

SATISFACTORY GEOSCIENCE EXPERIENCE

Work experience is an essential element in determining whether or not an individual is acceptable for professional registration/licensing. The responsibility for providing the proper environment, opportunities, range and progression of activities necessary to meet the work experience requirements rests with the employers of applicants, and the individuals who provide supervision during the internship period.

The following criteria are designed to provide guidance to candidates, employers and supervisors with respect to the level of experience expected of an applicant applying for professional registration or licensure.

To be accepted, a candidate's experience must include active and responsible participation in several aspects of geoscience:

- i. geoscience training and familiarization.
- ii. technical geoscience experience.
- iii. development of geologic concepts: preparation of reports concerning deposits of rocks, minerals or other naturally-occurring earth materials.
- iv. investigation of physical and chemical characteristics of geological materials, and their formation, interactions and significance in the environments in which they are found
- v. mapping and systematic geoscience evaluation (with specific reference to bedrock, unconsolidated earth materials and or snow, ice, groundwater, surface water and constituents thereof);
- vi. acquisition of sufficient field and other applied knowledge to gain a thorough appreciation of natural variability of geological materials and the constraints imposed by data collection and interpretation; and
- v. identification of geologic hazards and risk to the public and the environment.

Acceptable geoscience work experience must include the application of the knowledge of geoscience principles and practice and should provide exposure to and / or experience in the broad areas of management, communication, and the social implications. Assessment of the acceptability of the work experience is based on the extent to which the applicant's experience includes these areas, each of which is outlined in the following sections.

1. Application of the Knowledge of Geoscience Principles and Practice

The skilful application of geoscience knowledge is essential to earning a professional registration or licensure. Candidates and Geoscientists-in-Training (GIT) must be able to apply the technical training learned through the study of geoscience projects, so that optimal solutions are developed and implemented. It is important that the geoscience experience expose the candidate/GIT to a variety of technical projects that require more than routine analysis for solution. This requires the candidate/GIT to build on his or her geoscience training by

seeking out further knowledge. The candidate/GIT is expected to seek further knowledge on a regular basis to remain current of technological advances in his or her field of specialty throughout the candidate's/GIT's career.

2) **Management**

Candidates/GIT's must be able to document reasonable progression toward increasing management involvement and responsibility over time.

Management covers a wide area of a geoscientist's work, and includes more than just the supervision of staff. In the complex array of responsibilities facing modern managers, it is essential they understand the concepts of project management. Management experience has become an essential part of training.

The following components of management experience should be taken as a representative framework:

- a. Planning:
 - Concept development;
 - Identification of requirements;
 - Assessing the resources required.
- b. Scheduling:
 - Developing activity / task schedules;
 - Determining interactions and constraints;
 - Allocation of resources;
 - Assessing the impact of delays;
 - Interaction with other projects;
 - Interaction with the market place.
- c. Budgeting:
 - Development of conceptual budget;
 - Development of detailed budget, including estimates of labour, material and overhead;
 - Risk assessment of cost escalation potential;
 - Review of budget in light of changes.
- d. Supervision:
 - Leadership and professional conduct;
 - Organization of manpower;
 - Team building;
 - Management of technology.
- e. Project Control:
 - Understanding elements of the project as it relates to the total project;
 - Coordinating the phases of project work;
 - Monitoring of expenditure and schedule and taking appropriate action;
 - Quality control;
 - Data management;
 - Performance measurement.
- f. Risk Assessment:
 - Operating equipment and system performance;
 - Confidence limits on interpretations;
 - Social and environmental impacts.

3) **Communication Skills**

During the training period, candidates should be required to communicate effectively with superiors, co-workers, government regulators, clients and the general public. They should become proficient in the written and oral presentation of geoscience from daily record-keeping to major reports. Applicants should have regular and progressive opportunities to participate in:

- a. preparation of written work, including day-to-day correspondence, record-keeping, and report writing;
- b. making oral reports or presentations to colleagues, supervisors, senior management;
- c. preparation of reports to clients and regulators; and
- d. making public presentations.

4) **Social Implications of Geoscience**

The practice of geoscience has significant impact on the public, through its influence on such factors as the environment, safety, industrial development, finance and education. Candidates should become aware of the geoscientist's role in society and the social impact of projects in which they are involved. They should understand the role of the geoscientist from these points of view-and his or her ability to influence these social components. The objective is also to foster an awareness of the geoscientist's professional responsibility to guard against conditions which threaten life, property or the environment and to call such conditions to the attention of those responsible.

Awareness of social responsibility should include an understanding of the:

- a. safeguards in place to protect the public and mitigate adverse impacts;
- b. quality assurance measures involved with the production of geoscience products;
- c. value of geoscience works to the public;
- d. interface between the geoscience organization and the public when communicating the impacts and benefits of geoscience works;
- e. wider social implications of geoscience, gained through attendance at public meetings, or seminars sponsored by the GIT's organization;
- f. role of regulatory bodies on the practice of geoscience;
- g. provincial health and safety of the workplace legislation; and
- h. importance of the social component in sustainability.

5) **Sustainability**

The Association of Professional Engineers and Geoscientists of British Columbia is committed to integrating sustainability principles and practices into engineering and geoscience professions in the province of B.C.

All applicants, Engineers-in-Training, Geoscientist-in-Training and members are expected to:

- a. Maintain a basic awareness of the principles of sustainability. The Association's web site contains several sources of information on this subject.
- b. Be aware of any specific sustainability clauses that have been added to practice guidelines that apply to their area.
- c. To the extent possible, recognizing their position of influence, consider how sustainability principles could be applied and promoted in their specific work.

- d. Support opportunities to form partnerships with others, such as government and public bodies, educational institutions and other professional associations, to expand the global networks that seek to embed sustainability concepts in society as a whole.

6) **Sponsorship**

Referees provide confirmation of the candidate's experience. References are required from practicing professional geoscientists familiar with details of the candidate's work during the internship. Present and past direct supervisors are the most suitable referees. If a candidate claims experience from several positions, extra references may be required.

All candidates are required to nominate four or more Canadian and/or US referees. All should be professional geoscientists with first-hand knowledge of the candidate's work. At least two of the referees should have directly supervised the candidate and at least one professional geoscientist familiar with the candidate's work from outside his or her company should be nominated if possible. If experience outside Canada/United States must be verified, additional referees are required. A separate letter is required to explain if the candidate cannot nominate the required referees. Professional geoscientists with indirect knowledge of the candidate's work may be nominated if absolutely necessary. Please refer to the reference forms for more information.

7) **Requirement for Experience in a Canadian Environment**

Within the four-year minimum satisfactory geoscience work experience requirement, all applicants are required to gain at least one year of satisfactory geoscience work experience in a Canadian Environment*, under the direct supervision of a Canadian Professional Geoscientist from the discipline of geoscience demonstrated in the experience. Where appropriate, Council in its discretion may accept as equivalent the direct supervision of other supporting referees/references.

This is to ensure that applicants have demonstrated that they have had experience of a satisfactory depth and breadth; and that they are conversant with the applicable laws, practices, standards, customs, codes, conditions and climates specific to the practice of professional geoscience in Canada..

In exceptional circumstances, a candidate with less than one year of satisfactory geoscience experience in a Canadian Environment may be deemed, at the discretion of Council, to have satisfied the requirement. Each case will be assessed on its own merits.

All applicants **must** demonstrate that their Canadian Environment experience:

- 1) is supported by the undergraduate and/or postgraduate academic formation of the applicant;
- 2) is supported by a minimum of two Canadian. Professional Geoscientist referees/references from the discipline of geoscience demonstrated in the experience, and who have detailed knowledge of the work of the applicant; or supporting referees/references that is at Council's discretion to accept as equivalent;
- 3) is broad-based and at the level of complexity and responsibility that demonstrates that the applicant is ready to accept the full professional responsibility held by registered professional geoscientists, and has reached the level of professional maturity needed to judge when he/she is out of

his/her area of competence. This includes the application of geoscientific principles at a satisfactory level, adhering to APEGBC's Satisfactory Geoscience Experience requirement.

**The term "Canadian Environment" is defined as:*

- *work experience obtained in Canada, supervised by a professional geoscientist, registered or licensed in the applicable Canadian jurisdiction; or,*
- *work experience acquired outside Canada, where applicants demonstrate a good knowledge of laws, practices, standards, customs, codes, conditions and climates specific to the practice of professional geoscience in Canada..*