveness.

- Uses geographical information systems (GIS) to manage the integration, processing, and presentation of data to clients.
- Collect all pre-survey data such as CAD outline of water body, track lines for the vessel to follow and verified quality control points to ensure optimal results.
- Uses specialized technical software to provide data to produce nautical charts and maps.
- Uses appropriate software for timely processing of data collected to maintain the significance of the data collected.
- Research and updates knowledge and skills related to computer software and systems to keep up with technological advancements and recommends the latest innovations or improvements.
- Assesses and evaluates software specifications to determine the feasibility of new or existing systems configurations to meet user requirements, and client goals (internal and external).

Surveying

Carries out surveys of physical features present underwater to measure all factors that can affect marine activities.

- Interprets data from hydrographic surveys to design and update nautical charts for navigation.
- Uses sounding and electronic sensor systems to survey shallow waters for offshore and nearshore operations.
- Carries out reconnaissance operations of the survey area to perform the surveys effectively and economically.
- Locates horizontal and vertical control to identify all features of the seabed in true relative positions.



Data Analysis

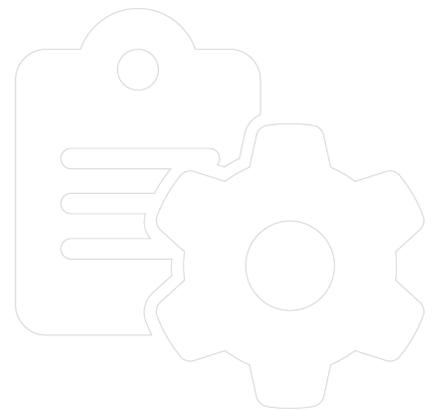
Applies recognized statistical tools and techniques to interpret and analyze data for the purpose of uncovering trends, patterns, and opportunities to enable strategic decision-making.

- Prepares summary reports of analysis results to be added into technical reports or presentations to expert and/or non-expert audiences.
- Performs mathematical calculations related to plant activities for the purposes of communicating results in a written report.
- Applies advanced quantitative and qualitative data analysis techniques and methods to determine environmental impacts of departmental initiatives, plans and activities.
- Analyzes and provides a scientific interpretation of data related to various sources of environmental issues.

Chartwork and Pilotage

Uses charts, nautical publications, and instruments to pilot a survey vessel in and out of harbours or anchorages, along coastlines, and through channels.

- Takes appropriate measures to stabilize the vessel to ensure hydrographic data collection is accurate.
- Prepares maps, charts, sketches, diagrams and reports on the currents and compositions of water bodies to properly design surveys.
- Uses nautical charts to identify navigable areas, shorelines, and non-navigable areas to safely navigate the vessel.
- Maintains an up-to-date logbook and a record of compass errors to ensure accurate reporting on the progress of the vessel.
- Produces charts and information related to changes or erosion of shipping lanes for the safety of navigation.



Equipment Operation

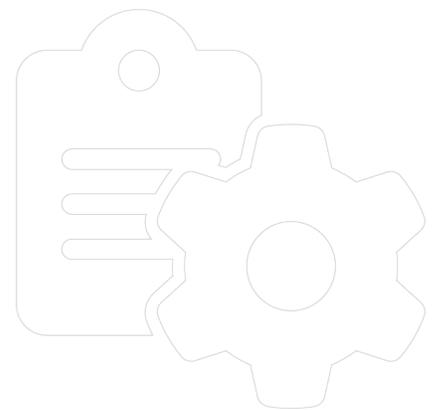
Operates equipment using established processes to ensure outcomes are within allowable variances and maximizes safety and efficiency.

- Uses remotely operated and autonomous underwater vehicles for deep ocean data collection to survey the seabed.
- Uses technology including, but not limited to single-beam, multi-beam, and side-scan sonar to collect seabed data to better understand its morphology.
- Installs, sets up and operates precision measuring equipment for electronic distance measuring.
- Operates equipment in compliance with organizational standards to maintain efficient and safe workplace operations.

Equipment Maintenance

Performs routine and non-routine maintenance of equipment to maintain safe and efficient operations.

- Adjust, calibrate, and maintain surveying instruments such as prisms, theodolites, and electronic distance measuring equipment to ensure accuracy efficiency.
- Performs corrective maintenance according to established protocols to ensure equipment and systems function efficiently.
- Performs preventative maintenance according to established protocols to ensure equipment and systems function efficiently.
- Identifies and reports major equipment maintenance needs, prior to failure, to maintenance personnel to ensure safe and efficient operations.
- Follows appropriate procedures to calibrate and recalibrate instruments and equipment to ensure accurate measurements and quality control.



PERSONAL AND PROFESSIONAL



Communication

Positively directs outcomes by delivering communication that results in a better understanding of goals and objectives and that captures interest, and gains support for immediate action.

- Maintains communications with the team, as well as external stakeholders, to exchange information, assess progress and reassign work as needed.
- Prepares comprehensive reports that clearly identify project objectives, scope, research findings, alternatives, and recommendations to create a defensible impact statement.
- Communicates with other team members to share information and resources to exploit opportunities and efficiencies.
- Integrates the contribution of multiple disciplines into an integrated and cohesive narrative that stakeholders can readily and easily understand.
- Shares relevant and useful knowledge, experience, or expertise to aid team members accomplish their objectives more efficiently or effectively.

Attention to Detail

Delivers a concentrated concern, including monitoring and checking information, organizing tasks and resources efficiently, or all areas involved towards the completion of an objective.

- Provides accurate, consistent information on all pieces of work to ensure reliable results.
- Provides information on a timely basis and delivered in an audience-appropriate language to communicate effectively.
- Provides accurate and reliable feedback when reviewing others' work to ensure consistent deliverables.
- Applies a concentrated concern to interpreting navigational information to ensure the vessel maintains true course during hydrographic surveys.



Teamwork

Actively participates in working with and helps others to accomplish a common objective.

- Recommends improvements or solutions to supervisors for the purposes of improving operational efficiency.
- Solicits input from team members for the purpose of improving efficiency.
- Verbally conveys complex technical information accurately, clearly, and effectively to communicate technical operations.
- Listens to constructive feedback and incorporates suggestions to achieve a collective objective.
- Ensures tasks are completed in the most efficient manner to optimize workplace output.

Problem Solving

Identifies problems and uses logic, judgement, and evidence to evaluate alternative scenarios and recommend solutions to achieve the desired goal.

- Considers the impact on the organization and environment when analyzing specific project objectives and goals.
- Analyzes project metrics to understand trends and potential areas of concern to take appropriate actions where required.
- Considers all pieces of information when attempting to solve problems to produce a cognisant and comprehensive solution.
- Takes an unbiased stance to interpreting new information to solve a problem in an object manner.
- Identifies service and maintenance issues to equipment and vehicles and makes appropriate contact with technical staff to alleviate mechanical problems.



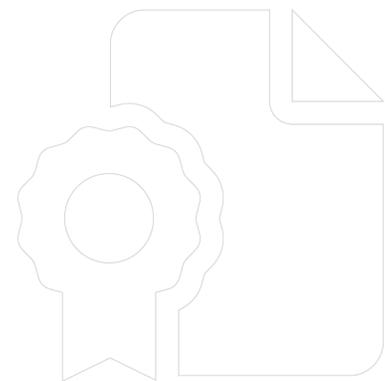
LEGAL, REGULATORY, AND POLICY



Regulatory Compliance

Adheres to specific regulations, codes, and legislation within a defined jurisdiction to ensure the health and safety of others.

- Complies with specific industry regulations within a defined jurisdiction to maintain a safe work environment.
- Records facility operations to ensure compliance with standards and regulations.
- Analyzes relevant regulations, legislations, and standards to ensure the project complies with laws, regulations, and standards.
- Demonstrate knowledge of regulations, codes, standards, and safety, including local engineering procedures and practices to ensure the safe operation of facilities and systems.



ENVIRONMENTAL



Ecological Analysis

Applies appropriate methodologies to conduct sampling, screening, and analysis of a specific location for the purposes of characterizing and monitoring the location' environment.

- Carries out exploration projects for marine resources in an ethical and sustainable way to ensure best practice.
- Uses hydrographic research to predict the effects of proposed and existing marine developments on the environment.
- Applies GIS tools to monitor change and identify trends in natural habitats or ecosystems to manage environmental quality.
- Collects samples using the established protocol to provide a better understanding of the environmental condition of the area.
- Evaluates environmental management policy alternatives to recommend strategies for sustainable development.

