Professional Qualifications of Various Professional Organizations
For use at the September 24, 2004 CSSAB Meeting

National Academy of Engineering:

http://www.nae.edu/

The National Academy of Engineering (NAE) mission is to promote the technological welfare of the nation by marshaling the knowledge and insights of eminent members of the engineering profession. Founded in 1964, the National Academy of Engineering (NAE) provides engineering leadership in service to the nation. The NAE operates under the same congressional act of incorporation that established the National Academy of Sciences, signed in 1863 by President Lincoln. Under this charter the NAE is directed "whenever called upon by any department or agency of the government, to investigate, examine, experiment, and report upon any subject of science or art."

Becoming a Member: Individuals can not apply for membership in the NAE and, thus, there are no "application forms" for membership in the NAE. The procedures for nomination and election of member and foreign associate candidates involve a search in all fields of engineering by present members of the NAE for outstanding engineers with identifiable contributions or accomplishments in one or both of the following categories:
1. Engineering research, practice, or education, including, where appropriate, significant contributions to the engineering literature. 2. Pioneering new fields of engineering, making major advancements in traditional fields of engineering, or developing/implementing innovative approaches to engineering education.
3. A candidate for membership shall also be recognized by associates and others for professional integrity.

A nomination must be made by a member of the Academy, with supporting references by at least three other members for member candidates and two other members for foreign associates (non-U.S. citizens). The call for nominations and reference support occurs between February and May; nomination packets are released only to members. Nominators and references are requested to maintain secrecy with regard to those being nominated for membership in the Academy. Peer committee reviews of nominees in various fields of engineering result in recommendations to the Committee on Membership for its consideration within guidelines established by the NAE Council. The final list of nominees is voted on by the entire membership of the NAE during the month of January with the results of the vote announced to the public in mid-February. The entire process is subject to strict confidentiality.

Comments: This organization is oriented towards Engineering research and teaching. I would not recommend it for Environmental Engineering.

American Academy of Environmental Engineers:

http://www.aaee.net/

The American Academy of Environmental Engineers is dedicated to excellence in the practice of environmental engineering to ensure the public health, safety, and welfare to enable humankind to co-exist in harmony with nature.

The Academy's Membership and Certification Programs: The American Academy of Environmental Engineers provides a structure for advancing your career as an environmental engineer, from the Academy's Intern Environmental Engineer program for recent graduates, through its Associate Environmental Engineer program for recently licensed engineers, to Diplomate Environmental Engineer (DEE) that gives you *full* membership in the Academy. There is also a special affiliation, Professor, for those teaching environmental engineering.

If you're a recent graduate with an EIT certificate, the Academy's Intern Environmental Engineer program can get you on the right track for success.

If you are a recently licensed (registered) engineer working in environmental engineering but without the eight years of experience required for specialty certification, you can still take advantage of the benefits that the Academy has to offer through the Associate Environmental Engineer program.

If you are a licensed, professional environmental engineer with at least eight years of full-time environmental engineering experience, specialty certification provides independent testimony to your special expertise and qualifies you for full membership in the Academy as a Diplomate Environmental Engineer (DEE).

If you are a tenured or tenure-track professor teaching environmental engineering, the Professor affiliation, enables you to actively participate in the decisions affecting environmental engineering and science education and obtain other Academy benefits.

The American Academy of Environmental Engineers certifies qualified licensed Professional Engineers recommended by peers in their field of specialty through certification procedures prescribed by the Academy's Bylaws.

Minimum Requirements: Each candidate for certification is required to possess certain minimum qualifications.

All candidates shall:

- Be persons of good moral character and of high ethical integrity and professional standing, as determined by the Academy's Board of Trustees.
- Possess a baccalaureate degree in engineering or related field acceptable to the Board of Trustees, from an academic institution of recognized standing.

- Hold a valid license or certificate of registration to practice professional engineering, issued by the lawfully constituted registration board of any State, territory, possession or district of the United States. A valid certificate of registration from a foreign country may be accepted provided it meets standards established by the Board of Trustees.
- Be professionally engaged in environmental engineering activities on a full time basis.

Experience Requirements: Candidates applying for certification by written and oral examinations shall have had at least eight (8) years of progressively responsible engineering experience following receipt of a baccalaureate degree or license, whichever occurs first, of which four (4) years shall have been in responsible charge of work at a level acceptable to the Board of Trustees in one or more of the designated environmental engineering specialties.

Candidates applying for certification without written examination must have had at least twenty (20) years of progressively responsible environmental engineering experience following receipt of baccalaureate degree or license, whichever event occurs first, of which sixteen (16) years shall have been in responsible charge of work at a level acceptable to the Board in one or more of the designated environmental engineering specialties.

Qualifying experience includes active and responsible participation and involvement in design, management, research, administration or teaching primarily in one or more fields of environmental engineering.

Initial Certification: The qualifications of all candidates for certification are first reviewed by the Academy's Admissions Committee to determine if the Academy's minimum requirements are satisfied and in which specialty the candidate is qualified to be examined. After approval by the Admissions Committee, the candidate is examined using written and/or oral examinations, as appropriate. The results of the examinations are returned to the Admissions Committee for evaluation of the examination results. Those candidates who meet all the prescribed requirements are recommended by the Admissions Committee to the Board of Trustees which votes to grant certification.

The written and oral examinations are specialty specific. They are developed and updated bi-annually by committees composed of Diplomates certified in the specialty covered by the examination. Security and scoring of the written examinations are the responsibility of the Academy's Test Administration Department. The oral examinations are conducted by teams of three Diplomates in accordance with prescribed guidelines. The hour-long oral examination, one part professional practice issues and two parts technical specialty problems, is used to determine a candidate's ethical concepts, maturity, presence of mind, engineering judgment, and ability to apply engineering principles and concepts which cannot be easily measured by written examinations. Should a candidate fail either one of the two examinations, the failed component(s) may be re-taken pursuant to Academy procedures.

Upon satisfactory completion of the entire Admissions process and paying the prescribed fees, the candidate is granted certification in a specialty recognized by the Academy and awarded the title, Diplomate of the American Academy of Environmental Engineers. A certificate embossed with the Diplomate's name and specialty is provided as confirmation.

Specialty Certification of experienced, licensed professional engineers by the American Academy of Enviornmental Engineers identified those with proven specialty capabilities in the following specialties of environmental engineering:

- Air Pollution Control
- Hazardous Waste Management
- Industrial Hygiene
- General Environmental Engineering
- Radiation Protection
- Solid Waste Management
- Water Supply and Wastewater Engineering

Those certified are awarded the title "Diplomate Environmental Engineer" which may be denoted in all documents as DEE. Maintenance of competence is assured by an annual recertification program that includes mandatory continuing professional development.

Diplomates who maintain their qualification for specialty certification and their credentials are listed in the annual edition of Who's Who in Environmental Engineering.

Comments: This particular organization is oriented specifically to Environmental Engineering. The criteria for membership includes exams in specialty areas of Environmental Engineering. The specialty areas pertaining to the Land Recycling Program would be the Hazardous Waste Management, Industrial Hygiene, and General Environmental Engineering. For sites with complex remediation systems, we could recommend this certification for the Engineers designing the systems. For sites with full risk assessments, we could recommend this certification in the Industrial Hygiene specialty. For sites with large volumes of hazardous waste remediation, we could recommend the Hazardous Waste Management specialty. I would recommend this as a professional credential for complex sites in the Land Recycling Program.

The American Board of Industrial Hygiene:

http://www.abih.org/

The American Board of Industrial Hygiene (ABIH®), a not-for-profit corporation, was organized to improve the practice and educational standards of the profession of industrial hygiene.

The activities presently engaged in for carrying out this purpose are:

1. offering certification examinations to industrial hygienists with the required educational background and professional industrial hygiene experience;
2. acknowledging individuals who successfully complete the examination by issuing a certificate;
3. requiring Diplomates to maintain their certification by submitting evidence of continued professional development; and
4. maintaining records and publishing a roster of certificate holders for the profession and the public.

Defining an Industrial Hygienist: Industrial hygiene is a term designed to evoke a simple view of what the practice means. However, it comes from a time when the words had a different interpretation to them. Industrial seems clear enough - practicing in a work or factory setting, but even that gets blurred these days when defining a problem in an office setting. Hygiene comes from the area of practice relating to cleanliness, sanitation, or health. Therefore, as initially determined, an Industrial Hygienist (IH) is a professional who is dedicated to the health and well-being of the worker. Typically, this would have an IH evaluating the health effects of chemicals or noise in a work place. This has been expanded a bit by the changing of our society from an industrial/agricultural base to more of a service economy to address issues of productivity (we must include the buzz-words of today such as a "value added" effect). It also now relates to an expansion of workplace to areas of the community outside the traditional place of employment.

The IH professional traditionally has gained knowledge by some combination of education, training, and experience. Ideally, this knowledge is used to anticipate when a hazardous condition could occur to cause an adverse health effect on a worker or the environment. Failing that, the IH must be able to recognize conditions that could lead to adverse health effects to workers or a community population. Still, there would be no real meaning to defining hazards if an evaluation of the probability and severity of a recognized adverse effect and some realistic control means would not be forthcoming to remove or reduce the impact of the situation

Traditionally, since the term "industrial hygienist" has not been restricted by law, anyone who feels they have some capability to act in the realm of advising on the health and well-being of workers could label themselves as an Industrial Hygienist. They may be newly installed in an organizational position calling for such knowledge, therefore, by

default, they become an Industrial Hygienist. One can always push to gain the necessary knowledge to function effectively, but there is still some doubt as to how to demonstrate that "competence" to the outside world. In the mid-1950's, a group of Industrial Hygienists from a national organization recommended that a voluntary certification program be established for industrial hygiene practitioners. In 1960, an independent corporation was established from the two national membership organizations, AIHA and ACGIH, to establish a national examination process to certify a minimum level of knowledge in industrial hygiene.

Because the program was voluntary, it did not restrict the practice of individuals calling themselves industrial hygienists. Indeed, today there are many competent persons practicing the profession of industrial hygiene who have not even sought certification. However, the program has, since its establishment, shown itself to be a hallmark of achievement that provides an indicator of success in the field. It measures to a defined standard the knowledge of a practicing Industrial Hygienists in sixteen rubrics, or technical areas, of practice.

Areas of Practice: The technical knowledge of industrial hygiene practice has been divided into sixteen areas: basic science; biohazards; biostatistics and epidemiology; engineering controls; non-engineering controls; ergonomics; ethics and management; analytical chemistry; sampling, monitoring and instrumentation; noise and vibration; ionizing radiation; nonionizing radiation; regulations, standards, and guidelines; thermal and pressure stressors; toxicology; and general IH topics including community exposures, hazardous wastes, risk communication, indoor environmental quality, and others (unit operations, process safety, and confined spaces).

Still, there are means of applying this knowledge that differ in many situations. Application is seen in the recognition of a hazard, the evaluation of the stressors, in the actual control of the situation, and in industrial hygiene management. These "domains" of practice differ as one advances through ones career. Recent efforts to create reasonable standards of practice have led to the development of a code of ethics for the practice of industrial hygiene. While it does not in itself define competence, it certainly becomes recognizable when it is absent.

Defining Qualifications for an Industrial Hygienis: Because the practice of industrial hygiene encompasses such a wide variety of knowledge areas, it was felt that, initially, there would need to be separate evaluations made of persons who restricted their practice to narrow areas. Aspect examinations were created to certify a minimum standard of knowledge short of a comprehensive test of all areas. These aspect examinations have been dropped, except for that of analytical chemistry, in favor of a comprehensive evaluation of an applicant's knowledge. However, recently, a sub-specialty examination has been offered to provide a test of specific knowledge in the area of Indoor Environmental Quality (IEQ). It allows an already certified individual to demonstrate added depth of their knowledge in IEQ.

Because the tests evaluated technical knowledge and not actual practice, it was felt that some minimum time in actual performance of industrial hygiene duties would be essential for entry into the process. Therefore, a period of five (5) years experience is necessary before a person may take the examination. An intermediate level examination (a CORE examination) was developed to recognize persons who were undertaking this voluntary certification, but who did not yet have the five years experience, and to ensure that those testing in the former "aspects" maintained a core knowledge in all areas of practice. Also, an allowance was made for graduate education, recognizing the contribution that education has toward developing a mature practitioner. The contribution of education has been further recognized in that currently an appropriate Bachelor's Degree is required to qualify to take the examinations, and the ABIH is considering a requirement that a Master's Degree be a prerequisite for sitting for the examinations in the future.

However, rote knowledge is not the sole quality that identifies a competent Industrial Hygienist. There is an "art" to applying the technical principles in a manner that provides a reasonable solution for a workplace health issue. This is the real value behind the experience requirement for certification. A relationship with a practicing "Certified Industrial Hygienist" (CIH) is the key to learning the nuances in applying knowledge to work out the best solution. A "mentor" to show a new IH how to apply the book knowledge in the real world is valuable. Also, experience in as wide a practice as possible is imperative when you must demonstrate your knowledge in these sixteen rubrics. This has become extremely difficult for "specialists" or those who practice in narrow areas. Limiting your experience to indoor environmental quality, or lead abatement, or confined spaces control can be a disadvantage when trying to demonstrate competency in other areas only known through a textbook or an "examination review course."

However, you can never discount individual drive. After all, that is what motivates an individual to participate in a "voluntary" certification process. Because the field has been seen as lucrative to some, there has been a push by some governmental entities and private businesses to require "certified" professionals to ensure the minimum knowledge and experience is available on their projects. This tends to drive provider organizations to propel individuals into the certification process, whether they want to go or not. But, individual motivation is the key to successful completion and garnering of the title "Certified Industrial Hygienist." The process has, through the demonstrated success of its diplomates, attained a "brand" recognition that gives a CIH a foot in the door that might otherwise be standing in line with the others in the crowd. It has even spawned imitators, but time will tell whether its reputation holds up under this intrusion. Several states have recognized the trademark and capabilities of those displaying the "CIH" and have enacted legislation to protect the title of "Certified Industrial Hygienist".

Certification Process: How do you go about becoming certified? First, there is the obvious need for technical knowledge. Everyone has their own method to gather this, but data have not been gathered to support the effectiveness of any one system. "Review Courses" seem to be plentiful, and computer systems to prepare the aspiring applicant

appear on many journal and trade magazine pages. Conventional wisdom tends to support knowledge gained through experience and the watchful guidance of a competent mentor. Many individuals take the examination to find out where they are weak with the intention of taking it again until the manage to pass. It is left to the individual to decide what is best for them.

The professional reference questionnaire (PRQ) is important as well. The Board's requirement for experience is based on activity on a professional or journeyman level. This causes a sticking point for many who find they are in a position that has them named as Industrial Hygienist, or Project Manager, when their scope of practice relies on strict adherence to a regulatory interpretation or exercise of very little independent judgement. Others, with titles of IH Technician or Specialist may be acting totally independently and practicing with a scope of extreme variability and many unknowns. This should be portrayed in the PRQ to be fair to the applicant. Details are important to the Board in making their evaluation of an applicant.

The ABIH also has a process it follows to review each application and prepare each examination. Examinations are prepared in minute detail. Each question is evaluated by a group of practicing CIHs to ensure it is correct and relevant to the practice of IH. Each item is rated on difficulty for its target audience - CORE or Comprehensive, and this is used to set the passing score for each test. Each question is also rated by professional testers to ensure its validity as a question for an examination. Questions are selected for use on an examination based on the latest survey of the practice of industrial hygiene, in both rubric areas and domains of practice to achieve a balance indicative of the current practice and some historical knowledge. And after each presentation of the examination, questions are again reviewed for validity.

The examination itself is the subject of an effort to ensure that it adheres to the standardized evaluation method. The passing score has remained within a narrow range, but the percentage of those passing have gone from 62.7 of all those sitting for the Comprehensive examination in 1979 to 46.4 percent in 1997 (with a similar drop in the CORE rates). Reasons for this drop are not easily documented, but there are many offered. Specialization of practice, lack of mentoring, taking the exam before being truly ready - these have all been proposed.

Certification Maintenance: And just because you manage to achieve your goal and demonstrate that you have met the established standard for certification doesn't mean that you can rest on your laurels. In 1979, the Board required that all diplomates demonstrate that they have been active in the field and have continued to improve their knowledge. Seven categories of practice are noted for the accumulation of "points" toward the forty required every five years. Some portion of these points are gathered for active practice, technical committee work, publications, education and meetings, teaching, retest, or other work. This requires that some program of continuing education be pursued to increase your knowledge of industrial hygiene.

Value of Certification: Is it worth it? For some the rewards are immediate and financial. For others, it is the satisfaction of knowing you have pursued a goal and made it. There is no hard and fast rule. The fact is indisputable that the earning of the designation as a "Certified Industrial Hygienist" is recognized as a mark of professionalism.

Comments: This certification is rigourous; it involves credential checks and an extensive exam. It also includes a continuing education requirement to keep certification. The Certified Industrial Hygienist (CIH) could do work in the Land Recycling Program in the Risk Assessment areas. But, most industrial hygienists work in the industry health and safety areas, which wouldn't include remediation and risk assessment. I wouldn't discount a CIH for Risk Assessment, but I would not make it a requirement for the Land Recycling Program.

Ecological Society of America

http://www.esa.org/

Defining a Standard: Since the 1960's, ecologists have been actively involved in setting environmental policy and influencing decision-making in our society. The Ecological Society of America strives to enhance the quality of this advice by instituting a Code of Ethics and providing a professional certification program designed to evaluate the education and professional experience of ecologists. Professional certification means that ecologists have demonstrated an appropriate level of education and experience in applying ecological principles in their professional environmental careers. There is an increasing nation-wide demand for certification credentials in the environmental arena. Most notably is the recent U.S. Department of Agriculture's Natural Resources Conservation Service (USDA-NRCS) call for certified professionals to act as Technical Service Providers to help farmers, ranchers, and other private landowners protect and restore resources through conservation planning.

Besides natural resource management, ecological expertise is needed on a host of other current environmental problems including: biotechnology, ecological restoration, ozone depletion, global climate change, ecosystem management, nitrogen deposition, species extinction and loss of biological diversity, invasive species, habitat alteration and destruction, and sustainable ecological systems. This expertise is provided by ecologists in academia, government, non-governmental organizations and the private sector. However, it has been shown that only a small minority of individuals with graduate degrees find full-time employment in academic institutions. Private environmental companies, Federal, state, and local environmental and natural resource agencies, applied research laboratories, and non-governmental organizations, including private foundations offer major employment opportunities for ecologists.

Recognizing this new direction for professional ecologists, the Ecological Society of America provides the certification program for its members, as well as nonmembers and the public who desire a statement of their professional qualifications. The professional certification program, begun in 1981, recognizes ecologists who seek to incorporate ecological principles in decision-making, who meet a minimum set of standards in education and experience, and who adhere to high ethical standards. It is clear that a formal identification of minimum standards for ecologists is needed and that society needs, welcomes, and now recognizes the ESA Certification Program as a means of identifying well-trained and reliable professionals who meet criteria of competence. Other scientific environmental organizations have furthered their certification programs in response to the requirement for professional certification credentials. The demand for professional certification is apparent. Ecologists need to meet that demand in order to ensure that ecological science is considered in environmental policy and decision making be it on the local, regional, national, or international level. Formal certification is an important criteria to be met by ecologists, whether they are employed in the private or public sector or in academia. Clearly ecological certification will define the standards,

formally identify the profession, and increase the respectability of ecologists in environmental affairs.

Certification Program Guidelines & Requirements

Goal and Function: The goal of certification is to foster the incorporation of ecological principles in the decision-making process of the Society. To meet this goal, the Ecological Society of America recognizes individuals whose education, training, and experience meet the established standards of the Society.

The ESA certification program provides ready access to professional ecologists for advice and technical guidance on public policy and regulatory issues facing society.

Though certification does not guarantee the competence of individuals to address specific matters, the Society attests that certified members have met minimum education and experience requirement for various certification levels. Each certified member also acknowledges adherence to the ESA Code of Ethics.

Objectives: 1. To serve the needs of ecologists who wish to establish and validate their professional credentials. 2. To guide biologists, government agencies, courts, and the public in defining minimum standards of education and experience for professional ecologists, and to encourage all practicing ecologists to meet such standards. 3. To create and maintain public confidence in the advice and opinions of Certified Ecologists as well as educated and experienced professionals who have pledged to uphold the Code of Ethics of the Ecological Society of America and to act in the best interest of the public. 4. To assist the public in identifying ecologists by establishing a procedure for critical peer evaluation based upon defined minimum education, experience, and ethical requirements.

Requirements for Eligibility - Education and Experience: Candidates must hold a bachelor's degree which includes the equivalent of at least 30 semester hours of biological science with at least 9 semester hours of ecology, and at least 12 semester hours of physical and mathematical science. Undergraduate requirements may be met in graduate programs but should be documented. Graduate degrees must include an introduction to three major areas of ecological inquiry: populations, communities and ecosystems.

Associate Ecologist: Successful completion of a bachelor's or higher degree in ecology or a related science from an accredited college or university, and at least one year of post-graduate professional experience gained in the performance of research or development of methods demonstrating technical competence in the current application of ecological principles and/or theory to decision making.

Ecologist : 1. Successful completion of a master's or higher degree in ecology or a related science from an accredited college or university, and at least two years of full-time equivalent professional experience after degree, OR at least 5 years of professional

experience in addition to the education requirement for Associate Ecologist. 2. In addition to experience required for Associate Ecologist, demonstration of ability to perform professional work in ecology such as independent studies, complex data analyses, and formulation and testing of hypotheses must follow completion of the master's degree or the degree level used to qualify for Ecologist's level.

Senior Ecologist: 1. Successful completion of a doctoral degree in ecology or a related science from an accredited college or university, and at least five years of professional experience, OR at least 10 years professional experience in addition to the education requirement for Ecologist. 2. Additional experience necessary to qualify at this level includes: a) demonstration, in work output, of thorough knowledge of the literature, scientific principles and theories of ecology, b) demonstration of written original contributions or original interpretation of ecological information, and c) demonstration of technical or organizational competence as evidenced by supervision of projects. Experience must follow completion of the degree level used to qualify for Ecologist. 3. An applicant who does not qualify under the above criteria may submit a statement to the Board of Professional Certification explaining why and how the intent of the education and experience requirements is satisfied.

A streamlined process for Certification of Senior Ecologists: ESA members who have at least 10 years of experience beyond their Ph.D may apply for certification at the senior level by submitting their full resume, signing the Code of Ethics and submitting a payment of $125.00. This means that a list of course work, experience and references will not be required for these senior ecologists. The Board of Professional Certification will reserve the right to request further information only if deemed necessary

Ethics and Professional Conduct: Certified Ecologists shall conduct their activities in accordance with the Code of Ethics of the Ecological Society of America and with the highest standards of professional conduct and personal honor. Those who subscribe to the Code of Ethics are eligible for certification, provided they meet minimum education and experience requirements

Comments: This certification only relies on degrees in Ecology, years of experience and signing a code of ethics. There is not a test for this certification. There is a discipline procedure for those who do not follow the code of ethics. This certification would be applicable to the Land Recycling Program for the Ecological Screening and Ecological Risk Assessments. Since this is the only certification available for Ecologist, we could recommend it for the Land Recycling Program.

National Association of Environmental Professionals

http://www.naep.org/

NEAP is:
the multidisciplinary association dedicated to the advancement
of the environmental professions in the U.S. and abroad.
. . . a forum for state-of-the-art information on environmental planning,
research and management.
. . . a network of professional contacts and exchange on information
among colleagues in industry, government, academe,
and the private sector.
. . . a resource for structured career development from student
membership to certification as an environmental professional.
. . . a strong proponent of ethics in the profession.

The Academy of Board Certified Environmental Professionals (ABCEP) administers the Certified Environmental Professional (CEP) Program which provides environmental professionals who possess special qualifications of education, experience, and accomplishment with the opportunity to be judged by a board of peers. Those individuals awarded the Certified Environmental Professional credential may use the designation "CEP" after their name. Originally, the CEP Program operated under the auspices of the National Association of Environmental Professionals (NAEP). However, in 1993, after 14 years of operation, NAEP transferred the CEP Program to the Academy, which has operated the program continuously since then. In 1999, ABCEP was independently incorporated as a non-profit organization in Washington, DC. Incorporation follows ABCEP's formal separation from the National Association of Environmental Professionals through a series of Bylaw changes by both NAEP and ABCEP. NAEP now endorses ABCEP as their recommended organization for certification.

Functional Areas

Certification is offered in five functional areas: (1) Environmental Assessment; (2) Environmental Documentation; (3) Environmental Operations; (4) Environmental Planning; and (5) Environmental Research & Education.

Environmental Assessments: includes evaluation of risks to (or past impacts upon) the occupants of ecosystems, work places, or residences exerted by physical, chemical, or biological agents to which exposure may occur (or may have occurred).

Environmental Documentation: includes preparation of reports, presentation of facts, completion of other actions to establish

administrative records demonstrating compliance with environmental statutes, regulations, and permits.

Environmental Operations: includes management of facilities in accordance with requirements of environmental statutes, regulations, and permits.

Environmental Planning: includes arrangement for future facility construction, operation, and /or management in accordance with anticipated requirements of environmental statutes, regulations, and permits (or permit renewals).

Environmental Research and Education: includes conducting and reporting on original investigations into the dynamics of environmental phenomena, teaching about such phenomena as investigated by oneself and/or other investigators.

Requirements for Certification

In addition to an affirmation of subscribing to the *ABCEP Code of Ethics and Standards of Practice for Environmental Professionals*, established by NAEP and adopted by the Academy, the following minimum qualifications must be met:

The applicant must posses a Bachelor's Degree and a minimum of nine years of applicable professional environmental experience. Five of the nine years must be in a position of responsible charge and/or responsible supervision. *Responsible charge* is defined as: the direction of environmental work by an environmental professional to the extent that successful completion of the work is dependent on the decisions made by the environmental professional without advice or approval of others. *Responsible supervision* is defined as: the supervision of another professional person's work by an environmental professional to the extent that the environmental professional assumes the professional responsibility for the work.

A Master's Degree may be substituted for one year of the nine years of professional experience and a Doctorate may be substituted for two of the nine years of professional experience. However, no such substitution will apply to the requirement for the five years in responsible charge and/or responsible supervision. Degrees claimed must be from fully accredited college or university (certified transcripts are required). The written portion of the examination consists of mandatory and elective essay questions designed to test the communication skills and technical experience of the applicant.

Evaluation of Applicant

Each applicant is evaluated by seven members of the Certification Review Board, who represent many fields of professional effort (i.e., consulting, academia,

private industry, government) in various sections of the country. The Board is responsible for determining the qualifications of each applicant and grants or denies certification based upon the information provided. An interview of the applicant is required (normally by telephone).

Institute of Professional Environmental Practice

http://www.ipep.org/

The Institute of Professional Environmental Practice (IPEP) is the independent, not-for-profit certifying organization for the Qualified Environmental Professional (QEP) and the Environmental Professional Intern (EPI) certifications. IPEP's objectives are to improve the practice and educational standards of environmental professionals and to administer the QEP and EPI application, examination, and certification process. The Institute is governed by a Board of Trustees and conducts business in accordance with the Board's adopted Bylaws and Policies & Procedures for Certification.

Code of Ethics: Individuals certified as competent by the Institute shall subscribe to the following code of ethics:

- Hold paramount protection of human health and natural environment;
- Comply with applicable statutes, regulations, and standards;
- Undertake and accept responsibility for professional assignments only when qualified;
- Provide professional opinion based on adequate knowledge derived from good science, thoughtful deliberation, and honest conviction;
- Act as faithful agent, maintain confidentiality and avoid conflict of interest but, where potential arises, disclose circumstances expediently and fully;
- Avoid professional practice while under influence of thought-impairing substance;
- Maintain competence through continuing professional development;
- Act with fairness, courtesy and good faith; give credit where due; and accept/give constructive, honest, and fair professional comment;
- Communicate clearly the potential consequences if professional decisions or judgments are overruled or disregarded; and exercise honesty, objectivity and diligence.

The QEP is the first and only credential of its kind. It is a multi-media, multi-disciplinary, fully accredited credential that requires environmental professionals to see "the big picture" and to have the skills and knowledge to solve "real world problems".

Through the QEP certification, environmental professionals demonstrate the

breadth and depth of their knowledge and experience. **They also agree to abide by IPEP's Code of Ethics.**

The QEP is distinguished from other certifications by its cross-disciplinary nature, its qualifying education prerequisites, its rigorous application and examination process, and by its continuing education requirements for recertification. The QEP establishes standards for the environmental professional and provides a career track for new professionals entering the field. It does not take the place of specialized certifications or registrations, but rather is a unique credential that serves to link and coordinate environmental practice.

The QEP is committed to:
• A strict code of ethics,
• High standards of environmental practice,
• Ongoing professional development, and
• Community and professional contributions.

The QEP has demonstrated:
• Ability to solve complex environmental problems,
• Awareness of multi-media impacts,
• Understanding of broad based, multi-disciplinary environmental issues, and
• In-depth knowledge in your area of professional practice.

IPEP is supported by the following Participating Organizations:
• *Air & Waste Management Association*
• *American Academy of Environmental Engineers*
• *American Industrial Hygiene Association*
• *National Association of Environmental Management*
• *Solid Waste Association of North America*
• *Water Environment Federation*

Institute of Hazardous Material Management:

http://www.ihmm.org/index.cfm

The CHMM® Program Is Accredited by the Council of Engineering and Scientific Specialty Boards (CESB)
(Meets ASTM Standard E1929-98 for Personnel Certifications)
The CHMM program is accredited by the Council of Engineering and Scientific Specialty Boards (CESB). The CHMM designation remains one of a select few accredited credentials in the environmental profession.

CESB's guidelines for accreditation include consideration of:

- Validity of the certification examination program
- Fairness of the procedures for determining applicant eligibility
- Adequacy of requirements for ensuring maintenance and enhancement of professional qualifications (recertification)
- Professionalism and independence of the certifying body
- Openness of the program to public scrutiny

As an accredited program, the Institute has earned a significant role in CESB's Board activities, including participation in the review of accreditation applications for other specialty certification programs.
The candidate for certification must have achieved a significant level of education and experience (see Levels, below), and then demonstrate that skill and knowledge by passing a rigorous examination which tests for:

- An understanding of the basic principles involved in technologies pertaining to hazardous materials management, including: chemistry, radiology, physics, biology, geology/hydrology, toxicology, and engineering.
- A knowledge of the regulatory framework of environmental and hazardous materials management: the Federal regulations associated with TSCA, RCRA, CERCLA, FIFRA, OSHA, DOT, and EPA.
- Competence and maturity of judgment in managing environmental programs and resources.

Once the environmental professional has successfully completed these requirements, he/she must pledge to maintain the highest standards of integrity through the CHMM Code of Ethics, and must demonstrate continued competence by undergoing recertification every five years.
All candidates for CHMM certification must have a baccalaureate degree (or higher) from an accredited college or university, and pass a professional multiple-choice examination developed and administered by the Institute of Hazardous Materials Management. Eligibility to sit for the exam, and the level of certification, are determined by the candidate's education and experience. All successful candidates must sign a Code of Ethics before certification.

Master Level: Attainment of a degree (as described above) in a field related to hazardous materials management/ engineering plus 7 years of experience in the field of hazardous materials management/ engineering, including responsibility for developing, implementing, directing and/or evaluating one or more related program activities.

Senior Level: Attainment of a degree (as described above) plus 3 years of appropriate experience in the field of hazardous materials management/ engineering.

The CHMM examination covers the topics listed below. It consists of 160 multiple-choice questions to be answered in a three-hour period. There is no penalty for wrong answers.

Laws and Regulations, including:

Hazardous Waste Management (RCRA) (40 CFR); Hazardous Materials Transportation (49 CFR); Toxic Substances Control (40 CFR); Occupational Safety and Health (29 CFR); Clean Water Act (40 CFR); Safe Drinking Water Act (40 CFR); Clean Air Act (40 CFR); Spills and Disposal Site Cleanup (CERCLA) (40 CFR); Hazard Communication Standard (29 CFR); Superfund Amendments (SARA); Pesticides Management (FIFRA) (40 CFR)

Compliance Standards, Work Practices and State of the Art, including:

Packaging and transportation of hazardous materials; hazardous materials handling and storage; hazards assessment and communication; personal protection/workplace safety and health practices; standards for radioactive materials; standards applicable to hazardous waste generators, transporters and TSD facilities; hazardous substances spills; cleanup of hazardous waste disposal sites.

Science and Technology, including:

Chemistry and physics of hazardous materials (e.g., corrosiveness, oxidation/reduction, polymerization, flammability, and radioactivity); biological effects of hazardous materials; geology/hydrology; toxicology; sampling and analysis.

Management of Hazardous Materials Programs, including:

Basic management principles; application of hazard prevention and control principles and concepts; liability and risk management; information gathering (i.e., resources and reference materials).

Academy of Board Certified Environmental Professionals
http://www.abcep.org/

The Academy of Board Certified Environmental Professionals (ABCEP) administers the Certified Environmental Professional (CEP) Program which provides environmental professionals who possess special qualifications of education, experience, and accomplishment with the opportunity to be judged by a board of peers. Those individuals awarded the Certified Environmental Professional credential may use the designation "CEP" after their name.

ABCEP is a member of the Council of Engineering and Scientific Specialty Boards (CESB), which is the national organization responsible for accrediting engineering and technology certification programs.

Evaluation of Applicants

Each applicant is evaluated by seven members of the Certification Review Board (CRB). Members of the CRB represent many fields of professional effort (i.e., consulting, academia, private industry, government). The CRB is responsible for determining the qualifications of each applicant and grants or denies certification based upon the information provided. The Lead Reviewer will interview the applicant to determine the extent of the applicant's knowledge and experience in his or her area of expertise and examine other matters considered germane to certification. These are generally conducted over the telephone.

The Academy and the certification program are operated in accordance with federal policies, which prohibit discrimination on the basis of race, color, sex, age, handicap, religion, or national origin.

Functional Areas

Certification is offered in five functional areas. Applicants must select ONE of the five areas, based on their past experience and future expectations.

Environmental Assessment: includes evaluation of risks to (or past impacts upon) the occupants of ecosystems, workplaces, or residences exerted by physical, chemical, or biological agents to which exposure may occur (or may have occurred).

Environmental Documentation: includes preparation of reports, presentation of facts, completion of other actions to establish administrative records demonstrating compliance with environmental statutes, regulations, and permits.

Environmental Operations: includes management of facilities in accordance with requirements of environmental statutes, regulations, and permits.

Environmental Planning: includes arrangement for future facility construction, operation, and /or management in accordance with anticipated requirements of environmental statutes, regulations, and permits (or permit renewals).

Environmental Reasearch and Education: includes conducting and reporting on original investigations into the dynamics of environmental phenomena, teaching about such phenomena as investigated by oneself and/or other investigators.

Fees

Applications must be accompanied by a $125 non-refundable application fee. It must be sent with the application. Checks or credit cards are accepted. We have found that some employers pay the application fees (see FAQs). Once you are certified, a second $125 payment is required, which covers the cost for a certification seal (a rubber stamp), a wall certificate, a lapel pin, and other promotional materials.

Once certified, membership in the Academy is $80 per year.

Requirements for Certification

The following minimum qualifications must be met:

The applicant must posses a Bachelor's Degree and a minimum of nine years of applicable professional environmental experience. Five of the nine years must be in a position of responsible charge and/or responsible supervision.
Responsible charge is defined as: the direction of environmental work by an environmental professional (you) to the extent that successful completion of the work is dependent on your decisions made without advice or approval of others.
Responsible supervision is defined as: the supervision of another professional person's work by an environmental professional (you) to the extent that you assume the professional responsibility for the work.

A Master's Degree may be substituted for one year of the nine years of professional experience and a Doctorate may be substituted for two of the nine years of professional experience. However, no such substitution will apply to the requirement for the five years in responsible charge and/or responsible supervision. Degrees claimed must be from a fully accredited college or university (certified transcripts are required).

The written portion of the examination consists of mandatory and elective essay questions designed to test the communication skills and technical experience of the applicant. This is a self-scheduled "take-home" exam. The link above connects you with our current list of questions. The maximum allowable length for each essay is four pages.

The applicant is responsible for getting eight (8) letters of recommendation from peers, clients, and/or supervisors. Members of the Certification Review Board will not know you, so they must make a judgment based on three things -- your knowledge (as demonstrated by you in the essays), your background (as described by you in your application) and your qualifications (as described in statements made by

your references). Therefore, these letters of reference are an important part of the review.

Ideally, the references should come from other CEPs or from individuals who hold a similar professional certification. Letters generally are 3-5 paragraphs long (1-2 pages). There is no standard form for them to fill out, but we do have a standardized request form. The letters can be mailed or emailed to the Academy, and you can start this process as soon as you decide to apply (you do not need need to wait until you have written the essays and sent in your application).

The applicant must subscribe to the ABCEP Code of Ethics and Standards of Practice for Environmental Professionals, established by NAEP and adopted by the Academy.

Code of Ethics and Standards of Practice for Environmental Professionals

The objectives of Environmental Professionals are to conduct their personal and professional lives and activities in an ethical manner. Honesty, justice and courtesy form moral philosophy which, associated with a mutual interest among people, constitute the foundation of ethics. Environmental Professionals should recognize such a standard, not in passive observance, but as a set of dynamic principles guiding their conduct and way of life. It is their duty to practice their profession according to this Code of Ethics.

As the keystone of professional conduct is integrity, Environmental Professionals will discharge their duties with fidelity to the public, their employers, clients, and with fairness and impartiality to all. It is their duty to interest themselves in public welfare, and to be ready to apply their special knowledge for the benefit of mankind and their environment.

Creed

The objectives of an Environmental Professional are:

1. to recognize and attempt to reconcile societal and individual human needs with responsibility for physical, natural, and cultural systems.
2. to promote and develop policies, plans, activities and projects that achieve complementary and mutual support between natural and man-made, and present and future components of the physical, natural and cultural environment.

Ethics

As an Environmental Professional I will:

1. be personally responsible for the validity of all data collected, analyses performed, or plans developed by me or under my direction. I will be responsible and ethical in my professional activities.
2. encourage research, planning, design, management and review of activities in a scientifically and technically objective manner. I will incorporate the best principles of the environmental sciences for the mitigation of environmental harm and enhancement of environmental quality.
3. not condone misrepresentation of work I have performed or that was performed under my direction.
4. examine all of my relationships or actions which could be legitimately interpreted as a conflict of interest by clients, officials, the public or peers. In any instance where I have a financial or personal interest in the activities with which they ar|e directly or indirectly involved, I will make a full disclosure of that interest to my employer, client, or other affected parties.
5. not engage in conduct involving dishonesty, fraud, deceit or misrepresentation or discrimination.
6. not accept fees wholly or partially contingent on the client's desired result where that desired result conflicts with my professional judgement.

Guidance for Practice as an Environmental Professional

As an Environmental Professional I will:

1. encourage environmental planning to begin in the earliest stages of project conceptualization.
2. recognize that total environmental management involves the consideration of all environmental factors induding: technical, economic, ecological, and sociopolitical and their relationships.
3. incorporate the best principle of design and environmental planning when recommending measures to reduce environmental harm and enhance environmental quality.
4. conduct my analysis, planning, design and review my activities primarily in subject areas for which I am qualified, and shall encourage and recognize the participation of other professionals in subject areas where I am less experienced. I shall utiliz|e and participate in interdisciplinary teams wherever practical to determine impacts, define and evaluate all reasonable alternatives to proposed actions, and assess short-term versus long-term productivity with and without the project or action.
5. seek common, adequate, and sound technical grounds for communication with and respect for the contributions of other professionals in developing and reviewing policies, plans, activities, and projects.
6. determine that the policies, plans, activities or projects in which I am involved are consistent with all governing laws, ordinances, guidelines, plans, and policies, to the best of my knowledge and ability.
7. encourage public participation at the earliest feasible time in an open and productive atmosphere.

8. conduct my professional activities in a manner that ensures consideration of technically and economically feasible alternatives.

Encourage Development of the Profession

As an Environmental Professional I will:

1. assist in maintaining the integrity and competence of my profession.
2. encourage education and research, and the development of useful technical information relating to the environmental field.
3. be prohibited from lobbying in the name of the Academy of Board Certified Environmental Professionals.
4. advertise and present my services in a manner that avoids the use of material and methods that may bring discredit to the profession.

The American Board of Toxicology, Inc.

http://www.abtox.org/

The American Board of Toxicology, Inc. was incorporated in the District of Columbia on April 17, 1979, as a self-sustaining not-for-profit corporation. It is not associated with any professional or scientific society or interest group.

Objectives

The purposes for which the Board is organized are to encourage the study of the science of toxicology, to stimulate its advancement by establishing standards for professional practice, to prepare and administer procedures including tests for the implementation of such standards, and to confer recognition by certificates or otherwise upon those members of the profession who, measured against such standards, demonstrate competence.

Eligibility

The following combinations of educational training and experience are needed to meet the eligibility requirements for admission to the Certification Examination:

> **(a)** an applicant must possess an earned doctoral degree in an appropriate field and have at least three years of full-time professional post-doctoral experience in toxicology (or part-time equivalent thereof) and also must have a principal involvement in the practice* of toxicology within the year immediately prior to the date of application; or

(b) an applicant must possess an earned Master's degree in an appropriate field and have at least seven years of full-time professional post-baccalaureate experience in toxicology (or part-time equivalent thereof) and also must have principal involvement in the practice* of toxicology within the year immediately prior to the date of application; or

(c) an applicant must possess an earned Bachelor's degree in an appropriate field and have at least ten years of full-time professional post-baccalaureate experience in toxicology (or part-time equivalent thereof) and also must have principal involvement in the practice* of toxicology within the year immediately prior to the date of application.

* Experience in the practice of toxicology should include such factors as research, testing, teaching, hazard assessment, safety evaluation, management, or clinical toxicology in animals or humans. Scholastic work towards a higher degree is not considered to be professional level experience.

The Certification Examination

The Certification Examination is composed of three major subject areas. These subject areas and their sub-topics are:

I. Toxicity of Agents: metals; organic solvents; pesticides; inhaled gases, dusts, aerosols, etc.; natural toxins; industrial chemicals; drugs and cosmetics; and food additives.

II. Organ Sytems and Effects: mutagenesis, carcinogenesis, developmental toxicology; reproductive toxicology; inhalation toxicology; neurobehavioral toxicology; immunological toxicology; cutaneous toxicity, ocular toxicity, hematopoietic toxicity, hepatic toxicity, renal toxicity; and endocrine-related toxicities.

III. General Principles and Applied Toxicology: general principles; toxicokinetics; factors influencing toxicity; risk assessments; epidemiology and biostatistics; regulatory toxicology; environmental toxicology; industrial and occupational toxicology; and forensic and clinical toxicology.

Eligible applicants must pass all parts of the exam within a two year period. Applicants that pass two out of the three parts of the examination are permitted to retake the part they did not pass in the year following their first try. Those who fail two or more parts of the examination are required to retake the entire examination. Applicants who do not pass the examination within the two year period of eligibility must again establish eligibility by resubmitting the application form and appropriate fees.

Examination Schedules

The Board establishes and announces the locations and dates of each year's examination, based on the number and geographic distribution of the candidates.

Certification

Persons who have passed all three parts of the Certification Examination will receive a certificate and are designated as Diplomates of the American Board of Toxicology. The term of certification is for five years from the issuance of the certificate.

Recertification

The ABT policy of Recertification identifies three performance criteria by which each Diplomate will be evaluated pursuant to recertification for five additional years. These criteria are:

1. Active Practice of Toxicology,
2. Continuing Education,
3. Maintaining Expert Knowledge in Toxicology.

As part of the latter criterion, each Diplomate will complete an open book recertification examination during the fourth year of recertification. Use of such an examination is regarded by the Board as a constructive and objective means by which the Diplomate and the Board may measure maintenance of expert knowledge in general toxicology.

After two recertification have been completed, subsequent recertifications will require that two satisfactory examination questions be submitted and accepted in lieu of the recertification exam.

Retired Status

The Board may grant to a Diplomate the designation of Retired Diplomate upon receipt of an application for such status as determined by certain criteria.

Directory

A ***Directory of Diplomates*** is published each year and distributed at no charge to all ABT Diplomates. There is a directory searchable by Diplomate name available on the web site to all non-Diplomates.

Applications

Applications for the Certification Examination can be obtained by writing to the ABT Office or downloading from the ABT web site. A reference list to assist the applicant in preparing for the examination and a one hundred-question sample exam is also available.

Board of Directors

The ABT is governed by a Board of Directors. Nominations to the Board of Directors are received from ABT Diplomates at-large. Election to the Board is conducted by the existing Board members with consideration given to maintaining a balance of Board representation from academia, industry and government. All Board members are Diplomates of ABT. Board members serve four year terms and contribute their time without remuneration.

Associations providing certification and or training related to the field of Geology:

The American Geological Institute (AGI) is a federation of 43 Geosciences societies. A few which could have or might be expected to have expertise in the area of site assessment and remediation for brownfield redevelopment.

Below are organizations, some are members of AGI, which I initially considered might have membership qualifications that would be appropriate for work on land recycling program projects. After a more through review I would not recommended some of these organization's certification as a basis for professional expertise in investigation and remediation of Land Recycling Program sites. For some of the other organizations, it will have to be policy decision to recommend them. There is one organization that provides training in which I believe would be very good training for those undertaking brownfield investigation and remediation work. This report looks at organizations and certifications, but there is nothing better than a person have experience working on a number of investigation and remediation projects to understand the complexity of this work. The program might also want to consider the number of successful Land Recycling Projects a consultant has worked on as another criteria.

Following is a list of organizations with description that I initially considered. Those that I do not recommend are so noted:

Association of Engineering Geologists
The Association of Engineering Geologists was originally founded as the California Association of Engineering Geologists (CAEG) in 1957. In 1963, CAEG became the Association of Engineering Geologists (AEG) after the first non-California Section was formed in Denver, Colorado. AEG was developed to meet the professional needs of geologists who are applying their scientific training and experience to the broad field of civil and environmental engineering. Engineering geologists work in close coordination with construction, foundation and highway engineers, hydraulic engineers and hydrologists and with environmental professionals in environmental remediation, city planning and natural hazard risk reduction. The mission of AEG is to provide leadership in the development and application of geologic principles and knowledge to serve engineering, environmental and public needs. AEG members represent geological engineers and geologists in practice, academic and governmental positions.

The strength of members in this organization is in the geotechnical phases of work, rather than the environmental assessments and remediation.

Society of Independent Professional Earth Scientists Chapters are located in twenty states mostly
in the Midwest and southwest US
Web site
http://www.sipes.org

SIPES, chartered in 1963 in Houston, Texas, has one of the strongest certification programs in the earth sciences. Members are certified by the Board of Directors for their professional experience, competence and ethics. SIPES has over 1,300 members located in 20 states. Their areas of expertise are worldwide in scope. Some bring about the drilling of oil and gas wells. Others are involved in different extractive industries of the earth's natural resources or in education.
Requirements:
Science or engineering degree leading to a career in earth sciences. 12 years of practice in the field of earth science. The years of experience required may be fulfilled by self-employment, as well as employment in industry, government or education as an earth scientist. Credit is given for degrees received from accredited universities. Members must be independent or self-employed with freedom of choice of clients and business associates. The sponsorship of three SIPES members is required. Applicants, who reside outside of a SIPES chapter state, may use SIPES sponsors or other professionals who are familiar with the applicant's experience in the earth sciences. SIPES has a membership reciprocity agreement with the Division of Professional Affairs of the American Association of Petroleum Geologists, and with the Society of Petroleum Evaluation Engineers. Sponsors are not required for DPA or SPEE members.
Not recommended!

Pennsylvania Council of Professional Geologists (PCPG)
116 Forest Drive
Camp Hill PA 17011
Web site
http://www.pcpg.org
The Pennsylvania Council of Professional Geologists (PCPG) was founded in 1989, as a Non-Profit Corporation in the Commonwealth of Pennsylvania. PCPG is a corporation of Member Companies. Members are drawn from a broad cross-section of the geological and environmental consulting businesses. Since 1989, membership in the PCPG grew from an original 20 Charter Members, to over 60 companies employing more than 1,200 geologists in the Commonwealth. One of the results of passing Professional Licensure for Geologists is that now Geologists are legally responsible for the work that they do. Geologists must signify the taking of that responsibility by applying a Geologist's Seal to all professional work products.
An organization for geologic companies rather than individuals. Not recommended

American Institute of Professional Geologists (AIPG)
Web site
http://www.aipg.org/ScriptContent/Index.cfm
The American Institute of Professional Geologists (AIPG), founded in 1963, is the largest association dedicated to promoting geology as a profession. It presently has more than 4,800 members in the U.S. and abroad, organized into 36 regional Sections, there is a Pennsylvania Section for the entire state. AIPG adheres to the principles of professional responsibility and public service and is the only international organization that certifies

the competence and ethical conduct of geological scientists in all branches of the science with members employed in industry, government, and academia.

AIPG is a nonprofit organization whose policies are determined by its Executive Committee.

The purposes of the AIPG include:

1. Advance the geological sciences and the profession of geology;
2. Establish qualifications for professional geologists;
3. Certify the qualifications of specific individual Member geologists to the public;
4. Promote high standards of ethical conduct among its Members and Adjuncts, and within the profession of geology; and
5. Represent, and advocate for, the geological profession before government and the general public.

AIPG Professional Certification - Certifies geologists based on their Competence, Integrity, and Ethics. Classifications include Certified Professional Geologist, Retired, Honorary Emeritus Member, Affiliated Professional, Candidate for Certification, and Student.

National Ground Water Association (NGWA)
Web site
http://www.ngwa.org
The National Ground Water Association is the organization for anyone associated with the ground water industry. Headquartered in Westerville, Ohio. The constituency consists of ground water geologists and hydrologists, engineers, ground water contractors, manufacturers, and suppliers of ground water-related products and services.

The purpose is to provide guidance to members, government representatives, and the public for sound scientific, economic, and beneficial development, protection, and management of the world's ground water resources. A not-for-profit organization founded in 1948 as the National Water Well Association. The name changed in 1991, and the organization has more than 15,000 professionals around the world.

Members are served through educational offerings, training, and current up-to-date information on the ground water industry delivered through a variety of resources. They have hosted educational courses and conferences on cutting-edge technology throughout the United States. They publish three publications, *Water Well Journal*, *Ground Water Monitoring & Remediation*, and *Ground Water*. They conduct two annual lecture series, the Darcy Hydrogeology Lecture Series and the McEllhiney Distinguished Lecture Series in Water Well Technology, at colleges and universities around the world. They also maintain Ground Water On-Line®, a database containing more than 90,000 ground water literature citations. They also have voluntary certification programs in well construction

and pump installation as well as one for ground water professionals (scientists and engineers).

NGWA has some certification programs. The certification program most appropriate for consultants submitting reports for the Land Recycling Program is the Ground Water Professional.
The web site for the Ground Water Professional is
http://www.ngwa.org/certification/cgwp-menu.html

Initial Requirements for Certification as a Ground Water Professional:
Applicants must have at least seven years of progressively more responsible professional experience, following receipt of a baccalaureate degree, during which full competence has been demonstrated in the application of scientific or engineering principles and methods to the execution of work involving:
(1) the understanding of the occurrence, movement, and composition of ground water,
(2) the development, management, or regulation of ground water, or
(3) the teaching and research of ground water subjects at the university level.
In fulfillment of this experience requirement, two years of experience credit shall be allowed for work performed during the completion of a master's degree or three years of credit shall be allowed for work performed during the completion of a doctorate degree providing that the graduate training was primarily in some aspect of ground water. In no case shall the total experience credit for academic work above the baccalaureate degree exceed a total of three years.

Applicant must furnish specific and explicit descriptions of the qualifying work experience. Qualifying work experience specifically does not include such routine activities as lithologic and water quality sampling, water level data acquisition, routine laboratory work, etc., where the elements of initiative, scientific or engineering judgment, and decision-making are lacking, nor does it include activities that do not use scientific or engineering methods to process and interpret water data. Where pertinent, the description should include a bibliography listing published or unpublished reports of substantive original investigations.

Maintaining Certification:

A Certified Ground Water Professional (CGWP) is required to renew their certification every three years. A renewal fee of $150 is charged at the time of approval of the Professional Development Credit (PDC) points earned during the three-year certification period. CGWP's are required to renew their certification every three years, commencing December 31, in the year in which he/she earned the designation. If one becomes a CGWP anytime in 2003, the renewal deadline is December 31, 2006, and so forth.

The renewal process includes submittal of a renewal fee and evidence of 36 professional developments credits (PDCs) over each three-year renewal period. Individuals who fail to submit renewal fees and evidence of the required PDCs by the December 31 deadline will be considered as "non- renewing" and will be notified accordingly and advised to cease

using the CGWP designation after their names. (Materials must be received by NGWA by the deadline).

"Non-renewing" CGWP's names will be removed from the active list at this time. Submitting the renewal fee, a reinstatement fee, and required PDCs by December 31 of the year following their active CGWP status may reinstate "Non-renewing" CGWP's. After December 31, the non-renewing CGWP shall forfeit the reinstatement option. Those who wish to reapply for the CGWP status in the future shall follow the same application process as those initially applying for the designation. The CGWP Committee or the AGWSE Board will review extenuating circumstance situations and/or questions concerning applicable PDCs on a case-by-case basis. These requests must be received in writing by March 31, following the end of the active status of the CGWP. "Non-renewing" CGWP's, with such circumstances, that fail to submit written requests by the deadline are subject to the stipulation.

Professional Development Credit points:
Credits are given for:
Attendance at local, regional, national, and international technical meetings (GSA, AGU, NGWA. etc.) (Three credits per day attended, or appropriate fraction thereof). Documentation of meeting must be supplied for approval.

Participation in or teaching of short courses and workshops (NGWA, GSA, universities, government training, etc.) (Four credits per day of participation or appropriate fraction thereof). Publication in refereed journals (*Ground Water, GSA Bulletin*, *Water Resources Research*, etc.) (Eight credits per published article).

Teaching at universities, colleges, junior colleges where not normally employed (Two credits per one semester or quarter hour).

Oral presentation of papers at technical society meetings (Four credits per paper presented).

Enrollment and attendance at university or college courses in relevant subjects (Seven credits per semester credit unit eamed/five credits per quarter credit unit earned).

ASTM International (ASTM)

100 Barr Harbor Drive
PO Box C700
West Conshohocken, PA, 19428-2959
Web link
http://www.astm.org/cgi-bin/SoftCart.exe/index.shtml?E+mystore

ASTM International is one of the largest voluntary standards development organizations in the world. Known for their high technical quality and market relevancy, ASTM International standards have an important role in the information infrastructure that guides design, manufacturing and trade in the global economy.

ASTM International, originally known as the American Society for Testing and Materials (ASTM), was formed over a century ago, when a group of engineers and scientists got together to address frequent rail breaks in the burgeoning railroad industry. Their work led to standardization on the steel used in rail construction, ultimately improving railroad safety for the public. As the century progressed and new industrial, governmental and environmental developments created new standardization requirements, ASTM answered the call with consensus standards that have made products and services safer, better and more cost-effective.

Today, ASTM continues to play a leadership role in addressing the standardization needs of the global marketplace. Known for its best in class practices for standards development and delivery, ASTM is at the forefront in the use of innovative technology to help its members do standards development work, while also increasing the accessibility of ASTM International standards to the world.

ASTM continues to be the standards forum of choice of a diverse range of industries that come together under the ASTM umbrella to solve standardization challenges. In recent years, stakeholders involved in issues ranging from safety in recreational aviation, to fiber optic cable installations in underground utilities, to homeland security, have come together under ASTM to set consensus standards for their industries.

Standards developed at ASTM are the work of over 30,000 ASTM members. These technical experts represent producers, users, consumers, government and academia from over 100 countries. Participation in ASTM International is open to all with a material interest, anywhere in the world.

There are a number of standards, which are useful to persons working on Land Recycling sites. The most useful is the Phase 2 Environmental Assessment Process.

Phase II Environmental Assessment Process

* Learn how to properly plan and perform Phase II investigations into Recognized Environmental Conditions (RECs) using the methodology in ASTM E 1903 Standard Guide for Phase II Environmental Site Assessments.
* Learn the various approaches used in the Phase II process to generate additional information regarding the identification and nature of potential contaminants associated with RECs identified during the Phase I and/or Transaction Screen Processes to assist in making informed business decisions concerning commercial real estate transactions.
* Gain an understanding of the level of knowledge necessary to satisfy the innocent purchaser defense under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and why due diligence is necessary.

Who Should Attend
* Environmental Professionals and Appraisers
* Environmental Professionals Responsible for Conducting Phase II Assessments or Reviewing Phase II Reports
* Property Owners
* Business Professionals Who Rely on Environmental Due Diligence
* Anyone Who Uses a Phase II Report

Fee Includes Cost $695.00
* E 1903 Phase II Environmental Site Assessment Process
* Course Notes
* Case Studies
* Certificate of Completion
* 1.4 Continuing Education Units (CEUs)
* Refreshment Breaks

Web link
http://www.astm.org/cgi-bin/SoftCart.exe/TRAIN/filtrexx40.cgi?U+mystore+fvfi9332+-P+ID+9+/usr6/htdocs/astm.org/TRAIN/traindetail.frm

The 1st part of this series the Phase I Environmental Site Assessment Practices For Commercial Real Estate: Transaction Screen & Phase I Site Assessment would also be useful for a general knowledge of brownfield assessment

One other area of expertise I came across on the Internet is
Soils Science Society of America
Web site
http://www.soils.org/
The Soil Science Society of America (SSSA) is the professional home for over 5,700 professionals throughout the world dedicated to the advancement of soil science. The primary purpose of the Society is to advance the discipline and practice of soil science by acquiring and disseminating information about soils in relation to crop production, environmental quality, ecosystem sustainability, bioremediation, waste management and recycling, and wise land use.
Some areas of expertise would have application to our Land Recycling Program.