CECAB

Canadian Environmental Certification Approvals Board

FOUNDING DOCUMENT, 1997

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Purpose

The Board of Directors of the Canadian Council for Human Resources in the Environment Industry (CCHREI) has prepared this Founding Document to:

- articulate the conceptual framework for a voluntary program for the certification of environmental practitioners in Canada,
- articulate the conceptual framework for the establishment of the Canadian Environmental Certification Approvals Board (CECAB),
- document the rationale behind the development of CECAB,
- facilitate discussion among stakeholders concerning the development of CECAB.

Overview

With annual revenues of well over $11 billion, the environment industry has become a major contributor to the Canadian economy. Anticipated growth in this industry suggests that employment opportunities should be good. However, in response to public demands for higher environmental standards for projects, new and tougher requirements are being imposed by governments and by private sector stakeholders in the banking, legal and insurance industries. As a result, there is a need for environmental practitioners and the companies that employ them to demonstrate their competence prior to being hired or contracted for environmental work.

In response to this need, the Board of Directors of CCHREI proposes this conceptual framework for the establishment of CECAB. Once established, CECAB would develop, implement and administer a voluntary certification program that would recognize the demonstrated skills, knowledge and experience of environmental practitioners beyond those recognized by existing licensing organizations.

Certification under CECAB would be based on the "discipline-plus" concept. This concept maintains that environmental practitioners require both discipline-related competencies and additional competencies related to the performance of environmental work. Practitioners usually acquire their discipline-related competencies through formal education or training, but may acquire the additional competencies through any number of means, including formal education or training, work experience or professional development.

Environmental practitioners, their employers, and the environment industry as a whole would benefit considerably from the certification. For practitioners, it would mean formal, Canada-wide recognition of their competence to perform environmental work. For employers, it would mean easier employee selection, improved access to capital and insurance by the demonstration of due diligence, and an enhanced corporate image. And, for the environment industry, it would bring about an improved national and international image, as well as assurance that the industry will maintain a competent work force with leading edge skills and knowledge. It should be noted, however, that CECAB's scope would be national. As such, its certification program would not address issues covered specifically by international conformity agreements of the International Organization for Standardization (ISO).

This Founding Document is the basis for the establishment of a voluntary Canadian certification program for environmental practitioners that would serve Canada well today and into the future. The conceptual framework proposed in this document would allow environmental certification in Canada to be defined under the guidance of individual environmental practitioners, professional and technical organizations, industry and industry associations, financial organizations and the education/training community.

CCHREI

CCHREI is an industry-initiated, not-for-profit Canadian corporation with a mission "to ensure an adequate supply of people with the demonstrated skills and knowledge required to meet the environmental human resources needs of the public and private sectors."

CCHREI was founded in 1993 based on the recommendations of two industry-initiated 1992 studies: *Together into the Future* and *Human Resources in the Environment Industry*. Both studies identified a number of human resource issues facing the environment industry and concluded that the single most important constraint to the growth of the industry was the shortage of suitably trained workers. (see Appendix 1) This constraint continues to challenge the industry.

Since its inception, and under the direction of industry, CCHREI has worked hard to address the environment industry's human resource issues. Part of this work has focused on documenting what environmental practitioners do. (see Appendix 3)

Another part has involved the Standards Council of Canada (SCC) and the ISO 14000 standards for environmental management systems. In 1997, CCHREI and SCC negotiated an Accreditation Support Agreement. Under this agreement, CCHREI will perform assessments, audits and re-assessments of organizations seeking SCC accreditation as certifiers of environmental auditors, and of organizations developing and/or providing environmental auditor training in support of the implementation of ISO 14000 in Canada.

Yet another part of CCHREI's work has focused on the development of a Canadian Youth Strategy for Environmental Employment that links young Canadians with national and international environmental employment opportunities. Under this strategy, CCHREI has developed the Environment Youth Internship Canada, the EnviroEntrepreneurs, and the National Environmental Youth Corps programs with Human Resources Development Canada, and the International Environmental Youth Corps program with Environment Canada.

CCHREI recognizes that CECAB's success will depend on its partnerships with industry stakeholders and on the signing of Memoranda of Understanding (MOUs) with existing Canadian certification organizations and others seeking to establish certification. In fact, CCHREI has already signed MOUs with the Canadian Council of Professional Engineers (CCPE), the Canadian Council for Technicians and Technologists (CCTT), and the Canadian Automotive Repair and Services Knowledge Network (CARS). (see Appendix 4) MOUs with other associations are in progress.

The Environment industry

Canada has a strong and dynamic environment industry that is a major contributor to our economy. According to the Government of Canada's 1994 *International Trade Business Plan: Environmental Industries*, the industry generates well over $11 billion annually in both domestic and international markets and has a work force of more than 150,000 environmental practitioners. The industry is Canada's third largest employer and one of our fastest growing economic sectors.

The industry now comprises approximately 4,500 environmental enterprises, most of which are small or medium-sized. These businesses manufacture products or provide services ranging from the development and maintenance of environmental management programs to air and water pollution abatement strategies to solid waste management to laboratory testing and environmental research. As well, businesses that are not part of the environment industry but that are part of other industries (such as the pulp and paper industry or the mining industry) are also engaged in environmental work and hire environmental practitioners.

The environment industry's growth has been driven to a large extent by industry's need to comply with the regulations set by government and the banking, insurance and legal industries, all of which are large users of environmental services. As well, the industry's growth has been driven by the fact that many countries look to Canada for technological and management solutions to environmental problems.

As the regulations become more complex, and as the industry develops and expands into global markets, it will become increasingly advantageous for environmental practitioners to demonstrate their competence prior to securing a job or contract. Already, there has been growing pressure from the public, industry, government, and the banking, insurance and legal industries for environmental practitioners to do this. This pressure points to the need for a certification program that will recognize environmental practitioners' environmentally-related skills, knowledge and experience.

To this end, in 1995, CCHREI initiated the formation of CECAB, which would develop, implement and administer a voluntary national certification program for environmental practitioners. This action was subsequently supported by the representatives of 18 national organizations who were present at a meeting convened by the Canadian Institute of Chartered Accountants (CICA) in January, 1996. (see Appendix 7)

Since then, CCHREI has continued its ongoing work toward the establishment of a program for certifying environmental practitioners. (see Appendix 1)

CECAB certification

The certification program administered by CECAB would be national and participation in it would be voluntary. Certified practitioners could use initials such as CEP, to stand for Canadian Environmental Practitioner or Certified Environmental Practitioner, to denote their achievement.

The certification would be based on the national occupational standards for environmental employment that CCHREI is currently developing in partnership with environment industry stakeholders. (See Appendix 5) The standards are being developed based on the "discipline-plus" concept.

The "discipline-plus" concept maintains that environmental practitioners require both discipline-related competencies and other competencies related to performing environmental work. Practitioners usually acquire their discipline-related competencies through formal education or training. They may, however, acquire their additional competencies through any number of means, including formal education or training, work experience or professional development.

The certification program would incorporate mechanisms for grandparenting and prior learning assessment such that the skills and knowledge that individuals have acquired over years of work experience would be recognized. The program would also include a maintenance requirement, a code of ethics, and a mechanism to address discipline.

Why develop a voluntary national certification program for environmental practitioners?

There are compelling reasons for establishing a voluntary national certification program for environmental practitioners. (See Appendix 6) The following points highlight some of them:

For the Environmental Practitioner, certification could:

- Provide formal, Canada-wide recognition of one's competence to perform environmental work in a specific field.
- Facilitate easier access to interesting and challenging career opportunities.
- Improve one's ability to relocate.
- Encourage ongoing skills upgrading.
- Provide career opportunities which may lead to promotions and higher wages.

For Employers, certification could:

- Provide an easier means of evaluating the competence of an employee or prospective employee.
- Decrease costs associated with the employee selection process.
- Provide greater assurance that competent employees are hired.
- Enhance the company's corporate image and position the company as a leader.
- Demonstrate a commitment to responsible environmental management.
- Improve access to capital and insurance.
- Reduce incidents that result in environmental liability.
- Provide a due diligence defense.

For the Environment Industry, certification could:

- Improve the image of the industry.
- Increase public awareness of the variety of environmental jobs.
- Provide a "one-window" approach to ensuring that Canada maintains a competent environmental work force.
- Save time and administration costs by adopting national standards administered through an impartial industry-based organization.
- Harmonize provincial requirements.

CECAB certification and other certifications

Canada currently has no accepted national mechanism for recognizing the broad-based competencies of environmental practitioners. CECAB certification would do this.

In doing so, CECAB certification would not compete with the activities of associations that represent licensed professions (such as engineering, law, accounting and medicine). Nor would it compete with the activities of associations that administer other existing discipline-related certifications or that certify specific environmental activities, such as environmental auditing. If a particular competency is already covered by a practitioner's license to practice, discipline-related certification or nationally accepted certification for a specific environmental activity, then CECAB would acknowledge, but not review, that competency.

One of the conditions of CECAB certification would be that environmental practitioners would first have to meet any existing requirements of their profession. That is, if a practitioner is eligible for licensure or certification from an organization (either provincial or national) that is relevant to his or her field, then that practitioner must obtain the licensure or certification before applying for CECAB certification.

For example, an engineer who performs environmental work that is not already covered within the practice of engineering would have to meet the requirements of the appropriate provincial member of the Canadian Council of Professional Engineers (CCPE) before he or she would be eligible to apply for CECAB certification. Similarly, a technician or technologist who performs environmental work would first have to meet the requirements (related to his or her defined discipline) of the appropriate provincial member of the Canadian Council of Technicians and Technologists (CCTT).

CECAB: Proposed structure

- CECAB would develop, implement and administer a voluntary national certification program for environmental practitioners based on the purpose, guiding principles, goals and key success factors outlined in Appendix 4. CCHREI would function as CECAB's secretariat.

- The certification program would be based on the national occupational standards for environmental employment that are being documented by CCHREI in partnership with environment industry stakeholders.

- An operating committee would manage the certification program. This committee would coordinate advisory committees and task forces that would recommend the policies that CECAB should implement regarding criteria for certification, grandparenting, disciplinary control, academic equivalence, ethics, appeals, maintenance requirements and fees. It would also ensure that the certification has rigor, and that it could meet international requirements.

- Participants in the advisory committees and task forces would be drawn from the membership of a National Forum. The Forum would comprise stakeholders representing individual environmental practitioners, professional and technical organizations, industry and industry associations, financial organizations, the education/training community, and government. It would be an inclusive body to which any interested stakeholder could belong. It would ensure a strong link between CECAB and a broad representation of stakeholders.

- CECAB would be professionally autonomous and governed by a Board of Directors.

- CECAB would offer certification services on a cost-recover, not-for-profit basis. It would become self-sustaining soon after its establishment.

APPENDICES

APPENDIX 1
Historical notes —
The Movement toward certification

A 1992 industry-sponsored study called *Together into the Future* first identified the environment industry's need for competent and qualified environmental practitioners. The study, which was conducted by the Special Waste National Adjustment Committee, surveyed Canadian companies in the special/hazardous waste sector. It concluded that the single most important constraint to the industry's growth was the shortage of suitably trained workers in key technical, scientific, professional and managerial occupations.

Concurrent with this study, the environment industry, represented by various associations including the Canadian Environment Industry Association (CEIA), approached Employment and Immigration Canada's Labour Market Outlook and Sectoral Analysis Branch for assistance in conducting a companion study. This second study, called *Human Resources in the Environment Industry*, was completed in 1992. It identified similar issues to those identified in *Together into the Future* and, like that study, recommended that a permanent, national, industry-led council be formed to assist stakeholders in addressing the industry's human resource issues.

As a result, the Canadian Council for Human Resources in the Environment Industry (CCHREI) was founded in 1993. CCHREI is an industry-initiated, not-for-profit Canadian corporation that is led by the private sector. Its mission is "to ensure an adequate supply of people with the demonstrated skills and knowledge required to meet the environmental human resource needs of the public and private sectors."

Since its inception, and under the direction of industry, CCHREI has worked hard to address the industry's human resource issues and to continue to identify its needs. Much of CCHREI's work has focused on developing a framework to support the creation of a program to certify environmental practitioners and accredit environmental courses and programs. This work has involved four major initiatives:

- ensuring input and validation from stakeholder groups
- the 1994 Human Resources Assessment
- the Skill-Set Documentation project
- the National Occupational Standards for Environmental Employment (NOS) project

With these initiatives nearly complete, CCHREI has laid a strong and credible foundation to develop a certification Board that would have the rigor to meet increasingly higher national and international requirements. Therefore, in late 1995, CCHREI initiated the formation of the Canadian Environmental Certification Approvals Board (CECAB), a professionally autonomous group that would develop, implement and administer a voluntary, national program for the certification of environmental practitioners.

In January 1996, the participants of a group convened by the Canadian Institute of Chartered Accountants (CICA) announced that they had agreed upon a Canadian organizational framework for accreditation and certification within Canada which included CECAB and its certification program for those environmental activities not covered by ISO or Canada's National Standard System. (see Appendix 7) The group included 18 representatives of a wide cross-section of organizations representing industry, government, professional associations and standards administrators.

The group had reached consensus on the framework after sixteen months of work. Throughout its deliberations, it considered issues such as international conformity arrangements (such as ISO 14000) and the need to harmonize CECAB's work with the work of associations that represent licensed professions or that administer other existing certifications. As a result of this framework, Canada has the opportunity to become a world leader in addressing the human resource needs of the environment industry.

APPENDIX 2
The Environment industry: Trends, issues & challenges

The environment industry's landscape is in constant flux as a result of economics and global markets, changing technology and legislation, and demographics. The impact of these factors on the industry's work force has been significant. Trends, issues and challenges are continuing to be identified as factors that may limit the industry's growth and ability to contribute to Canada's development and prosperity. The following are some of these:

Trends

The restructuring of the Canadian economy has changed the way people work. Trends illustrating these changes include:

- The shift to multiple, short-term contracts and part-time work. This shift has put pressure on individuals to upgrade their skills regularly, and to learn skills related to self marketing and personal liability management.

- Rapidly changing technology and increasingly complex regulations. This reality has also put pressure on individuals to upgrade their skills regularly.

- Changing demographics. One third of Canada's population consists of baby-boomers (born between 1945 and 1965), many of whom have found themselves with redundant skills. Demographics have also impacted the large numbers of youth who have been trained in environmental disciplines and still find themselves without full-time, appropriate employment.

- Corporate downsizing. Downsizing has resulted in the loss of professionals and their knowledge and expertise. It has also resulted in the loss of available employment opportunities.

- The shift to voluntary standards which is placing greater demands on individuals to demonstrate their capabilities

- The need for computer and internet literacy.

Issues

The 1992 *Human Resources in the Environment Industry* study identified for the first time the human resource issues facing the environment industry, and subsequent studies continue to identify similar issues. The issues are significant because this technology-intensive industry relies heavily on the technical knowledge of its work force. Addressing these issues is key to the industry's future prosperity. They include:

- The need to develop management skills, particularly among small, high growth companies, that make up the majority of businesses in the industry.

- The shortage of individuals with the technical and non-technical skills required for environmental projects.

- The need for companies to be responsive to constant change (regulatory, technological, etc.).

- The need for effective communication between employers and educators in identifying and addressing training/education issues.

- A general lack of interest in and declining enrollment in technical programs and a lack of understanding of the environment industry by youth.

- A lack of clearly defined career pathways within the environmental employment sector.

Challenges

Canada's environment industry is well positioned to compete in the expanding global marketplace. However, in order to enable the industry to fully exploit potential opportunities, its human resource needs must be met. In order to do this the industry must meet the following challenges:

- Establish a certification program for environmental practitioners that is nationally and internationally recognized for its consistency and rigorous standards.

- Harmonize this certification program with the many related certification programs offered by other organizations (such as associations that represent licensed professions). Recognize that because most certification programs fall under provincial jurisdiction, the harmonization process will have to take into account both provincial and national certification programs.

- Facilitate better communication amongst all environment industry stakeholders.

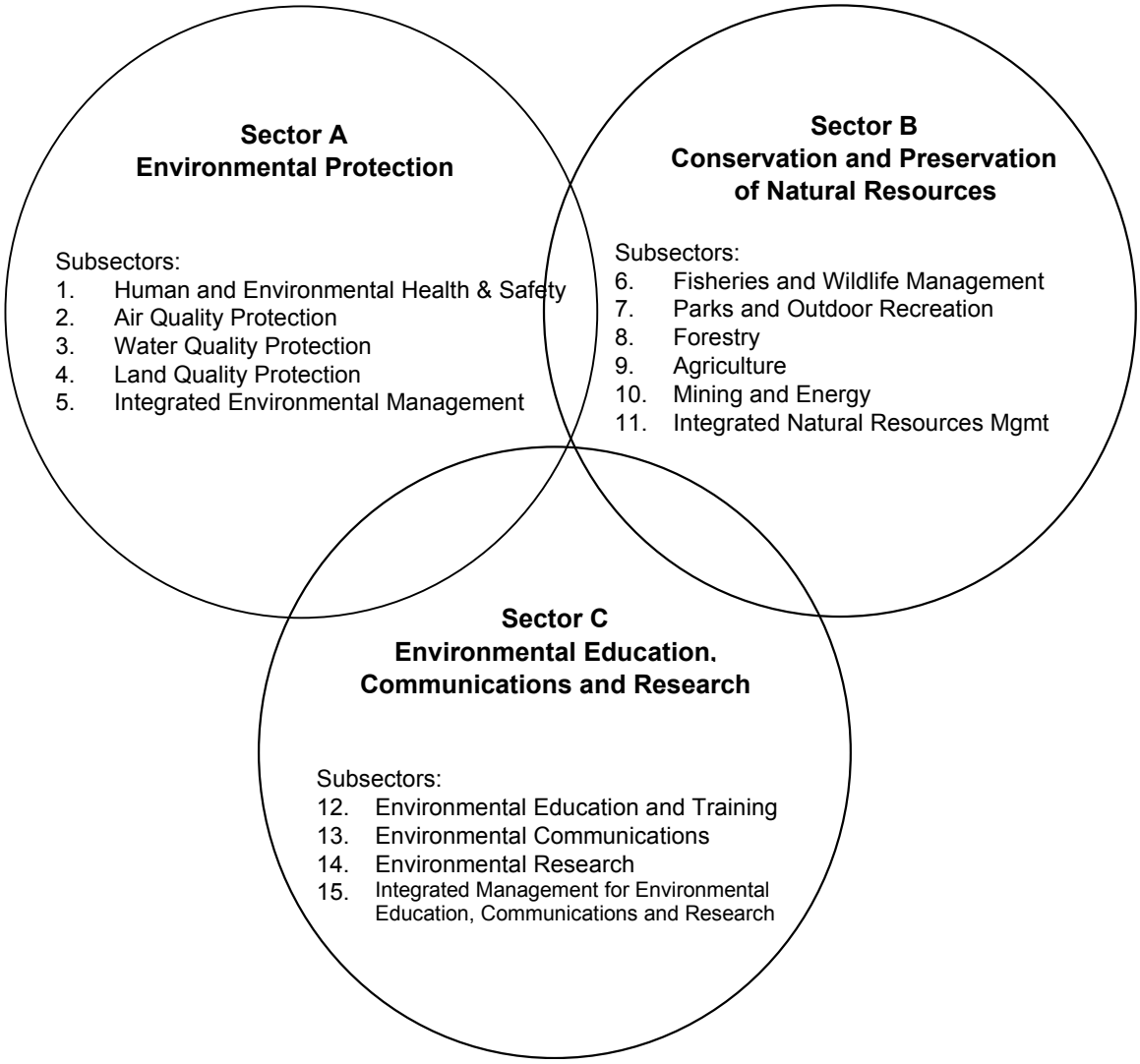
- Demonstrate for practitioners and the organizations that employ them, the value and competitive advantages that a voluntary national certification program could bring.

APPENDIX 3
Environmental practitioners

As defined by CCHREI, the term “environmental practitioner” refers to any person who performs environmentally-related work activities.

Environmentally-related work activities may pertain to the production of environmental goods or to the supply of environmental services. They may be performed by private or public sector employees who work in the environment industry or by practitioners who work for industries and organizations whose business focus is not solely dedicated to environmental protection.

CCHREI categorizes environmental work activities into three sectors and fifteen subsectors:



In 1994-95, through national consultations with over 1,600 environmental practitioners, CCHREI documented the work activities performed by, and the skills and knowledge needed by, practitioners working in the 15 subsectors. Environmental practitioners validated this work and CCHREI has published a summary of it in a three volume series entitled the *Skill-Set Documentation Summary Report Series.*

APPENDIX 4
CECAB: Purpose, guiding principles, goals and key success factors

Purpose

To develop, implement and administer a voluntary national certification program for environmental practitioners.

Guiding principles

- CECAB would be a professionally autonomous, not-for-profit organization.
- CECAB would maintain the highest standards in all of its activities.
- CECAB would serve as a national Board and seek recognition in all provinces.
- CECAB would ensure that its certification is consistent with relevant national and international initiatives (i.e. ISO 14000).
- CECAB would work in harmony with existing certifying bodies. By maintaining close communication with other bodies, it would also work to avoid duplication of activities.
- CECAB would operate in an efficient, results-oriented and cost-effective manner.
- CECAB would become self-sustaining soon after its establishment.

Goals

To ensure that:

- Canada achieves world-wide recognition for its environmental work force by adopting a certification program that is rigorous and that meets the highest possible standards.
- Canadian environmental practitioners are certified in accordance with national standards.
- Employers of environmental practitioners realize the benefits of a certified work force.
- Standards are developed where none currently exist.
- Environment industry stakeholders have the opportunity to participate in establishing and achieving the industry's goals.
- The competitive advantage of the Canadian environment industry is improved in both domestic and international markets.

Key success factors

CECAB's success would depend on:

- Establishing partnerships with industry stakeholders representing:

  - individual environmental practitioners,
  - professional and technical organizations
  - industry (both the environment industry and other industries that employ environmental practitioners)
  - industry associations
  - the education/training community
  - the legal community, financial services organizations and insurance organizations
  - government (federal, provincial and municipal)

- Establishing Memoranda of Understanding (MOUs) with existing Canadian certification bodies and others seeking to establish certification.

  At a meeting convened by the Canadian Institute of Chartered Accountants (CICA) in January, 1996, representatives of 18 national organizations agreed upon a Canadian organizational framework for accreditation and certification which included CECAB and its certification program for environmental activities not covered by ISO or Canada's National Standard System. The organizations present represented a cross-section of bodies from industry, government, the professional associations and standards administration organizations. (see Appendix 7)

  Also, since that time CCHREI has signed three MOUs: one with the Canadian Council of Professional Engineers (CCPE); one with the Canadian Automotive Repair and Services (CARS) Knowledge Network; and another with the Canadian Council for Technicians and Technologists (CCTT). Negotiations are currently underway to gain support from other professional organizations.

Appendix 5
National occupational standards
Example: Land quality protection technician /technologist

As mentioned in Appendix 3, in 1994-95, CCHREI documented the work activities performed by, and the skills and knowledge needed by, environmental practitioners working in the 15 subsectors. Based on this work, and in partnership with environment industry stakeholders, CCHREI is now documenting national occupational standards for these practitioners.

Once fully documented, the standards will outline the exact skills and knowledge that environmental practitioners in each subsector need to perform their work in a competent manner. For example, the standard for a practitioner who has technician/technologist qualifications and who is working in the **land quality protection subsector** might be the following:

The practitioner must be able to demonstrate competencies in the following areas:

1	Performing preliminary investigations: carrying out visual reconnaissances of sites, reviewing historical land use records, interviewing stakeholders (e.g. owners, workers and government agencies) and identifying environmental sensitivities
2	Developing and implementing a soil and water sampling/analysis program to identify and quantify suspected contaminants (including determining optimum locations for taking samples, data capture systems and quality assurance methods)
3	Determining the type of water/soil sampling or analytical equipment to be used depending on the application
4	Collecting, preserving, pretreating and transporting soil or water samples while satisfying the chain of custody requirements
5	Inventorying and documenting the type, severity and location of contamination on the site (or downstream from it)
6	Determining the extent and best method of environmental clean-up required to make the site fit for its intended use or return it to its original condition (taking into account costs and technological constraints)
7	Determining soil classification(s) for the site
8	Analyzing soil/water samples using routine lab instruments such as portable meters (pH, conductivity, ion-specific electrodes), titrators and colorimeters
9	Carrying out remediation using the most appropriate method (e.g. thermal, biological, chemical or physical treatment, containment, vapour extraction, excavation)
10	Determining the best ways to transport and treat/dispose of hazardous wastes
11	Executing the site remediation plan and direct contractors
12	Deploying analytical test instruments or sampling equipment: determining best locations, obtaining permits if needed, assembling, testing and calibrating equipment, documenting set-up conditions
13	Conducting post-remediation/decommissioning testing to determine if desired results have been achieved

14 Obtaining and interpreting air photos or satellite images of the site
15 Maintaining monitoring or sampling equipment as per manufacturer's specifications and standard operating procedures
16 Analyzing soil/water samples using midrange lab instruments such as UV-Vis scanning spectrophotometers, IR spectrometers, gas chromatographs and atomic absorption spectrometers
17 Identifying and inventorying hazardous waste streams or wastes in storage
18 Preparing samples for lab analysis using techniques such as grinding, screening, chemical digestion, solvent extraction, dilution or concentration
19 Obtaining necessary clean-up permits and approvals from regulators
20 Defining environmental performance requirements and establishing monitoring programs to ensure compliance

The practitioner must have solid general skills and knowledge in:

1 Environmental science
2 Sampling methodology and analysis
3 Scientific methods
4 Environmental auditing
5 Waste management
6 Chemistry, organic
7 Project management
8 Chemistry, inorganic
9 Remediation technology
10 Environmental impact assessment
11 Analytical measuring and monitoring instruments
12 Regulations, legislation and policies affecting natural resources
13 Engineering
14 Ethics, environmental and professional
15 Soil sciences
16 Occupational health and safety (including WHMIS and WCB)
17 Law, environmental
18 Mathematics
19 Risk management
20 Hydrogeology
21 Environmental emergency response and planning

The practitioner must have specialized or advanced knowledge in:

1 Chemistry, environmental
2 Wastes, characteristics of (types, classification, uses, chemistry, combustibility, hazards, hazardous components, transportation, etc.)
3 Contaminant characteristics (e.g. PCBs, PAHs, PCDD/PCDF, BTEX etc.)
4 Clean-up criteria, levels, guidelines (land)
5 Groundwater
6 Sampling methods, techniques (coring, drilling, tapping, grab sampling, background, duplicate and composite sampling)
7 Sampling equipment (types, purposes, limits, capabilities, operation and SOP)
8 Waste treatment techniques (biological, thermal, chemical, physical)
9 Environmental site assessment
10 Soil quality (investigation methods, sampling, analysis techniques, normal concentration, regulations)
11 Soil remediation technologies
12 Soil classification system and criteria
13 Licensing and permitting requirements

14	Contaminant containment systems
15	Aquifers
16	Construction and excavation management techniques
17	Chemistry, aquatic
18	Computerized sampling equipment and interfaces (e.g. data loggers, continuous emission monitors, remote site instrument access)
19	Environmental mitigation techniques (land quality)
20	Air photo interpretation
21	Surveying (equipment, techniques, grid pattern, grid preparation)

The practitioner must have the following abilities and be skilled in the following areas:

1	Communicating with and advising internal and external parties on technical matters
2	Recognizing one's own technical limitations and seeking specialists when needed
3	Computer usage - common off-the-shelf software
4	Deductive reasoning and forecasting based on past experience
5	Building effective relationships with parties external to the organization
6	Data collection and documentation, in the lab or field
7	Interpreting pertinent regulations or legislation
8	Observing and recording observations
9	Execution, implementation and control of plans
10	Managing and/or working on interdisciplinary project teams
11	Applying principles of quality assurance
12	Data analysis and interpretation, numeric and non-numeric
13	Delivering effective presentations to groups
14	Managing contracts and contractors
15	Following-through, living up to deadlines and commitments

The practitioner must have the following qualities:

1	Adaptability to change
2	Empathy for people who have different values
3	Consultative skills
4	Critical (analytical) thinking abilities
5	Energy and enthusiasm
6	Diplomacy and tact
7	Creativity
8	Thoroughness – paying attention to details
9	Dependability
10	Integrative skills (ability to see the “big picture”)
11	Leadership abilities
12	Decisiveness
13	Communications skills, written and oral

If a particular competency is already covered by a practitioner’s license to practice (in the case of an engineer, for example), then that competency would be acknowledged, but not reviewed, by CECAB.

A similar rigorous standard would also be applied for university graduates working in the land quality protection subsector. The criteria for that certification would be derived from the national occupational standards that will be completed in 1998.

APPENDIX 6
Benefits of certification

Following are some of the potential benefits (as well as some of the costs) that could be derived from a voluntary national certification program for environmental practitioners:

Individual environmental practitioners

Costs	Potential benefits
- cost of certification	- career advancement
- renewal fees	- career flexibility
- professional development costs	- higher wages
	- mobility (locally, nationally, internationally)
	- access to professional development activities
	- up-to-date skills & knowledge
	- recognized environmental skills, capabilities, experience

Business/industry

Costs	Potential benefits
- higher employee wages	- more knowledgeable employees (very important in service sector)
- initial shortage of certified employees	- improved hiring process and ability to evaluate potential employees
	- less supervision required
	- greater customer satisfaction
	- improved quality
	- potential for reduced liability & risk
	- due diligence defense
	- potential for less waste and errors
	- marketing benefit
	- domestic and export opportunities
	- fewer accidents and errors
	- access to new technology/process
	- greater access to capital

Education / training providers

Potential benefits

- improved design and delivery of training programs
- effective programs that meet industry needs
- potential for partnerships between industry and training/education providers leading to increased revenue for training/education provider
- standardization of knowledge and skills taught
- consistency in educational programming leading to improved transferability of credits across country
- well-equipped graduates

Users of services

Potential benefits

- assurance that consultants are competent
- improved selection process
- reduced liability
- due diligence defense

Canada

Potential benefits

- international recognition for environmental leadership
- improved access to global markets and increased competitiveness
- increased business leading to more jobs
- environmental stewardship
- harmonization of provincial jurisdictions

Cost / benefit analysis — Case study

In 1995, an actual Canadian-based food processing plant with 150 employees paid an over-strength surcharge of $210,000 because of the amount of grease, fat and oil it released into the municipal sewer system. Although the plant had water treatment technology in place, it did not employ or train staff with the competencies needed to monitor and operate the system.

In the summer of 1996, two college students from an environmental technology program completed a four month work placement at the plant. Over the four months, the surcharge dropped significantly from an average of $35,000 every two months to approximately $4,000 during the same time period. When the students left, the surcharge increased to its prior rate.

This real life example demonstrates that trained and competent staff can save a company considerable money. Hiring certified environmental practitioners could help a company realize huge cost savings because of the training, skills, experience and environmental competence the practitioners could offer.

Cost of environmental practitioners

Salary of environmental practitioner - 2 people @ $40,000 per year	$ 80,000

Benefit of hiring environmental practitioners

Over-strength surcharges	$ 210,000
Reduction of surcharge by 88%	-24,000
	$ 186,000
Minus salary	-80,000
NET benefit	$ 106,000

Appendix 7
The CICA process

The following document was released by the Canadian Institute of Chartered Accountants (CICA) in January 1996.

Joint Announcement:
Canadian Framework for Environmental Practitioner Accreditation and Certification

The framework agreed to on January 19, 1996 is important to Canadian business needs and to Canada's environmental protection agenda for two reasons:

- it plays a key role in positioning Canada in terms of international trade competitiveness for the ISO 14000 series of environmental management standards to be released later in 1996; and

- it will be instrumental in promoting the implementation of credible and cost-effective arrangements for denoting the competence of individuals to provide specialized environmental expertise and services in Canada, particularly in the areas of environmental auditing and site assessments.

ISO 14000 environmental management standards

The ISO 14000 standards are the world's first international standards for environmental management systems, life cycle assessment and environmental labeling, and Canada is playing a leading role in their development. They are being developed by a committee of the International Organization for Standardization (Technical Committee 207). Through the Canadian Standards Association acting on behalf of the Standards Council of Canada (SCC). Canada also provides the secretariat to the ISO committee. This committee is chaired by Canadian Dr. George Connell.

The SCC announced in December 1995 that it had initiated the development of its accreditation program for organizations registering their environmental management systems to the ISO 14000 standards. This involves accreditation of registration organizations, as well as accreditation of bodies that certify the auditors who actually carry out the registration audits, and accreditation of suppliers of training courses recognized in certifying auditors against established auditor qualification criteria.

International trading practices increasingly require that ISO registration programs established by individual countries conform with relevant ISO standards and related mutual recognition arrangements. Canada's international competitiveness therefore depends in part on the implementation of an environmental auditor accreditation and certification scheme that will be recognized internationally.

Auditor certification

Aside from the ISO registration program requirements, there are business and government needs for several other types of environmental auditing to be performed where the competence and credibility of the auditor are important considerations. Auditor certification schemes therefore play an essential role in meeting marketplace needs for reliable practitioners who satisfy agreed-upon professional standards for environmental auditing.

The Canadian Environmental Auditing Association (CEAA) is Canada's leading organization to meet these domestic and international marketplace needs. CEAA is working towards harmonization with its affiliated provincial bodies in Quebec and Nova Scotia that share similar aims and is expected to seek SCC accreditation as soon as possible of its auditor certification scheme now being implemented under a special CEAA task force.

Multi-stakeholder consultation

The process initiated in October 1994 under the convenorship of the CICA originally set out as a forum for responding to the needs of Canadian business and government bodies for greater professionalism, consistency and cost-effectiveness in environmental auditing and site assessment services. The participants in this process included representatives of both service users and providers, together with others interested in accreditation, registration, certification and standards setting. The engineering, legal and accounting professions were involved throughout, as was Environment Canada (which also provided senior staff support to assist CICA in facilitating the process).

The group recognized from the outset that Canada should aim for an overall scheme that would minimize proliferation of practitioner certification bodies in environmental auditing and other fields. The scheme also needed to build where possible on established organizations and be able to adapt to meet future needs. Above all, the accreditation and certification schemes had to be efficient, so as to minimize the cost and administrative burden on end users. The initial focus was on the full range of environmental auditing and site assessment services, but the group soon recognized the particular need for Canada to be ready to certify environmental auditors in 1996 for carrying out environmental management system audits for ISO 14001 registrations.

Consensus framework achieved

Following lengthy consultations and discussion of various options, the multi-stakeholder group agreed to adopt the organizational framework as the basis upon which to develop accreditation and certification schemes best able to meet the needs of the Canadian domestic market and ensure Canada's competitiveness internationally. The framework not only accommodates schemes to denote the competence of environmental auditors and environmental site assessors, but is also flexible enough to accommodate schemes for

accreditation and certification of other types of environmental practitioners, should such needs arise.

Two stakeholders in the process, the Associated Environmental Site Assessors of Canada (AESAC) and the Institute of Professional Environmental Practice (IPEP) are examples of organizations whose environmental practitioner certification schemes may be advanced and harmonized within the framework. AESAC plans to develop a national certification program for Phase I and Phase II site assessment practitioners: IPEP has already established a certification program (with designation as "Qualified Environmental Professional") for environmental practitioners in the field of applied environmental science.

Other aspects of the framework include:

- **Memorandum of Understanding:** The SCC and CCHREI are negotiating a Memorandum of Understanding setting out the role of CCHREI in providing assessment support to the SCC accreditation aspects of the framework.

- **Training course suppliers:** Suppliers of training courses, to meet the requirements of various practitioner associations, also may be accredited within the framework. This is particularly important for ISO 14000 program implementation, where accreditation will be carried out by the SCC with assessment support from CCHREI.

- **Canadian Environmental Certification Approvals Board (CECAB):** CCHREI has initiated the establishment of this new body in order to promote, implement and harmonize the certification of environmental practitioners in a variety of occupations and services. CCHREI is engaged in a consultative process to define the role of and implement CECAB. Also, some practitioner bodies are likely to seek SCC accreditation of their programs, where ISO standards or National Standards of Canada are involved.

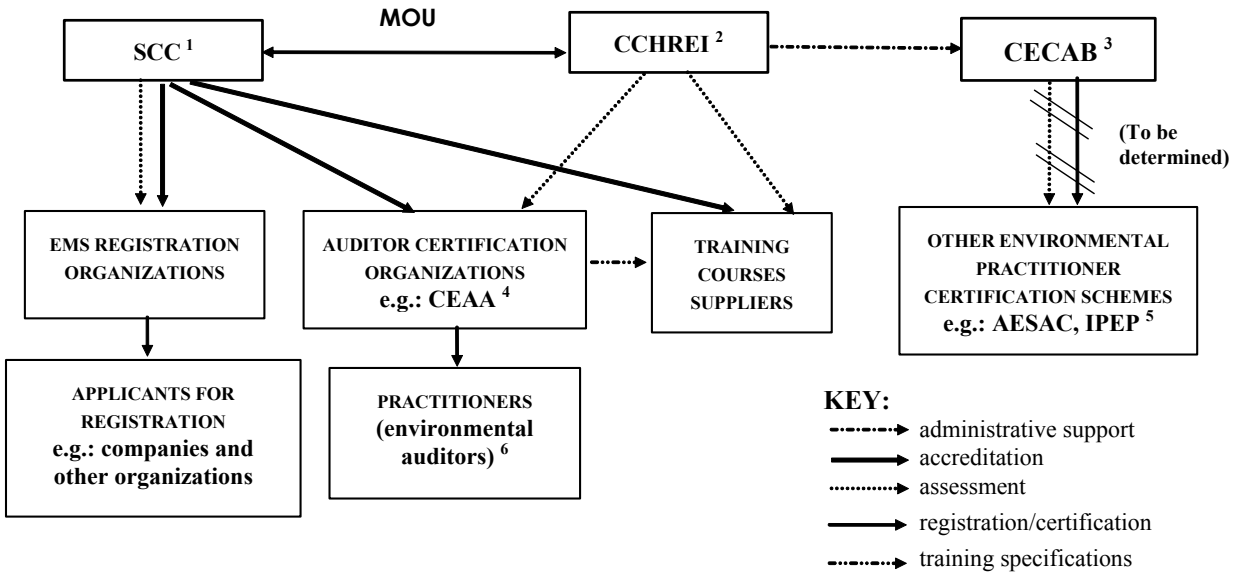
Voluntary implementation

Support for the coordination of the implementation of the framework and development of its various components will be achieved on a voluntary basis through the cooperation of and working relationships between the organizations that contributed to its design and adoption. Canada now has a framework that will enable it to meet international ISO 14000 requirements, as well as ensure the effective development and harmonization of its domestic markets for environmental practitioners.

The following organizations were present at the meeting:

Air and Waste Management Association
Associated Environmental Site Assessors of Canada
Canadian Bankers Association
Canadian Bar Association
Canadian Chemical Producers Association
Canadian Council for Human Resources in the Environment Industry
Canadian Council of Professional Engineers
Canadian Environmental Auditing Association
Canadian Environmental Industry Association, Ontario Chapter
Canadian Institute of Chartered Accountants
Canadian Manufacturers Association
Canadian Standards Association
Environment Canada
Institute of Certified Management Consultants of Canada
Institute of Professional Environmental Practice
Noranda Inc.
Society of Management Accountants of Canada
Standards Council of Canada

FRAMEWORK FOR CANADIAN ENVIRONMENTAL PRACTITIONER ACCREDITATION AND CERTIFICATION SCHEMES



[1] SCC will establish the criteria and procedures for accrediting environmental auditor certification bodies and training course suppliers for purposes of the ISO 1400 (EMS) registration program. Arrangements will be made for assessments against these criteria to be carried out by the Canadian Council for Human Resources in the Environment Industry (CCHREI) for the purposes of SCC accreditations.

[2] CCHREI will also assess and accredit environmental practitioner training courses and course suppliers in areas outside the scope of SCC accreditation programs.

[3] CCHREI has initiated the creation of a Canadian Environmental Certification and Accreditation Board (CECAB) as an autonomous vehicle to harmonize and guide accreditation and certification functions for various environmental occupations, i.e., in some instances it may offer accreditation of practitioner certification organizations, and in others (where denotation of competence is not otherwise available), oversee implementation of certification programs. CCHREI has commenced a consultative process for planning and implementing CECAB.

[4] The Canadian Environmental Auditing Association (CEAA), as Canada's leading environmental auditor certification organization, will prescribe auditor qualifications and training specifications, set exams, evaluate applications for certification, issue certifications and maintain auditor registers. It will seek accreditation by SCC for purposes of certifying auditors to conduct EMS registration audits.

[5] In the future, SCC may accredit other environmental practitioner certification schemes that relate to domestic or ISO standards within Canada's National Standards System. Future roles for CECAB in assessing and accrediting such schemes have not yet been defined. The Associated Environmental Site Assessors of Canada (AESAC) and the Institute of Professional Environmental Practice (IPEP) are examples of other environmental practitioner certification schemes.

[6] Certified environmental auditors work for EMS registrars regarding ISO 14000, and/or provide other types of environmental auditing within companies and as external service providers.

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