Southern Area Health Education Center & NM Department of Health
Environmental Health Epidemiology Bureau

2004

Community Environmental Health Assessment Toolbox for New Mexico

The 10 Essential Environmental Health Services:

1. Monitor health status to identify health problems in the community
2. Diagnose & investigate health problems and health hazards
3. Enforce regulations that protect health
4. Inform, educate, & empower people about health issues
5. Mobilize community partnerships
6. Link people to services
7. Evaluate population-based services
8. Assure a competent workforce
9. Develop plans & policies that support community health
10. Conduct research

Special Thanks To:
Jagan Butler

COMMUNITY ENVIRONMENTAL HEALTH ASSESSNMENT TOOLBOX FOR NEW MEXICO

This Toolbox is the result of numerous environmental health community leaders and staff of the Environmental Health Epidemiology Bureau, New Mexico Department of Health in cooperation with staff and contractors of the Southern Area Health Education Center.

It is dedicated to all the citizens who work to improve the environmental and public health in their communities.

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Preface

Community environmental health assessment (CEHA) is in its infancy in New Mexico. Public health assessments related to the preparation of Community Health Profiles and their subsequent Community Health Improvement Plans have traditionally *not* featured anything more than a passing reference to the need to consider the environment. There are several instances within the State where CEHA is practiced with several of these yielding good results:

- Several municipal and county governments with larger metropolitan populations have carried out CEHA as part of their overall public health assessments, some using cutting-edge technology such as geographic information systems (GIS) and monitoring of environmental public health indicators.
- The University of New Mexico's Community Education & Outreach Program (COEP) and New Mexico State University's Southern Area Health Education Center (SoAHEC) maintain specific programs oriented to the facilitation of environmental health assessment, and awareness raising and training; these are among the most sustained efforts in the State in support of CEHA.
- Non-governmental advocacy organizations have carried out some issue-specific assessments in partnership with local communities to reduce environmental health risks related to such problems as radiation from uranium mining and disease incidence in poor communities that lack proper water and sanitation services.
- Some health councils report that they performed environmental health analysis as part of their community health assessments in the past 10 years, but these efforts appear to be driven by the particular interests of individual members and did not necessarily develop out of the mission of the councils.

Despite these efforts, there is, at present, no real systematic treatment of CEHA at the State or county level, few appropriate protocols have been developed for the cultural, socioeconomic, and environmental realities of New Mexico, and very little emphasis has been placed on training in CEHA. As a result, state, county and municipal agencies are more reactive rather than proactive when it comes to supporting CEHA. For example, the New Mexico Environment Department (NMED) responds as potential environmental risks are detected by their monitoring or enforcement efforts. It may also respond to complaints from the public. Such responses can relate to emissions from sewage plants and septic systems, complaints associated with chemical and food processing plants, dairy odors, illegal trash dumping or burning, mine waste, or a catastrophic event, such as wild fires, chemical spills, or fish kills.

Similarly, the New Mexico Department of Health (NMDOH) responds to food-borne illness outbreaks, clusters of infectious communicable disease and/or complaints or demands by the community. It conducts investigations of outbreaks of certain communicable diseases but offers only limited support for investigations into environmental factors which communities believe are harming health.

Advocacy organizations monitor and report environmental problems, such as mine and chemical spills, improper operations at industrial installations, and illegal disposal of wastes or improper use/abuse of natural resources; however, the actual environmental health effects may be unknown as little data are collected and regulations may not be sufficiently protective.

There have also been various specific studies to determine harmful exposures or contamination from inorganic and organic substances, such as blood-lead testing in children, water quality monitoring for surface and well water, as well as occasional testing for pesticides levels in foods, and similar initiatives. These efforts are generally hit or miss and dependent on different sources of funding, which come and go.

While these efforts are important and necessary, most of them are reactive. Currently, there are few resources from the State to empower communities to assess, improve, and prevent environmental public health problems. There is a new unit in the Department of Health that focuses on environmental health and is supporting the development of this Tool Box and training for CEHA. Additionally, some coordination and support for CEHA in tribal and county health councils is occurring with support from this unit and the Public Health Division districts. However, these efforts mark only a beginning in the challenge to reconnect the environment and public health, make necessary changes in the regulatory and enforcement processes, and develop the resources to support healthier communities.

It bears repeating that a great deal of work is being done for environmental protection area, but it is fragmented. Among and between agencies, health councils, clinics, hospitals, and advocacy organizations, there is not even a common understanding of the term "environmental health". Moreover, there is no plan and system that links all efforts in a way that supports CEHA and coordinates follow-up action.

The impetus to prepare this CEHA Tool Box is in response to the deficiencies indicated above. The need for the Tool Box was highlighted in a report submitted to NMDOH by the Community Assessment Networking Group (CANG) on March 6, 2003. The group consisted of professionals representing several state agencies, area universities, and advocacy people, including: Lonnie Barraza, David Coffey, Ann McCambell, Brad Musick, Tom Ruiz, Tom Scharmen, Ernie Yazzie, and CANG co-leaders, Jagan Butler and Gene Gallegos. What follows is a summary of the group's recommendations:

In order to improve community environmental health assessment capacity there is a need to increase environmental health awareness at the community level. In addition, there is also a need for governmental agencies to increase their understanding of the community environmental health assessment process so they are well prepared to participate and support these activities. This can be accomplished through:

1. *The development and implementation of training modules, tailored for communities and governmental agencies that focus on environmental health, environmental justice, cultural sensitivity and community environmental health assessment.*
2. *Development of a Community Environmental Health Assessment Tool Box. It is recommended that the Tool Box include the following components:*
    - *A manual that provides direction on how to initiate a CEHA.*
    - *Repository of case studies that provide direction on how other communities completed CEHA activities, including those originating from the community, agency, or collaborative effort.*
    - *Repository of tools that could be used in a CEHA (goals, protocols, surveys, questionnaires, focus group questions, evaluation tools, etc.).*
    - *Environmental and health data sources to support the CEHA activities.*

- *Resource book listing community resources, agencies, policy makers, faith-based groups, NGO's and other key stakeholders in the community assessment arena.*
- *A model for an environmental health report card.*

The overall objective for preparing the CEHA Tool Box is to better integrate analysis of environmental conditions and causal agents with current community health assessments. As a result, community health improvement plans will consider aspects of environmental health together with other facets of public health, such as occupational health and safety, and behavioral health.

While the Tool Box is responsive to the CANG recommendations, it is only one of several elements necessary to facilitate the inclusion of environmental public health in community health assessments and plans in New Mexico. The Tool Box is intended as a guide and resource that should be used in tandem with a training program that builds awareness and understanding in the basic tenets of environmental health and in the use of the procedures and tools included therein.

In addition to building capacity, proponents of CEHA will require technical assistance to assist staffs of community health councils, public and environmental health agencies, clinics, and advocacy organizations in developing environmental health assessments, especially during the initial efforts to include CEHA in community health agendas. The authors express their hope that the New Mexico State Government, in coordination with county and municipal administrations, will embrace environmental health as an essential aspect of public health and establish a permanent, comprehensive, and formal institutional framework to support CEHA in the State.

This Community Environmental Health Assessment Tool Box was prepared by Paul Dulin and Allyson Siwik in fulfillment of work contracted by the Southern Area Health Education Center—New Mexico State University under funds provided by the Centers for Disease Control and Prevention through the New Mexico Department of Health.

Acknowledgements

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Also, the earnest answers and excellent suggestions provided by 60 staff persons of the following 53 local, state and national institutions and organizations interviewed within and outside of New Mexico helped bring focus on the most important aspects to include in the Tool Box, for which the authors express their gratitude.

Within New Mexico

- Southern Area Health Education Center
- Ben Archer Health Center/Hatch
- University of New Mexico, Health Sciences Center, Community Outreach & Education Program
- New Mexico State University, Department of Health Sciences
- New Mexico State University, Roswell Campus
- Doña Ana County Health and Human Services Department
- Grant County Health Council
- Reach 2000/Chaves County Health Council
- Healthier Communities Council of San Miguel County
- University of New Mexico/Roswell
- Family and Youth, Inc.
- Southwest Environmental Center
- Project del Rio
- University of Texas/El Paso, Center for Environmental Resource Management
- New Mexico Department of Health (NMDOH), Health Promotion Division
- NMDOH, Environmental Health Epidemiology Unit, Office of Epidemiology
- NMDOH, District 3, Improving Health Initiative
- NMDOH, District 3, Grant County Health Promotion Team
- NMDOH, Community Health Resources Program
- NMDOH, Public Health Division, Health Promotion, District 3
- NMDOH, Public Health Division, Health Promotion, District 2
- NMDOH, Public Health Division, Health Promotion, District 4
- NMDOH, Community Health Improvement Training Institute
- New Mexico Environment Department (NMED), Field Operations Management Division
- NMED Drinking Water Quality Bureau
- NMED, Surface Water Quality Bureau
- NMED, Superfund Oversight Section
- NMED, Filed Operations District 3
- Bernalillo County Environmental Health Office
- Bernalillo County Environmental Health Education Team
- NM Border Health Office
- U.S./Mexico Border Health Council

- Border Epidemiological and Environmental Health Center
- NM Public Health Association
- NM Environmental Law Center
- Southwest Organizing Project
- Southwest Research and Information Center
- Colonias Development Council
- Concerned Citizens for Nuclear Safety

Outside of New Mexico

- Texas Commission on Environmental Quality
- Delaware General Health District
- San Antonio Metropolitan Health District
- Border Environmental Cooperation Commission
- Island County Washington Health Department
- The Jordan Institute
- U.S. Environmental Protection Agency/U.S.EPA, National Center for Environmental Economics
- Agency for Toxic Substances and Disease Registry/U.S.EPA Region 6
- U.S.EPA Region 6, Superfund Program
- 7 Generations Environmental Consulting
- Ohio University, Institute for Local Government Administration and Rural Development
- Douglas Lupus/Autoimmune Support Group
- Center for Disease Control and Prevention/CDC
- National Institute for Environmental Health Sciences/NIEHS

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Acronyms

ADI: Acceptable Daily Intake

ATSDR: Agency for Toxic Substances and Disease Registry

CAA: Clean Air Act

CAS: Chemical Abstracts Service

CDC: Centers for Disease Control and Prevention

CEL: Cancer Effect Level

CERCUS: Comprehensive Environmental Response, Compensation, and Liability Information System

CFC: Chlorofluorocarbons

CFR: Code of Federal Regulations

CWA: Clean Water Act

DHHS: Department of Health and Human Services

DOJ: Department of Justice

DWEL: Drinking Water Equivalent Level

EA: Environmental Assessment

EHS: Extremely Hazardous Substances

EIS: Environmental Impact Statement

EP A: Environmental Protection Agency

EPCRA: Emergency Planning and Community Right to know Act

FOIA: Freedom of Information Act

GI: Gastrointestinal tract

HAP: Hazardous Air Pollutants

IPM: Integrated Pest Management

IRIS: Integrated Risk Information System

LEPC: Local Emergency Planning Committee

LOAEL: Lowest Observable Adverse Effect Level

MCH: Maternal and Child Health

MCL: Maximum Contaminant Level

MCLG: Maximum Contaminant Level Goal

MRL: Minimal Risk Level

MSD5: Material Safety Data Sheet

NAAOS: National Ambient Air Quality Standards

NEPA: National Environmental Policy Act

NESHAP: National Emission Standards for Hazardous Air Pollutants NIH: National Institutes of Health

NIOSH: National Institute for Occupational Safety and Health NLM: National Library of Medicine

NOAEL: No Observed Adverse Effect Level

NOEL: No Observed Effect level

NPDES: National Pollutant Discharge Elimination System

NTIS: National Technical Information System

NTP: National Toxicology Program

OR: Odds Ratio

OSHA: Occupational Safety and Health Administration

PCB: Polychlorinated Biphenyl

POTW: Publicly Owned Treatment Works

PRP: Potentially Responsible Party

RCRA: Resource Conservation and Recovery Act

RQ: Reportable Quantity

RR: Relative Risk

SDWA: Safe Drinking Water Act

SERC: State Emergency Response Commission

SIC: Standard Industrial Classification

STEL: Short Term Exposure Limit

TLV: Threshold Limit Value

TRI: Toxic Release Inventory

TSCA: Toxic Substances Control Act

UST: Underground Storage Tank

VOC: Volatile Organic Compound

WIC: Women and Infant Care

Frequently-Asked Questions (FAQs): Quick-Access Key for Using the Tool Box

FAQs provide another way to use the Tool Box, in addition to the table of contents. Below, a series of *frequently-asked questions* is presented, along with a page number corresponding to one or more sections in the Tool Box that provide guidance to resources useful in addressing each question.

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3.	What is "environmental health"?	2
4.	In what way is environmental health related to public health, behavioral health or occupational health and safety?	2
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Frequently-Asked Questions
30. For guidance in obtaining information and statistics for your community or county on the following items and issues, please see *Appendix C* and *Appendix E*: a. Environmental health statistics. b. Population demographics. c. The most important health problems (morbidity and mortality). d. Laws and regulations in New Mexico. e. Solid wastes. f. Sewage disposal. g. The quality of our drinking water. h. Air quality.

Frequently-Asked Questions

i. Food safety.

j. Occupational health and safety.

k. Discharge permits for industries.

l. Mining, oil and gas development.

m. Nuclear radiation, radon gas, and mining of uranium.

n. Pesticides and other toxic substances.

o. Cancer rates.

31. For guidance on what to do if your community has one or more of the following environmental health issues, please see *Table 2* (pages 34-38), *Appendix C* and *Appendix D*:

a. There is a problem of sewage running out on the ground or sewage smells in our community.

b. There is a lot of dust in the community that bothers our eyes and makes us cough.

c. Many children in the community have bad asthma or breathing difficulties.

d. We have a lot of people in our community that always have stomach aches and diarrhea.

e. There are strong chemical-like odors in a community that burn our eyes and/or make us cough.

f. We live near a hazardous waste site or Superfund site.

g. We live near a solid waste disposal site (landfill) or where one is proposed.

h. We live near a large dairy or concentrated animal feed lot.

i. We live in a farming area where they spray lots of chemicals.

j. We live near oil and gas wells.

k. We live near a uranium mine, or processing or storage facility.

I. Introduction to the Community Environmental Health Assessment Tool Box: What is it, What is it for, and Who should use it?

Community environmental health assessment (CEHA) is defined by the NMDOH Community Environmental Health Assessment Net Working Group as:

> "*An evaluation or appraisal of the health condition of people in the community, focusing on the possible connections between the environment and human health*."[1]

The Community Environmental Health Assessment Tool Box is a collection of resources and "tools" deemed necessary and appropriate to facilitate participatory environmental health assessments in smaller New Mexican communities.[2] The tools included in the Tool Box have been screened considering the varying social, cultural and economic settings in the State. The Tool Box provides access to resources of varying types and specificity—from comprehensive procedural manuals and guidelines, to checklists and survey instruments, data sources, websites, and institutional contacts—as well as general step-by-step guidance on best practices for implementing CEHA in New Mexican communities.

The Tool Box is intended as a guide for a standalone or complementary environmental health assessment. In the case of the latter, the Tool Box should be used for integrating elements of environmental health into current community health assessment and planning efforts, especially in terms of the Community Health Profiles and Community Health Plans currently prepared by community health councils throughout New Mexico.

Many of the procedural guidelines and data assessment themes covered in the CEHA Tool Box are already in use in various communities in the State, and have been included in recent training programs offered by NMDOH's Community Health Improvement Training Institute (CHITI). Consequently, the CEHA methodologies discussed here do not represent a departure from existing health assessment procedures. Rather, the Tool Box seeks to integrate additional elements into currently-used protocols in order to achieve a more comprehensive assessment of environmental factors affecting the health in the community, as well as improving means of targeting human and financial resources to prevent potential health problems.

The Tool Box is presented in printed format to provide ready access to users, and includes copies of several tools that have been applied with success in other U.S. states. The Tool Box will also be made available on NMDOH's website, which will facilitate direct links to the multitude of resources and institutional contacts included in this document. This Tool Box should be seen as a "living document" that should be updated periodically based on the experience gained at the community level. Users are encouraged to customize and expand upon the procedures and resources presented in the Tool Box, adapting the tools to their local socio-cultural, environmental and economic realities.

The intended users of the Tool Box are staffs of local and state-level public health and environmental management agencies, health councils, clinics responsible for preventative and primary health care outreach, private organizations that advocate for environmental health and social well-being, and higher education institutions with community health curricula. All of these organizations can act as catalysts and facilitators of CEHA in their respective constituent communities.

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[1] From final report of Community Environmental Assessment Networking Group. March 6, 2003.

[2] Smaller communities are understood to be those with less than 25,000 populations, including much smaller rural and unincorporated communities. However, the Tool Box is intended as a resource to be used in connection with implementation of CEHA throughout New Mexico and should also serve as a useful for such efforts in larger cities.

II. What is Environmental Health, Environmental Risks, and Environmental Justice?

Appendix A presents a glossary of the terms most often associated with CEHA, many of which are used in the text of this Tool Box. While there can be numerous interpretations of terms, it is worthwhile here to present a more detailed review of several key definitions to bring about a uniform understanding among all users of the Tool Box regarding how environmental health, environmental health risks and environmental justice are defined.

A. Some definitions related to CEHA

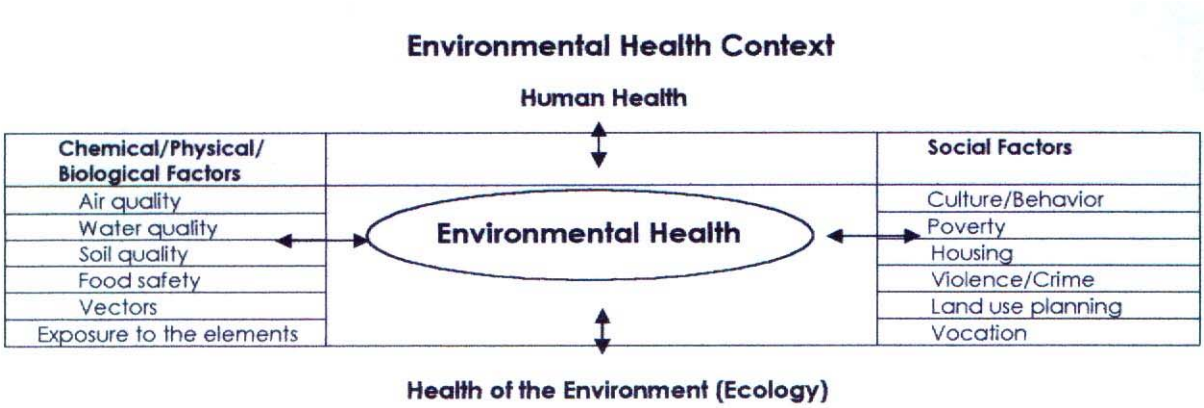
Public Health is defined as "the science and practice of protecting and improving the health of a community, as by preventive medicine, health education, control of communicable diseases, application of sanitary measures, and monitoring of environmental hazards" (The American College Dictionary of the English Language, Fourth Edition, 2000).

The *environment* is understood to be everything around us: the natural or unaltered environment and the human-made or built environment, our homes workplaces, schools, and our community, both outdoors and indoors, urban and rural.

Environmental health (EH) is just one aspect of public health. It is defined as, "Freedom from illness or injury related to exposure to toxic agents and other environmental conditions that are potentially detrimental to human health" (The Institute of Medicine; *in* Nursing, Health and the Environment, 1995).

Environmental health focuses on the linkages between human health and the conditions present in the environment and all of its elements, including such things as: the air that we breathe, the water that we drink and bathe and swim in, the soil we come in contact with, the food we consume, the housing we live in, and the landscape.

EH is related to the conditions of our housing and neighborhoods, the presence and operation of productive and industrial activities, and our community infrastructure, as well as naturally-occurring phenomena (e.g. dust and pollen from trees and plants) and forces and hazards present in nature (such as rainstorms, the wind, and landslides). The graphic presented below illustrates the interconnectedness of human health with environmental factors and environmental health within this context.



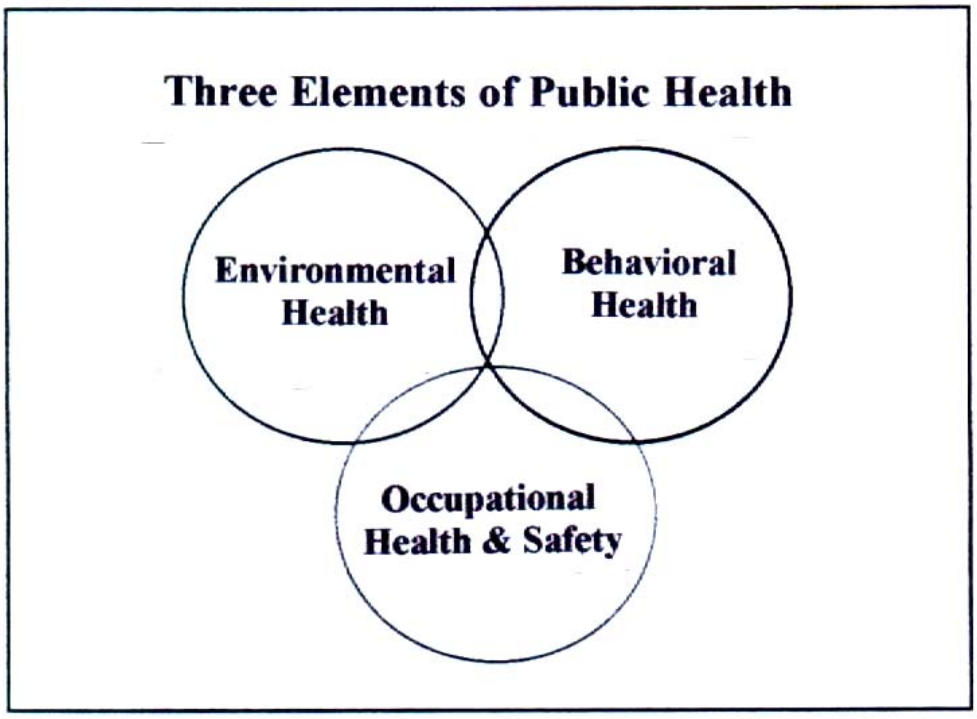
Pollution is a generic term that refers to those factors in the environment (e.g., substances in water, soil, or air) that degrade the natural quality of the environment and/or impair the usefulness of natural resources, offend the senses (hearing, sight, taste, smell), and/or may cause health hazards. Pollution, or contamination, usually results from human activity, but can also be caused by an act of nature.

New Mexico has a wide range of environmental conditions, from the hot and dry Chihuahuan desert in the south and transcending into the seasonally very cold and forested Rocky Mountains in the north. Our environment also includes an array of productive and industrial activities which alter conditions in the natural environment, including agriculture and food and feed processing, oil and gas production, minerals mining, chemicals manufacture, as well as nuclear materials processing and storage, and military reservations.

The *goal* of environmental health as a practiced science, and the CEHA Tool Box as a resource for facilitating EH, is to prevent and/or treat environmentally related human health problems by analyzing the relationships between social and cultural factors on one side, and chemical, physical and biological factors on the other in order to:

- Identify what in the environment is causing health problems;
- Identify how and where in the environment people are being exposed to health hazards;
- Identify what can be done either to reduce or eliminate human exposure to these hazards; and
- Monitor these health risks or hazards over time to ensure continued safety of the public.

As illustrated in the figure presented below, the term environmental health is related to, but is often distinguished from, other aspects of public health. In reality, the three elements of environmental health, behavioral health, and occupational health and safety are all related facets of public health.



For purposes of this Tool Box we describe occupational health and safety and behavioral health as follows. *Occupational health and safety* is linked to risks and hazards found in the workplace. However, these same risks or hazards would be considered EH issues if they were encountered at home or in the community. For instance, if an employee comes in contact with or ingests a toxic substance at his/her workplace, such as a volatile or caustic chemical or radiation, then it is considered an occupational health problem. However, if this chemical or radiation was to escape or move off the worksite and into the community, because of an accidental spill or emission that seeps into a nearby groundwater aquifer used by a community for drinking water, then it becomes an EH problem. Similarly, if a farmworker is exposed to a highly toxic pesticide while applying it on a field, it would be related to occupational safety and health; but if the pesticide being sprayed drifts into a nearby community and is ingested by children playing outside, it becomes an EH issue.

Behavioral health relates to risks that come as a result of high-risk behavior such as smoking, substance abuse, and unprotected sex. These issues can also become EH problems, such as when the second-hand smoke threatens children at home or patrons in a restaurant or other public place.

Another misconception is that EH is synonymous with *environmental impact assessments*. Environmental impact assessments involve a specialized process for determining what impacts a certain proposed activity will have on the environment. Also, EH is sometimes confused with "environmentalists" or "environmental protection". As such, when some people hear the words "environmental health" they assume that it is about activists and their advocacy organizations opposing economic development.

While EH is usually part of an environmental impact assessment, it is not one in the same, as environmental protection objectives for a particular project may be intended to promote conservation of certain ecosystems and threatened and endangered species of plants and animals, but not necessarily consider EH. Environmental Health does however respect the interrelationship of ecosystem health with human health. The differences between occupational and behavioral health, environmental impact assessments and environmental protection are important. However, they are all aspects of EH and, as such, can be part of any comprehensive CEHA.

The focus of any CEHA will depend on the perceptions of the problems and the interest of the workgroup that is implementing it. For some groups, EH only relates to those elements in the environment that are perceived to have a direct impact on human health. As a result, concerns like biodiversity and global warming are not an issue. Other groups hold that environmental health is actually a fusion of the elements of human health and the health of ecosystems and that this symbiotic relationship should be considered in a holistic manner, in which a healthy environment will lead to healthy humans. The Tool Box is intended as a resource for both groups.

During the past fifty years or so in New Mexico, public health has focused more on preventing injury or disease and providing "safety net" services, without dealing with the root causes of health problems that are related to environmental conditions. In many cases, community health assessments and profiles tend to rank issues and plan and fund actions more related to clinical medicine—that is, treatment by point-of-service providers such as clinics and hospitals. Many of the State's programs are oriented to behavioral health, including outreach and education to reduce smoking, teen pregnancy and alcoholism. These issues are important; however, there needs to be a more balanced and comprehensive response to managing community health, by including consideration of environmental health risks as an integral part of any community health assessment effort.

B. What are environmental health risks? And what are the sources of these risks?

Health risk and specifically, *environmental health risk* is a measure of the probability, or chance, that a person or members of a community may be subjected to injury, disease or death. The risk may be incidental, related to a particular one-time event or exposure to a hazard. For instance, a person may inhale toxic fumes from a chemical spill at a factory or a child may be exposed to a pesticide being applied in the home, bacterial poisoning from water consumption from a poorly-operating municipal water system, or contract hanta virus or plague linked to rodents living in garbage piles next to the home.

All human activity impacts our environment and our health. There is no such thing as "no risk" to human health and to the environment. Rather, it is the degree to which agents and hazards pose these risks and our bodies' capacity to endure them.

Alternatively, the risk may be long term. Ingestion of lower doses of toxic substances can accumulate in the human body over longer periods of time; for instance low levels of nuclear radiation in dust from a uranium mine, lead in homes, mercury found in the tissue of fish, or arsenic in drinking water from wells.

The level of risk differs among members of the community depending on many factors. Children and senior citizens are more susceptible to exposures of toxic substances than most adults, because their bodies are either in development or in decline. Women have different anatomy than men and each is more prone to certain environmental health risks than the other is. Pregnant women and their fetuses and new born infants are at the highest risk to factors in their environment, because even small amounts of a substance like mercury, lead or cigarette smoke can permanently interfere with the developmental sequence of the child.

Other factors which put people at varying degrees of environmental health risk are certain occupations, hobbies, exposure to second hand smoke, eating habits, excessive exposure to the elements, and, of course, genetic variations among members of our community that make some of us more vulnerable to different types of environmental health hazards.

In sum, environmental health risks are those which pose threats to the health of members of the community. These risks may occur in *nature*, such as:

- Fine particles of airborne dust and pollen that trigger or exacerbate respiratory diseases;
- Naturally-occurring toxic substances found in our drinking water, such as arsenic, uranium and lead;
- Earthquakes and floods; and
- Radiation from the sun, causing sunburn and skin cancers, and exposure to extremes of heat and cold.

These risks can also be caused by *human activities* that can alter the natural conditions in the environment including:

- Improper disposal of sewage or toxic industrial waste can lead to contamination of our surface and ground waters and these contaminants can in turn be ingested or absorbed through the skin causing illness and even death;
- Accidental or intentional releases of toxic substances into the air from industrial operations; and

- Concentrations of ozone, nitrous oxides, and fine particulates from auto emissions that settle into valleys during winter inversions and pose serious risks of respiratory illness. Because of the concentration of populations and their economic activities, urban areas are often subjected to a high level of environmental risks, while rural areas can experience different risks related to extractive activities like mining, oil and gas production and other productive activities, such as the agricultural use of pesticides and operation of dairies and feedlots.

The *home* is another source of environmental health risks:

- Improperly used or stored solvents and pesticides can be handled or even consumed by children causing acute poisoning;
- Garbage piled up in the back yard or a room in the home can attract insects and rodents which are vectors of certain diseases;
- Radon gas, which is prevalent in areas where uranium occurs naturally or is mined, can seep into homes and be concentrated in tightly-sealed houses; and
- Poor ventilation can lead to moisture buildup and the growth of mold and mildew which can trigger respiratory diseases.
- Building materials can be made with chemical compounds that admit gases into the home and indoor air, causing sickness.

Environmental risk assessment integrates disciplines of toxicology and epidemiology to identify and measure the types and degree of harm that humans and ecosystems may experience and the natural or human-provoked origins of these negative impacts.

Toxicology involves the study of the adverse effects of chemicals or physical agents on living organisms. Toxicological research often uses animal studies to predict health impacts of exposures to people. Our national and state public health and environmental protection programs are based on the establishment of health-based standards that reflect concentrations of toxic substances in our environment. Consideration is then given to "threshold levels" of a toxic substance, exposure beyond which is considered dangerous to the human body and that should not be exceeded in order to protect public health. When this research is effective, threshold levels are set with an adequate margin of safety. In many cases, standards and guidelines also exist to protect environmental resources such as fish populations and other wildlife.

Epidemiology studies the relationship between environmental agents and hazards and the occurrence of disease or injury in a human population. An important aspect of environmental health risk assessment is the determination of *exposure pathways*—that is, how exposed individuals came in contact with an environmental agent or hazard. Exposure pathways are determined from two perspectives:

- The *exposure source*, in terms of where in the environment the agent or hazard was encountered –for example, where the food was purchased or consumed, what source the water came from, or where the contaminant was inhaled.
- The *pathway* into the human body, whether the toxic agent was ingested through consumption of contaminated food or water, contact with the skin or the eyes, or inhaled into the respiratory system.

If we can determine the harmful exposure, the exposure source within the environment *and* the pathway into the body, then the level of risk can be assessed. It is also possible to determine what

causes a particular illness or injury to an individual or community. These studies are very important in developing information for CEHA.

Epidemiology is just as important in determining what constitutes an environmental health risk, and what does not. A certain amount of risk may be acceptable in terms of standards and threshold levels, as the cost to eliminate all risk may be prohibitively expensive. Again, this is why public health standards and guidelines have been established and compliance is monitored by the U.S. Environmental Protection Agency, the NM Environment Department and the NM Department of Health. These agencies are charged with protecting the health and safety of our citizens within a margin of safety that still allows practice of productive and economic activities.

Science is always improving our understanding of environmental health risks, which is why health standards are updated periodically based on new epidemiological and toxicological data and risk assessments. However, the rapid growth of economic development and productive activities, and the manufacture of an ever-increasing number industrial processes and chemicals have outpaced the science of risk assessment. The scientific research needed to evaluate the health and safety of potentially toxic products and by-products of productive and industrial activities on the human body, in many cases lags behind the introduction of new toxic agents or potentially hazardous industrial processes.

According to the US EPA (Science and Environmental Health Network, http://www.sehn.org, 2003), "*there seems to be widespread agreement that the data and methodologies needed for precise health risk assessment do not yet exist*." This situation is complicated by the fact that the health characteristics of our population are so variable, that it is difficult to ascertain the level of risk in all people in all communities.

Consequently, the communication of health risks, and especially how these relate to the varying environmental and socio-cultural settings of New Mexico, is especially challenging. This is one rationale for taking a cautious approach to environmental health risk, and balancing scientific risk assessment with other methods that attempt to determine *how much harm can be avoided*, rather than just considering how much harm is acceptable. This alternative approach has been called the Precautionary Principle.

This *Precautionary Principle*[3] has been proposed because, in addition to avoiding unnecessary harm, it is a more democratic approach to risk assessment and communication. It requires that:

i) Action be taken in the face of scientific uncertainty when a substantial risk from a new process or exposure is likely;

ii) It places the burden of proof of harm on the proponents of an activity, instead of the public;

iii) It requires that the proponent of a potential harmful activity explore alternatives that may be less harmful before taking action; and

iv) Allow for the potentially affected public to be involved democratically in the decision as to which alternative is preferable.

This principle involves consideration of environmental justice (see below) and informed consent by those communities that may be affected by a particular productive activity, whether these are an industrial processing facility, a new dairy, a solid waste landfill, nuclear materials processing facility, mining operation, a highway project, or similar development.

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[3] The Massachusetts Precautionary Principle Project, Clean Water Fund, Lowell Center for Sustainable Production, Massachusetts Breast Cancer Coalition, Science & Environmental Health Network.

Appendix D provides various resources useful in learning more about environmental risks that can affect your community.

For more information on the types of Environmental Risks that can affect your community, see:

Agency for Toxic Substances and Disease Registry: Public Health Assessment. www.atsdr.cdc.gov/HAC/pha.html

Centers for Disease Control and Prevention Cancer Cluster Resources. www.cdc.gov/nceh/clusters/resources.htm

Community Environmental Health Resource Center. www.cehrc.org

Community-Based Environmental Protection: A Resource Book for Protecting Ecosystems and Communities. July 1997. Office of Sustainable Ecosystems and Communities. U.S. EPA. Washington, DC www.epa.gov/ecocommunity/tools/resourcebook.htm

Comparative Risk Assessment: Electronic tutorial on history and methodology of comparative risk assessment. www.epa.gov/seahome/comprisk.html

Public Involvement in Comparative Risk Projects: Principles and Best Practices – A Sourcebook for Project Managers. Western Center for Environmental Decision-making.

Healthy Schools Network. www.healthyschools.org

What is Cancer? 2002. Agency for Toxic Substances and Disease Registry. Atlanta GA.

Physicians for Social Responsibility. www.psr.org

C. What is environmental justice?

Under our Federal and State laws, every person has the right to live in a healthy and safe environment and, under the principle of *informed consent,* to receive, understand and act on information of the real and potential effects of any proposed activity, both positive and negative, including impacts to their health—this is the premise of *environmental justice* (EJ).

Environmental laws and regulations have not always been applied and enforced equally throughout our society. *Low-income communities and communities of color* have been subjected disproportionately to greater levels of pollution and environmental health risks. Certain industrial activities, such as chemical industries, solid and nuclear waste landfills, and sewage treatment plants, have been sited within or adjacent to these communities with little regard to rights of their members to participate in decisions that will directly affect them, and in many cases without consulting them. These activities have also been carried out with little concern for the burden the community is already bearing from polluting activities.

The National Environmental Policy Act of 1969 provides the essential legal basis for citizens' rights in terms of real and potential risks to the environment and their health. All other laws relating to the protection of the environment and public human health and safety incorporate aspects of citizens' right-to-know, including some of the following examples:

Federal and New Mexico Legislation including Citizens Right-to-Know

Code of Federal Regulations	**State of New Mexico**
Clean Air Act	New Mexico Air Quality Control Act
Clean Water Act	Water Quality Act
Pollution Prevention Act	Environmental Improvement Act
Superfund Act	Solid Waste Act
Toxic Substances Control Act	Hazardous Waste Act
Emergency Planning and Right-to-Know Act	Hazardous Chemicals Information Act
Food Quality Protection Act	Pesticide Control Act
Occupational Safety and Health Act	Occupational Health and Safety Act
Freedom of Information Act	
Resource Conservation and Recovery Act (RCRA)	
Federal Insecticide, Fungicide, Rodenticide Act	

Both Federal and New Mexico statutes require that proponents of new industrial or productive activities (mines, industrial processing facilities, dairies, solid and liquid waste treatment and disposal facilities, radiological materials processing and storage, etc.) apply for permits that consider environmental protection and public health and safety, including a public consultation process. Public meetings and hearings are used as forums for facilitating public comment and informed consent. Also, local county and municipal governments use zoning and enforcement of environmental health codes to ensure the protection of the environment and public health.

In acknowledging EJ deficiencies, the President of the United States issued Executive Order No. 12898 in February of 1994, stipulating that all Federal agencies "shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States…".

This executive order mandated the enforcement of health and environmental statutes in minority and low-income communities, including: greater public participation, improved research and data collection, and analysis of differential patterns of consumption of natural resources.

> ***Environmental justice*: "embraces the principle that all people and communities are entitled to equal protection of our environment, health, employment, housing, transportation, and civil rights laws."**
> (Robert Bullard, Environmental Justice Law Center, Clark Atlanta University, 1997)

New Mexico has the largest proportion of minorities in the country, with nearly half of the population of Hispanic decent, one-third Spanish speaking, and various Native American communities with their unique social, cultural and linguistic character. New Mexico is also among the three poorest states in terms of per capita income, health coverage, and education. There are numerous cases, past and present, where communities in the state have suffered illnesses and injuries related to breaches of environmental justice. This means that EJ should be considered as an important element of any CEHA effort in the State.

However, one of the most serious challenges affecting the ability to conduct CEHA in New Mexico is the lack of EH data necessary to adequately determine the impacts of productive and industrial activities and the risks to rural and lower income communities. In addition to problems with data, people in communities that are burdened by environmental injustice are often hard pressed to participate in CEHA to deal with the injustices.

This Tool Box includes a number of resources geared to facilitating improved outreach to and participation of members of our constituent communities. These tools focus on the concept of "right-to-know" and equitable participation and involvement of all community members and stakeholder groups in decision making on issues that may affect them, regardless of their ethnicity, gender, socioeconomic standing, vocation, linguistic ability, or education level.

Appendix D of the Tool Box presents a list of useful resources concerning environmental laws and environmental justice. *Appendix E* lists State, Federal and non-governmental institutional and organizational contacts that can be accessed for more information on these subjects.

For more information regarding Environmental Laws and Environmental Justice, see especially:

A Citizen's Guide to Environmental Law and Environmental Decision Making (pamphlet). April 2002. New Mexico Border Health Office, NMDOH. Las Cruces NM.

A Citizen's Guide to Using Federal Environmental Laws to Secure Environmental Justice. 2002. Environmental Law Institute. Washington DC.

Environmental Health and Justice Training Manual: A Community Guide to Understanding the Environment. 1999. Amy K. Liebman, Patricia Juárez, Verónica Corella-Barud and Salvador Sáenz. Community University Partnership for Environmental Justice. Center for Environmental Resource Management. University of Texas at El Paso.

New Mexico Law Center. Santa Fe. www.nmenv.state.nm.us/lawcenter; http://www.nmenv.state.nm.us/Common/regs_idx.html

New Mexico Environmental Law Center. www.nmenvirolaw.org

EPA Environmental Justice Frequently Asked Questions: www.epa.gov/compliance/resources/faqs/ej/index.html

EPA Environmental Justice Geographic Assessment Tool www.epa.gov/compliance/environmentaljustice/assessment.html

Operations Manual for Hispanic Community-Based Organizations www.epa.gov/ecocommunity/pdf/hispopman-all2.pdf

III. How Do We Carry Out a Community Environmental Health Assessment and How is it Related to Community Health Assessments?

CEHA should be an integral part of community health assessments because it considers the linkages between human health and environmental conditions brought about by both natural processes and human activities. When community health assessments consider these linkages, they result in a more complete assessment of factors influencing the health of the community. A CEHA can be *comprehensive* involving all the elements of human health and the environment that affect the quality of life in the community. Or it can be *specific*, directed to analysis of a single issue perhaps already identified as a threat to environmental health in a particular community.

Most CEHA efforts carried in New Mexico have tended to be directed at specific issues, such as poor sanitation services, hazards of radioactive contamination, and water quality problems. Various smaller-scale and issue-specific CEHA initiatives have been carried out, some initiated with NMDOH funds and others undertaken by interested community-based groups and advocacy organizations. However, some programs have used a more comprehensive approach, as illustrated in some of the examples presented below:

- Bernalillo County is working with neighborhood associations to facilitate CEHA using household surveys. Reports from these surveys help the associations to determine priority issues and planning actions. This effort also includes the development of a GIS-based (geographic information system) data assessment, display program, and an annual environmental health "report card" on key indicators to facilitate awareness and planning.
- The Southern Area Health Education Center (SoAHEC) is managing several activities of community outreach in environmental health awareness, assessment and program action. The *Community-Based Environmental Health Assessment Project*, which was begun using the comprehensive PACE EH protocols, changed its focus to simplify participation and assessments in Northern Doña Ana and Southern Luna Counties. These simplified assessments resulted in several ongoing community environmental health programs.
- SoAHEC also manages an *Environmental Health Home Safety Education Project*, involving home visits by promotoras to assess such risks as pesticides, lead, fire hazards, mold contamination and food safety. This project provides point-of-service education and awareness, using innovative incentives, such as awarding smoke alarms, cabinet locks and other such items, to facilitate home health improvements and risk reduction.
- A *partnership model,* established by the Community Education Outreach Program (COEP) located with the University of New Mexico's Health Sciences Center, involves working with community laypersons, health workers, schools and social service providers to deliver environmental health-related training. The staff of COEP is invited by a community to provide training in basic risk assessment and epidemiology to help link environmental factors with health effects. Depending on the interest of the community, the COEP returns to deliver follow-on training and technical assistance with the ultimate goal of doing more integrated CEHA.

There has been recognition over the past decade in the public health sector, that community-based, collaborative approaches to solving environmental problems achieves solutions that may be better accepted by the community and may be more appropriate given the community's unique characteristics. For example, EPA has recognized the importance of collaborating with communities by creating its *Community-Based Environmental Protection Strategy.* This strategy comes in response to a need to find alternatives to the Agency's media-specific, top-down command-and-control methods to solve many of the nation's intractable environmental problems. The new approach engages public and private stakeholders in a comprehensive, collaborative process to find long-term solutions to environmental risks and recognizes the linkages between economic vitality and environmental health.

CEHA is crucial in orienting proactive efforts at preventing or reducing the incidence of disease and injury by managing the causes and origins of agents and hazards that provoke them.

Similarly, the National Institute of Environmental Health Sciences' (NIEHS) program for *Community-Based Participatory Research* involves communities in the implementation of culturally-relevant prevention and intervention activities. NIEHS has identified a number of benefits of this type

of approach such as facilitating the development of culturally-appropriate measurement techniques and interventions, as well as fostering a greater degree of trust in the community towards the researchers, which translates into better quality data.

The Environmental Law Institute's *Community Environmental Health Assessment Workbook* is a resource for community leaders and citizens groups that is intended to give citizens the tools to conduct their own analysis of their community's environmental health. The methodology relies on coupling science-based quantitative data with a qualitative assessment of community members' perceptions. The workbook contains excellent step-by-step guidelines and worksheets to walk a group through the assessment process and consensus building to identify environmental health priorities.

Alaska's *7 Generations* methodology is a guide for conducting environmental planning in Native Alaskan villages. The participant manual and the train-the-trainer manual are written in simple layperson's terms and contain useful step-by-step guidelines, environmental education exercises, surveys and tips for implementing environmental assessments in Native American communities.

Since community involvement and collaboration is now recognized as vital for community health, it is all the more critical that CEHA be incorporated into community health planning procedures currently practiced by most health councils in New Mexico. It is the intent of this Tool Box to facilitate this integration. As can be seen below, the steps used to carry out a community environmental health assessment are substantially similar as those currently used by community health councils in the state for comprehensive community health planning. *Appendix D* presents a complete list of resources and tools, including comprehensive manuals and guides, valuable in all steps of CEHA development.

Help for communities that want to conduct comprehensive CEHA

There are a number of methods and guides available for a comprehensive evaluation of community heath that explicitly includes the interconnections among the environment, human health, and quality of life. Many of these methodologies are community-based and are intended to improve the sustainability and livability of neighborhoods and the broader community. Here are some examples:

EPA's *Green Communities* program offers an on-line toolkit that walks one through the process of conducting a community assessment for the current situation, future trends, visioning for the future and developing action plans to achieve the community's future vision.

The Empowerment Institute offers the *Livable Neighborhood Program* that provides useful checklists for neighborhood livability assessments of health and safety, beautification and greening, resource sharing, and neighborhood building.

The National Civic League (NCL) has produced *The Community Visioning and Strategic Planning Handbook* that provides case studies and a general guide for developing a community vision for the future, identifying trends and the community's capacity for problem solving, and developing strategies for addressing the community's problems.

The NCL has developed a *Civic Index* to measure community planning and problem solving abilities, a useful tool to ensure that community groups are also planning to develop community infrastructure to effectively address their unique problems.

Comprehensive CEHA

Comprehensive CEHA usually results in a multitude of health issues being identified. These issues can relate to ecosystem impacts, quality of life, occupational safety and health, pollution sources, and behavioral health. It is in the nature of a comprehensive CEHA to use a broad brush or universal

approach to itemize and then categorize groups of issues. All issues are considered and then prioritized based on specific criteria which the community applies.

For example, the checklist presented in *Table 1* is a tool used to make an initial and preliminary assessment among a broad number of potential issues in a smaller, mostly rural community in New Mexico. It could be applied informally by a member of a health council or workgroup using a small group of key informants from the community. Ideally the administrator of the checklist is a person from this same community who has received basic training in concepts of environmental health or a professional familiar with the community.

***Comprehensive CEHA* is integral in nature and involves the assessment of all issues of health and the environment that relate to human health and well-being within that community.**

The checklist is used for the dual purpose of determining, in a preliminary fashion, community perceptions regarding their principle environmental health issues, while at the same time assigning a comparative "weight" to each issue to gauge their importance. Once the results are tabulated, a smaller and more focused number of issues can be considered by the health council or workgroup for more thorough research and analysis, to prioritize the issues and plan for action. *Appendix B* of the Tool Box includes several additional tools used in conducting holistic CEHA.

Issue-specific CEHA

In contrast to a comprehensive CEHA, a health council or workgroup may want to focus on a particular environmental health issue that has the potential for EH risk or is seen by a substantial group within the community as already harmful to health. For instance, just one of the specific issues indicated in the checklist in *Table 1* could be the focus of the CEHA effort.

The EH problem must first be identified in general terms. This provides a starting point from which to work. The health council or workgroup should outline all that is known about the issue in general terms. For example, the issue might be "high nitrate concentrations exist in groundwater in our community that may affect water quality of wells and the health of well users." The problem is then clarified by gathering all the available detailed information about it as well as any gaps in the information. In the nitrate example above, you may want to know the location of septic systems, farms and/or dairies in relation to wells in your community and any data available regarding the extent of substandard or improperly maintained septic systems in your area, fertilizer use on nearby farms and/or disposal practices of dairies. How many wells have nitrate concentrations above drinking water standards? What are the health effects of nitrate in drinking water? Have there been any adverse health effects reported in your community that could be linked to nitrates? Once sufficient information is collected, you can define the problem, and create and action plan. The information also provides you with a set of *indicators* that show how well your action plan is working.

As part of this effort, it is usually necessary to solicit the involvement of local, state and/or Federal environmental or public health agencies, depending upon the characteristics, magnitude, and severity of the issue. Ideally, this involvement will help guide a health council or workgroup through the process of identifying and analyzing the environmental health issue and the action planning. Partners could include county, municipal or State of New Mexico environmental departments and health departments, of several Federal agencies, such as the Center for Diseases Control, and Prevention (CDC), U.S. EPA and Agency for Toxic Substances and Disease Registry's (ATSDR).

Table 1: Comprehensive Environmental Health Checklist for a Small Rural Communities

Indicate which categories you think are the most important environmental health problems in your community by putting '1' for *very important problem*, '2' for *somewhat important problem*, then '3' for *small problem*.

Then put one or more numbers under each of the categories indicating what type of problem.

Note: *Only mark numbers for categories for which you feel there is a problem. You do not have to mark each one.*

[ ] Air Quality & Odors

[ ] Dust (ambient, roads)
[ ] Smoke (local burning)
[ ] Pollen, mold, hantavirus
[ ] Allergies & asthma
[ ] Auto emissions
[ ] Sewage odors
[ ] Odors from garbage
[ ] Drift from aerial agricultural spraying (odors, eye or breathing irritation)

[ ] Water Quality

[ ] Water quality of wells
[ ] Municipal system water quality
[ ] Potential contaminants (☑)
☐septic, ☐fertilizer & pesticides, ☐dairy wastes, ☐industrial spills, ☐water system leaks/bad pipes
[ ] Dumping of contaminants in canals, river & on-the-ground (oil, pesticides)
[ ] Agricultural spraying drift/spills

[ ] Sanitation

[ ] Septic system (functionality & problems)
[ ] Municipal sewage system
[ ] Solid Waste (☑)
☐neighborhood dumping
☐local collection service,
☐transfer station, ☐burning,
☐open dumping
[ ] Rodents
[ ] Scavenging dogs or wildlife

[ ] Occupational Safety

[ ] Worker safety (machinery & lifting hazards on the farm & processing facilities)
[ ] Pesticide management (☑)
☐lack or misuse of protective clothing & equipment
☐mishandling & bad labeling
[ ] Poor medical care
[ ] No health insurance/
[ ] Dehydration
[ ] Sunburn & overexposure

[ ] Household Hazards & Safety

[ ] House integrity (air/water leaks)
[ ] Accident & fire hazards
[ ] Electrical hazards
[ ] Poorly stored pesticides, solvents
[ ] Cleanliness & hygiene (roaches)
[ ] In-home smoking/2nd hand smoke
[ ] Mold, dust mites, hantavirus
[ ] Allergies & asthma
[ ] Food preparation/safety
[ ] In-home firearms
[ ] Radon gas

[ ] Natural Hazards

[ ] Sunburn & overexposure
[ ] Dehydration
[ ] Floods & arroyos
[ ] Land & debris slides
[ ] Storms, wind & rain damage
[ ] Wildlife, snakes, rabies
[ ] Insects (☑)
☐mosquitoes, ☐biting flies,
☐Africanized bees, ☐fire ants

[ ] Neighborhood Safety Hazards

[ ] Automobile traffic
[ ] Lack of street lighting
[ ] Aggressive dogs, rabies
[ ] Open pits & broken pavement
[ ] Electric transmission line hazards
[ ] Violence, crime & gunplay

[ ] Industrial Hazards

[ ] Strong odors, eye irritants
[ ] Industrial spills, explosions/fires
[ ] Gas line ruptures & emissions
[ ] Hazardous materials storage, loading/unloading & transport
[ ] Brownfields, abandoned mines

[ ] River & Irrigation Canals

[ ] Falling hazards (open canals)
[ ] Wading & swimming (drowning)
[ ] Ingestion of contaminated fish
[ ] Irrigation infrastructure (dams, siphons, gates & control valves)

[ ] Roads & Highways, Railroads & Walkways

[ ] Speeding traffic
[ ] Hazardous materials transport
[ ] Railroad crossings
[ ] Lack of sidewalks
[ ] Unskilled & drunk drivers
[ ] Dangerous bridges & intersections
[ ] Lack of crosswalks
[ ] Broken pavement

Methodologies used to investigate a single potential environmental health risk, or issue-specific CEHA, include protocols used by ATSDR for public health assessment and health consultation, and the EPA Superfund Program's preliminary assessment/site inspection for evaluation of sites containing hazardous materials. EPA also can determine if the issue warrants a remedial investigation/feasibility study for listing as a National Priority List site.

Given the complexity of employing quantitative risk assessment methods to determine the potential human health and ecological risk posed by a contaminated site or other environmental hazard, these assessments are carried out by Federal and state agencies. The community is typically included through public involvement strategies aimed at informing the community about the potential risks posed by the site and options for reducing exposure and/or remediation. EPA's Superfund Program does provide technical assistance grants and in some cases establishes community advisory groups to allow for a more active role in the assessment process.

Data collection is the most important aspect of issue-specific CEHA. Knowing which Federal, State, and/or local government agency has authority over the EH issue or components of the issue is helpful in gathering information to understand the EH problem as well as in developing possible solutions. Regulatory authorities use legally-established *standards* as indicators for monitoring and controlling most environmental health issues. Again, these standards are thresholds of tolerances equal to or below which are understood to protect human health and/or which the environment can absorb or suffer without becoming irreversibly degraded.

Appendix C of the Tool Box provides a summary of the most common environmental issues confronting New Mexico communities, the government agencies that have mandated regulatory responsibility for monitoring and managing these issues, and links to sites where statistical data and indicators can be obtained for each type of EH issue. The appendix also provides a list of the types of information and indicators that would be useful in assessing the problem. *Appendix E* provides additional links to institutional resources that can assist in this process.

For more information useful in conducting comprehensive or Holistic CEHA, see especially:

7 Generations: Addressing Village Environmental Issues for Future Generations of Rural Alaska. January 2000. Susan Unger and Dr. Rick Foster. Alaska Inter-Tribal Council. Anchorage, Alaska.

Community Environmental Health Assessment Workbook: A Guide to Evaluating Your Community's Health and Finding Ways to Improve It. 2000. Environmental Law Institute. Washington, DC.

Agency for Toxic Substances and Disease Registry: Public Health Assessment Guide. 1992. Lewis Publisher. Chelsea MI.

U.S. EPA Environmental Planning for Small Communities. www.epa.gov/seahome/trilogy.html

Iowa Department of Public Health. Community Health Needs Assessment & Health Improvement Plan Toolkit. http://www.idph.state.ia.us/chnahip/common/pdf/toolkit_complete.pdf

Environmental Sustainability Kit. Environmental Defense Fund. http://www.environmentaldefense.org/pdf.cfm?contentid=1247&filename=ESK%2Epdf

Community Engagement and Community Analysis and Needs Assessment. Minnesota Department of Health. http://www.health.state.mn.us/communityeng/needs/

The Livable Neighborhood Program: A Municipal Tool for Neighborhood Improvement Workbook. The Empowerment Institute. Woodstock, NY.

Community-Based Environmental Protection: A Resource Book for Protecting Ecosystems and

Communities. July 1997. Office of Sustainable Ecosystems and Communities, U.S. EPA. Washington, DC

www.epa.gov/ecocommunity/tools/resourcebook.htm

For more resources and tools useful in conducting Issue-specific CEHA, see especially:

Healthy Homes Step-by-Step Manual: Implementing an Environmental Health Program in Your Community. 2001. Southern Area Health Education Center/Border Health Education Training Center, New Mexico State University.

US EPA alphabetical index, which provides links for numerous EH issues. http://www.epa.gov/ebtpages/alphabet.html

EXTOXNET: The Extension Toxicology Network. http://ace.ace.orst.edu/info/extoxnet

Envirotools. www.envirotools.org

Brownfields Reclamation in New Mexico. NMED. http://www.nmenv.state.nm.us/gwb/ROS/VRP/VRP.html

Agency for Toxic Substances and Disease Registry. Public Health Assessment. www.atsdr.cdc.gov/HAC/pha.html

U.S. Environmental Protection Agency Superfund Cleanup Process. www.epa.gov/superfund/whatissf/sfproces/pasi.htm

Centers for Disease Control and Prevention Cancer Cluster Resources. www.cdc.gov/nceh/clusters/resources.htm

Community Environmental Health Resource Center. www.cehrc.org

A. *CEHA STEP #1*: How Do We Organize Members of Our Community and Work with Local and State Agencies and other Organizations to Implement a Community Environmental Health Assessment?

Your workgroup will coordinate the implementation of the CEHA process. This first step in the CEHA process involves the identification of stakeholder groups and recruitment of key members to your CEHA workgroup. Members should include representative community members, representatives of local and State public health and environmental agencies, economic interests, and advocacy organizations. Who are the organizations and individuals that have a stake in environmental health issues in your community?

"Including citizens in identifying and solving problems is called R-E-S-P-E-C-T! Respect for and sensitivity to the people you want to serve."
(From: *The Community Tool Box*)

Obviously, if there is a pre-established comprehensive community health council or a specialized health council (e.g. maternal and child health, environmental health), then the effort of organizing the community for implementation of CEHA would be limited to ensuring that there is equitable and inclusive representation of the diverse socioeconomic backgrounds and interests of the full community, adding members of constituencies more related to the principles of CEHA.

If however, CEHA is to be carried out in a county or municipality without an established health council, or in a community or group of communities at a sub-county level without such an organization, then more comprehensive procedures included in this step should be followed. In the latter case, it will be necessary to establish a CEHA team or workgroup derived from a coalition of representatives institutions present in the community (health, environmental, social services agencies of local, State, tribal and Federal governments, school districts), Councils of Government (COGs),

community leaders (natural and elected), health care providers (clinics, nurses, doctors), employers and business interests, and environmental and social services advocacy organizations.

One or more of these organizations may actually serve as the catalyst for organizing the CEHA workgroup, whether this is an advocacy organization, or a local or State public health or environmental agency. Also, as necessary or appropriate, health councils or workgroups can assign a select number of their members to a "task group" or sub-group to deal specifically with CEHA, with the results of this task group then brought into and integrated with the full community health assessment.

There are numerous procedural guides, manuals and tools available to facilitate the conceptualization and organization of a workgroup or team within a community health council to implement CEHA. The *Protocol for Assessing Community Excellence in Environmental Health* (PACE EH) guidebook, published by the National Association of County and City Health Officials (NACCHO) and Centers for Disease Control and Prevention (CDC) in May of 2000, breaks out three distinct process steps addressing actions of analyzing community resources and then selecting members for a CEHA team.

NMDOH has promoted the use of the *Community Health Improvement Process* (CHIP) model which includes three core components, the first of which is community building. The New Mexico Healthier Communities model includes eight non-sequential stages for addressing community health improvement, the first three of which are oriented to building community participation through a shared history and shared vision for the future.

The *Community Tool Box,* a web-based resource developed by the University of Kansas, offers numerous guidelines, procedures and tools for organizing the community, promoting participation, and carrying out participatory community assessments of all kinds. *Appendices D* of the Tool Box provides a list of useful tools and resources to facilitate participation of community members and organizations for purposes of implementing CEHA.

Nearly all community health assessment initiatives include the following activities as part of this step in the CEHA process:

- *Analysis of who and what we are*, identifying the social and economic fabric of the community, what are the existing institutions and organizations, current programs, and community leaders;
- *Development of a vision of how we want our community to be* in the future, validating the values of the diverse members of the community;
- *Establishment of a coalition* among organizational and institutional resources available within and/or accessible to the community to carry out CEHA;
- *Establishment of an entity to coordinate* implementation of CEHA and appointment of leaders; and
- *Building of awareness and knowledge* among members of the community of the concepts and procedures of CEHA, so that they may participate more effectively in the effort.

Once the group has been selected and each member has expressed his/her commitment to participate in the CEHA, the health council or workgroup members should then receive an orientation to all aspects of the CEHA for which this Tool Box can serve as a guide, including CEHA objectives and purposes, concepts, technical terms, use of tools and resources, and expected end products and services. It is extremely important that all members' interests and participation—regardless of their social or ethnic background, economic stature, education level, and language capabilities—be validated as part of the CEHA effort, beginning with organization of the CEHA workgroup and

"democratization" of knowledge. Greater awareness of the interrelationships of health and the environment will bring about more effective participation and contribution to decision making and in turn a more successful CEHA effort.

Depending on the experience of members of the workgroup, additional training may be needed in the following *process and communication elements* which have been identified as critical to this CEHA step (*Appendix F* provides a list of training resources available for facilitating improved understanding of CEHA terms and procedures, and facilitation of community workgroups):

- How to effectively facilitate the assessment process;
- How to conduct effective meetings, guidance in using multimedia (video, photographs, PowerPoint, etc.);
- How to manage expectations;
- How to bring community leaders into the project;
- How to develop partnerships;
- How to develop a process for group decision-making;
- Tools and incentives to encourage attendance and active participation in meetings;
- How to communicate with groups of differing socioeconomic, ethnic, racial, educational, vocational and linguistic backgrounds;
- How to interpret and communicate technical information using layperson's language;
- How to advertise and conduct effective small group and public or town meetings; and
- How to conduct effective media relations including development of a sample press release.

For more information and useful tools on facilitating Community Outreach, Participation and Organization, see especially:

The Community Tool Box (English and Spanish). http://ctb.ku.edu

7 Generations: Addressing Village Environmental Issues for Future Generations of Rural Alaska. January 2000. Susan Unger and Dr. Rick Foster. Alaska Inter-Tribal Council. Anchorage, Alaska.

Protocol for Assessing Excellence in Environmental Health/PACE-EH: A Guidebook for Local Health Councils. May 2000. Centers for Disease Control and Prevention, and National Association of County and City Health Officials. Atlanta GA.

EPA Green Communities: Community Involvement. www.epa.gov/greenkit/comunity.htm

EPA Superfund Community Involvement Toolkit. www.epa.gov/superfund/tools/index.htm

Guide on Consultation and Collaboration with Indian Tribal Governments and the Public Participation of Indigenous Groups and Tribal Citizens. U.S. EPA. Washington, DC. http://www.epa.gov/opptintr/tribal/index.html

Tools for Public Involvement. www.epa.gov/publicinvolvement/involvework.htm

Capacity Inventory Mapping Tool. Asset-Based Community Development Institute www.northwestern.edu/ipr/abcd/abcdtools.html

B. *CEHA STEP #2*: How Do We Implement an Environmental Health Risk Assessment and Communicate These Risks to our Communities?

This step involves identifying the scope of environmental health issues and collecting and analyzing secondary data (that is data that already exists) and primary data (information about the community that does not already exist) concerning social, cultural, economic, community health and environmental (natural and human influenced) characteristics of the community. While secondary data will be available from numerous local, State and Federal sources, it may be insufficient for certain smaller and more rural communities, thereby necessitating the collection of additional primary data based on local interviews, surveys and focus group meetings during the course of this CEHA step. Data will then be analyzed and a list of environmental health issues prepared for inclusion in a community environmental health profile.

A comprehensive environmental health risk assessment identifies the range of environmental health concerns in a community and analyzes these concerns according to a set of previously defined criteria. The analysis of each issue will be used to rank and prioritize the most significant environmental health issues in your community. At the completion of the assessment phase, you should have three products:

- A list of identified environmental health issues;
- A summary of data that clarifies and defines each issue; and
- An analysis of each identified issue.

The assessment phase is best accomplished with the participation of your community. Many of the problems confronting our communities may affect people differently. For instance, there may be environmental health issues that are significant for sensitive sectors of your populations, like children or the elderly. There may also be an environmental justice aspect to an environmental health problem such that a low-income or minority population may be disproportionately impacted by the environmental risk. The solutions to those problems will require the collaboration of many organizations, government agencies and the community as a whole.

The assessment and subsequent environmental health initiatives can be most effective if the community "buys-in" as to how environmental health issues are defined and the proposals for addressing them. The best way to ensure this community support is to fully involve your stakeholders. This section describes a number of methods for obtaining community input in the assessment process.

***Steps in Conducting an Environmental Health Risk Assessment*:**

i. **Identify environmental health issues through collection of primary and secondary data**
ii. **Define and analyze each problem**
iii. **Environmental risk communication**

There are many different approaches to carrying out an environmental health assessment. Time and resources in all likelihood will dictate for you how you accomplish this phase in the process. Some communities may need to complete an assessment quickly. Other communities may have the ability to implement a more rigorous assessment.

Resources for alternative methods for each step in the assessment phase are provided in this section to allow you to tailor your methodology to meet your specific needs.

Appendix D provides a number of useful tools and resources for facilitating EH risk assessments.

The analysis of your environmental health problems may also provide information related to the community's perceived risk versus actual risk. Your community may believe that the environmental health risk of a particular problem is extremely high. The analysis of science-based data may reveal that the environmental health risk is actually quite low. This information is very useful for identifying areas in which educating and raising the public's awareness can be most helpful to bring perceived risk in line with actual risk. This issue of risk communication is discussed more fully later in the section.

1. Identify environmental health concerns

The first step in the assessment phase is to identify the scope of environmental health issues in your community. Here are some sample questions to assist you in identifying and describing your community's environmental health problems.

- What are the environmental health concerns in our community (e.g., town, city, county)?
- Are these problems getting better or worse?
- Where in our community are environmental health problems occurring?
- What might be the environmental factors (e.g., air pollution, groundwater contamination) contributing to these environmental health problems?
- What are some of the other impacts brought about by these environmental contributors to environmental health problems (i.e., ecological and quality of life impacts)?

When doing this exercise, it is helpful to think comprehensively and also to organize the types of possible impacts caused by the environmental problem. For instance, if poor air quality is a problem in your community, you can identify the potential human health implications (e.g., exacerbation of asthma), ecological effects (e.g., damage to wildlife habitat) and quality of life impacts (e.g. losses of functionality and worker productivity) brought about by air pollution. "Quality of life" refers to the social, environmental and economic aspects of a community. Environmental health issues can affect the social fabric of our community as well as impose economic damages that can be quantified in dollar terms.

***Tips for Developing a List of Environmental Health Issues*:**

- **Be as comprehensive as you can**
- **Define problems in similar context and scope to facilitate comparisons of risk**
- **Minimize overlap between problems – categorize similar concerns together as much as possible**
- **Define problems in the same terms as available indicator data**
- **Use simple terms in layperson's language to describe environmental health problems**

(Adapted from: Environmental Law Institute, *Community Environmental Health Assessment Workbook)*

This step involves all aspects of collecting and analyzing secondary and primary data (see definitions below) required to implement an environmental health assessment. The information that will be required for CEHA will depend on whether a comprehensive or issue-specific assessment will be made. Obviously if you are planning an issue specific assessment, you will only need data that is related to that issue. Whereas, if you are planning a comprehensive assessment you will need a great deal of data.

Secondary data are preexisting statistics and records prepared mostly in quantitative form by local, State and Federal agencies. These data are considered public information as they are financed with taxes paid by citizens and are made available by a number of agencies on the Web and/or published in hard copy. Certain categories of information, especially those datasets that are very voluminous (especially "raw" or unprocessed data) or are highly technically specific to a particular issue (such as mercury or lead blood serum levels) can be consulted or obtained by sending a formal request to a particular agency and sent to interested parties.

The common types of secondary data available pertain to:

- *Socioeconomic, vocational and demographic indicators* (census of population, ethnicity, income levels, housing, fecundity rates, employment figures, etc.);
- *Location and characteristics of economic activities*, such as agriculture, mining, oil and gas production, and food industries;
- *Condition of the environment*, both natural and human built, such as indoor and outdoor air quality, surface and ground water quality, food safety, contamination of soils, and Superfund sites;
- *Environmental agents*, data that provides a measure of the environmental factors contributing to the environmental health risk in your community. For instance, emissions from vehicles contribute to poor ambient air (outdoor air) quality. Information on the amount of a contaminant released from different sources and the ambient concentrations of that contaminant (i.e., does the concentration of arsenic in my well water exceed the water quality standard for arsenic in drinking water?) are important for determining if the environmental conditions pose a threat to public health and if so, will be helpful in defining possible causes of the environmental health risk.
- *Health statistics*, in terms of morbidity (incidence and prevalence of disease and injury by category in a given population) and mortality (death rates in a given population), severity of the health effect (is normal functioning significantly impaired or is the effect mild?), and persistence or irreversibility of health effect (is this a transient effect or does exposure cause permanent damage?);
- *Specific public health and epidemiological studies for a particular issue*, such as blood serum lead levels, cancer clusters, heavy metals and pesticides in fish and birds, and one-time public health surveys; and
- *Availability of health care services* (outreach and services by agency, clinic, hospital, first responders).

If conducting a more comprehensive assessment, the health council or CEHA workgroup may also choose to collect the following data:

- *Ecological data*, information related to ecosystem effects such as land use changes, loss of vegetation, watershed degradation and flooding, loss of habitat or impacts to flora and fauna, (healthy ecosystems are important for the proper functioning of natural resources upon which human health is dependent); and
- *Quality of life information*, including community members' perceptions of nuisance factors, urbanization, aesthetics, traffic congestion, crime and overall health risks.

These data may be collected and published on an annual basis, as is the case for air quality in problematic areas. Data about water quality of municipal water systems and monitoring of the water quality of surface waters (under the Clean Air Act and Clean Water Act) is also collected annually.

Some data is intermittently depending on priorities of the agencies, whether there is an actual or a potential EH problem, and/or the availability of funding.

Appendix C of the Tool Box provides a summary of the most common environmental issues confronting New Mexico communities, the government agencies that have mandated regulatory responsibility for monitoring and managing these issues, and links to sites where statistical data and indicators can be obtained for each type of EH issue. *Appendix E* provides additional links to institutional resources that can assist in this process.

***Data Collection Guidelines*:**

- **Set a limit on how much information will be collected and how much time will be spent on this step; it's easy to get bogged down in never-ending information collection.**
- **Understand the limitations of your information; know what conclusions can reasonably be drawn from the data.**
- **Put your information in context: how does your community's incidence of birth defects compare to the county, state, or national rates?**

(Adapted from: *The Community Tool Box*)

There are four principal restrictions with secondary data sources that limit their validity in an environmental health risk assessment, and require that additional primary data be gathered:

i) Data are seldom analyzed and published beyond the county level, this makes it nearly impossible to determine how the data relates at your community level;

ii) The categories for which data are available are limited and do not always lend themselves to the needs of CEHA, as data tends to be concentrated in areas of clinical medicine (i.e. diagnosis and treatment);

iii) In most cases data is not linked to a particular geographical location. In the case of health statistics, for example, cases are on reported on the basis of the point-of-service provider's address. However, the incidence and prevalence of diseases and injuries are presented at a county, state or national level so the data cannot be tied to community members' residence. As a result you cannot determine the burden of a particular disease or injury for your community with the secondary data.

iv) In some cases, confidentiality policies can restrict access to certain data, especially in small communities where fewer cases may be documented, and in Native American communities due to ownership issues.

Secondary data can be of great use, especially if you want to compare socioeconomic, environmental and health characteristics in your community with others around the State. It is also useful when used in conjunction with primary data because it can provide a baseline for the data that is collected in your community and used for monitoring changes.

Primary data are those collected as part of a community's environmental health assessment effort, usually financed with resources budgeted for the CEHA process. Primary data can be collected using a number of different approaches depending on the type of data desired (i.e. quantitative versus qualitative) and the amount of time and financial resources available for data collection. The data can

be collected by staff of organizations represented on the health council or workgroup, contracted out to individual consultants of a university or firm, or a combination of the two.

The actual primary data that a health council or CEHA workgroup will choose to collect also depends on what gaps or deficiencies are found in the secondary information sources for the intended community or area which is the object of the CEHA. It may be determined by the health council and/or CEHA workgroup that additional primary data is required regarding community members' perceptions of potential EH health risks. Additional data may also be needed to enrich existing quantitative secondary data (for instance morbidity and mortality) with similar data sets broken down (disaggregated) to the sub-county or community specific levels.

Primary data collection can be achieved with a number of different tools. For enrichment of secondary data, for example, primary data may be collected at local health care service centers (WIC, MCH), point-of-service medical providers (clinics, hospitals), NMDOH district offices and county or municipal health and human services providers and then analyzed along side the secondary data to give the community a local read of and issue.

In some cases, surveys can be administered to households, in neighborhood meetings, at point-of-service locations and/or using mail-in and Internet methods. It is cautioned here, however, that the experience in surveys has been mixed, with higher levels of success obtained in larger metropolitan areas with ever-diminishing success for smaller communities and rural areas. Better results, especially for smaller communities and in neighborhoods, have been attained using techniques and tools such as focus groups, guided interviews, facilitated discussions, community mapping, and community or town meetings; although the data collected is generally qualitative.

Appendix B of the Tool Box provides several examples of these techniques for facilitating the collection of primary data. Some of the more important tools are discussed below for your convenience .

Focus groups

Focus groups are more formal discussions intended to solicit opinions from a representative sample of the community. This tool is used when it is important to obtain the community's depth of opinion or when a written survey is not adequate to understand the nuances or subtleties related to an issue. Focus groups use a trained facilitator that works to keep the group on the topic at hand as well as creates a non-threatening environment that will allow participants to freely express their opinions. The facilitator uses a series of prepared questions that is then put forward to the group, one after the other, for discussion and answer. A consensus answer is then registered; or if no consensus is reached by the group, then individual answers are registered by the facilitator.

Guided interviews with key informants

Guided interviews are administered to individual persons, such as key leaders in the community, businesspersons, the clergy, elected local (city and county) and state representatives, using an interview guide substantially similar to that used for focus groups. Questions are posed to each person and answers registered in a notebook. While sometimes confused with surveys, guided interviews are much less formal, require less time to administer, are more conversational and permit more free floating discussion. Guided interviews are used to determine general perceptions of persons as to real or potential environmental health issues, usually those deemed by interviewees as the most pressing of problems affecting their or their constituencies' quality of life.

Facilitated discussions

Similar to guided interviews, but applied with small groups of people, these are informal discussions among stakeholders of your community, and represent a low cost and fairly quick way to get the input necessary to scope out environmental health issues. The facilitator should make a list of stakeholders or those organizations to include in the discussions. These can include agencies and constituencies that have a stake in environmental health, such as health and environmental agencies, school staff, groups of workers or employees, non-governmental organizations involved in environmental or public health issues, a soil and water conservation district, or neighborhood associations. It is also worthwhile to include key leaders in the community, such as city and/or county commissioners and state legislators. You should respect and recognize the cultural and ethnic diversity in your community and include those voices in your discussions. The facilitator walks each group through a series of questions like those outlined above to gain an understanding of your community's environmental health concerns. A flip chart is useful for recording the group's responses.

Community mapping

According to the Policy Link Equitable Development Toolkit, community mapping is the "visual representation of data by geography or location, the linking of information to place…. in order to support social and economic change on a community level." The CEHA workgroup can engage all of its members in carrying out a community mapping exercise. Maps are powerful visual tools that can communicate patterns and tell stories quite effectively The CEHA workgroup can consider using maps to present environmental health problems to their community, whether these are hand drawn, mosaics of maps available from local, State and Federal agencies, or those generated by a computerized geographic information system. Maps can be used not only to raise awareness of EH issues, but to solicit public input on specific aspects of EH problems in the community. The U.S. Department of Housing and Urban Development distributes community mapping software under the *Community 2020* program. *Appendix B* provides several tools and guides useful in facilitating community mapping.

Surveys

A survey can be a useful tool for gathering information on public opinion regarding environmental health concerns. Formal surveys tend to be more time and resource intensive since the methodology and results need to hold up under scientific review. Informal surveys, however, can be used to quickly collect information from the community, including some quantitative data. Keep the following elements in mind when you're designing the survey instrument:

- *Your target audience*, keep it simple for the non-technical layperson;
- *Time constraint*, keep it short so that the survey can be completed within a reasonable period of time e.g., 10 – 15 minutes; and
- *How to remit questionnaires*, determine easy way(s) for completed surveys to be returned to your health council or workgroup.

***Types of surveys*:**

- **Door-to-door surveys**
- **Mail-in surveys**
- **Internet surveys**
- **Windshield surveys**
- **Sidewalk/neighborhood surveys**
- **EH Concerns surveys**
- **Site/community event surveys**

Surveys can be administered door-to-door, via Internet, at community events such as county fairs and festivals, and distributed at high schools, churches, and libraries or through the mail. Sample survey protocols and questionnaires are provided in *Appendix B* of the Tool Box.

2. Define, analyze and categorize environmental health problems

After accumulating the results of the primary and secondary data collection, the workgroup may now be faced with an unwieldy number of issues to address. It is important to look for ways to narrow the list of EH concerns. Are there issues that can be grouped into one problem category? Are there any issues outside the scope of the assessment that should be excluded? Once some general clean-up of the list of issues is completed, it will be helpful to prepare brief descriptive summaries or profiles for each of the environmental concerns to systematically organize the variety of data collected in the previous stage.

The *Community Environmental Health Assessment Workbook* provides a useful worksheet for summarizing environmental problems using consistent terminology. The list and summaries of EH issues are then placed into an ordered format for reference for the follow-on steps in the CEHA process. This annotated collection of EH issues essentially constitute input to the Community Health Profile employed in the community health improvement process currently used by NMDOH and health councils throughout the State.

3. Communicate environmental risks in order to have a shared perception of issues

At this step, emphasis is placed on a more detailed and participatory analysis of the preliminary list of EH issues and associated data gathered through the previous steps. To further refine the list of EH issues, you will have to work to communicate a more in-depth understanding among members of the health council or workgroup as to *what is* and *what is not* an environmental risk and, in a comparative way, whether it is a serious enough public health problem to be considered a priority issue.

An extremely important aspect to consider at this juncture is *communication of environmental health risk* to the community, or in this case, members of the health council and/or CEHA workgroup. There is a difference between "perceived" risks and "actual" risks.

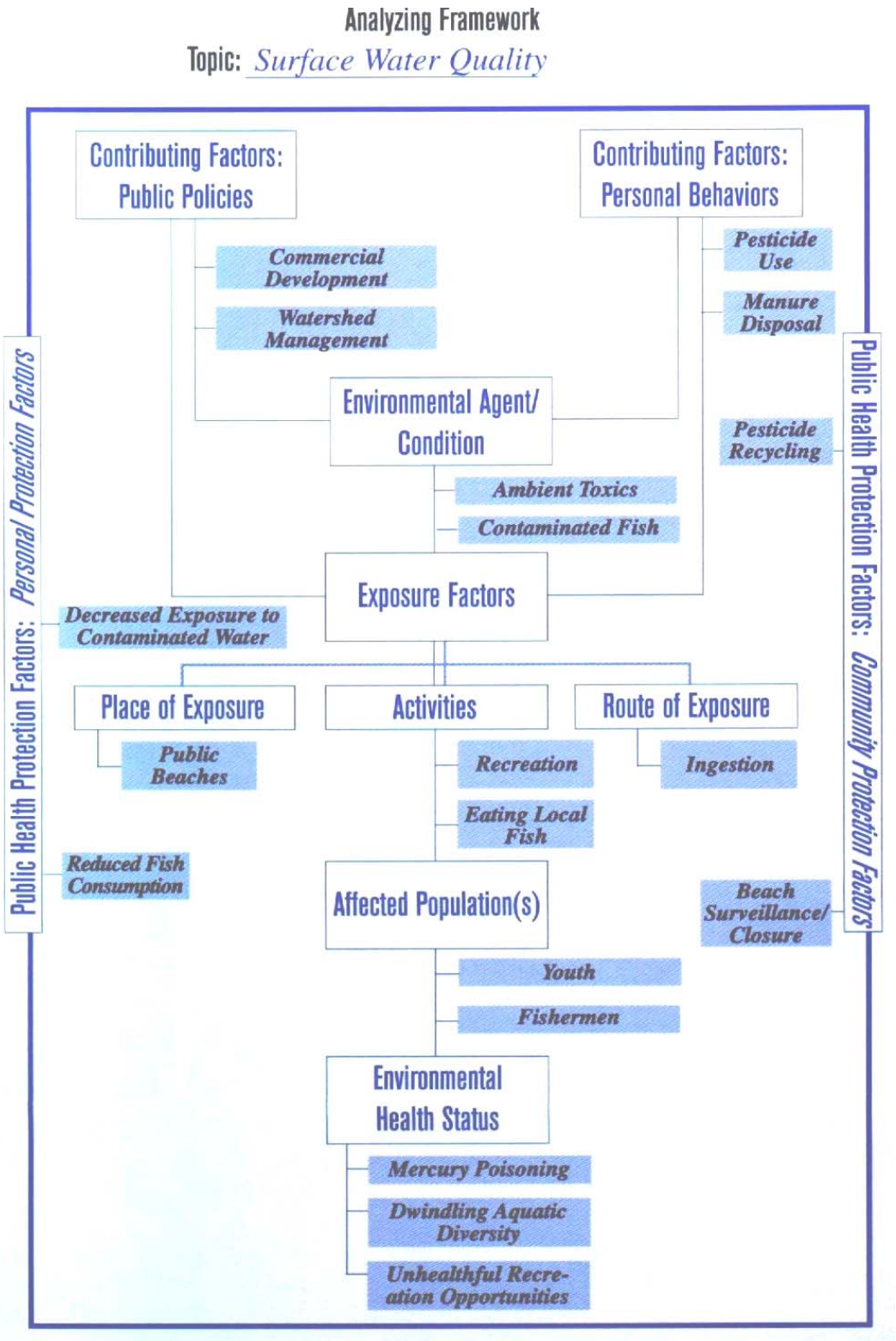
- *Perceived risks* are especially associated with nuisance factors, such as odors in the air, the mineral or metallic of drinking water, noises, or the fact that people live adjacent to some productive operation such as a factory, a mine, agricultural fields or a dairy. It should be noted that these risks can be real because nuisance factors can degrade the quality of life and the social capitol of a community; but they may not be causing actual health problems. Quality of life issues can be environmental justice issues and so are important; but they may not be as pressing as, say, excess nitrates in the communities drinking water.
- *Actual risks* are those for which health problems have been associated by virtue of epidemiological studies, exceedances of health or environmental standards and include such things as arsenic or harmful bacteria levels in drinking water, high levels of lead or other toxic substances in the air, exposures to radiological materials.

Communication about risk becomes a very important and challenging task for a Health Council or work group because some real risks can be dismissed as unimportant and some perceived risks that don't really effect health can garner a great deal of attention and energy. What helps with this challenge is the recognition that all issues are important and can be worked on at some point in time (even the hard water issue); but, there are some issues that are more significant to immediate health and there are some issues that can't be resolved given the resources the community has.

In summary, CEHA should include assessments of both secondary and primary data, including perceptions of the community. Epidemiological information is important to understand the incidence and prevalence of diseases and injuries, both real and potential, and their exposure pathways (secondary data). However, because such data are sometimes inconclusive or not always available for many of the communities in New Mexico, CEHA must rely also on information collected directly in

the community and from community members concerning their perceptions of environmental health risks (primary data).

While much of these data will be qualitative (such as summaries of opinions from a focus group), they have been found very useful as a basis for the preparation of Community Health Profiles and, where they are absent or no effort has been made to collect such data, the Profile will be incomplete. An informed community is the best way to bring about positive changes that will lead to the reduction of environmental health risks and overall improvements in community health.



Source: Protocol for Assessing Community Excellence in Environmental Health—PACE EH. May 2000
Centers for Disease Control and Prevention and National Association of County and City Health Officials.

Once a group has developed some consensus around actual issues and has developed the data to support the issues, it is an interesting challenge to identify the connections among health conditions, affected populations, exposure pathways, environmental agents and hazards, people's behavior, and health protection actions for each EH issue. The PACE EH Guidebook provides an interesting and effective tool for this analysis. The *Analyzing Framework* illustrated in the figure above focuses on surface water quality and is an example of how all the factors can come together to contribute to an assessment of an issue.

For more information regarding Environmental Health Risk Assessment and data sources see:

2000 Census of Population. 2002. U.S. Census Bureau. http://factfinder.census.gov

County Health Profiles (various in New Mexico, updated every 1-3 years). County Health Councils and the NM DOH. http://dohewbs2.health.state.nm.us/VitalRec/County%20Profiles/County%20Profiles.htm

New Mexico Tribal Report 2002: New Mexico Tribe-Specific Vital Statistics. NMDOH. http://dohewbs2.health.state.nm.us/VitalRec/Tribal.pdf

The State of the Environment: 2001 Report. 2002. NMED. Santa Fe. http://www.nmenv.state.nm.us/oots/2001_NMED_Report.html

New Mexico Environment Department's Annual 305-B Report under the Clean Water Act. http://www.nmenv.state.nm.us/swqb/305b/2002/index.html

Annual Drinking Water Quality Reports (required under the Clean Drinking Water Act for all drinking water systems in the New Mexico and the U.S.). Request copies from your regional, local or municipal water system operator.

Community Environmental Health Assessment Workbook: A Guide to Evaluating Your Community's Health and Finding Ways to Improve It. 2000. Environmental Law Institute. Washington, DC.

Healthy Homes Step-by-Step Manual: Implementing an Environmental Health Program in Your Community. 2001. Southern Area Health Education Center, Border Health Education Training Center, New Mexico State University.

Policy Link Equitable Development Toolkit: Community Mapping www.policylink.org

Environmental Defense Fund: Scorecard. www.scorecard.org

Hazardous Substance Research Centers. www.hsrc.org

Agency for Toxic Substances and Disease Registry. www.atsdr.cdc.gov

- ATSDR Office of Tribal Affairs. www.atsdr.cdc.gov/tribal
- ATSDR Public Health Assessments. www.atsdr.cdc.gov/HAC/pha.html

U.S. Environmental Protection Agency. www.epa.gov

- U.S. EPA Envirofacts. www.epa.gov/enviro
- EPA Superfund Program. www.epa.gov/superfund/
- Tools for Human Health Risk Assessment, Framework for Cumulative Risk Assessment. www.epa.gov/oerrpage/superfund/programs/risk/toolthh.htm
- EPA Tools, Technical Assistance and Training. www.epa.gov/epahome/training.htm
- EPA Office of Children's Health Protection. www.epa.gov/ochp/ochpweb.nsf/homepage
- EPA Software for Environmental Awareness. www.epa.gov/glnpo/seahome

Centers for Disease Control and Prevention. www.cdc.gov

- Cancer Cluster Resources. www.cdc.gov/nceh/clusters/resources.htm ; www.cancer.gov
- Guidelines for Investigating Clusters of Health Effects www.cdc.gov/mmwr/preview/mmwrhtml/00001797.htm

C. *CEHA STEP #3*: How Do We Rank which Environmental Health Issues are Important to Our Community?

At this step, the emphasis is placed on a deeper analysis of the list of environmental health issues identified in the preceding step. The health council or workgroup will normally employ several technical criteria and tools to rank environmental health issues to be addressed by the community. Wide participation is necessary so the final ranked list of EH issues reflects the best collective judgment of the health council or workgroup.

Because of limited resources, it is usually not possible to address all the identified environmental concerns at the same time. Strategic planning, of which prioritization is a key component, is necessary in order to tackle the most significant EH problems first, improve the capability to leverage resources across agencies to solve EH problems, and determine those EH issues to be dealt with in the short, medium and/or long term.

By this time, all secondary and primary data will have been collected, analyzed and interpreted (at some point, health councils and/or workgroups need to finalize the basic risk assessment phase and "shut the door" in order to concentrate on the prioritization phase). As in the case of procedures currently used by health councils and promoted through *CHITI Training Modules*, the preliminary list of issues must be ranked in order of significance and severity, whether actual or potential, using a series of technical criteria and a democratic participation exercise among health council or workgroup members. The CEHA process, however, takes this process one step farther in considering the linkage of health issues to the environment and causal factors. The ranking of issues then reflects the decisions of the health council or workgroup as to which EH issues, in rank order, require greater attention and more available resources to facilitate their resolution.

In order to compare across all of the environmental issues on the list, it is necessary to analyze the environmental health issues according to a set of consistent criteria. The *Community Environmental Health Assessment Workbook* offers three useful general criteria for analyzing EH issues:

- *Extent*: What is the magnitude or scope of the problem such as incidence of adverse health effects or number of hazardous waste sites in the community?
- *Severity*: How serious is the effect? Does it cause death, significantly impair body functioning or is it a mild effect?
- *Persistence/Reversibility*: Was the effect transient or did it permanently impair body function or the community's well being?

There are various methods for ranking among what can be a long list of environmental health issues determined to be affecting the community and condense them into manageable priority groups. A simple way to do this is to establish at least three ranked groups of issues: *low priority, moderate priority* and *high priority*.[4] Some ranking methods employ complex quantitative and even mathematical formulas, while others rely on simple voting methods among health council and/or workgroup members. The actual approaches used are dependent upon:

- *The quality of the data available*, e.g. good quantitative data concerning the magnitude and severity of EH issues permits the use of more quantitative methods;

[4] A health council and/or CEHA workgroup may want to establish more numerous groups of priorities or rank issues numerically based on a particular quantitative or qualitative process.

- *Availability of budgetary resources*, for which the health could hire consultants to develop the ranking; and
- *Time requirements*, whereas complex quantitative methods may require more time or, vice versa, ambitious efforts to consider the opinions or votes of a large cross-section of the community may require more time.

Appendix B provides several illustrative examples of techniques used for ranking EH risks or issues in the community, while *Appendix D* provides linkages to various resources that describe such techniques. Several key suggestions for ranking EH issues are provided in the following sections.

1. First, agree on your criteria for ranking issues!

Any ranking method used should include as a first action the selection of ranking criteria. Bearing in mind the general criteria indicated in the preceding paragraphs, the health council or CEHA workgroup should determine a limited number of criteria (preferably three to five) before actually beginning the process of ranking among the long preliminary list of EH issues identified under the previous CEHA step. Too few criteria may result in the assignment of too much or too little weight to a particular criterion; while too many criteria will complicate final calculations and potentially dilute the ranking to the point that it is meaningless. The establishment of these criteria reduces the influence of bias that members of the council or workgroup may have and allows the *data* to determine priorities.

The criteria should, ideally, be evidence-based using quantitative data sets (i.e. morbidity and mortality) as much as these are available, especially data on incidence and prevalence of disease and injury; but should also consider qualitative data, especially where the availability and quality of quantitative data is limited. The health council or workgroup should carry out an exercise to determine what information elements (criteria) should be used to rank EH issues in the community, such as:

- *Geographic magnitude of the EH problem or risk:* Where are the people affected or exposed to the risks represented by the problem? Is the problem concentrated in specific areas or neighborhoods in the community? Or is the EH problem or risks generalized throughout the area? Here we analyze the geographic linkage of the problem to the environment. It is important to have data broken down to the sub-county, community and/or neighborhood level as much as possible. Mapping of the data can help in the analysis of the geographic magnitude of EH risks and facilitate comprehension of patterns and trends in diseases and/or injuries and their connection to "place". Geographic information systems (GIS) are especially helpful tools for mapping the spatial distribution of risks; although simple plotting of information on a map of the CEHA outreach area by hand can be effective.
- *Demographic magnitude of the EH problem or risk:* How many people are affected or exposed to the hazards? Are only children, senior citizens, workers in a particular vocation, or other particular constituent groups affected? Incidence and prevalence of diseases and/or injuries among these constituent groups should be analyzed. The actual economic, social and environmental impacts of the EH risks in the community can then be analyzed in order to determine the level of importance to assign to the issue.
- *Severity of the disease and/or injury*. This element responds to the fact that some diseases or injuries are more serious than others, and therefore may constitute a greater risk in terms of mortality than other EH risks. For instance, while tuberculosis has a higher mortality rate than asthma, the latter has a higher morbidity rate and may represent a greater immediate risk to the community because so many more people may be affected by asthma.

- *Economic impact to the community*. This element gauges the perceived economic costs on the community of an EH risk. The risk may affect quality of life factors in the community, the potential for attracting new businesses or residents, could impact the productivity of the community in terms of lost work time, or imply very high costs of managing the EH problem.

Once the criteria have been established, the criteria themselves should be weighted according to what members of the health council, or workgroup feels are the most important in relative order. Consequently, a simple "weight-point" system can be used to assign relative importance to each criterion. For instance, a total of 100 points can be assigned among all criteria, representing 100% of the weight. Criteria deemed as more important as a determinant of rank order will be assigned more points; while those with less importance will be assigned comparatively fewer. Caution should be used to avoid assigning equal weights to more than one or two criteria as this, again, could lead to statistical dilution and complicate the effort to derive a relevant ranking among the EH issues in the preliminary long list. A weighted-point system can be used exclusively by the CEHA workgroup to establish its priority groups of EH issues, or can be used in an open forum among a more wide-ranging group, as described in the following section. *Appendix B* provides a few examples of applying a weighted-point system for ranking priority EH issues.

2. Guidelines for ranking in open forums

This method of ranking EH issues can be considered more "democratic" and can be used within an open forum among health council and CEHA workgroup members, or in a larger forum such as a community or town meeting. The effectiveness and validity of this method is highly dependent of the knowledge of the participants concerning EH issues. Results of the EH risk assessment (preceding CEHA step) must be shared with all participants. In the case of the fully open forum of a community or town meeting, a good amount of time must be spent on educating participants in environmental health concepts, including basic terminology (environmental health, basic epidemiology, etc.), perceived versus actual risks, and the objectives and process of community health improvement (community health profile and plans). This information will empower and validate the participation of all those present; *an informed community can and should participate in decisions regarding their environmental health*.

At the same time, a note of caution is sounded here concerning the risks of "popular decision-making". Public forums can be used as political pulpits and empower especially the more outspoken people and special interest groups to insert their agendas into the decision process. This situation can lead to a disaster in terms of evidence- or science-based decision-making. It is very important that full public forums have participants that represent the entire community—all social, cultural and economic interests. If the community is bilingual, then all materials should be translated before being introduced and a simultaneous translator should be on the premises with his/her translation equipment.

Any public forum must start out by defining the "rules of engagement", including ground rules for participating (e.g. *Robert's Rules of Order*) and a full explanation of the agenda, process and methods to be used during the meeting. These ground rules must be agreed to before the group gets down to business. If there are groups who are antagonistic or aggressive, meetings should be held with them before hand to make sure they understand and agree to the ground rules. The moderator plays a key role and must control the process at all stages to ensure a fair and fully participatory meeting. In addition to securing agreement about the ground rules for the meeting, before getting to the nuts and bolts issues, the public participants need to know what criteria have been used or will be used to rank the issues (see previous section on criteria). These criteria could include budgetary constraints and all the others mentioned above. It is wise to get agreement among participants about these criteria before proceeding to subsequent stages in the forum.

Whether the open forum is to be attended only by members of the health council and/or CEHA workgroup, similar procedures can be used. The first step (presuming that for a full public forum, basic EH concepts have already been introduced) involves presenting the results of the EH risk assessment in terms of the full preliminary list of EH problems and issues identified. The use of simplified textual, graphic and mapped information is encouraged. A question and answer period can ensue, in order to answer any questions and clarify any of the concepts or issues presented. Once the participants feel they have a grasp of the basic issues that have come to be prioritized, and there is agreement about the criteria for ranking and the meeting ground rules, *then* the methods and tools used for the actual ranking of issues can be introduced, including the use of a weighted-point system of other tool.

For more information regarding the Ranking of Environmental Health Issues, see especially:

7 Generations: Addressing Village Environmental Issues for Future Generations of Rural Alaska. January 2000. Susan Unger and Dr. Rick Foster. Alaska Inter-Tribal Council. Anchorage, Alaska.

Design for the Environment: Building Partnerships for Environmental Improvement. November 1999. USEPA, Office of Pollution Prevention and Toxics. EPA 744-R-99-003. Washington DC.

Environmental Health Report Card for the City of Albuquerque and Bernalillo County. 2001. City of Albuquerque Environmental Health Department and Bernalillo County Environmental Health Department. Alburquerque NM. http://www.bernco.gov/departments/environmental_health/reportcard.pdf

Protocol for Assessing Community Excellence in Environmental Health (PACE-EH) in Practice. July 2002. National Association of County and City Health Officials and Centers for Disease Control and Prevention.

Community Tool Box (Spanish and English language). http://ctb.ku.edu

Community Environmental Health Assessment Workbook: A Guide to Evaluating Your Community's Health and Finding Ways to Improve It. 2000. Environmental Law Institute. Washington, DC.

Tools for Public Involvement. www.epa.gov/publicinvolvement/involvework.htm

Assessment of Environmental Health Risks and Issues in Northern Doña Ana County. October 2002. Paul Dulin. Southern Area Health Education Training Center. New Mexico State University. Las Cruces NM.

D. *CEHA STEP #4*: How Do We Prioritize among Ranked Issues and Integrate Environmental Health Initiatives into a Community Health Plan?

Current NMDOH/community health council procedures require that a strategic Comprehensive Community Health Plan be prepared to provide medium- to long-term guidance for the health improvement process. Eventually the plan should include initiatives for action on the prioritized EH issues. The integration of environmental health improvement priorities and actions into existing strategic and annual plans should follow established procedures of the health council's Community Health Improvement Plans. If a health council or CEHA workgroup has initiated a distinct environmental health assessment process (usually related but not necessarily restricted to an issue-specific CEHA) a separate environmental health improvement plan will result from the process.

The ranked group of EH issues resulting from the previous CEHA step is used as a basis for selecting the appropriate interventions to use. Interventions can focus on a single issue or be more broadly focused to deal with several issues. In

If a strategic Comprehensive Community Health Plan already exists, the appropriate objectives, strategies and actions resulting from CEHA should be integrated into the existing plan.

any case, as the group moves into planning an intervention, additional prioritizing of EH issues and approaches for dealing with them may have to occur at this stage in response to:

- *Community perceptions and concerns.* As in any public health effort, if the community feels strongly enough that the issue exposes them to unacceptable health risks, there will be more support to the health council and the CEHA workgroup for dedicating resources to resolving the problem, and more proactive participation of the public in EH management activities. Therefore, perceptions and concerns of the community should constitute one of the criteria used in determining final environmental health priorities to be addressed in a community health plan. Information compiled from focus groups, household surveys, guided interviews and community meetings should be used to prioritize EH actions and interventions.
- *Other priorities of the health council, local, State and Federal agencies*. A number of public health improvement priorities have already been included in Community Health Improvement Plans, such as programs in behavioral health, specific MCH and WIC initiatives. EH improvement priorities need to be balanced with and among these other priorities to yield organizational synergies.
- *The availability of organizational and institutional resources*. If there are insufficient human and institutional resources to deal with the EH issue, then either the health council or workgroup and their respective coalition partners will have to develop those resources (getting collaboration from other agencies, hiring additional staff, training, opening additional field offices), or pass the issue to a lower-tier of priorities.
- *The availability of budgetary resources*. The availability of funds is a determinant in the ability of health councils or CEHA workgroups and their respective coalition partners to respond to budgeting for strategic and annual environmental health plans, as well as overall Comprehensive Community Health Plans. The level of resources available for the annual budgeting process, especially in difficult economic times, can be quite erratic and affect the validity and success of the strategic plan, especially as the intended outreach and intensity of activities are reduced and timelines may be delayed from year to year. Consequently, some environmental health priorities will be placed on hiatus, certain programs may be combined to save money, while others may have to be abandoned altogether for lack of required budgetary resources.
- *Changing environmental, social, political and economic development priorities*. There are always changes to be expected during the lifespan of a strategic plan (5-10 years). Depending on their nature and magnitude, these may require that environmental health improvement priorities be shifted or supplanted, sometimes on a moment's notice. Catastrophic events and disasters, and epidemics require immediate and widespread response, with staff and financial resources shifted to meet these needs. It is very difficult to plan for such problems as West Nile virus, Hantavirus, plague and/or *E. coli* outbreaks with a 5-year planning horizon, other than developing contingency plans. Changing demographics can also change the level of priority for a particular issue. Also, changes in the legislature and executive branches of local, State and Federal agencies can lead to major swings in support for programs not necessarily included in the strategic plan; or simply, important cutbacks in budgets allocated for activities included in the plan. This reality brings even more importance to the annual planning cycle.

Consequently, at least a minimum of three ranked groups of issues (high, moderate, and low priority) are subjected to an additional analysis relating to the five parameters indicated above, and are reprioritized based on the ability of the health council or CEHA workgroup and its coalition partners to

carry out environmental health initiatives for tackling each issue. Responsibility for strategically addressing each of the reprioritized issues resulting from the analysis should then be handled by members of the health council or workgroup in representation of their institution, organization or community to assure that there is sufficient support for the initiative.

Initiatives for taking actions to deal with an EH issue should be presented as part of a strategic plan. This plan should propose the goals and outcome objectives and activities necessary to bring about improvement of EH issues. The plan should also provide an estimate of the institutional/organizational and financial resources that will be necessary for implementing EH actions over a minimum three and maximum 10-year planning horizon. Inasmuch as such a strategic community health improvement plan already exists or will be prepared by a health council or workgroup, then facets of CEHA should be integrated into this effort.

Table 2 provides an illustrative list of EH action initiatives for different types of EH issues. Implementation of the initiatives indicated in the table will require coordinated participation of all coalition partners, including (and especially) local, State of New Mexico and, potentially, Federal authorities with jurisdictional mandates established under applicable laws and regulations. But these initiatives should also be seen as the responsibility of the health council and CEHA workgroup, as well as the community at large, for insisting in the timely treatment and/or solution of each individual EH problem.

Each health council or CEHA workgroup should develop a similar annotated table to guide further development of their respective strategic plan, and then should prepare more detailed descriptive summaries of the activities required to carry them out. These constitute the elements of the health council or CEHA workgroup's *environmental health improvement plan*, or its integration with an existing Comprehensive Community Health Improvement Plan. The environmental health improvement plan should include:

- A description of each basic environmental health improvement activity and subsets of activities as necessary and appropriate;
- Outcome indicators for each activity (see the following section on Indicators);
- Assignment of tasks to each respective coalition partner, including the health council and/or CEHA workgroup; and
- A timeline over the period of validity of the plan (e.g. 3 to 5 years).

Health councils and/or CEHA workgroups are intended to be the catalyst for environmental health improvement in their respective communities, and should play a coordinating and facilitating role in the development of all EH initiatives that figure into their respective environmental health improvement plans. The plans are intended to provide programmatic guidance to all coalition partners in the environmental health improvement process.

Once the strategic plan and basic list of initiatives is completed, then they should be used as a guiding reference for preparing *annual community environmental health improvement plans*. In the case a health council has an existing strategic Comprehensive Community Health Improvement Plan, the annual planning cycle should integrate the results of the CEHA and integrate and/or balance EH improvement activities with established programs. For specific EH improvement plans initiated by CEHA workgroups, the strategic plan will be considered the principal guiding document for the preparation of annual plans.

Table 2: Examples of Environmental Health Improvement Initiatives and Intended Outcome Indicators

Environmental Health Issue	Environmental Health Improvement Actions	Outcome Indicators
1. Solid Waste		
a. Waste accumulation and disposal in yards and neighborhoods; problems with rodents and scavenging dogs and wildlife	i) Develop awareness campaign in affected communities ii) Organize a community clean-up with help from county environmental services iii) Investigate and contract trash services that can be made available to community	• Reduction by 75% of homes with accumulated solid waste • 75% of homes in community with waste collection service
b. Illegal open dump sites on edge of town	i) Organize a community clean-up with help from county environmental services ii) Develop awareness of negative impacts and consequences of illegal open dumping iii) Monitor site and report dumping to authorities	• Removal of 100% of waste from existing dump sites • Reduction in 90% of incidence of illegal dumping with "O" tolerance program
c. Proposed sanitary landfill adjacent to community	i) Develop awareness among community of advantages and disadvantages of landfill ii) Participate in public meetings and hearings concerning environmental social and economic impact assessment and permitting process iii) Ensure that community concerns are considered in design and operation iv) Participate in proactive monitoring of correct operation as detailed in permits	• Landfill sited in appropriate location, designed with best available technology and practices, and operated with little or no nuisance problems as monitored by complaints from community
2. Liquid Waste		
a. Overflowing cesspools during rain events	i) Carry out census of homes' and businesses' sanitary disposal systems ii) Determine problem sites, applicable regulations and situation of each homeowner or business iii) Investigate financing options for installation of proper septic system or connection to municipal system	• Reduction by 50% of homes and businesses with improper septic disposal
b. High organic loading and bacteria in river	i) Investigate and determine potential point and non-point sources of contamination and level of human health risks ii) Determine if discharge permits exist and if in compliance with these iii) Advise those responsible for contamination that they either need to get a permit, comply with existing permit, or change operations	• 75% improvement in water quality of river at monitored locations • 90% of systems in violation brought into compliance with operational standards and discharge permits
c. Strong odors from drain outside of food processing company	i) Investigate and determine the source of the odors; take a sample for laboratory analysis and determine the risks to the community ii) Determine if a discharge permit exists and if the company is in compliance iii) As appropriate, advise the company that they either need to get a permit, comply with existing permit, or change operations to resolve the problem	• Problem corrected • Full compliance of company with operational standards and discharge permit
3. Air Quality		
a. Recurring problems of blowing dust with associated eye and respiratory illness	i) Investigate the origins of the dust and meteorological conditions which instigate it ii) Analyze options for solution, including: pavement of roads; planting of trees and basic landscaping in yards and public spaces to break up wind; home improvements to seal out dust iii) Carry out awareness campaign to directly involve community members in all applicable solutions	• Severity of effects of blowing dust reduced by 40% in affected communities • Reduction of dust levels in 60% of affected homes

Environmental Health Issue	Environmental Health Improvement Actions	Outcome Indicators
b. 15% incidence of chronic asthma rates in children	i) Carry out a household survey to investigate triggers, including: fugitive dust and poorly sealed doors and windows; household mold, mildew and hygiene; presence of solvents or other chemicals in home or in neighborhood; emissions from stoves and furnaces; animals or smokers in the home; possible triggers outside the home, in schools and workplaces ii) Recommend remediation for those triggers determined and educate household members on asthma prevention	• Reduction by half of the incidence of chronic asthma in children
c. Strong odors from nearby chemical plant and associated burning of eyes	i) Investigate and determine the source of the odors and emission; if necessary, take a sample for laboratory analysis and determination of human health risks ii) Determine if an emissions discharge permit exists and if the company is in compliance with permit iii) As appropriate, advise the company that they either need to get a permit, comply with existing permit, or change operations to resolve the problem	• Problem corrected • Full compliance of company with operational standards and emissions discharge permit
4. Mining of Minerals		
a. Contamination of groundwater associated with spoil evaporation pits	i) Take a sample for laboratory analysis and determination of human health risks ii) Investigate and determine potential point and non-point sources of contamination iii) Determine if discharge permits exist and if mine is in compliance with these iv) Advise those responsible for contamination that they either need to get a permit, comply with existing permit, or change operations to resolve the problem	• Correction/remediation of problem and full compliance with operational standards and discharge permits • Remediation program of groundwater problem (or its treatment) operational
b. Acrid dust clouds emanating from mine site	i) Investigate and determine the source of the emissions ii) If necessary, take a sample for laboratory analysis and determination of human health risks iii) Determine if an emissions discharge permit exists and if the company is in compliance iv) As appropriate, advise the company that they either need to get a permit, comply with existing permit, or change operations to resolve problems	• Problem corrected • Full compliance of company with operational standards and emissions discharge permits
c. Proposed mine development near community	i) Develop awareness among community of advantages and disadvantages of having a mine developed in the community ii) Participate in public meetings and hearings concerning environmental, social and economic impact assessment and permitting process iii) Ensure that community concerns are considered in design and operation of the mine iv) Participate in proactive monitoring of correct operation as detailed in permits	• Mine designed and developed based on best available practices and operated with little or no nuisance and human heath problems, and within established standards and norms
5. Oil and Gas Development		
a. Contamination of groundwater community supplies possibly associated with drilling or production	i) Take a sample for laboratory analysis and determination of human health risks ii) Investigate and determine potential point and non-point sources of contamination iii) Determine if discharge permits exist and if operators are in compliance with these iv) Advise those responsible for contamination that they either need to get a permit, comply with existing permit, or change operations to resolve the problem	• Correction of problem and full compliance with operational standards and discharge permits • Remediation program of groundwater problem (or its treatment) operational

Environmental Health Issue	Environmental Health Improvement Actions	Outcome Indicators
b. Strong odors from nearby gas field and associated burning of eyes and headaches	i) Investigate and determine the source of the emissions and how many affected; ii) If necessary, take a sample for laboratory analysis and determination of human health risks iii) Determine if an emissions discharge permit exists and if the operators are in compliance iv) As appropriate, advise the operators that they either need to get a permit, comply with existing permit, or change operations to resolve the problem	• Problems corrected • Full compliance of company with operational standards and emissions discharge permits
c. Reduction in wildlife populations; loss of hunting resources	i) Determine the trends in composition and numbers of wildlife in the affected area ii) Survey owners, residents, hunters and other interested parties as to possible reasons for reduction (poaching, road kills, poisonings, locations of dead animals found) iii) Analyze data, make probable determination of causes, determine if oil and gas operations have direct impact iv) As appropriate, advise operators they are responsible and need to change operations to resolve the problem	• Operation brought into compliance with wildlife protection standards • 50% reduction in wildlife losses and recuperating populations • Monitoring program established with financing of operators
d. Proposed oil and gas development of area just southwest of community	i) Develop awareness among community of advantages and disadvantages of having oil and gas fields developed in the community ii) Participate in public meetings and hearings concerning environmental, social and economic impact assessment and permitting process iii) Ensure that community concerns are considered in design and operation of the development iv) Participate in proactive monitoring of correct operation as detailed in permits	• Development designed on best available technology and practices, and operated within acceptable environmental protection and human health standards
6. Radioactive-based Materials		
a. Cancer cluster determined in community	i) Carry out a household and workplace surveys to investigate demographics and epidemiology of radiation levels in human tissue ii) Investigate potential causes, including: airborne contamination, fugitive dust; poorly sealed doors and windows; improper use of equipment at workplace; contamination of soil or water sources in homes, workplace or in neighborhood iii) If necessary, take a sample for laboratory analysis and determination of human health risks iv) Analyze data and make probable determination of causes, determine if a natural cause or nearby nuclear materials mining, processing or storage facility v) Recommend remediation for those causes determined and educate household members on prevention and primary care options vi) As appropriate, advise operators they are responsible and need to change operations to resolve the problem	• Exposure reduced by 90% with correction of operational standards and adoption of best available technology and safety and health protective equipment • Remediation program initiated for clean-up of problem areas • Establishment of a monitoring database to track prevalence and incidence, and treatment of victims
b. Proposed or actual operation of nuclear waste storage facility in the county	i) Develop public awareness of advantages and disadvantages of having facility in the community ii) Participate in public meetings and hearings concerning environmental, social and economic impact assessment and permitting process iii) Ensure that community concerns are considered in design and/or operation of the development iv) Participate in proactive monitoring of compliance as	• Facility sited at appropriate location that minimizes risk • Facility designed based on best available technology and practices, and operated within acceptable environmental protection and human-based health standards

Environmental Health Issue	Environmental Health Improvement Actions	Outcome Indicators
	detailed in permits and compliance with safeguards	
c. High levels of radioactive contaminants in community water supply	i) Take a sample for laboratory analysis and determination of human health risks ii) Investigate and determine potential point and non-point sources of contamination iii) Determine if discharge permits exist and if operators are in compliance with these iv) Advise those responsible for contamination that they either need to get a permit, comply with existing permit, or change operations to resolve the problem	• Correction of problem and full compliance with operational standards and discharge permits • Remediation program to correct groundwater contamination (or treatment of existing supply and/or development of alternative sources)
7. Agriculture (Pesticide Exposure, Dairies & Feedlots)		
a. Recurring problems of pesticide drift from area farms	i) Investigate and determine the source and types of pesticides being applied and under what conditions (time of day, meteorological conditions) ii) Determine human health risks associated with the particular chemicals in question iii) Determine how many affected and, as necessary, carry out a household and workplace surveys to investigate demographics and epidemiology of any possible cases of intoxications iv) Determine if operator has a pesticide applicator permit and if the operator is in compliance v) As appropriate, advise operators that they either need to get a permit, comply with existing permit, or change operations to resolve the problem vi) Initiate comprehensive training/retraining program for owners and applicators in best practices	• Reduction of cases of pesticide drift by 50% as reported by community and/or investigated by NM Department of Agriculture, Bureau of Pesticide Management • 90% of farm owners and their applicators trained and licensed
b. Odors and flies associated with dairy operation or a feedlot	i) Investigate and determine the source of the odors and flies, and determine the health risks to the community ii) Determine if the owner/operator has a discharge permit exists and if in compliance and applying best practices of fly control and waste disposal iii) As appropriate, advise the owner/operators that they either need to get a permit, comply with existing permit, or change operations to resolve the problem iv) Advise members of surrounding community of findings and make them aware of their rights to participate in proactive monitoring of correct operation of dairy in compliance with permits	• Reduction in complaints among residents by 60% • Reduction by 75% of complaints of nuisance odors from dairy operations
c. High nitrate levels in private wells	i) Take a sample for laboratory analysis and determination of human health risks ii) Investigate and determine potential point and non-point sources of contamination iii) For inefficient operation of septic systems in community, determine problem sites, applicable regulations and situation of each homeowner or business, and investigate financing options for installation of proper septic system or connection to municipal system iv) For farming operations and dairies, determine if discharge permits exist and if operators are in compliance with these v) Advise those responsible for contamination that they either need to get a permit, comply with existing	• Correction of problems at minimum of 50% of operations responsible for contamination • Reversal of nitrate trends and gradual improvement over time (50% in five years), and in full compliance with standards • Remediation of wells, improved treatment, and/or establishment of alternative sources of water

Environmental Health Issue	Environmental Health Improvement Actions	Outcome Indicators
	permit, or change operations to resolve the problem	
d. High incidence of injury in worker population at local dairy	i) Investigate nature, incidence and prevalence of injuries at local clinics and hospitals ii) Carry out household and workplace surveys to investigate demographics and epidemiology of injuries iii) Determine if dairy in compliance with OSHA guidelines and best practices iv) Advise owner/operator of any required improvements in infrastructure and operations needed to reduce risk of injury v) Advise workers of their rights to a safe and healthy workplace and avenues for complaint	• Reduction of 50% in incidence of injury among dairy workers • Dairy in full compliance with OSHA standards and regulations
8. In-Home Environmental Health and Safety		
a. Four deaths of children associated with poisonings in area homes, and two deaths attributed to house fires	i) Develop combined household EH risk audits and awareness campaign for community ii) Determine types and incidence of EH risks on case-by-case basis and make recommendations for immediate remediation of risks (lead, pesticides, electrical hazards, fire hazards, etc.) iii) Provide incentives for participation, especially those that will contribute to reduction of in-home EH risks, including: smoke alarms and extinguishers, cabinet and drawer locks, and electrical receptacle covers	• 100% reduction ("O" cases) of in-home poisoning • Reduction of in-home fire risk in 75% of homes
b. Chronic asthma in 25% of children in a particular neighborhood	i) Carry out a household survey to investigate triggers, including: fugitive dust and poorly sealed doors and windows; household mold, mildew and hygiene; presence of solvents or other chemicals in home or in neighborhood; emissions from stoves and furnaces; animals or smokers in the home; possible triggers outside the home, in schools and workplaces ii) Recommend remediation for those triggers determined and educate household members on asthma prevention	• Reduction by 75% in the incidence of chronic asthma in children
c. Recurring Hepatitis A outbreaks in particular neighborhood	i) Carry out a household and workplace surveys to investigate illness demographics and epidemiology ii) Investigate potential causes, including: food preparation practices at home; improper hygiene and hand washing; sources of food purchased; restaurants or homes where other food or drink consumed; contamination of soil or water sources in homes, workplace or in neighborhood iii) If necessary, take a food, water or blood samples for analysis and determination of health risks iv) Analyze data and determine causes and sources v) Recommend remediation for those causes determined and educate household and community members on prevention and primary care options vi) As appropriate, advise any other home, workplace or restaurant of contamination risks	• 100% reduction ("O" cases) of Hepatitis A attributed to risk factors in the homes and affected neighborhood

Appendix D of the Tool Box includes a list of resources, including comprehensive procedural manuals useful in integrating environmental health into community health plans.

For more guidance on preparing Community Environmental Health Improvement Plans, see:

Improving the Health of Your Community—From Community Building to Community Action. Improving Health Initiative Training Series. 2002. NMDOH, Community Health Improvement Training Institute. Santa Fe NM.

Community Tool Box. University of Kansas. http://ctb.ku.edu/tools/ ; and for Spanish language tools see http://ctb.ku.edu/tools/es/tools

Iowa Department of Public Health. Community Health Needs Assessment & Health Improvement Plan Toolkit. http://www.idph.state.ia.us/chnahip/common/pdf/toolkit_complete.pdf

The Community Visioning and Strategic Planning Handbook. The National Civic League. Denver CO.

Protocol for Assessing Excellence in Environmental Health/PACE-EH: A Guidebook for Local Health Councils. May 2000. Centers for Disease Control and Prevention, and National Association of County and City Health Officials. Atlanta

E. *CEHA STEP #5*: What Are Indicators of Environmental Health and How Do We Evaluate Progress toward Environmental Health Objectives?

Indicators will need to be established for monitoring progress toward meeting the objectives and goals set out in the strategic and annual community environmental health plans. Indicators will be developed based on data collected and made available by local, State and Federal agencies and by researchers from universities, specialized centers and foundations. Indicators may also be generated by the health councils and CEHA workgroups themselves. Based on the ongoing monitoring and evaluation of these indicators, community environmental health plans could be modified.

1. What are indicators?

According to the *Neighborhood Environmental Indicators Project (*www.neip.org): "indicators are packages of information that can be tracked over time to gauge change." They are measurable pieces of information that provide a picture of a given situation over time, for instance: the condition of the environment, the quality of life in a community, or health status of the community among many other examples. Indicators should be considered within a framework of measuring progress toward achieving the goals and objectives of the environmental health initiatives developed to address priority environmental health problems. Outcome measurement is important for understanding the effectiveness of your action plans and determining if changes need to be made to improve program effectiveness. The United Way's *Measuring Program Outcomes: A Practical Approach* (1996) provides an excellent step-by-step guide for developing a logic model and determining the outcome indicators that are important to track.

2. What kind of environmental health indicators are there?

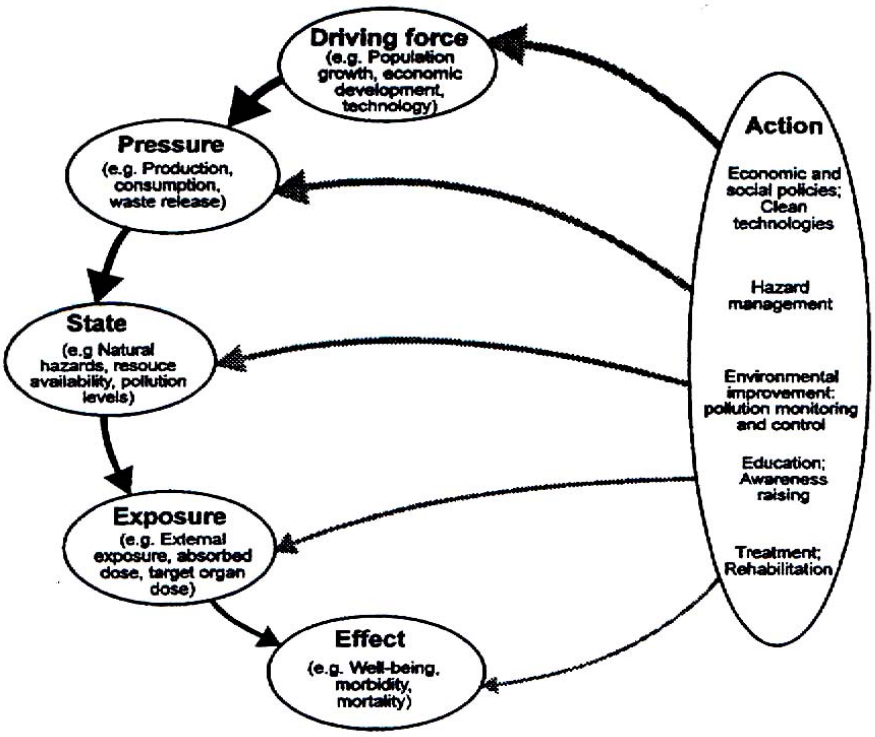
The Centers for Disease Control and Prevention (CDC) National Center for Environmental Health (NCEH) has developed "environmental public health indicators" (EPHIs) to assess health status or risk as it relates to the environment. These indicators are designed to aid states in achieving the objectives of *Healthy People 2010* and to help in developing environmental health surveillance programs. The indicators fall into four broad categories.

- *Hazard indicators* measure conditions or activities with the potential for exposure to a contaminant or hazard.

- *Exposure indicators* are biological measurements that express the concentration of a substance in tissues or fluids that could cause harm.
- *Health effect indicators* are those diseases or conditions that suggest exposure to a known or suspected environmental contaminant or hazard.
- *Intervention indicators* are programs or policies that mitigate the environmental hazard, exposure or health effect. The NCEH Environmental Public Health Indicators Project webpage provides a database of indicators and comprehensive links to a variety of sources for indicator data.

The United Nations Environment Program, World Health Organization and U.S. Environmental Protection Agency have developed the "DPSEEA Framework" for understanding the interactions of the environment and human health, and actions required to manage them (*Environmental Health Indicators: Framework and Methodologies*, World Health Organization, 1999). The Framework facilitates health councils' and CEHA workgroups' understanding of the linkages of EH issues with the environmental health improvement actions required to treat them and, in turn, to develop effective indicators to measure progress toward program goals and objectives.

The DPSEEA Framework



Driving forces (that you see at the top of the Framework) are considered the demographic, social, political, regulatory and economic factors that influence the environment and health. For instance, population and economic development drive human settlement patterns that can degrade the environment. Economic activities such as energy production, mining, agriculture, transportation, and manufacturing influence the environment and health.

In terms of industrial production, EH *pressures* exist at all stages in the production lifecycle: resource extraction, processing, distribution, consumption and waste generation. These pressures impact the environment and change the condition or *state* of the environment. Thus industrial activities may emit pollutants that negatively impact air quality or discharge effluent into surface waters that impairs water quality. People are *exposed* to these environmental hazards through particular pathways into the human organism that in turn lead to adverse health *effects*. There are also ecological effects and quality of life impacts that can be considered in this category.

Each of these aspects requires *actions* that are related to a specific indicator to measure the outcomes of the action. The health council and/or CEHA workgroup should decide which indicators in this framework will be the most useful in tracking progress towards goals. For instance, because data for air pollution-induced respiratory health effects may be unavailable, using ambient air quality concentrations as an indicator may be more appropriate to measure progress toward reducing risk of exposure to air pollutants.

3. Where does indicator data come from?

There are two principal sources for indicator data. The first source are those data sets that are already being collected by local and State agencies (health councils, municipal and county health and environmental agencies, NMDOH, NMED, Councils of Government), university researchers and specialized centers and foundations, and Federally-financed efforts by U.S.EPA, CDC, HUD and others. When considering this secondary data for use as an indicator it is important that the data be of sufficient quality and completeness to serve its intended purpose.

An important aspect of this data is that which is based on standards that are used by regulatory agencies. The standards are based on thresholds of tolerances equal to or below which human health is deemed to be protected and/or which the environment can absorb or buffer without becoming irreversibly degraded, and are used for monitoring and controlling the most important environmental health issues. Air, water, food safety, and occupational safety are examples of areas that have standards.

Indicators are then tracked for their variances in comparison with set standards using *minimum contaminant levels* (MCLs) or similar threshold levels. If the monitoring of the indicator shows a value below the MCL, then human health is considered to be safe. Conversely, if values are higher than the MCL, then the indicator shows a violation and potential health hazard, and actions must be taken to resolve the problem. If an environmental improvement action is taken and the contaminant drops back below the MCL, then that makes for a strong indicator that the action was successful and EH has been improved.

The other source is primary data that should be generated as part of the assessment process used by the health councils and CEHA workgroups. Focus groups, surveys, household interviews, town meetings, and other mechanisms—including local sampling of environmental and health parameters such as water and air quality analysis—may be used to assess progress in meeting the goals and objectives established in strategic and annual health improvement plans.

4. What are the characteristics of a good indicator?

CEHA workgroups can use their own "local" indicators based on these primary data. In both cases, emphasis should be placed on determining a minimum of indicators that answer questions related to the accomplishment of the objectives of the community environmental health plan. Also, as much as possible, indicators should be *evidenced-based* and quantitative, although qualitative indicators associated with the perceptions of members of the community (focus groups, guided interviews,

surveys, etc.) can also be used as part of the indicator set. As illustrated below, there are two popular codes for remembering the characteristics of a good indicator: *Smart and Cream*.

SMART & CREAM

Specific	Clear
Measurable	**Relevant**
Achievable	**Economic**
Relevant	**Achievable**
Targeted	**Measurable**

As indicated in the illustration, indicators should *specific and clear*, and not be subject to different interpretations. Selected indicators should be *measurable* in order to see increasing or decreasing trends toward the goals set for a particular health improvement action. Indicators should be directly *relevant* and *targeted* to a particular EH issue and its related health improvement goal. The indicator should be *achievable* based on the realities faced by your community, health council and CEHA workgroup, and not based on pie-in-the-sky hopes. Finally, the indicator should be cost-efficient in an *economic* sense, both from the standpoint of the costs of carrying out the EH improvement action and from the costs of taking data to track the indicator.

While New Mexico does not yet have a comprehensive system for integrally tracking indicators of all aspects of public health (including EH) for all of its health councils, there are examples of such systems in use in other states. The Iowa Department of Public Health (IDPA) has developed its own comprehensive *Family and Community Health Indicator Tracking System* (FACITS). This system, which is linked to the Department's Community Health Needs Assessment and Health Improvement Plans, combines data across a broad range of health (maternal and child, behavioral, environmental), infectious disease, morbidity/mortality, demographic, vocational, schools, neighborhood configurations, and other factors for each of the state's counties. Statistical data are updated annually and are made available online for all users, both professional and laypersons. The data are used as indicators for evaluating progress in the implementation of health improvement plans. The IDPA home page offers an excellent glossary used in the public health sector (http://www.idph.state.ia.us/ihits/default.asp).

Table 2, located in the preceding section of the Tool Box, provides a series of examples of outcome indicators directly linked to various EH issues commonly found in New Mexico and to a series of potential environmental health improvement actions. Some of these indicators are based on meeting standards set by local, State or Federal regulations, while others are simple indicators of completion of an activity or the solution to a problem. *Appendix C* of the Tool Box provides a list of indicators and sources of data for the most common environmental health concerns in New Mexico.

For more information concerning Indicators of Environmental Health, see especially:

Environmental Public Health Indicators Project. Centers for Disease Control and Prevention. www.cdc.gov/nceh/indicators/default.htm

Environmental Health Indicators: Framework and Methodologies. 1999. David Briggs. World Health Organization. Geneva. www.who.int/environmental_information/Information_resources/documents/Indicators/EHIndicators.pdf

Iowa Department of Public Health, Family and Community Health Indicator Tracking System (FACITS). http://www.idph.state.ia.us/ihits/default.asp

Neighborhood Environmental Indicators Project. www.neip.org

Green Communities Indicators. www.epa.gov/greenkit/indicator.htm

Public Assistance Records: A Source for Neighborhood Indicators. September 1999. Claudia Colton. The Urban Institute. Washington, DC. www.urban.org/nnip/publications.html

Check Your Success: A Community Guide to Developing Indicators. www.uap.vt.edu/checkyoursuccess

Guide to Sustainable Community Indicators. 1999. Maureen Hart. www.sustainablemeasures.com

Measuring Program Outcomes: A Practical Approach. 1996. United Way. http://national.unitedway.org/outcomes/resources/mpo/steps.cfm

IV. How Do We Obtain Technical Assistance and Financing for Community Environmental Health Assessments?

This Tool Box is only one of several resources necessary to carry out an effective community environmental health assessment. Experience in other states and municipalities throughout the country and in several instances in New Mexico demonstrate that two other ingredients are necessary for effective implementation of CEHA:

- *Someone to go to* if a health council or workgroup has questions concerning a CEHA procedure, interpretation of environmental health risk data, or strategies and methods for tackling certain environmental health issues; and
- *Funding* for financing the application of CEHA, including the costs of data searches and specialty services (e.g. GIS mapping), collection of additional primary data (surveys, guided interviews, focus groups, and their analysis), community or town meetings, and costs of media outreach, training and reproduction of reports.

Appendix E of this Tool Box, *Institutional and Organizational Resources for Guidance in Community Environmental Health Assessments,* presents a directory of local, State, regional and national public and private sector institutional and organizational contacts that can provide assistance in certain aspects of CEHA procedures depending on their respective mission and capabilities. As CEHA is in its infancy in New Mexico, members of health councils and workgroups need to understand that not all of their questions can be answered by contacting these entities; but can help guide you in the best possible direction. It is also hoped that health councils, CEHA workgroups, State and county agencies and advocacy organizations will mutually share their experiences with their peers

in other counties and communities so that their "lessons learned" can contribute to the success of other CEHA efforts.

Appendix G of the Tool Box, *Sources of Grant Funding for Community Environmental Health Assessments,* lists a number of local, State, regional and national publications and websites, public and private where health councils, workgroups, agencies and advocacy organizations can apply for funding for CEHA efforts. It should be understood, however, that most all of these sources have limited funding to be made available and use a competitive process for selecting grantees based on selection criteria and the quality of proposals. Interested parties will need to develop their capacity in grant writing. In most cases, matching of grant funds is required. Grantees may consider with the use of other funds or in-kind contributions of staff and material resources from agencies and organizations that are members of the health council or workgroup, or at least constitute part of the coalition that supports the CEHA effort in the community where the CEHA will be implemented.

V. Where and How Can We Receive Training in CEHA?

Many facets of the CEHA process presented in this Tool Box may be challenging to certain health councils and community workgroups, and the agencies and advocacy organizations that support them. Again, the Tool Box is only a resource guide and certainly does not cover in depth all of the knowledge and skill areas that will be necessary to successfully carry out a CEHA. It is expected that many of the members, if not most, of health councils, workgroups, and staff of agencies and advocacy organizations will need training in differing aspects of the CEHA procedure, as well as to develop a basic understanding of the terminology used in environmental health, risk assessments and in the strategies and approaches for solving the priority environmental health issues affecting their respective communities.

NMDOH's *Community Health Improvement Training Institute* (CHITI) has been at the forefront of providing substantive training of members and staff of community health councils throughout New Mexico. Recently, CHITI has included training modules aimed at building capacity of health councils in CEHA. This Tool Box is one of the principal references that will be used for facilitating this training. The training module will include more education as to EH concepts and terminology, instruction in the procedural steps of CEHA, use of environmental and health data as part of environmental health risk assessment, and more practical and hands-on application of many of the tools introduced in the Tool Box.

In addition to the CHITI initiative, *Appendix F* of the Tool Box, *Selected Training Modules and Materials Useful for Facilitating Environmental Health Assessments in New Mexico Communities*, provides an annotated list of training resources determined to be appropriate for the New Mexico setting, including various resources in Spanish. A number of these resources can be used as-is for training in environmental health concepts. Still others can be adapted and/or used as a reference by health councils, CEHA workgroups, public health and environmental agencies, and advocacy organizations to develop their own training modules considering local social, economic and environmental conditions, whether for training in comprehensive or issue-specific CEHA procedures.

Community Environmental Health Assessment Tool Box for New Mexico (CEHA-NM)

APPENDIX A: Glossary Environmental Terms and Definitions

Acid: A corrosive (destructive) solution. Vinegar is a common weak acid; batteryacid is a stronger acid.

Acid Rain: When emissions of sulfur and nitrogen compounds from power plants burning coal are transformed by chemical processes in the atmosphere and fall as rain, snow, or fog.

Active Ingredient: In any pesticide product, the component that kills or controls pests. Pesticides are regulated primarily on the basis of active ingredients.

Acute Effect: A harmful effect on any living organism in which severe symptoms develop rapidly and may go away after the exposure stops.

Acute Toxicity: Adverse effects that result from a single dose or single exposure of a chemical.

Acceptable Daily Intake (ADI): An estimate of the daily dose that is likely to be without harmful effect even if this amount is consumed every day.

Agency for Toxic Substances and Disease Registry (A TSDR): A U.S. government agency that conducts research focused on toxic substances and their effects on public health. Programs include health studies, substance-specific research, and maintaining various disease registries.

Air Quality Standards: The level of selected pollutants set by law that may not be exceeded in outside air. Used to determine the amount of pollutants that may be emitted by industry. See NAAQS.

Aquifer: An underground layer of rock, gravel or sand that is saturated with water, which can be pumped out.

Asbestos: A mineral fiber used for insulation that can pollute air or water and cause cancer or asbestosis when inhaled. EPA severely restricted the use of asbestos in manufacturing and construction.

Bactericide: A chemical used to control or destroy bacteria, typically in the home, schools, or hospitals.

Biochemicals: Chemicals that are either naturally occurring or identical to naturally occurring substances. Examples include hormones. Biochemicals function as pesticides. Biochemicals tend to be environmentally compatible and are important to Integrated Pest Management programs.

Biodegradable: The ability of a substance to be broken down physically and/or chemically in the environment. For example, many chemicals, food scraps, cotton, wool, and paper are biodegradable; plastics and polyester are not.

Biomarker: Indicators of the presence of a chemical in the body or an indicator of damage to a cell or to DNA.

Bioremediation: The use *of* living organisms (like bacteria) to clean up oil spills or breakdown other pollutants .in soil, water, and wastewater.

By-product: Materials, other than the intended product, generated as a result *of* an industrial process.

Carcinogenic or Carcinogen: A substance capable *of* causing cancer in humans or animals.

Chemical Abstracts Service Number (CAS#): A unique number assigned by the Chemical Abstracts Service to identify every single chemical.

Centers for Disease Control (CDC): The agency in charge of promoting health and quality of life by preventing and controlling disease, injury, and disability.

Cancer Effect level (CEL): The lowest dose *of* chemical in a study or group *of* studies that produces significant increases in the incidence *of* cancer (or tumors).

Comprehensive Environmental Response, Compensation, and liability Information System (CERCUS): A federal database that includes all sites that have been nominated for investigation by the Superfund program and the actions that have been taken at these sites.

Code of Federal Regulations (CFR): Specific federal regulations (accessible at any library).

Chlorination: Adding chlorine to water or wastewater to destroy bacteria, viruses, and other microorganisms.

Chlorofluorocarbons (CFCs): A family *of* chemicals commonly used in air conditioners and refrigerators as coolants. CFCs can move in to the upper atmosphere and destroy the ozone layer.

Chronic Effect: An adverse effect on any living organism in which symptoms develop slowly over a long period of time or recur frequently.

Clean Air Act (CAA): The comprehensive federal law that regulates air emissions from all sources. This law authorizes the EPA to establish National Ambient Air Quality Standards (NMQS) to protect public health and the environment. Clean Water Act (CW A): The federal law regulating discharges *of* pollutants to surface waters. This law gave the EPA the authority to set effluent standards on an industry-by-industry basis and to set water quality standards for all contaminants in surface waters.

Climate Change: Changes in weather worldwide from the buildup of man-made gases in the atmosphere that trap the sun's heat. Often referred to as global warming or the green house effect.

Carbon Monoxide (CO): A colorless, odorless, poisonous gas from the incomplete burning *of* fuel. Cars and trucks are the major source *of* CO.

Compliance: If a facility is in compliance, it is meeting the pollution laws and regulations.

Compost: Organic material that is produced when bacteria in soil break down biodegradable garbage or trash, making organic fertilizer. Gardeners and farmers use compost for soil enrichment.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund): Provides a federal fund to clean up uncontrolled or abandoned hazardous waste sites as well as accidents, spills, and other emergency releases of pollutants and contaminants into the environment.

Concentration: The amount of a substance (mass) mixed with another substance (volume). An example is five parts per million of carbon monoxide in air or 1 milligram/liter of iron in water.

Confounder: A factor associated with exposure and with a disease under study. It often distorts the results of a health study. Corrosive: A substance that' eats' or 'wears away' materials by chemical reactions.

Dechlorination: Removal of chlorine from water.

Deep Well Injection: A process by which waste fluids are injected deep below the surface of the earth.

Demographics: Information about a population such as the number of people, education levels, and income levels.

Department of Justice (DOJ): US government agency responsible for enforcing federal laws. The Environment and Natural Resources Division acts as the nation's environmental lawyer.

Detection Limit: The lowest concentration of a chemical that scientific instruments can detect.

Discharge: The release of any waste into the environment from a point source. Usually refers to the release of a liquid waste into a body of water through a pipe, but also refers to air emissions.

Disposal: The discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste or hazardous waste into the environment (land, surface water, ground water, or air).

Disposal Facility: A landfill, incinerator, or other facility, which receives waste for disposal except wastewater treatment.

Dissolved Oxygen (DO): Oxygen that is freely available in water to sustain the lives of fish and other aquatic organisms.

Dose: The amount of a substance taken into the body over a given period of time.

Dose Response: How an organism's response to a toxic substance changes as overall exposure to the substance changes. For example, a small dose *of* carbon monoxide may cause drowsiness; large dose can be fatal.

Dump: A land site where wastes are discarded in a disorderly fashion without regard to protecting the environment. Problems associated with dumps include multiplication of disease-carrying organisms and pests, fires, and air and water pollution.

Drinking Water Equivalent level (DWEL): The concentration chemicals in drinking water that does not cause harmful effects over a lifetime of exposure.

Ecology: The study of the relationships between all living organisms and the environment.

Ecosystem: The collection of all living organisms and the physical components (e.g. land and water) in an area.

Effluent: Wastewater discharged from a point source, such as a pipe.

Effluent Limitations: Limits on the amounts of pollutants that may be discharged by a facility. These limits are calculated so that water quality standards will not be violated.

Emergency Planning and Community Right-to-Know Act (EPCRA): Also known as Title III of SARA. Congress enacted EPCRA as the national legislation on community safety. This law was designed to help local communities protect public health, safety, and the environment from chemical hazards.

Emission: The release or discharge of a substance into the environment. Generally refers to the release of gases or particulates into the air.

Emission Standards: Government standards that establish limits on discharges of pollutants into the environment (usually into air).

Endangered Species: Animals, plants or other living organisms in danger of extinction by man-made or natural changes in the environment.

Environmental Assessment (EA): A preliminary, written, environmental analysis to determine whether a federal activity such as building airports or highways would significantly affect the environment It may require preparation of a more detailed Environmental Impact Statement.

Environmental Audit: An independent assessment (not conducted by EPA) of a facility's compliance policies, practices, and controls. Many pollution prevention initiatives require an audit to determine where wastes may be reduced or eliminated or energy conserved.

Environmental Equity: Equal protection from environmental hazards for individuals, groups or communities regardless of race, ethnicity, or economic status.

Environmental Impact Statement (EIS): A document prepared by or for EPA, which identifies and analyzes, in detail, environmental impacts of a proposed action. It is a tool for decision-making that describes positive and negative effects and lists alternatives.

Environmental Justice: The fair treatment of people of all races, cultures, incomes, and educational levels with respect to the development and enforcement of Environmental laws, regulations, and policies.

Environmental Protection Agency (EPA): The federal agency in charge of enforcing environmental regulations for the protection of human health and the environment.

Epidemiologist: A scientist who studies the various factors involved in the incidence, distribution, and control of disease in a population.

Erosion: The movement of soil by wind or water, intensified by land-clearing practices related to farming, residential or industrial development, road building, or tree farming.

Estuary: A complex ecosystem between a river and near-shore ocean waters where fresh and salt water mix. These areas include bays, mouths of rivers, wetlands, and lagoons and are influenced by tides and currents. Estuaries provide valuable habitat for marine animals, birds, and other wildlife.

Exceedances: Violation of the pollutant levels permitted by environmental protection standards.

Exposure: Chemicals, radiation or pollutants that come into contact with the body and present a potential health threat. The most common routes of exposure are inhalation, ingestion, and absorption.

Extremely Hazardous Substances (EHS): Chemicals or substances identified by the EPA as being very reactive or toxic.

Fecal Coliform Bacteria: Bacteria found in the intestinal tracts of mammals. These bacteria in later are an indicator of fecal pollution and possible contamination by disease-causing microorganisms.

Flammable: Any material that can be caught on fire easily and that will bum rapidly.

Freedom of Information Act (FOIA): The law that allows the public to obtain information from the federal government.

Federal Register: The federal document with the latest regulatory information and important notices from all U.S. government agencies.

Fugitive Emissions: Emissions to air that are not coming from a specific source. They are uncontrolled and difficult to monitor.

Fungicide: A pesticide used to control or destroy fungi on food or grain crops.

Garbage: Food wastes (animal and vegetable) resulting from the handling, storage, packaging, sale, preparation, cooking, and serving of foods.

Genotoxicity: Toxicity that damages genetic material.

Gastrointestinal tract (GO: The gastrointestinal tract refers to the stomach and small intestine of the body.

Ground Water: Water found below the surface of the land, usually in porous rock formations. Ground water is the source of water found in wells and springs and is used frequently for drinking.

Hazardous Air Pollutants (HAP): Air pollutants that are not covered by the NAAQS, but which can cause health problems.

Hazardous Waste: Wastes that pose substantial or potential threats to public health or the environment and is specifically listed as a hazardous waste by EPA. It has one or more of the characteristics of hazardous wastes ignitability, corrosiveness, reactivity, and toxicity).

Health Assessment: An evaluation of available data on existing or potential risks.

Heavy Metal: A common hazardous waste that can damage organisms at low concentrations and tends to accumulate in the food chain.

Herbicide: A pesticide designed to control or kill plants, weeds, or grasses. Almost 70% of all pesticides used by farmers and ranchers are herbicides.

Department of Health and Human Services (DHHS): The federal agency responsible for protecting the health of all Americans and providing essential human services, especially for those who are least able to help themselves.

Household or Domestic Waste: Solid waste composed of garbage and trash, which normally originates from residential, private households, or apartment buildings. Domestic waste may contain a significant amount of toxic or hazardous waste from improperly discarded pesticides, paints, batteries, and cleaners.

Incidence: The number of new illnesses in a population over a certain period of time, normally one year.

Incineration: The destruction of solid, liquid, or gaseous wastes by controlled burning at high temperatures.

Incinerator: A furnace for the burning of waste materials using controlled flame combustion.

Industrial Waste: Unwanted materials such as liquid wastes, sludge, solid wastes, and hazardous wastes, produced by industries.

Inert ingredients: "Non-active" substances, such as water, petroleum solutions, talc, com meal, or soaps. When discussing pesticides, inert ingredients do not attack a particular pest, but some are chemically or biologically active, causing health and environmental problems.

Initiation: The first phase of cancer.

Inorganic: Chemical substances of mineral origin.

Insecticide: A pesticide compound specifically used to kill or prevent the growth of insects.

Integrated Pest Management (lPM): A combination of biological, cultural, and genetic pest control methods with use of pesticides as the last resort.

Intemal Dose: The actual quantity of a chemical inside the organism, normally measured in the blood.

Inversion: An atmospheric condition caused by increasing temperature with elevation, resulting in a layer of warm air preventing the rise of cooler air trapped beneath. This condition prevents the dispersion of pollutants, increasing their concentration. Trapping pollutants near the ground increases ozone to harmful levels.

Integrated Risk Information System (IRIS): A database with information about the toxic effects of chemicals and safe levels of exposure.

Irradiated Food: Food that has been briefly exposed to radioactivity (usually gamma rays) to kill insects, bacteria, and mold. Irradiated food can be stored without refrigeration or chemical preservatives for a long period of time.

Lagoon: A shallow, artificial treatment pond where sunlight, bacterial action, and oxygen work to purify wastewater. Also called a stabilization pond or aerated lagoon.

Landfill: A method *for* final disposal of solid waste on land. The waste is compacted and put into the ground and then covered with soil.

Landfill Closure: The procedure an operator must go through when a landfill is filled. No more waste can be accepted and a seal usually is placed over the site. Monitoring is required after the site has been closed.

Leacheate: Water that penetrates a landfill and can pick up dissolved, suspended, and/ or microbial contaminants from the waste.

Lead (Pb): A toxic heavy metal affecting the nervous system; it accumulates in the body and is stored in bone.

Lethal Concentration 50 (LC 50): The concentration of a gaseous chemical, which causes 50% of the test organisms to die. It is a common measure of acute toxicity.

Lethal Dose 50 (LD 50): The dose of a chemical that will kill 50% of test organisms within a designated period of time. The lower the LD 50, the more toxic the compound.

Liner: A layer of natural clay or sheet of plastic which serves as a barrier to restrict leacheate from reaching or mixing with ground water in landfills or lagoons.

Lowest Observed Adverse Effect Level (LOAEL): The lowest dose used in a study that caused a harmful health effect.

Local Emergency Planning Committee (LEPC): A committee appointed by the State Emergency Response Commission (SERC), which develops comprehensive emergency plans, collects chemical release reports, and provides this information to the public.

Malformations: Permanent structural changes in a fetus or infant that may adversely affect survival, development, or function. Material Safety Data Sheet (MSDS): Printed material concerning a hazardous chemical, or Extremely Hazardous Substance, including its physical properties, hazards to personnel, fire and explosion potential, safe handling recommendations, health effects, fire fighting techniques, reactivity, and proper disposal.

Maximum Contaminant Level (MCL): The maximum permissible level of a contaminant in drinking water from a public water system. The MCL's are enforceable standards.

Maximum Contaminant level Goal (MClG): The concentration of a contaminant in drinking water which would be expected to not cause any harm even if the water is consumed every day for a lifetime.

Medical Waste: All wastes from hospitals, clinics, or other health care facilities that contain or have come into contact with diseased tissues or infectious microorganisms.

Microorganisms: Bacteria, mold, simple fungi, algae, protozoa, and a number of other organisms that are microscopic in size. Most are beneficial but some produce disease. Others are involved in composting and sewage treatment.

Minimization: Measures or techniques that reduce the amount of wastes generated during industrial production processes. This term also is applied to recycling and other efforts to reduce the volume of waste going to landfills. This is the same as waste reduction or waste minimization.

Mitigation: Measures taken to reduce adverse effects on the environment.

Monitoring Well: A well used to take water samples or to measure ground water levels.

Morbidity: Illness.

Mortality: Death.

Minimal Risk levels (MRL): An estimate of daily human exposure to a chemical that is likely to be without risk or adverse effects over a specified duration of exposure.

Mutagenic: The ability of a substance to cause changes in the DNA.

National Ambient Air Quality Standards (NAAQS): (ambient) air standards established by the EPA according to the Clean Air Act.

National Environmental Policy Act of 1969 (NEPA): Federal legislation requiring that all branches of government give proper consideration to the environment before taking any major action.

National Pollutant Discharge Elimination System (NPDES): The primary permitting program under the Clean Water Act, which regulates all discharges to surface water.

National Priorities List (NPL): The EPA's list of the most serious uncontrolled or abandoned hazardous waste sites.

National Emission Standards for Hazardous Air Pollutants (NESHAP): Emission standards set by the EPA for HAPs not covered by NAAQS that may cause an increase in illness or death.

National Institutes of Health (NIH): One of eight health agencies of the U.S. Public Health Service that is the focal point for biomedical research in the United States.

National Institute for Occupational Safety and Health (NIOSH): A research agency for the prevention of work related illnesses.

National Library of Medicine (NLM): The world's largest medical library, where materials in all major areas of the health sciences are collected.

No Observed Adverse Effect level (NOAEL): The highest level of exposure that does not cause observable harm.

No Observed Effect level (NOEL): The highest level of exposure that does not cause any observable effect.

Nitrogen dioxide (N02): An irritant and asphyxiate gas that worsens lung diseases and leads to formation of ozone. Motorized vehicles are the largest source of NO2

Non-Attainment Areas: Areas of the United States that do not meet the National Ambient Air Quality Standards by deadlines set in the Clean Air Act.

Non-point Source: Any source of pollution not associated with a distinct discharge point; includes sources such as runoff from agricultural lands, industrial sites, and parking lots, as well as escaping gases from pipes and fittings.

National Technical Information Service (NTIS): Part of the U.S. Department of Commerce. NTIS is the official resource for government-sponsored scientific, technical, engineering, and business-related information.

National Toxicology Program (NTP): A program that designs, conducts, and interprets animal experiments for toxicity and carcinogenicity.

Ozone (O3): The principal component of smog, which forms from vehicle emissions in the presence of sunlight.

Occupational Safety and Health Administration (OSHA): An agency that is located in the Department of labor and is responsible for creating and enforcing workplace safety and heath regulations.

Odds Ratio (OR): A measure of the increase in the chance of disease for a person who is exposed to a chemical as compared to a person who is not exposed.

Organic: A chemical made with carbon; includes most pesticides and solvents.

Organically Grown: Food, feed crops, and livestock grown without any pesticides or hormones.

Organism: Any living being, plant, mammal, bird, insect, reptile, fish or bacterium.

Oxidant: A chemical that can react chemically with other substances. Ozone is an oxidant that can damage lung tissue if it is breathed, or can destroy microorganisms if it is added to drinking later.

Parameter: A measurable property. Temperature, pressure, and density are parameters of the atmosphere.

Particulates: Liquid or solid particles such as dust, smoke, mist, or smog found in air emissions.

Particulate Matter (PM1o): Ash, smoke, soot, dust, fibers, and liquid materials such as droplets and aerosols.

Pathogen: A bacterial organism capable of producing disease.

Permit: A legal document issued by state and/or federal authorities containing a detailed description of the proposed activity and operating procedures as well as appropriate requirements and regulations.

Pesticide: Substances intended to repel, kill, or control 'pests' like weeds, insects, rodents, fungi, bacteria, or other organisms. The family of pesticides includes herbicides, insecticides, rodenticides, fungicides, and bactericides.

Plume: The area which will be polluted by a contaminant after it is released.

Point Source: A stationary location or fixed facility such as an industry or municipality that discharges pollutants into air or surface water through pipes, ditches, lagoons, wells, or stacks a single identifiable source such as a ship or a mine.

Pollution: Any substance in water, soil, or air that degrades the natural quality of the environment, offends the senses of sight, taste, or smell, or causes a health hazard.

Pollution Prevention: Conserving energy, minimizing wastes, material substitutions, alterations, and product improvements to reduce the amount of pollution produced.

Polychlorinated Biphenyl (PCBs): A group of toxic chemicals used in electrical transformers and capacitors. PCBs were banned in 1979.

Potable Water: Water that is considered safe to drink.

Potentially Responsible Party (PRP): Any individual or company that is potentially responsible for or has contributed to a spill or other contamination at a Superfund site. Whenever possible, the EPA requires PRPs to clean up sites they have contaminated.

Prevalence: The current number of people suffering from an illness at a given point in time.

Primary Pollutants: Air pollutants that can affect health. Promotion: The second phase of cancer.

Publicly Owned Treatment Works (POTW): A municipal or public service district wastewater treatment system.

Quality Assurance/Quality Control: A system of procedures, checks, audits, and corrective actions to ensure that all technical, operational, monitoring, and reporting activities are of the highest achievable quality.

Radioactive Waste: Any waste that emits radiation.

Radionuclides: Radioactive particles, man-made or natural.

Radon: A colorless, naturally occurring gas formed by radioactive decay of uranium. Radon accumulating in basements and other areas of buildings without proper ventilation has been identified as an important cause of lung cancer.

Raw Water: Water prior to any treatment or use.

Reactivity: Refers to those hazardous wastes that are unstable and can undergo violent chemical changes, but do not explode.

Receiving Waters: A river, lake, ocean, stream, or other body of water into which wastewater or treated effluent is discharged.

Recycling: Reusing materials and objects rather than discarding them as wastes.

Refine: To remove impurities

Residue: Stuff that is left over after some process, such as the solids left after water is evaporated.

Resource Conservation and Recovery Act (RCRA): A law that gives the EPA authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also sets forth a framework for the management of non-hazardous solid wastes.

Inhalation Reference Concentration (RfC): The concentration of a contaminant in air which is not expected to cause any health effects even if it is breathed continuously over a lifetime.

Oral Reference Dose (RfD): An estimate of a daily oral exposure to the human population that is likely to be without harmful effect during a lifetime (normally used for water).

Risk: A measure of the chance that damage to life, health, property, or the environment will occur in a specified period of time.

Risk Assessment: A study to estimate the level of risk associated with a specific situation or release of a contaminant.

Risk Communication: The process of exchanging information about levels or, significance of health or environmental risks.

Risk Factor: A characteristic (e.g. race, sex, age, and obesity) associated with increased chance of a health problem.

Rodenticide: A pesticide or other agent used to kill rats and other rodents.

Reportable Quantity (RQ): Quantity of a hazardous substance that needs to be reported under CERCLA. If a substance exceeds its RQ, the release must be reported to the National Response Center and community emergency coordinators in areas likely to be affected.

Relative Risk (RR): A measure of the increase in the chance of disease for a person who is exposed to a chemical as compared to, a person who is not exposed.

Scrubbing: A common method of reducing stack air emissions by spraying a liquid that concentrates the impurities into waste.

Safe Drinking Water Act (SDWA): Law establishing and enforcing safe standards for public water systems.

Secondary Pollutants: Air pollutants that may have negative effects other than health, such as damage to buildings.

Sediment: Topsoil, sand, and minerals washed from the land into water, usually after rain or snow melt.

Septic tank: An underground tank to collect wastes from homes that are not connected to a municipal sewer system. Wastes go from the home into the tank and are decomposed by bacteria.

Sewer: A channel or conduit that carries wastewater to a treatment plant. Sanitary sewers carry household, industrial, and commercial wastes.

Standard Industrial Classification (SIC): A classification of industries according to their process or activity.

Siting: Choosing a location for an industrial facility.

Sludge: The residue (solids and some water) produced as a result of water or wastewater treatment.

Smog: Combination of particles and gases causing cause the air to look hazy and can cause breathing problems.

Sulfur Dioxide (SO2): A gas emitted from electrical power plants. It is the principal component of acid rain and can affect the respiratory system.

Solid Waste: As defined under RCRA, any solid, semi-solid, liquid, or contained gaseous materials discarded from industrial, commercial, mining, or agricultural operations, and from community activities. Solid waste includes garbage, construction debris, commercial trash, sludge from water supply or waste treatment plants, or air pollution control facilities, and other discarded materials.

State Emergency Response Commission (SERC): Appointed by the state to oversee the administration of EPCRA at the state level. This commission designates and appoints members to LEPCs and reviews emergency response plans for cities and counties.

Short Term Exposure Limit (STEL): The maximum concentration to which worker scan be exposed for up to 15 continuous minutes. No more than four exposures c3re allowed per day, and there must be at least 60 minutes between exposure periods.

Surface Water: All water naturally open to the atmosphere (rivers, lakes, reservoirs, ponds, streams, seas, and estuaries).

Suspended Solids: Solids that either float on the surface or are suspended in water, wastewater, or other liquids.

Sustainable Agriculture: Environmentally friendly methods of farming that allow the production of crops or livestock without damage to the farm as an ecosystem, including effects on soil, water supplies, biodiversity, or other surrounding natural resources.

Teratogen: A substance capable of causing birth defects.

Threshold Limit Value (TLV): The concentration of an airborne substance that a healthy person can be exposed to for a 40-hour workweek without adverse effect.

Tolerance: Permissible residue level for pesticides in raw agricultural produce and processed foods. Whenever a pesticide is registered for use on a food or feed crop, a tolerance must be established. The EPA establishes the tolerance levels, which are enforced by the Food and Drug Administration and the Department of Agriculture.

Toxic Chemical: Substances that can cause severe illness, poisoning, birth defects, disease, or death when ingested, inhaled, or absorbed by living organisms.

Toxic Release Inventory (TRJ): A database with information about toxic chemicals that are being released into the environment. Industries are required to report their emissions annually.

Toxic Substances Control Act (TSCA): A law enacted by Congress to test, regulate, and screen all chemicals produced or imported into the U.S. Many thousands of chemicals and their compounds are developed each year with unknown toxic or dangerous characteristics. TSCA requires that any chemical that reaches the consumer market place be tested for possible toxic effects prior to commercial manufacture.

Toxic: The ability to damage an organ or system.

Toxicant: Man-made substance that damages an organ or a system.

Toxin: Plant or animal derived substance that damages an organ or a system.

Trade Secret: Any confidential formula, pattern, process, device, information, or set of data that is used in a business to give the owner a competitive advantage. Such information may be excluded from public review.

Turbidity: The amount of clouds in water due to suspended silt or organic matter.

Ultraviolet Rays: Invisible radiation from the sun. Some UV rays (UV-A) enhance plant life and are useful in certain medical and dental procedures. Other UV rays (UV-B) can cause skin cancer or other tissue damage.

Underground Injection: A mean of disposing of liquid waste by injecting them deep into the ground through a well.

Underground Storage Tank (UST): A tank and any underground piping connected to the tank that has 10% or more of its volume (including pipe volume) beneath the surface of the ground. USTs are designed to hold gasoline, other petroleum products, and hazardous materials.

Vapor: The gas released by solid or liquid substances at ordinary atmospheric pressure and temperature.

Vapor Dispersion: The movement of vapor clouds or plumes in the air due to wind, gravity, spreading, and mixing.

Virus: Extremely simple microorganisms, some of which can cause diseases in humans.

Volatile: Any substance that evaporates or catalyzes rapidly.

Volatile Organic Compounds (VOC): Any organic compound that evaporates readily to the atmosphere. VOCs contribute significantly to smog production and certain health problems.

Water Table: The top of an aquifer, the level where the ground is saturated with water.

Wetlands: land areas that are very wet, immersed by surface or ground water frequently enough or for sufficient duration to support plants, birds, animals, and aquatic life. Wetlands generally include swamps, estuaries, and other areas and are federally protected.

Wildlife Refuge: An area designated for the protection of wild animals, within which hunting and fishing are either prohibited or strictly controlled.

Xenobiotic: A term for man-made substances found in the environment (i.e., synthetics, plastics).

Units and measurements

Acre-feet: A unit of volume of water. 1 acre-foot of water is the amount of water when 1 acre of land is covered by a foot of water.

Square feet (ft2): A unit of area. 1 square foot is the area of one foot by one foot.

Cubic feet (ft3): A unit of volume. 1 cubic foot is the volume of one foot wide by one foot long by one foot high.

Feet (ft): 1 foot is equivalent to twelve inches.

Gram (g): A unit of weight.

Kilogram (kg): 1000 grams.

Latitude & Longitude: A measure of where something is located on Earth.

Square meter (m2): A unit of area. 1 square meter is the area of one meter by one meter.

Cubic meter (m3): A unit of volume. 1 cubic meter is a volume of one meter wide by one meter long by one meter high.

Milligrams (mg): 1/1000 of a gram.

Million gallons per day (MGD): A flow of water equal to one million gallons flowing past a point each day.

Milligrams/liter (ms/L): A measure of concentration used in the measurement of fluids. Mg/L is the most common way to present a concentration in water.

Parts per million (ppm): A measure of concentration, where there is one part (one drop) of a chemical in a million parts (1 million drops) of water.

Parts per billion (ppb): A measure of concentration, where there is one part of a chemical in a billion (1000 millions) parts of water.

pH: The measure of acidity or alkalinity of a chemical solution, from 0-14. Anything neutral, for example, has a pH of 7. Acids have a pH less than 7, and bases (alkaline) greater than 7.

Pollutant Standard Index (PSI): A measure of the overall level of ambient air quality.

Community Environmental Health Assessment Tool Box for New Mexico (CEHA-NM)

APPENDIX B:
Tools and Resources to Support Community Environmental Health Assessment

This appendix includes the following selection of tools and resources that were found helpful in facilitating CEHA in New Mexico communities. Some of the tools are available in both English and Spanish.

Setting the Foundation for CEHA

- PACE-EH Potential Participants List
- Team/Meeting Management Strategies
- Guidelines for Interaction
- Expectations of an Assessment Team Member
- Memorandum of Agreement

Primary Data Collection Tools and Assessment Instruments

- Photo Documentary
  - What the Community Sees
  - Lo Que la Comunidad Ve
- Environmental Health Group Discussion Questions
  - English
  - Spanish
- Environmental Health Assessment Survey
- Community Environmental Health Concerns--Issues Checklist
- South Valley Partners in Environmental Justice Survey
- Examples of Techniques Used for Ranking Environmental Health Risks or Issues in a Community as Part of the CEHA Process

PACE-EH Potential Participants List

Who should be involved in the CEHA?

- Minority, disadvantaged, and typically underrepresented segments of the community
- Environmental justice organizations and neighborhood associations
- Local business organizations (e.g. Chamber of Commerce)
- Consulting agencies specializing in environmental quality, environmental health, community assessment, and health statistics
- Environmental organizations and associations
- Research institutes
- Local medical and dental societies
- First responders
- Religious organizations
- Schools, colleges, and universities (including schools of public health)
- Cooperative extension services
- Law enforcement agencies
- Volunteer organizations, senior citizen programs, and civic organizations
- Boards of health and other administrative/policy boards
- Hospitals, community health centers and other health and human service agencies
- Federal, state, and local environmental protection, environmental quality, environmental planning, and natural resource agencies and organizations
- Health maintenance and managed care organizations
- Local elected officials

Team/Meeting Management Strategies

- Create a Steering Committee of lead agency staff and community representatives as a subset of the team to:

  1. Draft the meeting agendas and minutes.
  2. Document decisions and areas of debate.
  3. Hold team members accountable for their commitments.

- Utilize good meeting strategies:

  1. Start and end meetings on time.
  2. Ensure effective use of meeting time.
  3. Limit meetings to two hours.
  4. Designate a scribe, timekeeper, and facilitator for meetings.
  5. Set an agenda that allows for networking, sharing, and socializing.
  6. Offer food and refreshments at the meetings.
  7. Make sure there is buy-in in from the whole team on the agenda.

- Maintain a workable team size (16 to 25) people.

  1. Have a list of potential alternates to the team.
  2. Allow for additions and substitutes to the team.

Guidelines for Interaction

- Participate actively.
- Honor time limits.
- Listen to, consider, and respect the experience and opinion of others: focus the discussion on the content and not the individual.
- Keep comments brief and on-topic.
- Remember that everyone's opinion is legitimate.
- Support positive confrontation and encourage each other to explore issues more deeply.
- Give voice to difference; do not be afraid to say things that you anticipate to be controversial. Acknowledging and explaining differences promotes understanding.
- Be clear on facts versus opinion.
- Do not be afraid to express your view up front.
- Try to contribute things that work toward the goal.
- Do not quote others. Give each other the freedom to explore ideas with trust.
- Become an observer of self. Adopt an attitude of learning.
- All participants share the responsibility for enforcing the guidelines for interaction.
- Recognize that we are unlikely to change each other's core beliefs although we can try to understand them.
- Find and work on common ground; acknowledge that there is no common ground.
- Avoid non-negotiable positions.
- Suspend assumptions.
- Do not assume that individuals represent organizational policy.
- Bring up facts relevant to the discussion at the beginning of the meeting, not the end.

Expectations of an Assessment Team Member

Length of Commitment

- A maximum of two years will be required to develop and implement an environmental health plan.

Estimated Time Required

- Level of participation may vary depending on commitment and ability to provide time.
- Nine to twelve meetings per year for up to 2 hours each.
- One to two hours of homework, preparation, and follow-up per month.
- Willing to participate through the phone, mail, or e-mail if not able to attend a meeting.

Desired qualities

- Commitment to improving the health of the community.
- Knowledge related to environmental issues, community resources, and communities.
- Ability to represent an important perspective, organization, or area in the county.
- Willingness to keep an open mind.

MEMORANDUM OF AGREEMENT

In an effort to involve communities in the process of addressing environmental health issues in Southern New Mexico, the New Mexico Border Health Office has funded the Community-based Environmental Health Assessment (CEHA) project. The goal of the project is to develop an environmental health action plan that reflects community concerns. It is based on the Protocol for Assessing Community Excellence in Environmental Health (PACE-EH), a framework designed by the National Association of County and City Health Officials to engage communities in addressing environmental health issues from a local perspective. The New Mexico Border Health Council's Environmental Health Committee (EHC) has agreed to take a leadership role in this project and will coordinate the CEHA activities in Doña Ana County. In an effort to build a process that reflects a positive and productive environment, CEHA participants are being asked to sign a memorandum of agreement (MOA) that outlines the process, structure, ground rules, and expectations. The MOA is as follows:

I. Purpose

The purpose of this MOA is to outline the ground rules and expectations of the Environmental Health Committee and its role in the CEHA project.

II. Support Process

The New Mexico Border Health Council's Environmental Health Committee will act as the governing body for the CEHA project and guide the process in Doña Ana County.

II. Decision-making Process

Decisions made during the PACE-EH project will be voted on by the group present at the EHC meetings unless otherwise specified. Members of the Environmental Health Committee will have an equal vote when decisions are made and the decisions will be based on a general consensus where all views will be acknowledged.

The creation of specialized committees to work on specific tasks will be created as needed, and these subgroups will have an advisory role to EHC in their assigned area.

III. Ground Rules

The EHC PACE-EH participants agree to conduct themselves in the process as follows:

- Participate actively, honor time limits, keep comments brief and on-topic.
- Listen to, consider and respect the experiences and opinion of others: focus the discussion on the content and not the individual.
- Remember that everyone's opinion is legitimate.
- Support positive confrontation and encourage each other to explore issues more deeply.
- Give voice to difference; do not be afraid to say things that you anticipate to be controversial (acknowledging and explaining differences promotes understanding).

- Be clear on facts versus opinion.
- Do not be afraid to express your view up front.
- Find and work on common ground; acknowledge that there is no common ground.
- Avoid non-negotiable positions.
- Suspend assumptions.
- Do not assume that individuals represent organizational policy.
- Bring up facts relevant to the discussion at the beginning of the meeting, not the end.
- Do not quote others. Give each other the freedom to explore ideas with trust.
- Become an observer of self. Adopt an attitude of learning.
- All participants share the responsibility for enforcing the guidelines of interaction.
- Recognize that we are unlikely to change each other's core beliefs although we can try to understand them.

IV. Expectations for participation in the PACE-EH project

Length of Commitment

- A maximum of one and a half to two years will be required to develop and implement an environmental health action plan.

Estimated Time Required

- Nine to twelve meetings per year for up to 2 hours each.
- One to two hours of homework, preparation, and follow-up per month.
- Level of participation may vary depending on commitment and ability to provide time.
- Willing to participate through the phone, mail, or e-mail if not able to attend a meeting.

IV. Desired qualities

- Commitment to improving the health of the community.
- Knowledge related to environmental issues, community resources, and community concerns.
- Ability to represent an important perspective, organization, or area in the county.
- Interest in the development of an environmental health action plan.
- Interest in collaborating with other organizations and individuals on environmental health issues.
- Willingness to keep an open mind.

I agree to the terms outlined in this MOA:

Name: _____

Mailing Address: _____ (Work _____ Home _____)

City: _____ State: _____ ZIP: _____

Phone: _____ (Work) _____ (Home)

FAX: _____ e-mail:_____

Employed by: _____

Title: _____

What the Community Sees

You have been chosen to participate in an activity to identify environmental health concerns in your community. The project uses cameras as a way of documenting the concerns you have. You are being asked to take pictures of issues that you feel affect the health and quality of life of your community.

When taking these pictures here are several ideas on the types of thing to consider:

1. Issues that may affect what is taken into our bodies such as food, water and air.
2. Issues that may expose people to the elements, such as cold, heat, wind, etc.
3. Issues that we are exposed to because of where we live, work and play.
4. Issues that may lead to accidents, injuries, illness and disease.
5. Issues that affect the quality of life of the community.

Please fill out the attached form for each picture taken. This is an example of how to fill out the form. Please refer to the instructions below. In addition, if you feel that there are issues that you may not be able to be photograph, those issues can be recorded on the *Community Environmental Health Concerns - Other Issues Worksheet*. Thank you for your participation; the pictures illustrate important environmental health issues in your community.

Camera #: ___ Photo #:___

Community/Area:

Description of picture:

How important is this issue to you? *(Where 1 means not important and 5 means very important)*

Not Important				**Very Important**
1	**2**	**3**	**4**	**5**

Instructions

1. Fill in the **Camera #** you are using. This is the number that is located on the blue dot on the back of the camera.
2. Write in the **Photo #** that you are taking. It is the number on top of the camera. It starts with the number of pictures remaining and works down to zero.
3. Write in the **Community/Area** where the picture is being taken such as *Hatch or outside Rincon*.

4. Write in the **Description of picture.** In this example you could write - *These are barrels used to burn trash, which smells bad and makes it hard to breath*.
5. Then rank the issue based on how important it is to you.

The picture taken will be pasted here.	Camera #____ Photo # _____ Community/Area: _____ Description of Picture: _____ _____ _____ _____ _____ _____ _____ How important is this issue to you? (5 means extremely important) Not important 1 2 3 4 5 Very Important

****

The picture taken will be pasted here.	Camera #____ Photo # _____ Community/Area: _____ Description of Picture: _____ _____ _____ _____ _____ _____ _____ How important is this issue to you? (5 means extremely important) Not important 1 2 3 4 5 Very Important

****

The picture taken will be pasted here.	Camera #____ Photo # _____ Community/Area: _____ Description of Picture: _____ _____ _____ _____ _____ _____ How important is this issue to you? (5 means extremely important) Not important 1 2 3 4 5 Very Important

Community Environmental Health Concerns – Other Issues
Worksheet

Please list below the environmental health issue you are concerned about and the area where this is a concern. Then rank this issue on a scale of 1 to 5 in order of importance (5 means extremely important).

Issue:_____
_____
_____
_____
_____

		Not as Important				Extremely important
Community/Area: _____	Rank	1	2	3	4	5

****

Please list below the environmental health issue you are concerned about and the area where this is a concern. Then rank this issue on a scale of 1 to 5 in order of importance (5 means extremely important).

Issue:_____
_____
_____
_____
_____

		Not as Important				Extremely important
Community/Area: _____	Rank	1	2	3	4	5

****

Please list below the environmental health issue you are concerned about and the area where this is a concern. Then rank this issue on a scale of 1 to 5 in order of importance (5 means extremely important).

Issue_____
_____
_____
_____
_____
_____

		Not as Important				Extremely important
Community/Area: _____	Rank	1	2	3	4	5

Lo Que la Comunidad Ve

Usted ha sido escogido para participar en una actividad para identificar los problemas de la comunidad en cuanto a la salud ambiental. El proyecto usa cámaras para documentar los problemas identificados. Le estamos pidiendo que tome una o más fotos de los problemas que piensa que podrían afectar la salud y la calidad de vida en su comunidad.

Cuando estas tomando estos retratos, aquí hay varias ideas en los tipos de cosas para considerar:

1. Problemas que podrán afectar las cosos que están tomados en nuestros cuerpos como la comida, el agua, y el aire.
2. Problemas que pueden exponer la gente a ciertos elementos como el frío, el calor, el viento, etcétera.
3. Problemas a que estaremos expuestos en el ámbito en donde vivimos, trabajamos, y jugamos.
4. Problemas que podrán conducir a accidentes, heridas, y enfermedades.
5. Problemas que afectan la calidad de vida en la comunidad.

Por favor llene los datos en la caja colocada al lado de cada foto tomada. Aquí hay un ejemplo en cómo llenar la caja. Por favor, hay que referirse a las instrucciones abajo en este formato. Adicionalmente, en los casos de algún problema para cual usted no podría tomar una foto, se los puedan indicar en un papel denominado *"Problemas de Salud Ambiental en la Comunidad-Otros Problemas: Hoja de Trabajo."* Gracias por su participación; las fotos ilustran los problemas y preocupaciones importantes de salud ambiental en su comunidad.

de Cámara: ___ # del Foto: __
Comunidad/Área:
Descripción de la foto:
¿Que tan importante es este problema? *(5 quiere decir extremadamente importante)*
No tan Importante **Extremadamente Importante**
1 2 3 4 5

Instructions

1. Llena el **# de Cámara** que está usando; es el número que esta localizada en el punto azul atrás de la cámara.
2. Escribe el **# del Foto** que estas tomando. Este es el número que esta en lo alto de la cámara. Esto comienza con el número de fotos que quedan y trabaja hasta que llega a cero.
3. Escribe el/la **Comunidad/Área** en donde estas tomando el retrato, por ejemplo: *Hatch o a fuera de Rincón*.
4. Escribe el **Descripción del retrato.** En este ejemplo puedes escribir: - *Estos son barriles que usan para quemar la basura, que huele mal y causa dificultades para respirar.*
5. Ahora, clasifique el problema según su importancia (1 para no tan importante hasta 5 para muy importante).

La foto debe pegarse aquí.

de Cámara: ___ # del Foto:__
Comunidad/Área: _____
Descripción de la foto: _____
_____
_____
_____
_____
_____

¿Que tan importante es el problema ? (5 quiere decir extremadamente importante)

No tan importante				Extremadamente importante
1	2	3	4	5

****

La foto debe pegarse aquí.

de Cámara: ___ # del Foto:__
Comunidad/Área: _____
Descripción de la foto: _____
_____
_____
_____
_____
_____

¿Que tan importante es el problema? (5 quiere decir extremadamente importante)

No tan importante				Extremadamente importante
1	2	3	4	5

****

La foto debe pegarse aquí.

de Cámara: ___ # del Foto:__
Comunidad/Área: _____
Descripción de la foto: _____
_____
_____
_____
_____

¿Que tan importante es el problema? (5 quiere decir extremadamente importante)

No tan importante				Extremadamente importante
1	2	3	4	5

Problemas de Salud Ambiental en la Comunidad-Otros Problemas

Hoja de Trabajo

Por favor describa el problema de salud ambiental sobre que qué está preocupado(a). Ahora clasifique el problema en escala de 1 a 5 en orden de importancia (1 siendo de menor importancia y hasta 5 para indicar que el problema es extremadamente importante)

Detalles:_____
_____
_____
_____

		No tan Importante				Extremadamente importante
Comunidad/Área: _____	Clasificación	1	2	3	4	5

****

Por favor describa el problema de salud ambiental sobre que qué está preocupado(a). Ahora clasifique el problema en escala de 1 a 5 en orden de importancia (1 siendo de menor importancia y hasta 5 para indicar que el problema es extremadamente importante)

Detalles:_____
_____
_____
_____

		No tan Importante				Extremadamente importante
Comunidad/Área: _____	Clasificación	1	2	3	4	5

****

Por favor describa el problema de salud ambiental sobre que qué está preocupado(a). Ahora clasifique el problema en escala de 1 a 5 en orden de importancia (1 siendo de menor importancia y hasta 5 para indicar que el problema es extremadamente importante)

Detalles:_____
_____
_____
_____

		No tan Importante				Extremadamente importante
Comunidad/Área: _____	Clasificación	1	2	3	4	5

Group Discussion Questions

1. What are the major environmental health issues affecting the people of Northern Doña Ana County?	**List the issues affecting your community here.**
When answering this question here are several ideas on the types of things to consider: a. Issues that may affect what is taken into our bodies such as food, water, air, etc. b. Issues that we are exposed to because of where we live, work, or play. c. Issues and areas in the community that may lead to accidents, injuries, illness, disease, or death. d. Issues that affect the quality of life of the community such as noise, smells, trash, etc. e. Issues that may expose people to the elements such as cold, heat, wind, etc.	1. 2. 3. 4.
2. Which of the issues listed above needs the most attention?	**Rank the three most important issues here.**
When answering this question here are several things to consider. a. The number of people who are being affected by the issues. b. How life threatening is the issue? c. What are the consequences if the problem is not addressed?	1. 2. 3.
3. Is there anything that can be done to address these issues?	**List possible strategies and actions that could help to address these issues.**
When answering this question here are several things to consider. a. Do these issues involve people's behaviors that could be changed? b. Are there groups that are already working on these types of issues that need additional support? c. What can the community do to help address the issue?	1. 2. 3.

Group Discussion Questions

1. What does the word "health" mean to you?	
When answering this question think about the broad sense of health	
2. What does the word "environment" mean to you?	
When answering this question think about your surroundings.	
3. What does the words "environmental health" mean to you	
When answering this question think about how the environment affects your community's health.	
What are the major environmental health issues affecting your community?	**List the issues affecting your community here.**
When answering this question here are several ideas on the types of things to consider: a. Issues that may affect what is taken into our bodies such as food, water, air, etc. b. Issues that we are exposed to because of where we live, work, or play. c. Issues and areas in the community that may lead to accidents, injuries, illness, disease, or death. d. Issues that affect the quality of life of the community such as noise, smells, trash, etc. Issues that may expose people to the elements such as cold, heat, wind, sun etc.	1. 2. 3.
5. Which of the issues listed above needs the most attention?	**Rank the three most important issues here.**
When answering this question here are several things to consider. a. The number of people who are being affected by the issues. b. How life threatening is the issue? c. What are the consequences if the problem is not addressed?	1. 2. 3.
6. Is there anything that can be done to address these issues?	**List possible strategies and actions that could help to address these issues.**
When answering this question here are several things to consider. a. Do these issues involve people's behaviors that could be changed? b. Are there groups that are already working on these types of issues that need additional support? c. What can the community do to help address the issue?	1. 2. 3.

Preguntas de Discusión para el Grupo

a. **¿Cuales son las preocupaciones ambientales mayores de la comunidad que afectan la gente del norte condado de Doña Ana?**	**Pone en una lista las preocupaciones que afectan su comunidad aquí.**
En respondiendo a esta pregunta, aquí hay varias ideas en los tipos de cosas para considerar: a. Problemas que podrán afectar las cosas que están tomados en nuestros cuerpos como la comida, el agua, y el aire. b. Problemas que pueden exponer la gente a ciertos elementos como el frío, el calor, el viento, etcétera. c. Problemas a que estaremos expuestos por causa de donde vivimos, trabajamos, y jugamos. d. Problemas que podrán conducir a accidentes, heridas, y enfermedades. e. Problemas que afectan la calidad de vida de la comunidad.	1. 2. 3. 4.
2. ¿Cuales de las preocupaciones indicadas arriba necesitan mas atención?	**Clasifica las tres preocupaciones más importantes.**
En respondiendo a esta pregunta, aquí hay varias ideas en los aspectos a considerar: a. El número de gente que está afectada por estos problemas. b. ¿A que nivel representa el problema una amenaza para la comunidad? c. ¿Cuales son las consecuencias si los problemas no están resueltos?	1. 2. 3.
3. ¿Habría algo que se puede hacer para enfocarse en estas preocupaciones?	**Ponga en lista las estrategias y acciones que pueden ayudar enfocarse en estas preocupaciones.**
En responder a esta pregunta, aquí hay varias ideas en los aspectos a considerar: a. ¿Podrían las preocupaciones envolver la conducta de la gente que pueden ser cambiados? b. ¿Habrían grupos que ya están trabajando en resolver estos tipos de problemas que necesitan apoyo adicional? c. ¿Que cosas podría la comunidad hacer para enfocarse para resolver estos problemas?	1. 2. 3.

Environmental Health Assessment

The study of environmental health focuses on the interaction between the environment and where we live, work and play. It looks at natural, as well as, manmade issues that have an impact on our health and quality of life. This includes those thing that affect the air we breathe, water we drink, food we eat and things we touch.

This survey is part of an effort to increase community participation in the area of environmental health. Your responses will play a role in developing a community plan to address environmental health problems in your community. All of your answers are completely confidential. Thank you for taking the time to participate in this project.

1. Which of the following environmental issues are you most concerned about? Please check all that apply.

Air quality indoor/outdoor
[ ] Trash/wood burning
[ ] Dust (fields, roads, wind storms)
[ ] Fields and ditches burning
[ ] Pollen
[ ] Cigarettes
[ ] Mold
[ ] Bad smells
[ ] Automobile exhaust
[ ] Industrial air pollution

Food safety
[ ] At restaurants
[ ] At home
[ ] Food you buy

Hazardous material
[ ] Handling
[ ] Disposal
[ ] Storage
[ ] Transportation

Inadequate housing
[ ] Heating
[ ] Cooling
[ ] Plumbing
[ ] Weather proofing
[ ] Electrical

[ ] Sewage system

Natural issues
[ ] Sun exposure (skin damage)
[ ] Radon gas
[ ] Rodents (rats, mice)
[ ] Wind storms
[ ] Flooding
[ ] Fire
[ ] Insects (mosquitoes, flies, bees, spiders, etc.)
[ ] Animal control (dogs and cats)
[ ] exposure to heat and cold

Waste disposal-
[ ] Sewage/Septic systems
[ ] Solid waste
[ ] Trash/illegal dumping

Water quality-Contamination
[ ] Industrial water pollution
[ ] Agricultural pesticides, fertilizers, etc.
[ ] Sewage disposal (septic systems)
[ ] Chemical spills
[ ] Leaking gas storage tanks
[ ] Natural sources (Fluoride, Arsenic, Salt, etc.)
[ ] Automobile oil/radiator fluid, etc.
[ ] Water quantity reducing water quality

Other
[ ] Land use planning
[ ] Pesticides/herbicides exposure
[ ] Worker safety
[ ] I do not have any concerns
[ ] Other_____

2. Using the above list please circle the top three issues you feel needs the most attention.

3. From the list above what environmental concerns would you like to learn more about?

_____

4. Circle 2 of the following environmental health problems you are most concerned about in your community.

a) Asthma /Allergies	f) Food borne diseases	k) Poisonings
b) Birth defects	g) Immune System problems	l) Reproductive disorders
c) Cancers	h) Infectious diseases	m) Respiratory illness
d) Chemical sensitivities	i) Injuries/Accidents	n) Other _____
e) Developmental disorders	j) Neurological disorders	o) I have no concerns

5. Are there any environmental issues in your community that you feel may be contributing to a family or friends illness? (Please circle yes or no)
YES NO If yes, what?
_____

6. Is there anything where you work that you feel may be harming your health?
YES NO If yes, what?
_____

7. Are you exposed to chemicals or pollutants at work*?*

Yes-*check all that apply* No I do not know

a. Bug killers (pesticides) and/or Plant killers (herbicides)
b. Soldering
c. Solvents such as paint thinner, turpentine, acetone, etc.
d. Construction debris
e. Other_____

8. Do you feel your home is environmentally safe to live in?
YES NO If no, why not?
_____

9. Do you use or have any of the following products inside your home. (Circle all that apply)

Use in your home	**Have/store in your home**
a. Bug killers (pesticides)	a. Plant killers (herbicides)
b. Homemade health remedies	b. vinyl mini blinds
c. Homemade cosmetics	c. Carpet
d. Imported Mexican ceramic pots used for food storage or cooking	d. Pets (dogs, cats, birds, etc.)
e. Old peeling paint	e. Paint thinner or other solvents
	f. Other_____

10. Would you like to learn more about how to protect your family from environmental health problems? YES NO If yes, what would be the best way to provide you with this information?

a. Community b. Small group c. Hand outs d. Home visits e. Videos f. Other_____

presentations presentation

11. Can we contact you in the future about trainings and information on environmental health issues?
YES NO If yes, how?

_____

12. What do you think can be done to better protect the community from environmental health issues?

_____
_____
_____
_____
_____
_____
_____
_____

13. Would you be interested in participating in a group that is currently working on environmental health issues in your community? YES NO

If yes, how can we get in touch with you?

_____
_____
_____
_____

COMMENTS:_____
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Community Environmental Health Concerns - Issues Check List

This survey is part of an effort to develop an environmental health action plan for Doña Ana County. Your responses on this survey will play a major role in determining which environmental problems are given top priority in the next several years.

1. Which of the following environmental health issues do believe should receive priority attention in your community? Please check up to ten (10). Your community is: _____

Air quality indoor/outdoor

[ ] Industry air pollution
[ ] Trash/wood burning
[ ] Dust (field plowing)
[ ] Dust (roads)
[ ] Burning (fields and ditches)
[ ] Pollen
[ ] Cigarettes
[ ] Mold
[ ] Bad smells
[ ] Automobile exhaust

Housing

[ ] Heating
[ ] Cooling
[ ] Plumbing
[ ] Weatherization
[ ] Electrical
[ ] Sewage treatment

Water quality drinking/ground/surface

[ ] Industry water pollution
[ ] Agricultural pesticides, fertilizers
[ ] Sewage disposal (septic systems)
[ ] Chemical spills
[ ] Water treatment
[ ] Gas storage tank leakage
[ ] Natural sources (Fluoride, Arsenic, Salt, etc.)
[ ] Automobile oil/radiator fluid

Natural issues

[ ] Sun exposure
[ ] Radon gas
[ ] Rodents
[ ] Tornadoes (heavy winds)
[ ] Flooding
[ ] Fire
[ ] Insects (mosquitoes, flies, bees)

Waste disposal

[ ] Sewage
[ ] Solid waste
[ ] Access to facility

Hazardous materials

[ ] Handling
[ ] Disposal
[ ] Storage

Food safety

[ ] Restaurants
[ ] At home
[ ] Wildlife - fish/game

Other

[ ] Pesticide usage
[ ] Worker safety/health
[ ] Other_____

2. Using the above list please circle the three most important issues that you think need attention.

3. Are there any environmental conditions in your immediate community that you feel may be contributing to any family illness? (Please circle yes or no)
YES NO If yes, what? _____

4. Is there anything at your work place that you feel may be harming your health?
YES NO If yes, what? _____

5. Do you feel your home is environmentally safe to live in?
YES NO If no, why not? _____

South Valley Partners in Environmental Justice

Environmental health is based on the belief that the environment affects our health. The environment includes the relationships between our health and our homes, workplaces, schools, and the outdoors. Including the air we breathe and the water we drink. The Rio Grande Community Development Corporation, the Community Environmental Health Program at UNM and the Bernalillo County Environmental Health Department ask for your help to identify environmental health issues that are important to the people who live in the South Valley. Please answer the questions below on all three pages. All of your answers are completely confidential. Thank you for taking the time to complete this questionnaire.

1. What South Valley neighborhood or area do you live in?
(For example, Armijo, Five Points, etc.) _____

How many years have you lived in the South Valley? _____

2. Do you work in the South Valley? (Check one)
a. Yes ___ b. No ___

3. Are you exposed to chemicals or pollutants at *home?*
Yes, such as: (Circle all that apply) No I do not know
a. Bug killers (pesticides) and/or plant killers (herbicides)
b. Paint thinner or other solvents
c. Imported and/or unglazed ceramic pots
d. Soldering
e. Dust, including sawdust
f. Heavy metals such as lead and mercury
g. Do you use homemade health remedies and/or cosmetics
h. Other_____

4. Are you exposed to chemicals or pollutants at *work?*
Yes, such as: (Circle all that apply) No I do not know
a. Heavy metals such as lead, mercury, arsenic, etc.
b. Dust, including saw dust
c. Soldering
d. Solvents such as paint thinner, turpentine, acetone, etc.
e. Bug killers (pesticides) and/or Plant killers (herbicides)
f. Other_____

5. What environmental concerns do you have? (Circle all that apply)
a. Air quality
b. Diseases associated with keeping livestock/pets
c. Land development
d. Land use
e. Livestock control
f. Noise
g. Water quality
h. Crime (robbery, vandalism, etc.)
i. Medical problems related to environmental contamination
j. Animal control
k. Pesticides/herbicides
l. Rodents (rats, mice)
m. Safe food
n. Odor emitting industries
o. Unsafe work environment
p. Excess light at night
q. Other _____

6. From the list above what environmental concerns would you like to learn more about?

7. What do you think is the *most important* environmental health problem that exists in the South Valley?

8. How does the above problem affect you and your family?

9. What concerns do you have regarding water? (Circle all that apply)

a. Having safe water for drinking and household use
b. Having enough safe water for drinking and household use
c. Having enough water for livestock/fields
d. Having safe water for livestock/fields
e. Irrigation rights
f. Safety of private well water
h. I have no water concerns
g. Other _____

10. What do you consider environmental eyesores in the South Valley? (Circle all that apply)

a. Graffiti
b. Abandoned cars
c. Illegal dumping
d. Abandoned buildings
e. Billboards
f. Accumulation of litter or debris on property
g. Other _____
h. I do not think the South Valley has eyesores

11. What are the most important health concerns in your family and neighborhood?

12. When you have an environmental health problem who do you talk to? (Circle all that apply)

a. Clergy
b. Community organization
c. Elder
d. Family member
e. Friend
f. Government agency
g. Healthcare provider
h. Spouse
i. Teacher
j. Other _____

13. How many acres of land do you use in the South Valley? (Circle one)

a. None
b. ½ acre
c. ½ –1 acre
d. 1–2 acres
e. 2–5 acres
f. 5–10 acres
g. 10 acres or more

14. How do you use this land? (Circle all that apply)

a. Agriculture
b. Livestock
c. Open space
d. Personal landscaping
e. Primary residence
f. Recreation
g. Small business
h. Other _____

15. I am concerned about the changing use of land in the South Valley, such as:
(Circle all that apply)

a. Agricultural changes
b. Commercial & housing developments
c. Cost of buying land
d. Limited availability of utilities
e. Unpaved roads
f. Escalating price of land and homes
g. I am not concerned about changing land use
h. 0ther_____

16. What is the *best* way for you to receive information on environmental health?
(Circle one)

a. Radio
b. TV
c. Newspaper articles
d. Community meetings
e. Workshops
f. Internet or websites

17. Where do you go *most often* for your family's healthcare?
(Circle one)

a. First Choice
b. UNMH
c. NM Department of Health
d. Another clinic in the South Valley
e. Another clinic outside of the South Valley
f. Other_____

18. In your own words what does "environmental health" mean?

COMMENTS: _____
_____
_____
_____
_____

Examples of Techniques Used for Ranking Environmental Health Risks or Issues as Part of the CEHA Process

Determination of Rank with Weighted Selection Criteria

The CEHA workgroup should determine a limited number of criteria (preferably three to five) before actually beginning the step of ranking among the long preliminary list of EH issues identified under the previous CEHA step. Too few criteria may result in the assignment of too much or too little weight to a particular criterion; while too many criteria will complicate final calculations and potentially dilute the ranking to the point that it is meaningless. The establishment of these criteria reduces the influence of bias that members of the council or workgroup may have and allows the *data* to determine of priorities. The criteria should, ideally, be evidenced-based using quantitative data sets (i.e. morbidity and mortality) as much as these are available, especially data on incidence and prevalence of disease and injury; but should also consider qualitative data, especially where the availability and quality of quantitative data is limited. The health council or workgroup should carry out an exercise to determine what information elements (criteria) should be used to rank EH issues in the community. Some of these elements are:

- *Geographic magnitude of the EH problem or risk:* Where are the people affected or exposed to the risks represented by the problem? Is the problem concentrated in specific areas or neighborhoods in the community? Or is the EH problem or risks generalized throughout the CEHA outreach area? Here we analyze the geographic linkage of the problem to the environment. It is important to have data disaggregated to the sub-county, community and/or neighborhood level. Mapping of the data can help in the analysis of the geographic magnitude of EH risks and facilitate comprehension of patterns and trends in diseases and/or injuries and their connection to "place". Geographic information systems (GIS) are especially helpful tools for mapping the spatial distribution of risks; although simple plotting of information on a map of the CEHA outreach area by hand can be effective.

- *Demographic magnitude of the EH problem or risk:* How many people are affected or exposed to the risks? Are only children, senior citizens, and workers in a particular vocation, or other particular constituent group affected? Here we look at incidence and prevalence of diseases and/or injuries among the various constituent groups that make up the community. The actual economic, social and environmental impacts of the EH risk in the community can then be analyzed in order to determine the level of importance to assign to the issue.

- *Acuteness of the disease and/or injury*. This element responds to the fact that some diseases or injuries are more serious than others, and therefore may constitute a greater risk in terms of mortality than other EH risks. For instance, West Nile virus has a higher morbidity rate than asthma and may represent a greater immediate risk to the community.

- *Economic impact to the community*. This element gauges the perceived economic costs on the community of an EH risk. The risk may affect quality of life factors in the community, the potential for attracting new businesses and residents, or could impact the productivity of the community in terms of lost work time, or may imply very high costs of managing the EH problem.

Once the criteria have been established, the criteria themselves should be weighted according to what members of the health council or workgroup feels are the most important in relative order.

Consequently, a simple "weight-point" system can be used to assign relative importance to each criterion. For instance, a total of 100 points can be assigned among all criteria, representing 100% of the weight. Criteria deemed as more important as a determinant of rank order will be assigned more points; while those with less importance will be assigned comparatively fewer. Caution should be used to avoid assigning equal weights to more than one or two criteria as this, again, could lead to statistical dilution and complicate the effort to derive a relevant ranking among the EH issues in the preliminary long list. An example of an exercise in assignment of weights to four selection criteria is presented below:

Criterion	Maximum Weight Points Assigned	Rationale
i. Geographic magnitude of the EH problem or risk	30	If the EH issue exposes members to risks throughout the community, then it should be a determinant of ranking priorities, but subordinate to demographic determinants.
ii. Demographic magnitude of the EH problem or risk	40	The incidence and prevalence of disease in particular constituent groups, especially at-risk children, should be a determinant in orienting EH improvement.
iii. Acuteness of the disease and/or injury	20	While certain diseases and injuries may represent a higher level of risk, we should not concentrate public health care funding on relatively fewer members of the community.
iv. Economic impact to the community	10	The EH risk may affect perceived quality of life factors in the community, potentially affecting the ability to attract new businesses and residents, but other criteria are more important.
Total Weight	**100**	**The total among all criteria should be 100**

With the criteria now "weighted", each EH issue identified in the preceding CEHA step should subjected to each of the weighted criteria. It should be determined to what degree each EH issue (in the long list) responds to each criterion. The number of points to be assigned per EH risk or issue for each of the four criteria will depend on the nature of the risk. For each of the four criteria, any number of points can be assigned (usually in groups of five points) from 0 to the maximum number of weight points for that criterion, depending on the rationale used by the members of the health council/workgroup.

As can be seen from the example exercise below, valuations assigned by CEHA /workgroup members varied based on a number of analytical reasons, using the best data available. Solid waste is ranked at the top of EH issues, and actions to resolve this issue should be considered with a higher priority in the Community Health Plan. Air quality and the unsafe use and storage of pesticides in the home are considered of moderate importance and should be considered in the Health Plan, albeit with less emphasis or resources as the solid waste issue. Operation of the chemical factory was seen as an issue of much lower priority, as fewer residents are affected and the risk to human health was determined to be low (essentially comprising a nuisance), and the issue will be given very low priority in the health plan if it is considered at all.

Environmental Health Issue	Weight Points per Criterion					Rationale
	i	ii	iii	iv	Total	
a. Air quality (blowing dust)	20	25	10	10	65	The problem affects those residents in neighborhoods with no vegetation or landscaping, where PM_{10} levels exceeded standards about 20% of the time. Sufferers of asthma and bronchitis are especially at risk. The issue adversely affects quality of life factors in terms of the aesthetics of the area.
b. Improper solid waste disposal	30	35	5	10	80	The problem exists throughout the community and exposes residents to a broad number of disease vectors and potential health problems at all demographic levels, especially children. This is the most important problem affecting the "image" of the community.
c. Household pesticides	10	30	10	0	50	The risk exists in about half of homes in the community and is a serious problem for small children, who are exposed to poisoning and death. However, it is not seen as widespread problem, with only one case of poisoning reported in the last 3 years.
d. Chemical factory	5	15	0	5	25	Only a few residents complain about the noise and odors emanating from the factory; but monitoring shows that these nuisances do not exceed environmental health standards.

This assignment of weight points should be repeated for all EH issues listed as a result of the preceding risk assessment step, and then issues should be grouped according to their totals of weight points. This exercise will distribute EH issues according to their comparative rank, for instance in three echelons: *high priority issues, moderate priority issues, and low priority issues*. The health council or workgroup can then analyze the results of the groupings and, after discussion among their members, accept by acclamation the results of the ranking exercise (or challenge them, but with evidence and cause to avoid bias and "lobbying").

Open Forum Ranking Techniques

This method of ranking EH issues can be considered more "democratic" and can be used with in an open forum among health council or CEHA workgroups, or in a larger forum such as a community or town meeting. The effectiveness and validity of this method is highly dependent of the knowledge of the participants concerning EH issues. Results of the EH risk assessment (preceding step) must be shared with all participants and, at least in the case of the fully open forum of a community or town meeting, a good amount of time must be spent on educating participants in environmental health concepts, including basic terminology (environmental health, basic epidemiology, etc.), perceived versus actual risks, and the objectives and process of community health improvement (community health profile and plans). This information will empower and validate the participation of all those present; an informed community can and should participate in decisions regarding their environmental health.

At the same time, a note of caution should be sounded here concerning the risks of "popular decision-making". Public forums can be used as political pulpits and empower especially vociferous groups and interests to insert their agendas into the decision process. This situation can lead to a disaster in terms of evidence- or science-based decision-making. It is very important that full public forums have

participants that represent the entire community—all social, cultural and economic interests. If the community is bilingual, then all materials should be translated before being introduced and a simultaneous translator should be on the premises with his/her translation equipment. Any public forum must start out by defining the "rules of engagement", including ground rules for participating (e.g. *Robert's Rules of Order*) and a full explanation of the agenda, process and methods to be used in during the meeting. The moderator plays a key role must control the process at all stages to ensure a fair and fully participatory process. In terms of a full and open public forum, health councils or workgroups should explain to participants that the results of the meeting will be considered with emphasis during the final stages of issues prioritization and the preparation of community health plans; but also indicate what other criteria may be used (e.g. EH health data, and available staff and budgetary resources).

Whether the open forum is to be attended only by members of the health council or workgroup, similar tools can be used. The first step (presuming that for a full public forum, basic EH concepts have already been introduced) involves presenting the results of the EH risk assessment in terms of the full preliminary list of EH problems and issues identified. The use of simplified textual, graphic and mapped information is encouraged. A question and answer period can ensue, in order to answer any questions and clarify any of the concepts or issues presented. Once the participants feel they have a grasp of the issues, then the methods and tools used for the actual ranking of issues can be introduced. Two such techniques/tools are described below.

Tally-the-Dots

Each EH issue should be printed on a separate placard and taped side by side in no particular order to the walls of the meeting hall; although each issue should be numbered for reference. The following steps are:

a) Each participant is given 10-20 "dots" (1/2-inch colored dots with adhesive on the back, available in any office supplies location); the exact number of dots will depend on the number of issues put before the forum; but each participant should receive the same number of dots;

b) Participants are then asked to take about 10 minutes to walk around the room and study *all* of the EH issues taped to the walls;

c) At the end of the ten minutes, so as to restrict any "lobbying" or influence by others, participants should be given no more than 2 or 3 minutes to rapidly affix their dots to the issues they feel are most important. They can put up to one-third of their dots on any one issue to indicate their perception that the issue is a high priority, and/or affix any number of dots (one or more) to those issues they feel are also EH priorities; then

d) At the end of the exercise, the total number of dots is determined for each EH issue, and are ranked accordingly in the following three groupings: *high priority, moderate priority and low priority*.

Community Environmental Health Assessment Tool Box for New Mexico (CEHA-NM)

APPENDIX C: Sources for Environmental Health Statistics in New Mexico

PROBLEM/POTENTIAL IMPACTS	TYPES OF INFORMATION/indicator	Responsible AGENCIES	WEBSITES
1. Solid Waste	*Solid Waste Management regulation*	NMED, Solid Waste Bureau	www.nmenv.state.nm.us/NMED/env_prot.html#SWB
Poor solid waste management: • Illegal dumping and burning of waste • Groundwater contamination from leaking landfills • Rodent problems • Lack of disposal capacity	• *Active landfills in NM* • *Current and projected quantity of solid waste generated* • *Disposal capacity* • *Closure-closeout plans*	NMED, Solid Waste Bureau	2000 Solid Waste Management Report: www.nmenv.state.nm.us/NMED/env_prot.html#SWB
	Recycling programs in NM	NMED, Solid Waste Bureau	New Mexico Recycling Directory: www.nmenv.state.nm.us/NMED/env_prot.html#SWB
2. Liquid Waste	Liquid Waste Disposal Regulations Discharge Permits	NMED, Liquid Waste Disposal Program (LWDP)	www.nmenv.state.nm.us/fod/LiquidWaste/index.html http://www.nmenv.state.nm.us/swqb/psrlist.html
Improper on-site disposal of household and municipal and industrial wastes can lead to ground and surface water contamination causing: • Waterborne diseases incidence • Fish contamination • Nuisance problems	*Depth-to groundwater data*	Office of the State Engineer	www.seo.state.nm.us/water-info/index.html
	Well water reports	Office of the State Engineer	www.seo.state.nm.us/water-info/index.html
	Groundwater contamination/septic tanks	NMED-LWDP	www.nmenv.state.nm.us/fod/LiquidWaste/GWcontam.jpg
	Surface water contamination by septic tanks, and municipal sanitation systems	NMED-LWDP & Surface Water Quality Bureau	www.nmenv.state.nm.us/fod/LiquidWaste/SWcontam.jpg NMED's Annual 305-B Report under the Clean Water Act http://www.nmenv.state.nm.us/swqb/305b/2002/index.html
	Concentrations of coliform or nitrates above health-based water quality standards	U.S. EPA Safe Drinking Water Information System	www.epa.gov/enviro/html/sdwis/index.html Drinking water contaminants and standards: www.epa.gov/OGWDW/mcl.html#mcls
3. Air Pollution	*Criteria air pollutants/Air toxics:* *National Ambient Air Quality Standards* *State air quality regulations;* *Air pollution control programs at federal, state and local levels;* *Emissions discharge permits*	U.S. Environmental Protection Agency New Mexico Environment Department/Air Quality Bureau	www.epa.gov/airnow www.nmenv.state.nm.us/aqb/index.html http://www.nmenv.state.nm.us/aqb/permit/index.html
• Respiratory health effects e.g., asthma, chronic obstructive pulmonary disease, respiratory infections • Premature mortality • Visibility degradation	*Air pollutant emissions data by source category (e.g., mobile/stationary/area sources) and/or economic activity (e.g., agriculture, mining)*	NMED/Air Quality Bureau	www.nmenv.state.nm.us/aqb/modeling/modelingemissions.html
	Is the county/city a non-attainment area (i.e., not in compliance with Federal air quality standards?)	NMED/Air Quality Bureau	www.nmenv.state.nm.us/aqb/modeling/na_map.html

PROBLEM/POTENTIAL IMPACTS	TYPES OF INFORMATION/indicator	Responsible AGENCIES	WEBSITES
	Ambient air quality monitoring data – number of days with air quality concentrations for a specific pollutant above health-based standards	NMED/Air Quality Bureau	www.nmenv.state.nm.us/aqb/monitor/index.html
	Number of people potentially at risk of exposure including sensitive subpopulations- total population, # of children, # elderly	U.S. Census Census 2000 Gateway	www.census.gov www.census.gov/main/www/cen2000.html
4. Mineral Mining	*Mining Act regulations* *Ground water and surface water quality regulations and discharge permits*	NM Energy, Minerals & Natural Resources Dept. NMED/Surface Water Quality Bureau	www.emnrd.state.nm.us www.nmenv.state.nm.us/gwb/gwqbhome.html http://www.nmenv.state.nm.us/swqb/psrlist.html http://www.nmenv.state.nm.us/swqb/305b/2002/index.html
All types	*Individual mining operational permits*	EMNRD, Mining and Minerals Division	www.emnrd.state.nm.us/mining/
Groundwater contamination: • Human exposure to toxic substances through drinking water • Ecological impacts	*Ground water quality data*	NMED, Groundwater Quality Bureau, Mining Environmental Compliance Section	Groundwater Atlas: www.nmenv.state.nm.us/gwb/GWQ%20Atlas/data.html
	discharge permits		www.nmenv.state.nm.us/gwb/mecs2.html http://www.nmenv.state.nm.us/swqb/psrlist.html
Surface water contamination: • Human exposure to toxic substances through drinking water • Ecological impacts	*Surface water quality data*	NMED, Surface Water Quality Bureau	www.nmenv.state.nm.us/swqb/links.html http://www.nmenv.state.nm.us/swqb/305b/2002/index.html
	discharge permits		http://www.nmenv.state.nm.us/swqb/psrlist.html
Air pollution from fugitive dust, other facility emissions: • Human exposure to toxic materials through inhalation	Air pollutant emissions data from air quality permit	NMED, Air Quality Bureau	www.nmenv.state.nm.us/aqb/modeling/modelingemissions.html http://www.nmenv.state.nm.us/aqb/permit/index.html
	Air quality monitoring data associated with mining activity	NMED, Air Quality Bureau	www.nmenv.state.nm.us/aqb/monitor/index.html
	Number of people potentially at risk of exposure including sensitive subpopulations	U.S. Census Census 2000 Gateway	www.census.gov www.census.gov/main/www/cen2000.html

PROBLEM/POTENTIAL IMPACTS	TYPES OF INFORMATION/indicator	Responsible AGENCIES	WEBSITES
5. Oil and Gas Production	*Oil and gas regulations* *Oil and gas construction permitting for air quality*	EMNRD, Oil Conservation Division NMED, Air Quality Bureau	www.emnrd.state.nm.us/ocd www.nmenv.state.nm.us/aqb/projects/gcp4_oil-gas/AQB_GCP-4_index.html
Land and groundwater contamination from oil field wastes: • Human exposure to toxic substances through drinking water • Ecological impacts	*Groundwater quality and discharge permits*	Oil Conservation Division, Environmental Bureau	www.emnrd.state.nm.us/ocd/bureaus/Environmental/environm.htm http://www.nmenv.state.nm.us/swqb/psrlist.html
	Waste disposal	Oil Conservation Division, Environmental Bureau	www.emnrd.state.nm.us/ocd/bureaus/Environmental/environm.htm
6. Radiological Materials	*Radiation Protection Act*	NMED, Radiation Control Bureau	www.nmenv.state.nm.us/nmrcb/home.html
Naturally-occurring Radon: • Inhalation exposure linked with incidence of lung cancer • Ingestion exposure	*Naturally-occurring radon levels in NM by zip code*	NMED, Radiation Control Bureau, Indoor Radon Outreach Program	http://www.nmenv.state.nm.us/nmrcb/radon.html http://www.nmenv.state.nm.us/nmrcb/home.html
	Concentrations of radon above health-based standard in drinking water	U.S. EPA Safe Drinking Water Information System	www.epa.gov/enviro/html/sdwis/index.html Drinking water contaminants and standards: www.epa.gov/OGWDW/mcl.html#mcls
Uranium Mill Tailings: • Exposure to radon gas through inhalation linked with incidence of lung cancer • Exposure to radioactive and toxic materials through drinking water	*Indoor air quality concentrations of radon in vicinity of uranium mill tailings*	NMED, NMDOH	www.nmenv.state.nm.us/aqb/iaq/index.htm
	Concentrations of radioactive materials above health-based standards in drinking water	U.S. EPA Safe Drinking Water Information System	www.epa.gov/enviro/html/sdwis/index.html Drinking water contaminants and standards: www.epa.gov/OGWDW/mcl.html#mcls

PROBLEM/POTENTIAL IMPACTS	TYPES OF INFORMATION/indicator	Responsible AGENCIES	WEBSITES
7. Agriculture/Pesticides	*Pesticide registration* *Pesticide application licensing* *Farm Worker Safety – Federal Worker Protection Standard*	NM Dept. of Agric., Bureau of Pesticide Management U.S. EPA	http://nmdaweb.nmsu.edu/divisions/aes/pest.html www.epa.gov/pesticides/health/worker.htm
Human health and ecological effects due to exposure from pesticides: • Water contamination • Pesticide drift from aerial spraying • Worker exposure	Groundwater quality	NMED, Groundwater Quality Bureau	www.nmenv.state.nm.us/gwb/GWQ%20Atlas/data.html
	Surface water quality	NMED, Surface Water Quality Bureau	NMED's Annual 305-B Report under the Clean Water Act http://www.nmenv.state.nm.us/swqb/305b/2002/index.html
	Concentrations of organic pesticides in drinking water above health-based standards	U.S. EPA Safe Drinking Water Information System	www.epa.gov/enviro/html/sdwis/index.html Drinking water contaminants and standards: www.epa.gov/OGWDW/mcl.html#mcls
	Pesticide poisoning data	NM Poison Center Data Center	http://hsc.unm.edu/Pharmacy/poison/z%20Pages/data%20center.shtml
8. Agriculture/Dairies	*Confined Animal Feed Operations (CAFOs) state requirements;* *Discharge Permits* *National Pollutant Discharge Elimination System*	NMED/Surface Water Quality Bureau U.S. EPA	www.nmenv.state.nm.us/swqb/cafoq_a.html http://www.nmenv.state.nm.us/swqb/psrlist.html http://cfpub.epa.gov/npdes/permitissuance/permitscanning.cfm
Ground and surface water contamination: • Potential drinking water contamination • Impacts to aquatic ecosystems • Lost recreational opportunities	*Discharge permits*	New Mexico Environment Department, Surface Water Quality Bureau and Groundwater Quality Bureau	www.nmenv.state.nm.us/swqb/psrlist.html
	Ground water quality data *Surface water quality data*		Groundwater Atlas www.nmenv.state.nm.us/gwb/GWQ%20Atlas/data.html NMED's Annual 305-B Report under the Clean Water Act http://www.nmenv.state.nm.us/swqb/305b/2002/index.html
	Fish consumption guidelines		http://www.nmenv.state.nm.us/swqb/305b/2002/index.html
	Concentrations of fecal coliform and nitrates above health-based water quality standards	U.S. EPA Safe Drinking Water Information System	www.epa.gov/enviro/html/sdwis/index.html Drinking water contaminants and standards: www.epa.gov/OGWDW/mcl.html#mcls

PROBLEM/POTENTIAL IMPACTS	TYPES OF INFORMATION/indicator	Responsible AGENCIES	WEBSITES
9. Home Environmental Health and Safety			
Problems with: • Solid Waste • Septic disposal • Asthma/respiratory disease • House fires/victims • Radon gas • Electrical shock • Poisonings in the home • Hantavirus, Plague, Hepatitis	Solid waste disposal codes and standards	County & municipal environmental agencies, NMED	Individual county and municipal env. agency offices and websites www.nmenv.state.nm.us/NMED/env_prot.html#SWB
	Septic disposal codes and discharge standards	NMED, municipal environmental agencies	www.nmenv.state.nm.us/fod/LiquidWaste/index.html Individual municipal environmental agency offices and websites
	Asthma and respiratory disease registry	NMDOH, county and municipal health agencies	www.health.state.nm.us Individual county and municipal heath agency offices and websites
	Incidence of house fires and electrical risks, incidence and victims	Local and municipal fire departments, clinics and hospitals	Individual local and municipal fire departments, clinics and hospitals
	Poisonings in the home	Local clinics and hospitals, NMDOH, US EPA	Individual local clinics and hospitals www.health.state.nm.us http://www.epa.gov/ebtpages/emerpoisoning.html
	Incidence of Hantavirus, Plague, Hepatitis	NMDOH, CDC, local clinics and hospitals	http://www.cdc.gov/ncidod/diseases/hanta/hantvrus.htm http://www.cdc.gov/ncidod/diseases/submenus/sub_hepatitis.htm Individual local clinics and hospitals

Additional Environmental Health Data Sources

2000 Census of Population. 2002. U.S. Census Bureau. http://factfinder.census.gov

County Health Profiles (various in New Mexico, updated every 1-3 years). County Health Councils and NMDOH. http://dohewbs2.health.state.nm.us/VitalRec/County%20Profiles/County%20Profiles.htm

New Mexico Tribal Report 2002: New Mexico Tribe-Specific Vital Statistics. NMDOH. http://dohewbs2.health.state.nm.us/VitalRec/Tribal.pdf

The State of the Environment: 2001 Report. 2002. NMED. Santa Fe. http://www.nmenv.state.nm.us/oots/2001_NMED_Report.html

New Mexico Environment Department's Annual 305-B Report under the Clean Water Act. http://www.nmenv.state.nm.us/swqb/305b/2002/index.html

Annual Drinking Water Quality Reports (required under the Clean Drinking Water Act for all drinking water systems in the New Mexico and the U.S.). Request copies from your regional, local or municipal water system operator.

EXTOXNET: The Extension Toxicology Network. http://ace.ace.orst.edu/info/extoxnet

National Cancer Institute. Washington DC. www.cancer.gov

Trust for America's Health. www.healthyamericans.org

Environmental Defense Fund: Scorecard. www.scorecard.org

Water Resources Investigations Reports (specific to river basins in New Mexico, with various dates). U.S. Geological Survey. Albuquerque. www.usgs.gov

U.S. EPA Envirofacts. www.epa.gov/enviro

Hazardous Substance Research Centers. www.hsrc.org

Community Environmental Health Toolbox for New Mexico (CEHA-NM)

APPENDIX D: Guide to Useful Tools and Resources in the Development of All Facets of Community Environmental Health Assessments

Title of Resource	Technical Focus and Abstract of Content	Language[5]		User Level[6]		Utility for CEHA in New Mexico
		Eng	Span	Lay	Prof	
Comprehensive Step-by-Step Guidance on CEHA						
Community Environmental Health Assessment Workbook. Environmental Law Institute. www.eli.org	Step-by-step guide for community groups to conduct CEHA on their own.	X		X		Excellent, simplified approach for conducting a CEHA. Worksheets are quite useful for walking project team through CEHA steps and for organizing large amounts of information.
Protocol for Assessing Excellence in Environmental Health/PACE-EH: A Guidebook for Local Health Councils. National Association of County and City Health Officials. http://pace.naccho.org/DownloadPage.asp	Provides an overview of the PACE-EH methodology to identify, prioritize and implement solutions to environmental health problems.	X	X		X	The PACE-EH protocol is not considered appropriate for New Mexico, as it is quite involved, contains numerous steps and is costly in terms of time and monetary resources to implement. However, the guidebook does provide good overview material, especially for the more advanced health councils and agencies, and especially for ranking and prioritizing issues and actions. Use of this resource in NM communities will require specialized assistance.
Protocol for Assessing Community Excellence in Environmental Health (PACE-EH) in Practice National Association of County and City Health Officials. http://pace.naccho.org/DownloadPage.asp	A compilation of local communities' experiences in implementing the PACE-EH methodology. Provides summaries of results of PACE-EH assessments in 10 pilot sites.	X			X	This compendium is interesting and useful to see the different ways in which pilot sites adapted the PACE-EH methodology to unique situations in their respective communities.
7 Generations: Addressing Village Environmental Issues for Future Generations of Rural Alaska. Susan Unger and Dr. Rick Foster. Alaska Inter-Tribal Council. www.state.ak.us/dec/dsps/compasst/7generations/7gen.htm	Manual for Alaska's 7 Generations community EH assessment/planning process for tribal villages. Includes ice breakers and group activities, lessons in pollution prevention that can be applied in tribal communities, tips for facilitating meetings, and step-by-step guide to using the 7 Generations Manual.	X		X		Understandable, very simple guide. Can be used at the high school level or for a general layperson audience. Good group exercises for understanding concepts such as pollution, environment, how to do a community environmental issues survey, the difference between pollution prevention, recycling/reuse and waste treatment, among many others. Geared toward Alaskan native communities, but could be adapted to New Mexico.
EPA Green Communities Toolkit www.epa.gov/greenkit/risk.htm	Step-by-step, on-line guide for planning and implementing sustainable actions at the local level. Includes how to do a community assessment,	X		X	X	Very useful guide for conducting a CEHA in a more holistic manner to achieve sustainable communities for the long-term. Most material can be utilized by lay persons, although some sections

[5] Indicates if all or part of the resource is presented in English and/or Spanish language.
[6] Indicates the level of sophistication of the resource, whether it is appropriate for Laypersons (Lay) or Professionals (Prof).

Title of Resource	Technical Focus and Abstract of Content	Language[5]		User Level[6]		Utility for CEHA in New Mexico
		Eng	Span	Lay	Prof	
	conduct a trends analysis, develop a future community vision, create sustainable action plans, and how to implement those actions. Provides a variety of links to useful resources and tools and case studies for each step in the process.					such as risk assessment fundamentals are geared more towards professionals.
Environmental Sustainability Kit. Environmental Defense Fund. http://www.environmentaldefense.org/pdf.cfm?contentid=1247&filename=ESK%2Epdf	Focused on the environmental and pollution prevention aspects of sustainable communities. Topics include development of a consensus-based process, project development, indicators, case studies and resources.	X		X		Components of the kit on developing a consensus-based process, stakeholder participation, ground rules, strategy development and indicators are all useful for the CEHA process.
Healthy People 2010 Toolkit. Public Health Foundation. Office of Disease Prevention and Health Promotion, US Department of Health and Human Services. http://www.healthypeople.gov/state/toolkit	A step-by-step guide for health planning by public health agencies and health councils. Includes fairly comprehensive treatment of: developing a health assessment team and leaders; identifying and garnering resources (including grants); setting priorities and establishing objectives of community health plans; establishing baseline measures and indicators; and communicating health goals and objectives. Sites various states' programs and experiences for each step in the process. Provides numerous helpful links to other resources at state and federal levels.	X		X	X	A very comprehensive toolkit. More appropriate for NMDOH and District offices, but with numerous resources of value to health councils, clinics and advocacy organizations as well. The toolkit has a very good treatment of data collection and interpretation, as well as setting indicators ("measures"). Excellent accompaniment of links to other resources, including grant-making. One drawback is that, similar to other similar toolkits and comprehensive guides, there is little treatment of EH as part of an integral health assessment.
The Community Toolbox. http://ctb.ku.edu	On-line resource provides information on assessing community needs and concerns, analyzing problems and goals, developing a model of change, coalition building, forming partnerships, strategic planning, leadership, management and group facilitation. Provides case studies and troubleshooting guide.	X	X	X	X	This is an excellent, user-friendly tool that could be easily accessed by NM communities. Great tool for troubleshooting. Environmental health, however, is not the systematic focus of any of its core materials, thus limiting its relevance to general health assessment and community involvement.

Title of Resource	Technical Focus and Abstract of Content	Language[5]		User Level[6]		Utility for CEHA in New Mexico
		Eng	Span	Lay	Prof	
General Information on Environmental Health, Exposure Pathways, Epidemiology, and Environmental Risk Communication						
U.S. Environmental Protection Agency http://www.epa.gov	The EPA web site provides extensive information and data on environmental and environmental health issues. The site is organized by topic and is easily searchable. There is also information in Spanish.	X	X	X	X	This is a very useful webpage for general and technical information on environmental and environmental health issues. Searchable databases provide state and county-level data of environmental quality at www.epa.gov/enviro/ or www.epa.gov/surf
Centers for Disease Control and Prevention http://www.cdc.gov	The CDC site provides a wealth of public health and environmental health information ranging from infectious disease, diabetes, cancer and workplace safety and health. The EH page provides information on a variety of EH topics with quick links to the National Center for Environmental Health and ATSDR.	X	X	X	X	This is a useful webpage for general information on environmental health and public health issues. The NCEH link provides information on environmental public health indicators. The ATSDR link provides good information on toxic substances and exposures. The webpage is also available in Spanish with many of the documents and reports also translated into Spanish.
Agency for Toxic Substances and Disease Registry http://www.atsdr.cdc.gov/contents.html http://www.atsdr.cdc.gov/HAC/HAGM/toc-html.html	Website covers all aspects of exposure to toxics, toxicological profiles on hazardous substances, the National Exposure Registry, maps of hazardous waste sites, and public health assessments conducted by ATSDR for specific hazardous waste sites.	X		X	X	This is a useful website for collecting information about toxics, such as minimum risk levels and toxicological profiles or for gathering data for a specific hazardous waste site. Site also contains useful risk communication information.
Pan-American Health Organization http://www.paho.org/spanish/dd/pin/ps030407.htm	This site provides a variety of health and environmental health information and data for the Americas. The site contains country health profiles and trends and situation analyses. Also provides a searchable database of PAHO publications. A "virtual health library" also contains information on environmental health and public health in general.	X	X	X	X	The webpage is written in English, Spanish and Portuguese and is a useful source of Spanish information on environmental health topics.
U.S. Environmental Protection Agency: Tools, Technical Assistance and Training http://www.epa.gov/epahome/training.htm	The web page provides links to EPA and other federal agencies on topics such as databases, software, and modeling tools useful for assessing environmental quality, a calendar of environmental conferences and on-line training courses.	X		X	X	The web site is useful to present the range of tools, technical assistance and training that may be available on environmental issues at the federal level. These links will in turn lead to more specific information related to your topic of interest.

Title of Resource	Technical Focus and Abstract of Content	Language[5]		User Level[6]		Utility for CEHA in New Mexico
		Eng	Span	Lay	Prof	
New Mexico Center for Health Sciences: Community Outreach & Education Program http://hsc.unm.edu/envirohealth/coep.shtml	Provides educational resources on environmental health to communities as well as policy markers. Site provides downloadable reports and training information on risk assessment, pesticide exposure, environmental justice and epidemiology.	X		X	X	Good place to obtain educational materials on basics of risk assessment, EJ and epidemiology.
New York Committee for Occupational Safety and Health http://www.nycosh.org/link.html	Contains a variety of health and safety resources and links to more than 1,000 health and safety web sites. Covers several environmental, occupational and health topics such as asbestos, lead, indoor air quality, pesticides, and worker compensation.	X		X	X	There are a number of interesting articles and reports on topics such as crayons as source of lead problems, contaminated vermiculite as a cause of asbestosis, and a handbook for occupational health and safety for hazardous waste management activities.
EnviRN University of MD-School of Nursing http://envirn.umaryland.edu	EnviRN site is "dedicated to supporting nursing professionals seeking accurate, timely and credible scientific information on environmental health and nursing." The site provides a "virtual nursing village" to share teaching strategies, practice guidance and consensus on future research needs for nursing and environmental health. The site provides modules on EH for incorporation into nursing curricula. Downloadable AV programs, presentations and documents.	X		X	X	There is some good basic information on environmental health, EH case studies and resources that would be appropriate for CEHA. Other information is geared towards nursing students.
Environmental Laws and Environmental Justice						
New Mexico Environment Department – Law Center http://www.nmenv.state.nm.us/lawcenter	New Mexico Administrative Code and New Mexico Statutes Annotated related to environmental protection and environmental quality. Links are also provided to Federal environmental statutes.	X		X	X	This site is useful for reference purposes related to environmental laws.
Southwest Research and Information Center http://www.sric.org/voices/2003	The mission of SRIC is to provide accurate information to the public on issues that affect the environment, human health and communities in order to protect natural resources.	X		X	X	The on-line newsletter provides useful information and contacts on current environmental issues confronting New Mexico such as farm worker safety, EH impacts of uranium mining, and nuclear waste disposal.

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U.S. EPA Environmental Justice Program www.epa.gov/compliance/environmentaljustice/index.html	This site describes EPA's EJ program including the history of EJ, the National EJ Advisory Committee, grants programs, Interagency Working Group on EJ, community intern program, and an EJ mapping tool.	X	X	X	X	This is a very good source for general EJ information and federal policies related to EJ.
A Citizen's Guide to Environmental Law and Environmental Decision Making (pamphlet). New Mexico Border Health Office, NMDOH Soon to be accessible at: www.nmborderhealth.com	A primer on laws applicable in New Mexico related to environmental health and justice, right-to-know, worker protection standards, and related themes for water, air, pesticide, solid and liquid wastes, etc. Provides a brief summary on selected laws related to these topics.	X		X		A good, concise primer that synthesizes the salient aspects of a number of environmental laws relating to health in the community, home and workplace in New Mexico.
Community Outreach, Participation and Organizational Strategies						
The Community Toolbox. http://ctb.ku.edu	On-line resource provides information on coalition building, forming partnerships, strategic planning, leadership, management and group facilitation. Provides case studies and troubleshooting guide.	X	X	X		This is an excellent, user-friendly tool that could be easily accessed by NM communities. Great tool for troubleshooting. Environmental health, however, is not the systematic focus of any of its core materials, thus limiting its relevance to general health assessment and community involvement.
The Asset – Based Community Development Institute http://www.northwestern.edu/ipr/abcd.html	This webpage provides community builders with useful information, resources and tools for assessing and mapping community capacity and mobilizing those local abilities.	X		X	X	Most links are publications of Institute for Policy Research from Northwestern University. There is an example of a community capacity inventory that can be reprinted and used to assess skills of community members. This is a useful webpage for those groups interested in community development.
Superfund Community Involvement Toolkit. www.epa.gov/superfund/tools/index.htm	A comprehensive guide for community involvement in EPA's Superfund process, the toolkit covers topics such as communications strategies, cross-cultural communications, facilitation and conflict resolution, risk communication, dealing with the media, and conducting public meetings.	X		X		Although the toolkit targets the Superfund process from the Federal perspective, chapters on risk communication, communications strategies and cross-cultural communications would be useful in the context of NM communities.

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Minnesota Department of Health Community Engagement Program www.health.state.mn.us/communityeng/index.html	An on-line resource that outlines the fundamentals and importance of community engagement. It provides a variety of resources for a range of activities such as obtaining citizen and stakeholder participation, conducting effective meetings, how to conduct focus groups, and resources related to multi-cultural dialogue.	X		X		This is a useful website that provides good information on the basic principles of community engagement Although some of the multi-cultural resources are geared toward minority groups that are not present in New Mexico, the concepts presented are applicable.
Risk Assessment, Data Collection, and Data Sources						
American Cancer Society http://www.cancer.org	American Cancer Society provides information on cancer to cancer patients, survivors, professionals and others. The site presents a variety of information related to prevention and treatment of cancer and potential risk factors. Cancer statistics available with breakouts specifically for African-Americans and Latinos.	X	X	X	X	This is a helpful site for general information regarding cancer and for state and national level data related to cancer incidence, mortality, survival rates, and risk.
National Institute of Environmental Health Sciences http://www.niehs.nih.gov	The NIEHS web page provides information related to how environmental exposures affect health, differences in susceptibility to exposures and how these change over time. Resources include information on genetics and genomics, the Environmental Genome Project including environmentally responsive genes, searchable list of publications by topic, and access to "Environmental Health Perspectives."	X		X	X	This site is more technical in nature and is useful to research the science behind environmental exposures and potential links to adverse health effects.
National Toxicology Program http://ntp-server.niehs.nih.gov	The NTP coordinates toxicological testing for new chemicals being used in products. The site provides technical information regarding toxicity and carcinogenicity of chemical compounds.	X			X	This site is helpful for research purposes related to toxicity/carcinogenicity of specific chemicals.

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Trust for America's Health http://healthyamericans.org/state/index.php?stateid=nm	Website provides environmental health information by state such as blood lead levels in children, hot spots of lead air quality, birth defects surveillance, cancer tracking report card and disease clusters. The site also provides an environmental justice analysis, a map of air quality, health risks, exposure and emissions.	X		X	X	This is a useful site to get a statewide picture of potential hotspots for environmental risks.
U.S. Environmental Protection Agency http://www.epa.gov	The EPA web site provides extensive information and data on environmental and environmental health issues. The site is organized by topic and is easily searchable. There is also information in Spanish.	X	X	X	X	This is a very useful webpage for general and technical information on environmental and environmental health issues. Searchable databases provide state and county-level data of environmental quality at www.epa.gov/enviro/ or www.epa.gov/surf
Environmental Defense Scorecard www.scorecard.org	This webpage uses EPA data to provide comparisons and rankings of areas by zip code based on pollutant releases to air, land, and water, air and water quality and presence of Superfund sites. Web page provides an EJ analysis by county. Health effects information is also available.	X	X	X	X	This is a one stop clearinghouse for environmental quality information although some of the baseline data used may be dated and may need to be updated using EPA data available at www.epa.gov/enviro. Comparisons to other counties in the state are useful for understanding local environmental issues in the context of the state as a whole.
Issue-Specific Environmental Health Assessment						
Solid Waste						
U.S. Environmental Protection Agency: Solid Waste www.epa.gov/epaoswer/osw/	The web page contains information on clean up, industries, pollution prevention, treatment and control, and waste programs.	X	X	X	X	The site has important information, methodologies, guides, catalogs and publications related to solid waste and pollution prevention.
Solid Waste & Recycling www.solidwastemag.com/	Although a commercial site, Solid Waste & Recycling Magazine is a Canadian trade magazine that provides technical and strategic information to managers in the rapidly changing municipal and industrial solid waste market.	X		X	X	Technical information about solid waste generated by different industries. Guides are practical and helpful to promote appropriate solid waste management.
Global Recycling Network www.grn.com/pub/swm_chmm.html	Global Recycling Network is an electronic information exchange that specializes in the trade of recyclables	X		X	X	Solid waste marketing in all trade levels. Guides are good outreach tools for education regarding proper solid waste disposal.

Title of Resource	Technical Focus and Abstract of Content	Language[5]		User Level[6]		Utility for CEHA in New Mexico
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	reclaimed in Municipal Solid Waste (MSW) streams, as well as the marketing of eco-friendly products.					
NM Environment Department, Solid Waste Bureau www.nmenv.state.nm.us/NMED/env_prot.html	The Solid Waste Bureau does not have its own web site, but there is some information available on the NMED webpage such as the state recycling directory and state-wide Solid Waste Management Report for 2000.	X		X	X	This is helpful information for NM communities regarding landfill capacity, current and projected quantity of solid waste generated and closure/closeout plans for landfills.
Liquid Waste (Sanitation)						
New Mexico Environmental Department: Liquid Waste Program www.nmenv.state.nm.us/fod/LiquidWaste/index.html	Liquid waste program web page contains state liquid waste regulations and policies, gray water irrigation guide, contacts re: highly vulnerable water bodies, reference materials on septic tanks and links to ground water information.	X		X	X	This is a useful webpage for state liquid waste policies and regulations. There is some limited mapping available of groundwater contamination from septic tanks.
National Environmental Services Center National Small Flows Clearinghouse http://www.nesc.wvu.edu/nsfc/nsfc_septicnews.htm	Webpage provides a wealth of information regarding septic systems including general overview of septic systems and maintenance, outreach materials, databases, publications, listserv and discussion group.	X		X	X	Great webpage for everything you would want to know about septic systems and wastewater management.
Air Quality						
U.S. Environmental Protection Agency: Office of Air Quality Planning and Standards AIRNOW http://www.epa.gov/airnow Technology Transfer Network (TTN) http://www.epa.gov/ttn/	The TTN is a clearinghouse of technical information related to air pollutant emissions and air quality. CICA provides air quality information for the U.S.-Mexico border region. AIRNOW website provides real-time and forecasted air quality concentrations and potential health effects for cities nationwide.	X	X	X	X	These web pages provide in-depth general and technical information related to air pollution, air pollution control, air quality, and health effects from air pollution. Air quality monitoring, modeling, emissions, and permitting information are available at the county level.
U.S. Environmental Protection Agency: Office of Air and Radiation Indoor Air Quality Program http://www.epa.gov/iaq/index.html	This page is a clearinghouse for information related to indoor air quality. Information and public outreach materials are available for asthma, radon, molds, second-hand smoke, and Tools for Schools.	X	X	X	X	This site provides useful information and outreach materials on indoor air quality topics. "Tools for Schools" is particularly helpful as a management program for IAQ in schools.

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		Eng	Span	Lay	Prof	
New Mexico Environment Department Air Quality Bureau http://www.nmenv.state.nm.us/aqb/index.html	Site provides online access to state air quality regulations, permits, air quality studies, wildfire smoke, visibility and air quality monitoring data.	X		X	X	This is a good site to assess air quality issues in New Mexico counties with a variety of readily accessible information.
American Lung Association: Air quality, indoor air quality http://www.lungusa.org	Information allergy, asthma, cancer, and chronic obstructive pulmonary disease. Site also provides prevalence and trends in lung disease and air quality data.	X	X	X	X	Good general information on lung disease. Data and statistics are also helpful.
Water Quality						
New Mexico Environment Department Ground Water Quality Bureau www.nmenv.state.nm.us/gwb/gwqbhome.html Surface Water Quality Bureau www.nmenv.state.nm.us/swqb/index.html	These two web pages provide state regulations and policies related to groundwater and surface water quality protection.	X		X	X	Good sites for state water quality information. In some cases, may be quicker and easier to visit EPA sites to get local level data (e.g., reports by local drinking water systems).
U.S. Environmental Protection Agency Local Drinking Water Information www.epa.gov/safewater/dwinfo.htm	This site provides Safe Drinking Water Act information for local drinking water supplies nationwide. Health information, list of standards, maximum contaminant levels by contaminant, regulations and policies, and FAQs are also available.	X		X	X	This is a quick, easy-to-use site to get data related to exceedances of drinking water standards in local drinking water systems. Database is searchable by county.
U.S. Environmental Protection Agency Enviromapper for Water www.epa.gov/waters/enviromapper/index.html	On-line mapping tool allows user to display information for water bodies of U.S. such as impaired water bodies, water quality standards, and assessed waters.	X		X	X	This site allows the user to create maps of water bodies for a given watershed. More advanced GIS capabilities and data are also available.
U.S. Geological Survey National Water Quality Assessment Data Warehouse http://water.usgs.gov/nawqa/data	Site provides a variety of groundwater and surface water data for specific watersheds or portions of watersheds nationwide. Data provided includes stream flow information, pesticide and nutrient concentrations, aquatic organism tissue samples, and groundwater levels among many others.	X			X	Mapping and data output capabilities for more advanced users.

Title of Resource	Technical Focus and Abstract of Content	Language[5]		User Level[6]		Utility for CEHA in New Mexico
		Eng	Span	Lay	Prof	
Mining (Minerals)						
NM Energy, Minerals & Natural Resources Department www.emnrd.state.nm.us	Web page provides state law and regulations related to mining operations as well as permitting, closure/closeout, and financial assurance information.	X		X	X	This is an important website for all mining related activities in New Mexico.
U.S. Environmental Protection Agency http://www.epa.gov/ispd/sector/mining.html	This webpage provides mining industry and environmental compliance information. Summaries of environmental issues related to mining are given.	X		X	X	This is a useful site for background information on the mining sector and federal environmental requirements applicable to mining.
Oil and Gas Development						
New Mexico EMNRD, Oil Conservation Division/Environmental Bureau www.emnrd.state.nm.us/ocd	Site provides environmental regulations applicable to oil and gas industry for prevention of groundwater contamination. Permitting information is also accessible.	X		X	X	This site is helpful for investigation of oil and gas operations in New Mexico.
Radiological Materials (Uranium Mining/Processing, Weapons Manufacture, Storage and Waste Disposal)						
New Mexico Environment Department Radiation Control Bureau http://www.nmenv.state.nm.us/nmrcb/home.html	Site provides access to state Radiation Protection Regulations as well as policy and guidance documents. Webpage also contains links other bureau programs such as indoor radon outreach and radioactive material information.	X		X	X	Site is helpful in researching laws and regulations related to state radiation protection. However, the site does not contain any geographically-specific information that would be helpful to CEHA practitioners.
U.S. EPA: Radioactive Waste Disposal Issues http://www.epa.gov/rpdweb00/docs/radwaste/	Site provides an overview of radioactive waste disposal practices for uranium mill tailings, transuranic waste, spent nuclear fuel, and low-level radioactive waste. Links to other resources, publications and frequently asked questions are also included.	X		X	X	This is a good site for overview material regarding regulatory and environmental issues associated with radioactive waste disposal.
U.S. Environmental Protection Agency: Radon in Drinking Water: Questions and Answers www.epa.gov/safewater/radon/qa10.pdf	Frequently asked questions about radon in drinking water.	X		X	X	Useful public outreach material for those communities with radon problems.
U.S. Environmental Protection Agency: Radon in Homes www.epa.gov/radiation/docs/assessment/radon_in_homes.pdf	Public information brochure that provides overview of the radon problem, how to test for radon and mitigation measures.	X		X	X	Useful public outreach material for communities with radon issues.

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		Eng	Span	Lay	Prof	
U.S. Nuclear Regulatory Commission: Regulatory Guides – Environmental and Siting www.nrc.gov/reading-rm/doc-collections/reg-guides/environmental-siting/active/	Many regulatory guides for radiation exposure in each state.	X		X	X	A complete list of regulatory guides. Information about radiological effluent and environmental monitoring, as well as nuclear material are provided.
World Information Service on Energy (Uranium) www.antenna.nl/wise/uranium/	This website offers highly technical information related to uranium mining, milling, uranium enrichment and fuel fabrication, and depleted uranium. Very comprehensive with studies and data from around the world.	X		X	X	This site is very technical and would be appropriate for those communities needing more detailed information related to uranium mining/milling.
Agriculture (Pesticide Exposure, Dairies)						
New Mexico Department of Agriculture Bureau of Pesticide Management http://nmdaweb.nmsu.edu/DIVISIONS/AES/pest.html	Provides links to NM Pesticide Control Act, applicable regulations, pesticide licensing and certification, pesticide registration & Endangered Species Protection Program.	X		X	X	This site would be useful if investigating enforcement issues associated with pesticide use by commercial or agricultural users.
U.S. EPA Pesticides Program http://www.epa.gov/pesticides/index.htm	Provides links to a variety of information related to pesticides such as health and safety, environmental effects, regulations, mosquito control and WNV, and integrated pest management. Resources for kids are also provided.	X		X	X	This is a good overview site to get general as well as technical information related to pesticides.
Pesticide Action Network www.pesticideinfo.org	The web includes current toxicity and regulatory information for about 5,400 pesticide active ingredients and their transformation products.	X		X	X	Helpful for understanding toxicology of pesticides.
Beef stocker USA http://beefstockerusa.org/	University-sponsored web site provides fact sheets on cattle waste management and links to waste sites managed by other universities.	X		X	X	Information would be helpful to understand industry animal waste management practices.
U.S. EPA National Agriculture Compliance Assistance Center www.epa.gov/agriculture/index.html	One-stop clearinghouse of information related to environmental requirements for the agriculture industry. Site provides links to information on animal feeding operations, agricultural worker protection standard, crops, forestry and nurseries/greenhouses.	X	X	X	X	This site contains information useful in understanding how environmental regulations apply at the federal level to the agricultural community. There are links to data such as water discharges under the National Pollutant Discharge Elimination System (NPDES).

Title of Resource	Technical Focus and Abstract of Content	Language[5]		User Level[6]		Utility for CEHA in New Mexico
		Eng	Span	Lay	Prof	
New Mexico Department of Agriculture Dairy Bureau http://nmdaweb.nmsu.edu/divisions/aes/dairy.html	Web site provide links to state laws and regulations applicable to dairies that would ensure that dairy products are free of bacteria and antibiotics	X		X	X	Limited information that would be helpful only in researching legal requirements for dairies.
In-Home Environmental Health and Safety						
U.S. Environmental Protection Agency: America's Children and the Environment http://www.epa.gov/children/indicators	Site provides EPA's first report on trends in environmental factors that may affect the health of children.	X	X	X	X	Useful information regarding environmental risk factors for children.
Community Environmental Health Resource Center http://www.cehrc.org	The web page provides information related to environmental hazards in housing such as lead, carbon monoxide, radon and mold. A n example visual survey form is provided in both English and Spanish. Information on tenant's rights, laws and policies related to housing are also provided.	X	X	X	X	This is a useful webpage for general and how-to information on assessing environmental hazards in housing.
Healthy Homes Step-by-Step Manual: Implementing an Environmental Health Program in Your Community. Southern Area Health Education Center, Border Health Education Training Center	A good step-by-step guide for assessing EH risks in the home setting including: electrical wiring and receptacles, lead in pottery, fire hazards, pesticides, food security, gas hookups, etc. Includes a survey instrument and risk documentation forms.	X		X		This manual provides all of the elements necessary to conduct environmental health risk assessments in the home setting. [*Note*: SoAHEC is in the process of developing a specific toolbox for facilitating EH home assessments.]
Food Safety/Food-borne Illness						
U.S. Department of Agriculture www.foodsafety.gov	Site offers a variety of food safety information in English, Spanish and many other languages. Consumer advice, news and alerts, outreach materials, reporting illness and product complaints, and links to other federal, state and local programs are provided.	X	X	X		This is a good site for general food safety information.
New Mexico Environment Department Field Offices www.nmenv.state.nm.us/NMED/field_op.html	The field offices of NMED are responsible for food safety inspections. This site provides contact information but no information or data related to the program.	X		X		Extremely limited webpage. Useful for contact information only.

Title of Resource	Technical Focus and Abstract of Content	Language[5]		User Level[6]		Utility for CEHA in New Mexico
		Eng	Span	Lay	Prof	
Ranking and Prioritizing Environmental Health Issues as Part of a Community Health Profile						
Healthy People 2010 Toolkit. Public Health Foundation. Office of Disease Prevention and Health Promotion, US Department of Health and Human Services. http://www.healthypeople.gov/state/toolkit	Step-by-step guide for health planning by public health agencies and councils. Fairly comprehensive treatment of: developing health assessment teams & leaders; identifying and garnering resources (including grants); setting priorities and objectives of community health plans; establishing baseline measures and indicators; and communicating health goals and objectives. Cites various states' programs and experiences for each step in the process. Provides helpful links to other state & federal resources.	X		X	X	A very comprehensive toolkit, presented in a format that can be readily accessed for training. More of an appropriate toolkit for NMDOH and District offices, but with numerous resources of value to health councils, clinics and advocacy organizations as well. The toolkit has a very good treatment of data collection and interpretation, as well as setting indicators ("measures"). Excellent accompaniment of links to other resources, including grant-making. One drawback is that, similar to other similar toolkits and comprehensive guides, there is little treatment of EH as part of an integral health assessment.
Community Environmental Health Assessment Workbook. Environmental Law Institute. www.eli.org	The ELI workbook provides a step-by-step procedure and worksheets for ranking and prioritizing environmental health problems.	X		X		The worksheets are particularly useful and the step-by-step guide is simple enough that it can be applied by lay persons.
PACE-EH. National Association of County and City Health Officials. www.naccho.org	Provides an overview and example approaches for ranking and prioritizing environmental health issues. Includes example worksheets.	X	X	X	X	Simplified overview of ranking and prioritization processes. Worksheets are useful and adaptable to any situation.
Indicators and Evaluation						
Sustainability Starts in Your Community: A Community Indicators Guide. Redefining Progress & Earth Day Network. www.sustainer.org/pubs/	Step-by-step guide for use in determining indicators in a participatory manner, including development of a baseline and monitoring of indicators of change.	X				An excellent primer and step-by-step guide for determining and setting indicators. The format is easy to read and ready for use as a training resource.
Environmental Indicators Project. Neighborhood Environmental Indicators Project of Pacific Institute for Studies in Development, Environment and Security (SIDES). http://www.neip.org	On-line guide for developing environmental indicators at the neighborhood level to promote social and environmental justice. Topics include: developing a framework, characteristics of indicators, criteria to assess data quality and usefulness of indicators to the community, and improving the process to develop indicators. Includes case studies and other resources.	X		X		A user-friendly and simple guideline for developing environmental indicators.

Title of Resource	Technical Focus and Abstract of Content	Language[5]		User Level[6]		Utility for CEHA in New Mexico
		Eng	Span	Lay	Prof	
Building and Operating Neighborhood Indicator Systems: A Guidebook. G. Thomas Kingsley. National Neighborhood Indicators Project. The Urban Institute. www.urban.org/nnip/pdf/guidebk.pdf	Technical guide provides summary of the National Neighborhood Indicators Project, history of social indicators, guidance on use of GIS, NNIP partner project summaries, and guidance on how to build and use a neighborhood indicators system and its costs.	X			X	Overly technical, but Chapter 4 on building a neighborhood indicators system is most valuable. Provides important lessons learned from other cities regarding creation of a long-term indicators system. Chapter 6 provides cost information for building a system.
Environmental Health Indicators: Framework and Methodologies. David Briggs. World Health Organization. http://www.who.int/ceh/publications/cehframework/en/	Provides overview of indicators framework; profiles of environmental health indicators for socio-demographic context, air pollution, sanitation, shelter, access to drinking water, vector-borne disease, solid waste mgt., hazardous and toxic substances, food safety, radiation, etc. Profiles are quite extensive including definition of indicator, specification of data needed, data sources and availability, computation and application.	X			X	Useful indicators and profiles; however geared more toward less developed/poorer countries. Good overview of indicators framework with useful schematic. The framework lacks drivers and complete health effects for air pollution. Well developed indicators for socio-demographic context.
Check Your Success: A Community Guide to Developing Indicators. On-line Indicators Guide and Workshop. Virginia Tech University www.uap.vt.edu/checkyoursuccess/workshop.html	Website provides on-line access to overview of use of indicators and evaluation process. Includes step-by-step guide for conducting an indicators workshop with useful worksheets. Site also contains case studies, table of indicators, references, and links. User may also download guide for free.	X		X		Very good, simplified overview of evaluation process and steps to develop good indicators. Worksheets for use during an indicators workshop are quite useful and easily adaptable.
Measuring Program Outcomes: A Practical Approach. United Way of America. http://national.unitedway.org/outcomes/resources/mpo	Demonstrates the use of logic models in clarifying and communicating outcomes. Cites experiences of many types of agencies. Includes worksheets, examples and a bibliography on measurement issues and performance indicators.	X		X	X	Very good step-by-step guidebook and accompanying video presentation covering the ins and outs of outcome measurement. This guide has been used by thousands of programs nationwide to design and implement a program outcome measurement system.
The Community Tool Box -- A Framework for Program Evaluation: A Gateway to Tools. ctb.ku.edu	On-line resource providing extensive overview of CTB framework for evaluating programs. Provides examples, graphics, step-by-step guide and troubleshooting help.	X	X	X	X	Useful, on-line resource. More dense, but could serve as a resource for project implementers.

Title of Resource	Technical Focus and Abstract of Content	Language[5]		User Level[6]		Utility for CEHA in New Mexico
		Eng	Span	Lay	Prof	
EPA Green Communities Toolkit www.epa.gov/greenkit/indicator.htm	On-line orientation to a variety of indicators including: environmental, economic, social, sustainability, economic prosperity, healthy community and social well being. Provides information on how to select, use and report indicators, data sources, references and real world examples of indicators.	X		X	X	Very good table of indicators, their purpose and linkages to broader issues. Useful method for evaluating and selecting indicators in the group context.
Preparing an Environmental Health Action Plan						
Community Environmental Health Assessment Workbook. Environmental Law Institute. www.eli.org	The ELI workbook describes the process of identifying potential strategies for action, identifying resources and analyzing, evaluating and selecting appropriate strategies. Worksheets guide the user through this process.	X		X		Description of this process is quite good and easy to follow. The worksheets are particularly useful to guide user through the process and keep track of information.
PACE-EH. National Association of County and City Health Officials. http://pace.naccho.org/DownloadPage.asp	Overview of components of an action plan.	X	X	X	X	This is good overview material, but some groups might need more information and assistance in how to put some of the action plan elements together.

Community Environmental Health Assessment Tool Box for New Mexico (CEHA-NM)

APPENDIX E: Institutional and Organizational Resources with Relevance to CEHA in New Mexico

New Mexico Environmental Department. www.nmenv.state.nm.us

New Mexico Health Department. http://www.health.state.nm.us

Southern Area Health Education Center (SoAHEC) of the Border Health Education Training Center, New Mexico State University. Las Cruces NM. www.border-health-education-training-center.org

National Association of County and City Health Officials (NACCHO).
http://pace.naccho.org/DownloadPage.asp
Agency for Toxic Substances and Disease Registry. www.atsdr.cdc.gov

- ATSDR Office of Tribal Affairs. www.atsdr.cdc.gov/tribal/pha.html
- ATSDR Public Health Assessments. www.atsdr.cdc.gov/HAC/pha.html

U.S. Environmental Protection Agency. www.epa.gov

- EPA Superfund Program. www.epa.gov/superfund/
- Tools for Human Health Risk Assessment; Framework for Cumulative Risk Assessment. www.epa.gov/oerrpage/superfund/programs/risk/toolthh.htm
- EPA Tools, Technical Assistance and Training. www.epa.gov/epahome/training.htm
- EPA Office of Children's Health Protection. www.epa.gov/ochp/ochpweb.nsf/homepage

Centers for Disease Control and Prevention. www.cdc.gov

- Cancer Cluster Resources. www.cdc.gov/nceh/clusters/resources.htm; www.cancer.gov
- Guidelines for Investigating Clusters of Health Effects www.cdc.gov/mmwr/preview/mmwrhtml/00001797.htm

National Center for Environmental Health. www.cdc.gov/nceh

National Institute of Environmental Health Sciences. http://www.niehs.nih.gov/

Pan-American Health Organization. Washington DC. www.paho.org

Community Environmental Health Assessment Tool Box for New Mexico (CEHA-NM)

APPENDIX F: Selected Training Resources Useful for Facilitating CEHA in New Mexico Communities

Title, Author & Contact Information	Abstract of Content	Language		Critique of Utility to CEHA
		Eng	Spa	
General Information on Environmental Health and Environmental Risk Communication				
Community Environmental Health Education Modules for Health Care Providers and the Lay Community: Basic Risk Assessment. Community Education Outreach Program/UNM http://hsc.unm.edu/envirohealth/coep.shtml	Modules for facilitating awareness and basic capacity in CEHA, using several mini-lectures, case-study type exercises to relate basic concepts of EH, exposure pathways and steps in risk and toxicity assessments. Includes several questionnaires and checklists for determining origins of illness, and risks at the workplace and in the home. Module includes various appendices with more in-depth information on several topics related to case studies and exercises, including cancer data for NM.	X		Good basic overview of concepts of EH, exposure pathways, with several good graphics. Parts can be used in training materials of toolbox, although more complementary graphics are needed. Good checklists and questionnaires for determining EH risks in the home and workplace, and guidance for basic data and risk assessments. Medical history and risk assessment questionnaires are more specific and applicable for assessing individual patients by healthcare providers.
Community Environmental Health Education Modules for Health Care Providers and the Lay Community: The Search for Wellness. Community Education Outreach Program/UNM http://hsc.unm.edu/envirohealth/coep.shtml	Modules for facilitating awareness as to basic epidemiology and exposure pathways, including an emphasis on EH risks to children. Module includes in-depth information on several topics related to case studies and exercises, including leukemia related to nuclear radiation and cancers. Includes several questionnaires and checklists for determining origins of illness, and risks at the workplace and in the home. Module includes various appendices with more in-depth information on several topics including cancer data for NM.	X	X	Good primer on basic epidemiology and exposure pathways, using hypothetical case-studies. PowerPoint presentations on these subjects in Spanish and English with good graphics. Only selected resources are available in Spanish.
Environmental Health and Justice Training Manual: A Community Guide to Understanding the Environment. Community University Partnership for Environmental Justice. Center for Environmental Resources Management/CERM. Univ. of Texas/El Paso http://www.cerm.utep.edu/outreach/cupej/environmentalHealth_justice.pdf	Step-by-step training guide with helpful resources for implementing training in environmental health concepts and environmental justice. Includes a specific workshop module on understanding toxicity and interpreting health information. Emphasizes air, water and pesticides and exposure pathways. Includes a series of appendices with good background and support information for each workshop module. Contains a comprehensive glossary of terms.	X	X	Simplistic, straightforward training resources including definitions and graphics that are easy to understand. Perhaps one of the best resources of its type in English and Spanish language appropriate to New Mexico.
Salud Ambiental Latinas Tomando Acción: An Environmental and Community Organizing Training Manual. Environmental Health Coalition ehcoalition@igc.apc.org	Step-by-step guide for training community members in organizational development around environmental protection and EH issues.	X	X	Useful and practical Spanish-language resource for facilitating organizational development around environmental health issues in the community, and formation of CEHA workgroups in Spanish-speaking communities.

Title, Author & Contact Information	Abstract of Content	Language		Critique of Utility to CEHA
		Eng	Spa	
Basic Concepts in Environmental Health and Toxicology. Environmental Health Education Center of the University of Maryland School of Nursing.	Presents the basics of EH and toxicology, with several case study type scenarios and their analysis (mercury, pesticides and chlorine).	X		Good PowerPoint presentation on the basics of EH and toxicology in lay terms.
What is Cancer? Agency for Toxic Substances and Disease Registry.	A pamphlet presenting basic information on cancers and their origins.	X		Good basic primer on cancers, their risks and origins. Good graphics and tables indicating risk factors and incidences in adults vs. children. Material from this pamphlet is readily adaptable for inclusion in a training module on EH risks.
Environmental Health: A Nursing Perspective. Maria Teran-MacIver and Kris Larson. Agency for Toxic Substances and Disease Registry.	A collection of overhead or PowerPoint-type pages encompassing basic lectures on exposure pathways, basic toxicology, EH risks to children, culture differentiation, and risk communication.	X		Very basic and easily understood language, with simple illustrations (although some illustrations depict Native Alaskans and would need to be replaced). Especially good for clinics with promotora outreach programs. Spanish translation would render this useful throughout New Mexico.
Comprehensive Step-by-Step Guidance on CEHA				
Train-the-Trainer Manual, 7 Generations: Addressing Village Environmental Issues for Future Generations of Rural Alaska. Susan Unger and Dr. Rick Foster. Alaska Inter-Tribal Council. www.state.ak.us/dec/dsps/compasst/7generations/7gen.htm	Manual to conduct train-the-trainer workshops for Alaska's 7 Generations community EH assessment/planning process for tribal villages. Includes ice breakers and group activities, lessons in pollution prevention that can be applied in tribal communities, tips for facilitating meetings, and step-by-step guide to using the 7 Generations Manual.	X		Understandable, very simple train-the-trainer guide. Can be used at the high school level or for a general layperson audience. Good group exercises for understanding concepts such as pollution, environment, how to do a community environmental issues survey, the difference between pollution prevention, recycling/reuse and waste treatment, among many others.
Healthy People 2010 Toolkit. Public Health Foundation. Office of Disease Prevention and Health Promotion, US Department of Health and Human Services. http://www.healthypeople.gov/state/toolkit	A step-by-step guide for health planning by public health agencies and health councils. Includes fairly comprehensive treatment of: developing a health assessment team and leaders; identifying and garnering resources (including grants); setting priorities and establishing objectives of community health plans; establishing baseline measures and indicators; and communicating health goals and objectives. Sites various states' programs and experiences for each step in the process. Provides numerous helpful links to other resources at state and federal levels.	X		A very comprehensive toolkit, presented in a format that can be readily accessed for training. More of an appropriate toolkit for NMDOH and District offices, but with numerous resources of value to health councils, clinics and advocacy organizations as well. The toolkit has a very good treatment of data collection and interpretation, as well as setting indicators ("measures"). Excellent accompaniment of links to other resources, including grant-making. One drawback is that, similar to other similar toolkits and comprehensive guides, there is little treatment of EH as part of an integral health assessment.
Community Environmental Health Assessment Workbook. Environmental Law Institute. www.eli.org	Step-by-step guide for community groups to conduct CEHA on their own.	X		Simplified approach for conducting a CEHA. Worksheets are quite useful. Does not include information for project evaluation, and grant writing assistance.

Title, Author & Contact Information	Abstract of Content	Language		Critique of Utility to CEHA
		Eng	Spa	
PACE-EH. National Association of County and City Health Officials. http://pace.naccho.org/DownloadPage.asp	Provides an overview of the PACE-EH methodology to identify, prioritize and implement solutions to environmental health problems.	X	X	The PACE-EH protocol is not considered appropriate for New Mexico, as it is quite involved, contains numerous steps and is costly in terms of time and monetary resources to implement. However, the guidebook does provide good overview material, especially for the more advanced health councils and agencies, and especially for ranking and prioritizing issues and actions. In any case, use of this resource in NM communities will require specialized assistance.
EPA Green Communities Toolkit www.epa.gov/greenkit/risk.htm	Step-by-step, on-line guide for planning and implementing sustainable actions at the local level. Includes how to do a community assessment, conduct a trends analysis, develop a future community vision, create sustainable action plans, and how to implement those actions. Provides a variety of links to useful resources and tools and case studies for each step in the process.	X		Useful guide for conducting a CEHA in a more holistic manner. Geared toward achieving sustainable communities for the long-term.
Environmental Laws and Environmental Justice				
Environmental Health and Justice Training Manual: A Community Guide to Understanding the Environment. Community University Partnership for Environmental Justice. CERM/UTEP http://www.cerm.utep.edu/outreach/cupej/environmentalHealth_justice.pdf	Step-by-step training guide with helpful resources for implementing training in environmental health concepts and environmental justice. Links concepts to federal laws and Executive Order No. 12898. Includes a series of appendices with good background and support information for each workshop module. Contains a comprehensive glossary of terms.	X	X	Simplistic, straightforward training resources including definitions and graphics that are easy to understand. Perhaps one of the best resources in English and Spanish language appropriate to New Mexico. Should be complemented with case study examples of just how principles of environmental justice have been carried out in New Mexico, as well as a presentation on NM laws.
Environmental Justice: Frequently Asked Questions www.epa.gov/compliance/resources/faqs/ej/index.html	Provides answers to 21 frequently asked questions regarding environmental justice including a definition of the concept, how to assess whether or not an EJ problem exists, how is it being addressed by EPA and examples of EJ issues around the country.	X		Can be easily used in any training to describe the concept of environmental justice, its origins and how it is addressed by EPA.
A Citizen's Guide to Environmental Law and Environmental Decision Making (pamphlet). New Mexico Border Health Office, NMDOH	A primer on laws applicable in New Mexico related to environmental health and justice, right-to-know, worker protection standards, and related themes for water, air, pesticide, solid and liquid wastes, etc. Provides a brief summary on selected laws related to these topics.	X		A good, concise primer that synthesizes the salient aspects of a number of environmental laws relating to health in the community, home and workplace. While not intended as a training resource, its content can be readily adapted for such purposes.

Title, Author & Contact Information	Abstract of Content	Language		Critique of Utility to CEHA
		Eng	Spa	
Community Outreach, Participation and Organizational Strategies				
Improving Health Initiative Training *Series, '02*: *Improving the Health of Your Community—From Community Building to Community Action.* NMDOH, Community Health Improvement Training Institute	A comprehensive module that focuses on concepts and provides several tools for facilitating community participation and the formation of groups for undertaking health assessments. Includes guidance on evaluating and obtaining available resources in the community, community mapping techniques, community capacity building, determining and prioritizing issues, etc. This is the module that provides the overview (the "big picture") of the entire CHITI training module series.	X	X	A good module in terms of its summary treatment of all aspects covered under the entire series of training modules offered by NMDOH/CHITI. However, the inclusion of so many tools may actually confuse some health council members (overload); although more detailed treatment of these tools and approaches are covered in specific modules which follow. In terms of CEHA, there is very little treatment other than a mention of environmental factors influencing health and health assessments.
Improving Health Initiative Training *Series, '02*: *Working with Groups and People in Them.* NMDOH, Community Health Improvement Training Institute	IHI Training Module covering group dynamics and group decision making, how to run a meeting, how to facilitate, and cultural sensitivity.	X	X	This is a useful training. However, it would benefit from some real-life examples and hands-on exercises to demonstrate concepts. This is good overview material and the training provides useful tips, but more in-depth training may be necessary in the areas of facilitation and cultural sensitivity. [*Note*: Spanish language module copy reviewed was incomplete].
The Community Toolbox. Curriculum for 16 core competencies such as assessing community needs and resources, strategic planning, evaluating the initiative. http://ctb.ku.edu/	On-line resource provides information on coalition building, forming partnerships, strategic planning, leadership, management and group facilitation. Provides case studies and troubleshooting guide. Extensive, on-line training includes participant guide and experiential learning activities in the 16 core areas. Participants produce a planning product which is used to assess competence in core areas.	X	X	This is an excellent, user-friendly tool that could be easily accessed by NM communities. Great tool for troubleshooting. The core curriculum is available online on a fee-for-service basis. Environmental health, however, is not the systematic focus of any of its core materials, thus limiting its relevance to general health assessment and community involvement.
The Community Tool Box: Parte A. Modelos para Promover la Salud y Desarrollo en la Comunidad: Introducción a las Herramientas. http://ctb.ku.edu/tools/es/tools_toc.htm	Spanish language guide to facilitate meetings with community groups in order to communicate aspects of health and prioritize actions.	X	X	Fairly comprehensive in scope of public health, but few specific inferences concerning environmental health. Useful in terms of understanding the concepts of organizing and communicating health information to communities, but overly complex in terms of the number of steps involved. The module is more appropriate to those communities or groups with sufficient time available to carry out the full module.
Superfund Community Involvement Toolkit. www.epa.gov/superfund/tools/index.htm	Comprehensive guide for community involvement in EPA's Superfund process, covers topics such as communications approaches, cross-cultural communications, facilitation and conflict resolution, risk communication, dealing with the media, and conducting public meetings.	X		Although the toolkit targets the Superfund process, chapters on risk communication, communications strategies and cross-cultural communications would be useful trainings in the context of NM communities. These resources can be readily accessed for training purposes.

Title, Author & Contact Information	Abstract of Content	Language		Critique of Utility to CEHA
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Risk Assessment, Data Collection, Analysis and Interpretation				
Improving Health Initiative Training Series, '02: • *Choosing an Evidenced-Based Approach;* • *Evidence-Based Environmental Strategies in Health Improvement* NMDOH, Community Health Improvement Training Institute.	These modules develop the approach of using tried-and-true methods as a starting place for community health assessments (best practice, science-based approaches, standards accepted in the public health community).	X		The modules present the convincing argument that science-based data and methods should be used in community health assessments; however, it focuses primarily on behavioral health (substance abuse, tobacco, violence prevention, nutrition and diabetes) and has only a passing mention of EH. The more theoretical treatment of "environmental strategies" is a bit confusing, in that several concepts (environmental assessment, behavioral health, occupational health) are blurred in meaning.
Improving Health Initiative Training Series, '02: *Using and Abusing Local Data.* NMDOH, Community Health Improvement Training Institute.	The module provides a logical progression of steps in using secondary data sources, as well as guidance in the types of calculations for measures of health and health risks. Gives and overview of methods of generating primary data within the community or outreach area, and the costs of using different methods. Also gives guidance on the use of graphics to facilitate communication of the results of data analysis.	X		A very good module for engendering an understanding of data types and methods for its collection. The discussion of tools for data collection (surveys, focus groups, etc.) is very helpful. The material on concepts of abusing data, in terms of the inappropriate use of incomplete or scanty data in making decisions concerning community health issues and action plans, is somewhat weak. There is essentially no systematic treatment of environmental health and data that links health to the environment.
Healthy People 2010 Toolkit. Public Health Foundation. Office of Disease Prevention and Health Promotion, US Department of Health and Human Services. http://www.healthypeople.gov/state/toolkit	A step-by-step guide for health planning by public health agencies and health councils. Includes fairly comprehensive treatment of: developing a health assessment team and leaders; identifying and garnering resources (including grants); setting priorities and establishing objectives of community health plans; establishing baseline measures and indicators; and communicating health goals and objectives. Sites various states' programs and experiences for each step in the process. Provides numerous helpful links to other resources at state and federal levels.	X		A very comprehensive toolkit, presented in a format that can be readily accessed for training. More of an appropriate toolkit for NMDOH and District offices, but with numerous resources of value to health councils, clinics and advocacy organizations as well. The toolkit has a very good treatment of data collection and interpretation, as well as setting indicators ("measures"). Excellent accompaniment of links to other resources, including grant-making. One drawback is that, similar to other similar toolkits and comprehensive guides, there is little treatment of EH as part of an integral health assessment.
EPA Green Communities. On-line Orientation to Risk Assessment and Tools for Risk Assessment. www.epa.gov/greenkit/risk.htm	Basic, very simplified overview of risk assessment. Provides information on how risk assessment is used and the various dimensions of risk that are evaluated in risk assessment.	X		Mostly not useful to lay person. Risk dimensions are helpful, but no discussion is provided, therefore it is of limited value.

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Community Environmental Health Education Modules for Health Care Providers and the Lay Community: Basic Risk Assessment; & The Search for Wellness. Community Education Outreach Program/UNM http://hsc.unm.edu/envirohealth/coep	Modules for facilitating awareness and basic capacity in CEHA, using several mini-lectures, case-study type exercises to relate basic concepts of EH, exposure pathways and steps in risk and toxicity assessments. Includes several questionnaires and checklists for determining origins of illness, and risks at the workplace and in the home. Module includes various appendices with more in-depth information on several topics related to case studies and exercises, including cancer data for NM.	X	X	Good basic overview of EH concepts, exposure pathways, with several good graphics. Parts can be used as training materials, although more graphics are needed. Good checklists and questionnaires for determining EH risks in the home and workplace, and guidance for basic data and risk assessments. Medical history and risk assessment questionnaires are more specific and applicable for assessing individual patients by healthcare providers. PowerPoint presentations on these subjects in Spanish and English with good graphics. Only selected resources are available in Spanish.
Healthy Homes Step-by-Step Manual: Implementing an Environmental Health Program in Your Community. Southern Area Health Education Center, Border Health Education Training Center	A good step-by-step guide for assessing EH risks in the home setting including: electrical wiring and receptacles, lead in pottery, fire hazards, pesticides, food security, gas hookups, etc. Includes a survey instrument and risk documentation forms.	X		While not strictly a training resource, this manual provides all of the elements necessary to facilitate training in environmental health risk assessments in the home setting. Lacks sufficient graphics to support conveyance of the messages. Would also be useful to have the same guide in Spanish.
Statistics and Evaluation Workshop: Healthy Gente and Healthy Border 2010. US-Mexico Border Health Coalition/CDC.	The workshop curriculum contains a number of useful resources, including an annotated list of agencies and data registry sites, primarily within the Federal Government, and information on environmental justice by race groups. The workshop focuses especially on types of data pertinent to health.	X		While oriented to the US-Mexico border region, resources presented in the curriculum are useful for many if not all New Mexico communities, especially the lists of resources (websites, data registries). The sections on statistics are good, but may be quite challenging to members of health councils and advocacy groups. The workshop did not directly cover EH as an integral part of its analytical focus on health, which is seen as a drawback.
Finalizing the Assessment and Ranking and Prioritizing Environmental Health Issues as Part of a Community Health Profile				
Improving Health Initiative Training Series, 2002: *Setting Priorities and Analyzing Issues—The First Steps in Developing a Comprehensive Community Health Plan.* NMDOH, Community Health Improvement Training Institute	Summary treatment of methods in determining issues and their priorities, using several tools for facilitating their ranking. Links issues with the need to develop indicators.	X		Provides good general guidance and several tools for working with groups to determine health issues in the community and in ranking their priority for follow-on action plans (e.g. tree diagrams). Inclusion of more real-life case studies and detailed treatment of tools would improve the effectiveness of this module.
Community Environmental Health Assessment Workbook. Environmental Law Institute. www.eli.org	The ELI workbook provides a step-by-step procedure and worksheets for ranking and prioritizing environmental health problems.	X		The worksheets are particularly useful and the step-by-step guide is simple enough that it can be applied by lay persons.
PACE-EH. National Association of County and City Health Officials. http://pace.naccho.org/DownloadPage.asp	Provides an overview and example approaches for ranking and prioritizing environmental health issues. Includes example worksheets.	X	X	Simplified overview of ranking and prioritization processes. Worksheets are useful and adaptable to any situation.

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Preparing an Environmental Health Action Plan				
Improving Health Initiative Training Series, '02: Setting Priorities and Analyzing Issues—The First Steps in Developing a Comprehensive Community Health Plan. NMDOH, Community Health Improvement Training Institute	Describes the steps used in a comprehensive community health planning process and components of and linkage to a community health profile. Links actions of identifying community resources and their mapping (agencies, services, etc.) to the planning process, as well as the need to develop indicators to facilitate evaluation and tracking of progress in execution of health plans. Illustrates several methods for determining community health issues and tools for facilitating their ranking.	X		Provides good general guidance to the steps involved with community health planning, from recruiting resources to identifying priority issues to proposing actions as part of a plan. The description of tools is a bit too general to facilitate their actual adoption by course participants. The module could be more effective with more detailed treatment on the use of tools and the inclusion of more real-life case studies. The module does not consider EH as a parameter in the development of community health plans.
Community Environmental Health Assessment Workbook. Environmental Law Institute. www.eli.org	The ELI workbook describes the process of identifying potential strategies for action, identifying resources and analyzing, evaluating and selecting appropriate strategies. Worksheets guide the user through this process.	X		Description of this process is quite good and easy to follow. The worksheets are particularly useful to guide user through the process and keep track of information.
PACE-EH. National Association of County and City Health Officials. http://pace.naccho.org/DownloadPage.asp	Overview of components of an action plan.	X	X	This is good overview material, but some groups might need more information and assistance in how to put some of the action plan elements together.
Indicators and Evaluation				
Sustainability Starts in Your Community: A Community Indicators Guide. Redefining Progress & Earth Day Network. www.sustainer.org/pubs/	Step-by-step guide for use in determining indicators in a participatory manner, including development of a baseline and monitoring of indicators of change.	X		An excellent primer and step-by-step guide for determining and setting indicators. The format is easy to read and ready for use as a training resource.
Environmental Indicators Project. Neighborhood Environmental Indicators Project of Pacific Institute for Studies in Development, Environment and Security (SIDES). www.neip.org/	On-line guide for developing environmental indicators at the neighborhood level to promote social and environmental justice. Topics include: developing a framework, characteristics of indicators, criteria to assess data quality and usefulness of indicators to the community, and improving the process to develop indicators. Includes case studies and other resources.	X		A user-friendly and simple guideline for developing environmental indicators.
Building and Operating Neighborhood Indicator Systems: A Guidebook. G. Thomas Kingsley. National Neighborhood Indicators Project. The Urban Institute. www.urban.org/nnip/pdf/guidebk.pdf	Technical guide provides summary of the National Neighborhood Indicators Project, history of social indicators, guidance on use of GIS, NNIP partner project summaries, and guidance on how to build and use a neighborhood indicators system and its costs.	X		Overly technical, but Chapter 4 on building a neighborhood indicators system is most valuable. Provides important lessons learned from other cities re: creation of a long-term indicators system. Chapter 6 provides cost information for building a system.

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Environmental Health Indicators: Framework and Methodologies. David Briggs. World Health Organization. http://www.who.int/ceh/publications/cehframework/en/	Provides overview of indicators framework; profiles of environmental health indicators for socio-demographic context, air pollution, sanitation, shelter, access to drinking water, vector-borne disease, solid waste mgt., hazardous and toxic substances, food safety, radiation, etc. Profiles are quite extensive including definition of indicator, specification of data needed, data sources and availability, computation and application.	X		Useful indicators and profiles; however geared more toward less developed/poorer countries. Good overview of indicators framework with useful schematic. The framework lacks drivers and complete health effects for air pollution. Well developed indicators for socio-demographic context.
Indicators of Sustainability On-line Training Course. Maureen Hart. Sustainable Measures. www.sustainablemeasures.com	Provides an on-line training course/train-the-trainer guide for developing sustainable indicators. Provides examples of group exercises, definitions of sustainability, what makes a good indicator, evaluating indicators, and indicator projects and resources.	X		Excellent, easy-to-use on-line training that can easily be adapted for classroom use. Indicators discussed measure "sustainability" and are not limited only to environment and environmental health. The course approach is more holistic in nature.
Improving Health Initiative Training Series,'02: Demystifying Evaluation. NMDOH, Community Health Improvement Training Institute.	This course provides (1) an understanding of the logical relationship between goals, objectives, activities, and evaluation; (2) knowledge and skills in identifying elements to be included in an evaluation of direct services and programs; (3) knowledge and skills in identifying elements to be included in an evaluation of the local community's health improvement effort; and (4) familiarity with common evaluation designs and data collection and analysis procedures.	X	X	Great overview of evaluation process in community health improvement programs, but needs to provide examples of evaluation in the context of environmental health interventions.
Check Your Success: A Community Guide to Developing Indicators. On-line Indicators Guide and Workshop. Virginia Tech University www.uap.vt.edu/checkyoursuccess/workshop.html	Website provides on-line access to overview of use of indicators and evaluation process. Includes step-by-step guide for conducting an indicators workshop with useful worksheets. Site also contains case studies, table of indicators, references, and links. User may also download guide for free.	X		Very good, simplified overview of evaluation process and steps to develop good indicators. Worksheets for use during an indicators workshop are quite useful and easily adaptable.
Measuring Program Outcomes: A Practical Approach. United Way of America. http://national.unitedway.org/outcomes/resources/mpo	Demonstrates the use of logic models in clarifying and communicating outcomes. Cites experiences of many types of agencies. Includes worksheets, examples and a bibliography on measurement issues and performance indicators.	X		Helpful in facilitation of CEHA, especially in terms of communicating EH risks and ways to measure the impact of environmental health improvement actions.
The Community Tool Box -- A Framework for Program Evaluation: A Gateway to Tools. http://ctb.ku.edu/	On-line resource providing extensive overview of CTB framework for evaluating programs. Provides examples, graphics, step-by-step guide and troubleshooting help.	X	X	Useful, on-line resource. More dense, but could complement IHI training or serve as a resource for project implementers.

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EPA Green Communities Toolkit www.epa.gov/greenkit/indicator.htm	On-line orientation to a variety of indicators including: environmental, economic, social, sustainability, economic prosperity, healthy community and social well being. Provides information on how to select, use and report indicators, data sources, references and real world examples of indicators.	X		Very good table of indicators, their purpose and linkages to broader issues. Useful method for evaluating and selecting indicators in the group context.
Grant Proposal Writing and Fundraising				
Proposal Writing Short Course. The Foundation Center. www.fdncenter.org/learn/shortcourse/prop1.html	Reviews components of a grant proposal from statement of objectives, to description of problems and issues, to developing the proposal of activities for which funding is sought.	X	X	Good, basic summary of a grant proposal. Offers good grant writing resources. More information needed for budget development. Needs examples of good proposals and environmental health proposals in particular.
Proposal Writing – Getting the Funding You Need. NMDOH, Community Health Improvement Training Institute.	Basic information and resources regarding researching potential funders. Overview of how to develop goals, objectives, work plan, budget and evaluating the project. Provides examples of goals, objectives and evaluation questions. Includes grant/funding resources.	X	X	This is an excellent training tool that could easily be adapted to the CEHA in by providing example grants for environmental health and supplement with grant sources for environmental health projects. Needs a bit more detail on budget development.
EPA Grant Writing Tutorial. U.S. EPA. www.epa.gov/glnpo/seahome/grants.html	On-line or downloadable grant-writing tutorial geared toward EPA environmental justice and environmental education grants. Provides an overview of components of a grant, mock grant writing exercise and examples of good grant proposals. Also provides downloadable forms for the grant application process.	X		This is a valuable tool for groups considering writing an EPA grant.
The Community Tool Box – Writing a Grant http://ctb.ku.edu/	On-line tool provides an overview of the components of the grant, examples of good/bad grants for each grant component and how to improve your case, funding resources.	X	X	This material would augment the CHITI grant writing training quite well. Need real examples of environmental health grants.
Grant Opportunities Guidebook: Private and Public Funding Sources. New Mexico Outreach Office, US-Mexico Border Health Commission	A pamphlet-style resource guide on sources for funding of environmental and public health projects of all kinds. Provides a short annotated list of resources of regional private foundations in and around New Mexico, national private foundations, and federal government agencies. Also indicates sites for grant-writing training and assistance.	X		While not a training module per se, the guidebook cites specific federal, state and local (public and private) sources for applying for grants, as well as other resources available for guiding grant preparation. This guidebook was prepared in New Mexico and should be considered in any training on grant writing.

Community Environmental Health Assessment Tool Box for New Mexico (CEHA-NM)

APPENDIX G: Guidance to Sources for Grant Funding for CEHA in New Mexico

- *Grant Opportunities Guidebook: Private and Public Funding Sources*. May 2003. New Mexico Outreach Office, US-Mexico Border Health Commission. Las Cruces NM.
- Paso del Norte Health Foundation. El Paso TX. www.pdnhf.org
- North American Commission for Environmental Cooperation. www.cec.org/grants
- Healthy Schools Network, Inc. www.healthyschools.org
- Community Tool Box. http://ctb.ku.edu
- *Community Toolbox for Children's Environmental Health*. San Francisco CA. www.communitytoolbox.org
- New Mexico Re-Leaf Tree Planting Program. Forestry Division, Bernalillo District/N.M. EMNRD
- P.O. Box 458, BERNALILLO NM 87004; TEL: 505-867-2334. http://www.emnrd.state.nm.us/forestry/RELEAF/RELEAF.CFM
- Healthier Communities Grants. New Mexico Department of Health (or contact respective Pubic Health Districts I, II, III and IV).
- W.K. Kellogg Foundation. www.wkkf.org/Grants
- Community Environmental Health Resource Center. www.cehrc.org
- The Foundation Center. http://fdncenter.org/ Proposal Writing Short Course. http://fdncenter.org/learn/shortcourse/prop1.html
- Centers for Disease Control and Prevention. www.cdc.gov
- U.S. EPA
  - Summary of Federal Assistance to Communities for Environmental Projects www.epa.gov/ecocommunity/matrix.htm
  - Office of Water Catalog of Federal Funding for Watershed Protection. http://cfpub.epa.gov/fedfund/
  - Grant Writing Tutorial. www.epa.gov/glnpo/seahome/grants.html
  - Smart Growth Funding. www.epa.gov/smartgrowth/funding.htm
- U.S. Department of Agriculture, Rural Development. http://www.rurdev.usda.gov
- Catalogue of Federal Domestic Assistance. www.cfda.gov

- U.S. Department of Energy Center of Excellence for Sustainable Development. www.sustainable.doe.gov
- Directory of Funding Sources for Grassroots River and Watershed Conservation Groups. www.rivernetwork.org

Contact the Environmental Health Epidemiology Bureau, Epidemiology & Response Division New Mexico Department of Health for more information.
(505)476-1734

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