

APPENDIX A: DEFINING GROUND WATER PROTECTION GOALS

A.1 HISTORICAL TYPES OF GROUND WATER PROTECTION GOALS

Under Strategic Activity 1, a State is asked to establish an overarching ground water protection goal. Historically, ground water protection goals have fallen into five general types:

- **Non-Degradation.** This goal is considered the most stringent of possible ground water protection goals because it defines all contamination as unacceptable. To achieve such a goal, all activities that would potentially contaminate ground water would need to be eliminated or controlled. Furthermore, all presently contaminated ground water would need to be restored. While the relative vulnerability of ground water could be a factor in determining needed prevention measures, the relative use and value of the ground water would not be factors in determining either prevention or remediation measures.

Critics argue that from a prevention standpoint, a non-degradation goal is impossible to enforce because many basic human activities (e.g. crop production, resource extractions, septic systems, etc.) would require unrealistic prohibitions to eliminate their potential to cause some level of ground water pollution. And, from a remediation standpoint, a non-degradation goal would often be economically, if not technologically, beyond our society's reach. Critics further contend that technological advances in water quality monitoring can now reveal minute levels of substances -- the presence of which in ground water would constitute degradation but whose environmental health impact may be minimal or non-existent.

As a practical matter, non-degradation is viewed more often as a general policy aim rather than as a day-to-day operational criterion or objective.

- **Anti-Degradation.** For the purposes of this document, this goal applies the above non-degradation objective to only the prevention side of the ground water protection issue; i.e., its intent is to avoid making ground water contamination worse. The goal does not provide a reference for remediation activities other than to avoid further degradation of ground waters that are already contaminated.
- **Prevention, Reduction or Remediation of Contamination to the Extent Possible.** This goal requires the consideration of certain pragmatic factors in determining what ground water protection measures are "possible." In determining what is "possible", technological feasibility or the availability of technology would need to be considered.

Social or economic considerations may also enter into determinations of what is "possible." For specific source controls, these other factors are often considered and balanced, either explicitly or implicitly, in a context of competing interests. Legislation at the federal or State levels or ordinances at local levels may specify explicitly that a regulatory agency must take into account certain social or economic factors in determining appropriate ground water protection measures. For example, prevention measures established by EPA under RCRA Subtitle D are to "take into account the practicable capability of a municipal solid waste landfill (MSWLF)." EPA, therefore, considers the cost impacts to MSWLFs in determining which measures to prevent ground water contamination are "possible."

Legislation at the federal and State levels and ordinances at local levels can also implicitly incorporate social and economic considerations into what protection measures are "possible". Society's preference for what is "possible" can be revealed where the processes of representative government have resulted in prescribing performance, design, operational or zoning requirements for ground water protection. For example, a local zoning ordinance allowing one residential dwelling per ten acres in order to limit ground water contamination from septic systems has implicitly incorporated social and economic development considerations in what is "possible" in protecting ground water.

Critics of this goal suggest that it is "source-specific" and, therefore, does not provide a unifying approach to protecting the ground water resource. Other critics are concerned that such a goal can often lead to ground water degradation where determination of what is "possible" in ground water protection is bounded by social and economic considerations. Furthermore, the approach raises the issues of who decides what is "possible" and of whether these decisions reflect an informed societal choice.

- **Differential Protection Based on Relative Risks to Human Health or the Environment.** This goal takes into account the relative risks to human health or the environment posed by ground water contamination. Under this goal, a decision-maker must first determine what risks to human health and the environment would result if ground water contamination takes place. The decision maker must then weigh these risks against some benchmark to determine appropriate prevention or remediation measures. Such benchmarks can be set at a particular level of risk (e.g., a one in a million chance of cancer incidence over a 70-year life-span) or vary according to other factors such as technological feasibility and social/economic impacts.

As described above in the previous goal discussion, these other social, economic, and technical factors can be incorporated, either explicitly or implicitly, in legislation or ordinances at the federal, State or local levels. For example, FIFRA requires EPA to weigh the risks against the benefits of a pesticide's use before taking regulatory measures, including those aimed at ground water protection.

Critics of this goal claim that it is often difficult to determine accurately all risks associated with ground water contamination and, therefore, the total impact of contamination will not be factored into protection decisions. Critics are concerned that such a goal can often lead to ground water degradation where decisions attempt to balance ground water protection against the social and economic impacts of such protection. Furthermore, the approach raises the issues of who decides what "risks" are acceptable and whether these decisions represent an informed societal choice.

- **Differential Protection Based on Relative Use and Value of the Ground Water.** Because it is usually difficult to ascertain actual risks, this goal relies on information about the relative use and value (See Appendix B) as well as the vulnerability of underlying ground water in determining the degree of protection to be afforded. The decision-maker is still faced with determining what benchmark will be used to determine the level of protection afforded to a particular use. Such a benchmark can be set as a particular concentration of a contaminant for a particular ground water use or value (e.g., the MCL for current or reasonably expected drinking water) or can vary according to social and economic factors as described above for previous goals.

Critics of this goal claim that it leads to "writing-off" of ground water resources where the use and value of the resource are not clear or are not considered significant relative to the social and economic costs of remediation or prevention. Furthermore, this approach also raises the issues of who decides the beneficial use and value of ground water resources and whether these decisions reflect informed societal choice.

A.2 EPA's GROUND WATER PROTECTION GOAL

EPA's ground water goal is to prevent adverse effects to human health and the environment and protect the environmental integrity of the nation's ground water resources. Several reviewers of an early draft of this Guidance commented that this goal does not, by itself, provide sufficient operational direction. In part, this is a result of the EPA goal not fitting into any one of the five traditional goals described above. They recommended that the Agency provide clarification of its goal so States can

determine if their own protection goal is at least as stringent as EPA's -- as required by CSGWPP adequacy criteria.

EPA's goal also states that "in determining appropriate prevention and protection strategies, EPA will also consider the use, value and vulnerability of the resource, as well as social and economic values." Given the lessons learned over the last several years (see Section 1.3) regarding the extensive use and high value of ground water, its vulnerability to contamination, and the social and economic consequences of such contamination, EPA will pursue the following three-tiered hierarchy of preferred ground water protection objectives:

- **Prevention of contamination whenever possible.** In order to meet the Agency's goal of preventing adverse effects to human health and the environment and protecting environmental integrity, prevention of contamination must be the first priority of the CSGWPP approach.
- **Prevention of contamination based on the relative vulnerability of the resource, and where necessary the ground water's use and value.** While prevention of contamination whenever possible must be the first priority of a CSGWPP, EPA also recognizes that basic human activity has impacts on ground water. Prevention of all discharges to all ground water is not possible. This should not be construed as allowing ground waters to be "written-off." Rather, EPA believes that some level of protection should be considered for all ground water resources.

Other factors may need to be taken into account when making ground water protection decisions. The relative vulnerability¹ of the ground water should help determine the level of source control measures necessary to prevent contamination. As an additional preventive measure, the relative use, value, and vulnerability of ground waters at different locations should be considered in decisions regarding the siting of facilities or activities. Also, due to limited government personnel and financial resources, the relative use, value, and vulnerability of ground waters should be key factors in setting priorities for day-to-day operations of relevant programs (e.g. which permits to write first, which inspections to do first, which clean-ups to begin first).

Finally, in some cases, EPA is required by statute to base regulation on consideration of the risks and the benefits of activities that may pose

¹EPA defines ground water vulnerability as the relative ease with which a contaminant introduced into the environment can migrate to an aquifer under a given set of management practices, contaminant characteristics, and aquifer sensitivity conditions. Ground water vulnerability assessment methods assess hydrogeologic characteristics, contaminant characteristics, and management practices related to contaminants.

health or environmental concerns. Such consideration could result in targeting prevention measures to those areas where ground waters are considered to have certain uses and values that, if not protected and conserved, would pose an unreasonable risk to human health and the environment now or for future generations. While under these federal statutes EPA and the States will need to ensure protection of ground waters with certain uses and values, States are encouraged to pursue prevention whenever possible.

- **Remediation based on relative use and value of ground water.** Although the focus of ground water protection should be on the prevention of contamination, remediation must be pursued as a final option when prevention fails or where contamination already exists. EPA's goal is to remediate all aquifers to meet their designated uses. Given the expense of cleaning up ground water contamination and the need to focus more effort and resources on prevention, EPA and the States must take a realistic approach to restoration based upon the actual and reasonably expected uses of the resource as well as on social and economic values. EPA, the States, and other federal agencies must work together to ensure consistent approaches to determining clean-up objectives.

As noted above in Section A.1, certain social/economic as well as technologic factors can be considerations in determining what are "possible" measures for preventing ground water contamination. Similar factors can come into play in determining what level of remediation should be achieved for ground water considered to have a particular use or value. It is EPA's position that determinations of what factors will be employed should be explicit and done through considerable public education and participation --- often perhaps through representative governmental processes. Furthermore, such decisions should be made, to the extent possible, at the governmental level closest to the people most affected.

In general, States and local governments should play the prominent role in such decision-making. This is especially appropriate when: a) the activities of concern are numerous (e.g., 23 million septic tanks) or highly localized (e.g., vary in impact and number from State to State) and nationally present a low to medium risk potential; b) when land-use management is the principal protection approach; and c) when technologies currently exist or are easily developed to address the problem.

The federal government may need to take the primary role in these decisions when: a) there is a need to establish national regulatory consistency (e.g., to limit significant adverse impacts on interstate commerce); b) when the scope of the effort

requires national resources (e.g., research, expertise for technically complex environmental problems); c) when State-by-State efforts would create unwarranted and inefficient duplication; and d) when national security is involved (e.g., disposal of high-level radioactive waste).

A.3 EPA's POLICY TOWARD ENDORSING CSGWPP GOALS

Under Strategic Activity 1, a State's goal must be no less protective than EPA's goal. Therefore, for:

- **Prevention.** A State's goal must, at least, be based on preventing ground water contamination whenever possible. A state is encouraged to determine what is "possible" explicitly and through adequate public participation -- State legislation may often be the best vehicle for such policy determinations. Where appropriate, the State should also allow local governments, which are closest to those most affected, to make these decisions. States and local governments will, however, need to follow federal laws where they prescribe what is "possible."

A State's goal must be just as, or more stringent than, EPA's goal for prevention. A State's goal could, therefore, be based on "non-degradation" or "anti-degradation" as well as prevention whenever possible. However, EPA recognizes the need will arise to balance the economic and social costs of prevention with the underlying ground water's use and value. Therefore, while a State is encouraged to pursue prevention whenever possible, a State or its localities may have statutes, regulations, or ordinances that operate under a less stringent standard. State and local approaches must, however, be in compliance with any applicable federal statute or regulation.

- **Remediation.** A State's goal must, at least, be based on protecting ground water currently used, or reasonably expected to be used, as a source of drinking water as well as ground waters that are closely hydrologically connected to surface waters. For drinking waters, the attainment of Maximum Contaminant Levels (MCLs) established under the Safe Drinking Water Act (SDWA) should be the remediation goal. For ground waters closely hydrologically connected to surface waters, the goal should be to reduce contamination so that its discharges to surface water does not exceed water quality standards established under the Clean Water Act (CWA).

A State's goal can be more stringent than EPA's goal for remediation. A State's goal could, therefore, be based on "non-degradation." A State's goal could also be based on either "remediation to the extent possible" or "differential protection based on relative risks to human health and the

environment." However, the resulting State clean-up objectives need to at least as stringent, and consistently applied, as the standards described above.

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APPENDIX B: DEFINING VALUES AND REASONABLY EXPECTED USES OF GROUND WATER

B.1 GROUND WATER VALUES

As described in Appendix A, a State's perception of the value of its ground water is a key factor in determining remediation objectives or in siting facilities that have a potential to contaminate. Value, as discussed in Strategic Activity 2, is a key factor in assigning priorities for ground water protection or remediation activities. The States are given the flexibility to define their own ground water values through the CSGWPP.

Recent studies indicate that people value ground water for many different reasons, each of which should be considered by States. EPA held a Ground Water Valuation Conference on October 20, 1992, to provide a common base of knowledge on the types of ground water values. Experts were invited to discuss their recent studies on this topic. The description of values described below was derived from this conference and previous EPA reports.

Ground water is valued in three ways:

- For its current uses;
- For its future or reasonably expected uses; and
- For its intrinsic values.

B.1.1 Current Use Value

Persons most commonly value ground water for its many uses, and pay a price to use it -- the **use value** of ground water. The value of the ground water depends on its use. However, not all of the uses of ground water are easily quantifiable. For example, ground water has great value for maintenance of streamflow and lake levels and their associated ecosystems, particularly during dry seasons. Also, the value of the ground water may vary depending on the availability of alternate sources and vulnerability to contamination. In locations where many competing uses are withdrawing ground water faster than it is recharged, the cost to produce, and therefore the value of ground water, may be rising as the resource becomes scarce.

B.1.2 Future or Reasonably Expected Use Value

There is also a value given to the future use of ground water, known as **option value**. Option value is the value people place on ground water that they don't currently use, but want to have the option to use in the future. Reasonably expected use is a subset of this option use value -- it is ground water that not only has the

potential for use in the future, but is expected to be used. The value will depend on the expected use.

B.1.3 Intrinsic Value

Society places an intrinsic value on ground water, separate from any thought of using the resource, called **non-use value** (value other than for its specific uses). Studies have shown that Americans are willing to pay for the knowledge that clean ground water exists. **Existence value** is the value that individuals place on simply knowing that clean ground water exists independent of any use. **Bequest value** is the value the current generation places on the ability to pass clean ground water on to future generations. These values are difficult to quantify, and require the use of survey data. EPA's draft report "Methods for Measuring Non-Use Values: A Contingent Valuation Study of Ground Water Cleanup" also indicated that individuals are willing to pay just to know that clean ground water exists. This willingness to pay becomes a significant amount when added up over the population of a city, county, or State.

B.2 DEFINING REASONABLY EXPECTED USES OF GROUND WATER

EPA recommends that States use the process described in this Appendix to define reasonably expected uses of ground water. The priority-setting and program implementation components of a CSGWPP (i.e., Strategic Activities 2 and 4) both rely on a State's resource characterization efforts. This characterization could be done through an interactive process. An important application of State resource characterizations will be to identify reasonably expected uses of ground water so that those uses which have particular value or benefit to the State can be afforded greater attention using a differential management approach. These uses may include ecological support and drinking water, as well as other purposes. States may also want to consider other principal uses and factors, such as for agriculture and industry. It is left to States to determine relative priorities among the uses.

The approach described below allows each State to tailor resource based priority-setting to its own institutions. First, a public process is described for defining the reasonably expected uses of ground water. Second, factors are identified for States to consider in defining ground waters reasonably expected to be used for ecological purposes and drinking water. Third, an EPA default definition for Federal program purposes will be applied to the extent needed to implement regulatory programs in States choosing not to define these uses.

- (1) Public Process. To obtain the operational flexibility through the CSGWPP, the State's public process to determine reasonably expected uses should (a) maximize public input, and (b) have its results consistently applied across programs.

(a) The State should utilize a public participation process with objectives as defined in 40 CFR Part 25. State laws designating ground water uses are considered adequate for this purpose. States are encouraged to keep their ground water use designations current. The objectives of 40 CFR Part 25 are to:

- Ensure that the public has the opportunity to understand official programs and proposed actions;
- Ensure that the government decision defining reasonably expected uses includes consulting interested and affected segments of the public;
- Ensure that the government action is as responsive as possible to public concerns;
- Encourage public involvement in implementing environmental laws;
- Keep the public informed about significant issues and proposed project or program changes as they arise;
- Foster a spirit of openness and mutual trust among EPA, States, sub-state agencies, and the public; and
- Use all feasible means to create opportunities for public participation and to stimulate and support participation.

(b) The State should consistently apply its definitions of ground water uses across all prevention and remediation decisions over which the State has control. For example, (i) the State should use a consistent definition regardless of waste type (e.g., sewage sludge or municipal solid waste) in determining facility requirements, and (ii) a State's definition would apply similarly to State and Federally funded remediation. As another example, application of a State's definition, which would require remediation programs to create an "island of clean" within a larger region of previously contaminated ground water, could be considered an inconsistent application.

(2) Defining Reasonably Expected Uses for Ecological Support and Drinking Water

While States are expected to consider all uses, this section focuses on support of ecological systems and drinking water, because most laws that EPA implements focus on human health and the environment.

(a) **For Ground Water Supporting Surface Water Ecosystems:** EPA's 1991 Ground Water Protection Strategy emphasizes protection of ground water closely hydrologically connected to surface waters to ensure ecosystem integrity. EPA considers the following factors important indicators of ground water hydrologically connected to surface water. A State may choose to use other factors. States should negotiate with the EPA Regions which factors are most appropriate for their respective circumstances.

- Relative ground water travel time from potential contaminant sources;
- Relative contribution of ground water to quantity and quality (chemical and physical) of surface water;
- Biota living in or dependent on ground water/surface water ecosystems;
- Climatic or seasonal variations; and
- Attainment of water quality standards to support designated use of surface water.

(b) **For A Reasonably Expected Source of Drinking Water:** EPA considers the following factors to be important in evaluating the future use of ground water. EPA expects States to consider or dismiss, with a sound rationale, from consideration these factors when determining a reasonably expected drinking water source. The State may also use other factors. States should negotiate with EPA Regions which factors are most relevant to their respective circumstances.

- Hydrologic characteristics, including water quality and quantity;
- Availability and cost of alternative water supplies;
- Demographics, including future growth and population patterns;
- Remoteness from likely areas of residential or other development;
- Land use planning;
- Remediation technology for, and practicality of, remediation;

- Cost of prevention and remediation; and
- Inter-jurisdictional considerations (Tribes, federal government, other States).

(3) EPA's Definition of "Reasonably Expected Uses of Ground Water."

In the absence of State definitions, EPA's definitions of "Ground Water Supporting Surface Water Ecosystems" and "A Reasonably Expected Source of Drinking Water" will apply.

- (a) **Ground Water Supporting Surface Water Ecosystems:** EPA's definition for ground water closely hydrologically connected to surface water and supporting its ecosystems is ground water which, if its availability or quality are affected, would result in surface water not meeting the water quality standards required to support its designated use. (This definition reflects the current state of information on ground water - surface water interaction. This definition may change as more information becomes available.)
- (b) **A Reasonably Expected Source of Drinking Water:** EPA's definition for a reasonably expected source of drinking water is ground water that is available in sufficient quantity for its intended use and contains fewer than 10,000 mg/l total dissolved solids. This definition derives from the Safe Drinking Water Act, Part C - Protection of Underground Sources of Drinking Water, Section 1421. EPA has developed this definition to be as protective as possible of future ground water uses; however, EPA recognizes that this definition may be more comprehensive than a State may wish to be.

EPA's Assistance to States. EPA realizes that a State may find it useful to have the benefit of EPA's views on how best to define ground water supporting surface water ecosystems and ground water that is a reasonably expected source of drinking water. To provide this guidance, EPA is developing a technical assistance document on resource assessment.

APPENDIX C: HOW THIS GUIDANCE WAS DEVELOPED

This Comprehensive State Ground Water Protection Program Guidance was developed using a deliberative process involving federal and State agencies as well as the public. Development began in the Summer of 1989, when EPA Administrator Reilly formed a Ground Water Task Force to review and coordinate EPA's policy on ground water protection. The Task Force, which consisted of senior Agency managers from all offices with ground water-related responsibilities, issued its final report in July 1991. The report, Protecting the Nation's Ground Water: EPA's Strategy for the 1990s, describes the Agency's policy of engaging in an aggressive and comprehensive approach to protecting the nation's ground water resources. The Strategy:

- Sets forth principles to ensure the protection of ground water resources;
- Identifies States as having primary responsibility for ground water protection; and
- Introduces methods for improving EPA's coordination of ground water-related activities.

The Strategy outlines the CSGWPP approach that is the primary vehicle through which many of the Strategy's policies and objectives will be met. During the preparation of the Strategy, the Task Force sought comment and input from States, other federal agencies, and numerous public and private organizations on all facets of the initial development of the CSGWPP approach.

Preparation of this guidance on implementation of the CSGWPP approach followed the release of the Strategy and also involved a high level of State and public input. Between December 1991 and February 1992 a series of Roundtable discussions involving EPA and State and Tribal officials from agencies with ground water responsibilities were held throughout the country. The Roundtables were organized to provide a forum for State and Tribal views on four key subjects: (1) what are the necessary elements of a successful CSGWPP; (2) what are the criteria for determining the adequacy of each CSGWPP element; (3) what can prevent successful implementation of a CSGWPP; and (4) what EPA can do to help the States and Tribes implement CSGWPPs successfully.

The Roundtable Discussion approach introduced a new and innovative dimension to program guidance development. Thirteen separate Roundtables, with a total of over 700 State and Tribal participants, were held around the country. Comments, opinions, and questions from the Roundtables have been used to inform EPA decision making and have influenced the development of the draft CSGWPP Guidance in many ways. For example, the number of CSGWPP elements was reduced and revised to six Strategic Activities to reflect views expressed in the Roundtables; specific adequacy criteria were included or excluded based on State

reduced and revised to six Strategic Activities to reflect views expressed in the Roundtables; specific adequacy criteria were included or excluded based on State and Tribal arguments; and certain procedures associated with the CSGWPP process were revised. In particular, EPA initially planned on providing a State with increased flexibility only when the State had a fully implemented, EPA-concurred-upon CSGWPP. However, Roundtable participants suggested instead that increased program-specific flexibility should occur as specific milestones are met in the progressive implementation of each State's CSGWPP. This Guidance adopts that approach.

In July 1992, EPA published the draft CSGWPP guidance and carried out a broad range of outreach activities to ensure that the draft CSGWPP guidance document was reviewed by all States' agencies involved in ground water protection, numerous federal agencies, tribes, national organizations of State and local governments, national environmental organizations, business groups, EPA Regions and other entities committed to adequately protecting ground water resources. EPA published a notice on July 7, 1992, in the Federal Register that the draft guidance was available for distribution to the public. Simultaneously, EPA distributed copies of the draft guidance, accompanied by a letter from EPA's Deputy Administrator, F. Henry Habicht II, that requested commenters to address specific questions concerning the guidance and the Comprehensive State Ground Water Protection Program (CSGWPP) approach, to a large number of State officials. EPA supplied about 4,000 copies of the draft guidance to the public.

During the 60-day comment period, EPA's Office of Ground Water and Drinking Water, Office of Pesticide Programs, Office of Radiation Programs, and Office of Solid Waste and Emergency Response met with national associations of State and local governments, environmental organizations, States, local government officials, and five federal agencies (Department of Defense, Department of Energy, Department of Interior, U.S. Department of Agriculture, and the Nuclear Regulatory Commission) to obtain additional views.

EPA Headquarters, in an effort to build a new partnership with its sister federal agencies, held a Federal Interagency Roundtable in March 1992. In addition, EPA held meetings with other involved federal agencies this summer to discuss the draft guidance and to develop plans for more active efforts at programs coordination. As a follow-up to these meetings, EPA Headquarters, at a staff level, has approached the other federal agencies with several ideas to forge ahead into this new partnership, which has resulted in the descriptions of these efforts in Part II, Section II.

As of October 15, 1992, a total of 96 comments had been received on the draft guidance, primarily from the following groups:

- State Agencies (64 from 44 States)
 - Environmental (30)
 - Health (9)
 - Agriculture (12)
 - Natural Resources (13)
- Business and Trade Groups (8)
- Environmental Groups (2)
- Local Governments (4)
- Citizen Groups (1)
- Federal Agencies (6)
- Universities (1)
- National Organizations of State and Local Governments (4)
- EPA HQ Offices (4)
- EPA Regions (13 from 8 Regions)

This guidance document represents a significant reexamination of the concepts and approaches outlined in the draft guidance based on the numerous comments received.

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APPENDIX D: GLOSSARY OF ACRONYMS

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| ACP: | USDA Agricultural Conservation Program |
| ADID: | Advanced Identification (under CWA §404) |
| ARAR: | Applicable or relevant and appropriate requirement |
| ARS: | USDA Agricultural Research Service |
| ASCS: | Agricultural Stabilization and Conservation Act |
| BIA: | DOI Bureau of Indian Affairs |
| BLM: | DOI Bureau of Land Management |
| BMP: | Best management practice |
| CERCLA: | Comprehensive Environmental Response, Compensation, and Liability Act |
| CSRS: | USDA Cooperative State Research Service |
| CWA: | Clean Water Act |
| CZM: | Coastal Zone Management |
| CZMA: | Coastal Zone Management Act |
| DASD (E): | DoD Deputy Assistant Secretary of Defense |
| DERP: | DoD Defense Environmental Restoration Program |
| DNAPLs: | Dense non-aqueous phase liquids |
| DoD: | US Department of Defense |
| DOE: | US Department of Energy |
| DOI: | US Department of the Interior |
| DOT: | US Department of Transportation |
| DSMOA: | DoD Defense and State Memoranda of Agreement |

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| DSMOA: | DoD Defense and State Memoranda of Agreement |
| ECAP: | DoD Environmental Compliance Achievement Program |
| EM: | DOE Office of Environmental Restoration and Waste Management |
| EPA: | US Environmental Protection Agency |
| ERS: | USDA Economic Research Service |
| ES: | USDA Extension Service |
| FIFRA: | Federal Insecticide, Fungicide and Rodenticide Act |
| FS: | United States Forest Service |
| GOA: | US General Accounting Office |
| GIS: | Geographic Information System |
| HRS: | Hazard Ranking System |
| HSWA: | Hazardous and Solid Waste Amendments of 1984 to RCRA |
| IAGs: | Interagency Agreements |
| IHS: | DOI Indian Health Service |
| IRP: | DoD Installation Restoration Program |
| MCL: | Maximum Contaminant Level |
| NAPLs: | Non-aqueous phase liquids |
| NASS: | USDA Agricultural Statistic Service |
| NEPA: | National Environmental Protection Act |
| NOAA: | National Oceanic and Atmospheric Administration |
| NPDES: | National Pollutant Discharge Elimination System |
| NPL: | National Priority List |
| NPS: | Nonpoint Source |

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| NRC: | Nuclear Regulatory Commission |
| OAR: | EPA Office of Air and Radiation |
| OE: | EPA Office of Enforcement |
| OERR: | EPA Office of Emergency and Remedial Response |
| OHWP: | DoD Other Hazardous Waste Program |
| OPA: | Oil Pollution Act of 1990 |
| OPPTS: | EPA Office Prevention, Pesticides, and Toxic Substances |
| OSD: | Office of the Secretary of Defense |
| OSM: | DOI Office of Surface Mining |
| OSWER: | EPA Office of Solid Waste and Emergency Response |
| OW: | EPA Office of Water |
| PA/SI: | Preliminary Assessment and Site Investigation |
| PCBs: | Polychlorinated biphenyls |
| POTW: | Publicly owned treatment works |
| PWS: | Public water supply |
| PWSS: | Public water supply system |
| QA/QC: | Quality assurance/quality control |
| RAD: | Radiation |
| RASA: | Regional Aquifer-System Analysis |
| RCRA: | Resource Conservation and Recovery Act |
| RCRA C: | Resource Conservation and Recovery Act Subtitle C |
| RCRA D: | Resource Conservation and Recovery Act Subtitle D |
| Reclamation: | DOI Bureau of Reclamation |

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| RFA: | RCRA Facility Assessment |
| SARA: | Superfund Amendments and Reauthorization Act |
| SCS: | USDA Soil Conservation Service |
| SDWA: | Safe Drinking Water Act |
| SMCRA: | Surface Mining Control and Reclamation Act of 1977 |
| SMP: | State Management Plan to prevent ground water contamination from pesticides |
| SRPA: | Small Reclamation Projects Act |
| SNC: | Significant noncompliance |
| SSA: | Sole Source Aquifer |
| TDP: | Technology Development Program |
| TSCA: | Toxic Substances Control Act |
| UIC: | Underground Injection Control |
| UMTRCA: | Uranium Mill Tailings Radiation Control Act |
| USDA: | United States Department of Agriculture |
| USGS: | United States Geological Survey |
| UST: | Underground Storage Tank |
| VOCs: | Volatile Organic Compounds |
| WHP: | Wellhead Protection |
| WQIP: | Water Quality Incentive Practices |