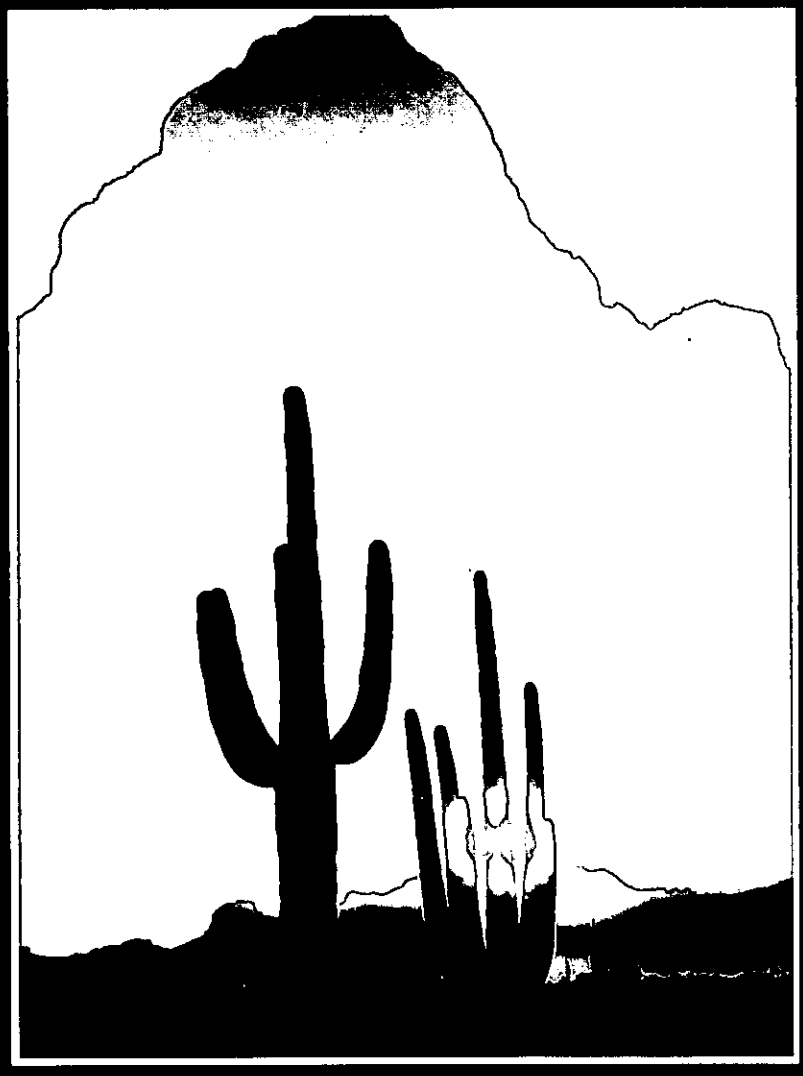
OUR LANDS

New Strategies For Protecting The West



Blueprints For Action

WESTERN GOVERNORS' ASSOCIATION BOARD OF DIRECTORS

Established in 1984 through the merger of two governors' organizations, the Western Governors' Association (WGA) is an independent, nonpartisan organization of governors from 17 western states, two Pacific territories and one commonwealth. The Association was formed to provide strong regional leadership in an era of critical change in the economy and demography of our region. The organization is founded on the understanding that the vital issues and opportunities shaping our future span state lines and are shared by governors throughout the West. The spirit of the WGA is one of boldness and intelligence, for it is those characteristics that typify the West and its leaders.

The WGA identifies and addresses key policy and governance issues in natural resources, the environment, human services, economic development, international relations and fiscal management. The issues are selected by the governors based on regional interest and impact. WGA helps the governors develop strategies both for the complex, long-term issues facing the West and for the region's immediate needs. Through WGA the governors develop and advocate policies that reflect regional interests and relationships in debates at the national and state levels.

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Dear Friends and Colleagues,

The theme for my year as Chairman has been "Our Lands: New Strategies for Protecting the West." I chose this as my theme because I believe we are at a crossroads in the West. Down one road lies the status quo – balkanized natural resource debates and an increasingly expensive bill for environmental regulation. Down the new road lies cooperation, prioritization, innovation, and visionary management.

Quality work is being done in individual states that shows the way down this road. In addition, we are forging new areas of partnership with federal agencies, and the region is working collectively to address mutual problems. I believe we have started down the right road. In so doing, we have shown that environmental progress and economic prosperity must be mutually inclusive.

There were three elements to my theme this year – one of which was improving our strategies for managing the environment. Governor Pete Wilson led this effort for us which culminated in this book. The book calls for a new framework for western environmental policy. That framework is based upon improving the way we establish environmental priorities, creating better pricing signals, encouraging voluntary initiatives, working within ecosystems, and resolving disputes without litigation.

This new framework was developed and embraced by the Western Governors' Environmental Policy Council. The Council, which includes representatives of industry, environmental groups, state, tribal, and federal agencies, was empaneled last year to examine environmental policy in the region. The Council also identified a number of areas where new or additional initiative is warranted to broaden the application of the principles and tools described here to other key regional concerns.

By adopting this new environmental framework in partnership with the federal government, we will be able to better integrate environmental regulation and pollution prevention, we will improve the interface of water quality and water quantity management, and we will better coordinate our strategies across state, tribal, and international boundaries. In order to effectively accomplish this, we continue to improve how we measure the results of our environmental protection expenditures to ensure we are getting the best results at the least cost and we must improve state, tribal, and local capacity for environmental and resource management strategies embraced in the case studies and proposals in this book.

In closing, I would like to thank my colleague Pete Wilson for his leadership and the Environmental Policy Council members for their advice in this effort. In addition, I would like to thank the Environmental Protection Agency for joining us as partners in examining how to improve environmental and natural resource management in the region and I thank the William and Flora Hewlett Foundation for its support.

Sincerely,

Fife Symington, Chairman

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June 4, 1993

Dear Fellow Westerner:

We in the West have always faced unique challenges in managing our environmental and natural resources. The strength of our economy has consistently depended on the health and bounty of these resources. As we approach a new millennium, the changing realities of our region require innovative, new approaches in order to ensure that we are able to achieve both economic growth and environmental protection. Many elements of the Western landscape make this a significant challenge.

Our region's ecosystems are overlaid with a myriad of political and organizational entities, whose responsibilities are not always compatible. In addition to city, county and state boundaries, over a dozen agencies of the federal government own or control a massive amount of land and resources in the West. More than forty sovereign Indian nations exist in the region. Further, as our economy has grown and diversified in the past two decades, the connections with our international neighbors in the north and south have also become more important.

Amidst this growth the West is challenged by the availability of water. As the lifeblood of both the natural environment and the human economy, the wise management of this scarce resource has always been paramount. With population growth placing increasing demands on our region's fragile ecosystems, we must diligently pursue new ways to use our water supplies more efficiently.

Another challenge which has recently gained new importance is the decline of various indigenous plant and animal species in the West. As we work to restore the health of these species, we must seek a new equilibrium, which balances the needs of all of the residents of our region.

This document elucidates the commitment of the Western Governors to develop these new approaches, and it describes the key principles and the critical tools for our success. In these pages are case studies that highlight several of the innovative projects and programs that are being pioneered by states and localities to improve their protection of the environment. These endeavors can only be successful with the cooperation and participation of our federal partners. We must challenge them to join us in forging flexible, problem-specific approaches to Western environmental issues. Together, these efforts lay out a blueprint for a successful strategy to meld economic progress and environmental protection, to guarantee the prosperity of our future.

Sincerely,

James M. Strock
Secretary for Environmental Protection

Douglas P. Wheeler
Secretary for Resources

Blueprints for Action

The Western Governors' Association would like to thank the U.S. Environmental Protection Agency for its joint funding of the Western Governors' Environmental Policy Council deliberations and the background research on models of innovation. Western Governors' Association also wishes to acknowledge and thank the William and Flora Hewlett Foundation for providing funding for the development of case studies and the printing of this book.

WGA thanks the Environmental Policy Council members for their ideas, guidance, and their time, both at meetings and in reviewing draft chapters. In particular, WGA would like to thank Doug Wheeler, California Secretary for Natural Resources, and Ed Fox, Director of the Arizona Department of Environmental Quality, for their role in guiding the project. In addition, this book would not have been possible without the help of state and federal environmental and natural resource agency staff who helped identify innovative approaches and provided descriptions of programs.

On behalf of the Environmental Policy Council, WGA would also like to thank all the people who helped organize and conduct a tour for the Council of the San Pedro River in Arizona and who provided briefings on the cooperative efforts underway in the river basin to protect the environment and natural resources.

Finally, the Western Governors' Association would like to thank:

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Western governors created the Western Governors' Environmental Policy Council last year to examine the state of environmental and natural resource policy in the West. The idea of the Council emerged from ongoing discussions among western governors and the Administrator of the Environmental Protection Agency. Those discussions focused upon two shared concerns – 1.) that national "one size fits all" environmental policy often creates unintended and irrational effects in the West and 2.) that new strategies are needed that are more efficient and effective if we are to continue to improve our management of the environment.

The Council is comprised of representatives of industry, academia, environmental organizations, states, tribes, and federal agencies. The Council met twice over the last year to discuss principles to guide environmental management in the West and identify emerging state-based strategies which could serve as blueprints for other western states in refining their programs on similar issues.

It is important to note that the blueprints that follow are state-based. The Council recognizes the importance and effectiveness of strategies at the local level, such as pay-as-you-throw pricing for household garbage, and at the federal level, such as the community right-to-know law that requires companies to list pollutants their plants emit. However, the Council's main focus has been on how western states can more effectively meet their part of the environmental challenge.

The basic principles the Council identified that should serve as a basis for a new framework for western environmental policy can be summarized in five different categories. They are as follows:

Establish environmental priorities — Environmental priorities are often established by the latest "high profile" threat or by available funding sources. The primary new tool for setting environmental priorities is comparative risk analysis and risk communication. Comparative risk analysis uses scientific data to enable comparison among different types of environmental concerns and those results are then provided to citizens and policymakers to better inform the decisionmaking debate.

While several states, most notably Washington and Colorado, have pioneered the use of comparative risk analysis, the case studies presented in this book are new efforts underway in Arizona and on tribal reservations that seek to further refine this important new policy technique. Also profiled in this book is an effort under consideration in Oregon to create a state team to help small communities prioritize their environmental challenges.

Create better pricing signals — The primary regulatory tools that have been used over the last two decades to reduce pollution levels have been numerical standards, mandated technologies, and compliance-related enforcement. These approaches have been very successful but the cost of achieving the environmental progress has been significant. These techniques have also worked best for large point sources. Market strategies, which use price/cost incentives and disincentives to reward less polluting or damaging activities, hold promise to become an effective tool for additional environmental

progress. Price signals can reward superior performance, introduce other benefits such as resource conservation, and work more effectively on broadly dispersed non-point sources.

Three western case studies are included in this book as blueprints for better pricing strategies – southern California's new tradable air permits, Oregon's proposed vehicle emission fees which tie car emissions and miles traveled to the annual vehicle registration fee, and California's water bank that created a market for water transfers to ease the effects of the drought.

Encourage voluntary initiatives — Another method of achieving environmental goals at a reduced cost is to encourage voluntary initiatives. These efforts can reward businesses which design cost-effective initiatives which build on the businesses' own resources and ideas rather than a federally mandated approach to pollution control or prevention. By encouraging such behavior, government can look for ways to promote positive corporate action, not just seek out and punish noncompliance.

The examples cited in this book are Colorado manufacturers' and Region VIII EPA's efforts to reduce hazardous waste generation and PacifiCorp's tree planting efforts in Oregon and Utah to offset carbon dioxide emissions.

Work across political boundaries and within ecosystems — Much of the policy implementation for environmental protection and resource management has been along political or agency boundaries in the past. There is a growing awareness of the need to work within natural borders to achieve environmental goals. Neither pollution nor natural resources stop at the state line and if strategies are not coordinated within the ecosystem, money will be wasted, and resources not protected.

There are numerous examples of successful ecosystem based strategies in the West. Three are presented in this book. They include California's new biodiversity strategy to identify critical wildlife habitat and to work with landowners to voluntarily set aside areas from development, coordinated habitat protection efforts in the Great Plains region stretching from Canada to Mexico, and a blueprint for a state-based strategy focusing on ecosystems to remediate abandoned mine wastes.

Resolve disputes without litigation — If the nation and the West are to establish effective strategies to achieve legitimate environmental goals, then developing consensus strategies on the front end and utilizing dispute resolution rather than litigation to resolve ongoing differences will be critical. The crucial nature of how to use and conserve western resources is front and center in the now global debate concerning sustainable development. Charting the right direction to initiate this important objective must be accomplished fundamentally by negotiation, not by the expense and delay and restriction of litigation. Many states have established dispute resolution services to mediate disputes, including environmental and natural resource disputes.

Highlighted in this report is a case study profiling a successful negotiation of water and habitat concerns at Pyramid Lake in Nevada and a blueprint for a regional network of dispute resolution services in the High Plains of North America involving several states, tribes, and Canadian provinces.

Oregon Livable Communities

As environmental and public health regulations have grown in number over the past several years, many communities have been inundated with new state and federal requirements. Many cities need to meet multiple requirements simultaneously. These cities have fewer technical and financial resources to use in this effort, and are subject to enforcement sanctions if found to be in noncompliance.

Oregon is creating a program to help its small communities set priorities for requirements and develop coordinated long-term strategies for reaching and maintaining compliance. To carry out the program, the Department of Environmental Quality proposed an Environmental Project Team. The team would receive direction from an advisory committee and help individual cities and involved agencies to rank environmental protection requirements by level of risk and cost. The Livable Communities Project will focus on federal environmental programs that have been delegated to the state for administration. The team will also help the cities get compliance orders allowing extensions when necessary and provide them with some protection from undue fines and legal liability.

Arizona and Tribal Comparative Risk Efforts

As the West struggles to assert its own set of priorities for environmental management, several western states, including Washington, Colorado, California, Hawaii, and Texas, have turned to the comparative risk process as a tool to sharpen their own environmental polices and strengthen their relationships with the federal government.

Two new projects, including the Tribal Comparative Risk Project which links eight Indian tribes in the north central U.S. and the Arizona Comparative Environmental Risk Project, are breaking new environmental and political ground.

The comparative risk technique used in these projects is a process employing analytical methods to help people systematically rank environmental problems and devise management strategies to address them. In doing so, comparative risk can help leaders and citizens understand human health risk, ecological system risk, and economic and social threats in the discrete environment.

The Portland Smog Fee

The 1990 amendments to the Clean Air Act have forced leaders in the Portland, Oregon, metropolitan area to intensify the search for effective and politically viable air pollution control strategies. In 1992, a diverse group of Portland-area leaders gathered to create a package of recommended strategies for reduction of motor vehicle emissions and an emission fee has emerged as one of these strategies.

If implemented, the emission fee would be assessed on all private automobiles registered in the Portland metropolitan area. The fee would be calculated by measuring the amount of emissions from a vehicle, determining a fee per mile based on the measured emissions, and multiplying the fee by the number of miles driven since the previous assessment. In Portland, this would occur every two years.

The proposed fee would encourage drivers to reduce their cost by keeping their cars well-maintained, reducing the number of miles they drive, and seeking higher efficiency when purchasing a new vehicle. Revenue generated by the fee would be used to expand transportation alternatives and to offset the fee's effects on low-income drivers. The anticipated change of behavior resulting from the disincentive of the fee and the incentive of improved transportation alternatives is expected to curtail emission of carbon monoxide and smog-producing gases from motor vehicles.

RECLAIM - Tradable Air Permits

This case study examines the proposed use of tradable emission reduction credits by the South Coast Air Quality Management District. This District has exclusive responsibility for air pollution control for Los Angeles, Orange, Riverside, and the non-desert portions of San Bernardino counties in Southern California. In 1992, the District provisionally adopted the Regional Clean Air Incentives Market (RECLAIM) program which, in the District's words, "represents a bold departure from traditional command and control regulations."

RECLAIM has yet to be implemented. The District is in the process of rule development. However, the development of the program to date is significant because it illustrates how market-based incentives may be combined with the tools of traditional command and control regulation to reduce the compliance costs of effective pollution control.

Water Marketing, The California Water Bank

Beginning in 1987, the western United States entered into a prolonged drought period. The situation was most serious in California, where the lack of rainfall and low storage in reservoirs resulted in serious water shortages in 1991 and 1992 affecting cities, agriculture and the environment. A Drought Water Bank was created by Governor Pete Wilson to purchase water from water users in northern California who had a nearly normal supply. Most of the water was purchased from farmers, who either did not grow a crop or shifted water use from surface water to ground water. This water was transported throughout California by the Drought Water Bank run by the Department of Water Resources, to cities, and other farmers to reduce the economic hardships of the drought. The redistribution was timed and staged in ways to minimize environmental damages and maximize benefits.

The 1991 Water Bank program showed that more than 800,000 acre-feet of water could be transferred from one use to another in a short period of time at reasonable cost through a commitment to make the program succeed. A similar 1992 Drought Water Bank purchased almost 200,000 acre-feet of water to meet critical water needs in the sixth year of the drought. The Drought Water Bank success has made a permanent impact on how California water managers will deal with future severe water shortage conditions.

PacifiCorp's Carbon Offsets Program

PacifiCorp, an investor-owned utility serving seven western states, is investigating a variety of techniques to offset carbon dioxide (CO_2) emissions. "Offsetting" CO_2 or carbon involves developing techniques to absorb additional carbon dioxide or reduce emissions from sources away from power plants. While there is no current regulation of CO_2, a variety of emission goals have been set by states and the new federal Energy Policy Act allows for the voluntary tallying of carbon offsets.

The first offset pilot projects implemented by PacifiCorp are an urban shade project in Salt Lake City and a rural tree planting project in Oregon. The utility partnered with a non-profit organization to implement the urban tree planting project and with a state agency and private landowners in the rural program to explore novel approaches to addressing carbon emissions.

This case study describes the potential benefits of moving ahead now with low-cost private projects to reduce carbon emissions. The case study suggests carbon offsets should be part of an overall strategy to address carbon emissions. The larger implication of the possible use of carbon offsets is that states may be able to develop partnerships with private companies which have ancillary benefits for the state. These benefits may include reforestation of under-utilized lands, energy efficiency improvements, economic development, and natural resource protection.

Pollution Prevention Partnership

In 1989, senior Colorado representatives from industry, regulatory agencies, and public interest groups concerned with environmental pollution began to meet over early morning coffee. At first, they sought a dialogue between industries and regulatory agencies – turning potential foes into teammates. Later, this "breakfast club" evolved into the Pollution Prevention Partnership. The goal: working together to prevent pollution at its source.

The Partnership has reduced the quantity of hazardous materials used and disposed in Colorado. The first major project, called "SolvNet," focused on 1,1,1 Trichloroethane (TCA). TCA poses severe health and environmental hazards. The Partnership set a goal to reduce the use and release of this industrial "solvent-of-choice" by 70%. Partnership members methodically searched for acceptable alternatives, testing over 50 compounds. By making changes in processes, materials, and business methods, they exceeded their goal. Pollution prevention – by reducing solvent use – reduces burdensome regulatory compliance, taxes, and surcharges. Prevention decreases health risks to employees. With escalating costs for disposal, and "end-of-pipe" waste control, Partnership members will save millions of dollars in future years because of their solvent reductions. The Partnership has become a model for non-regulatory, voluntary alliances to reduce pollution.

The California Biodiversity Plan

The administration of Governor Pete Wilson has embarked upon an unprecedented effort to improve the conservation of California's vast and complex biological diversity. This strategy involves both 1) the establishment of a cooperative process and a formal entity for improving communication and coordination between federal, state and local governments in order to better conserve biodiversity, and 2) a formal commitment to the transition from single species protection to ecosystem planning through an innovative state program called Natural Communities Conservation Planning (NCCP).

The Great Plains Initiative

Land managers, landowners, and policy makers have access to new information on the way ecosystems function. Ecologists and biologists have shown that ecological processes are intertwined across local, state, and international boundaries, as well as management boundaries for agencies that oversee fish and wildlife, water quality, and agricultural practices on the Great Plains. Because nature does not adapt to these arbitrary lines, it is necessary to develop dynamic models to manage across them holistically.

The Great Plains Initiative (GPI) is an experimental program comprising a variety of governmental, nongovernmental and landowner agencies and organizations. The intent of GPI is to collect data on habitats and species in decline on the Plains, and develop innovative management strategies to protect them proactively across political boundaries. In doing so, GPI is addressing many of the economic issues tied to the natural resources of the West.

A State Strategy for Abandoned Mine Wastes

The purpose of this blueprint is to describe the essential elements of a state-based program to cleanup inactive and abandoned noncoal mine sites. The blueprint identifies the significant issues, presents program ideas and principles, and illustrates through examples how those principles can be put into practice.

The recommended approaches include setting cleanup priorities, working within river basins, initiating projects on the state and local level, establishing cooperative relationships among interests at all levels, and developing incentives to encourage follow-through and positive results.

This blueprint provides a starting point for individual states to develop or further refine their Inactive and Abandoned Mine programs.

The Transboundary Initiative

Environmental policy is approaching an impasse in the American West. Policymakers and resource managers are finding it more and more difficult to field proposals or take action without being challenged. At the same time, stakeholders – including business and industry, citizen and environmental groups, Native Americans, and local, state, and federal governments – are demanding more meaningful participation in public decisionmaking processes. This atmosphere of gridlock is not unique to any resource or institution, but influences proposals for economic development and growth management, water use and management, public land management, intergovernmental relations, hazardous waste management, and nearly every other environmental arena.

In light of the complexity of environmental disputes and the limitations of conventional forums for public decisionmaking (including legislative processes, administrative hearings, and judicial proceedings), people have been experimenting with more collaborative approaches to resolving environmental disputes. These approaches, which include negotiation and mediation, are designed to resolve disputes or potential disputes through cooperative, face-to-face interaction among the affected interests. Perhaps the most fundamental difference between conventional and collaborative approaches is that collaborative approaches seek consensus – that is, the affected interests strive to reach agreement on the formulation of a problem and its solution.

Several states, Canadian provinces, and Native American tribes in the Great Plains have begun to look at establishing a regional network for dispute resolution and consensus building. Their goals and initial efforts are described in this case study.

The Truckee-Carson-Pyramid Lake Water Rights Settlement

The Truckee and Carson River basins in western California and eastern Nevada form a region whose demands for water outstripped its supply years ago. The resulting reduction in water quality and quantity caused dramatic declines in fish and wildlife species and habitat, threatened tribal rights, and left a growing human population and their water providers anxious about how they would meet present and future demands.

Decades of water quantity and quality disputes involving Pyramid Lake, located at the terminus of the Truckee River in northwestern Nevada and the Carson River and its associated terminal wetlands, were substantively resolved with the passage of the Fallon Paiute Shoshone Indian Tribes Water Rights Settlement Act of 1990 (of which Title II is the Truckee-Carson-Pyramid Lake Water Rights Settlement). The Act resulted from negotiations involving the primary stakeholders. They included the Pyramid Lake and Fallon tribes, California, Nevada, the Truckee-Carson Irrigation District, and Sierra Pacific Power Company (representing interests of the growing Reno-Sparks metropolis). These parties were subsequently joined by other interests in the basin.

The settlement's resolution to the basin's water quality and quantity disputes will be achieved primarily through water conservation, water rights acquisition, retirement of land and transfer of water rights, water banking, reoperation of reservoirs, and establishment of tribal settlement funds.

Helping Small Communities Prioritize Environmental Responsibilities: The Oregon Livable Communities Concept

by Elana Stampfer

Problem Statement

Small communities, those numbering 5,000 residents or less, have environmental responsibilities similar to those of larger communities, but they have far fewer financial and technical resources to meet the requirements. Large cities have permanent staff to help them plan and comply with federal and state regulations. These staff are able to write permit and grant applications. They are familiar with people and procedures in state and federal regulating agencies.

In contrast, small communities do not always have the resources to create a staff of environmental professionals; consequently, it is more difficult to comply with environmental regulations. As one small town manager said, the public works staff must be "Jacks-of-all-trades." Often, the person who operates the sewage system also runs the drinking water treatment plant and building maintenance. There is not enough time or resources to develop expertise in one area. When new rules are developed, they may be more challenging to someone who must manage many different municipal services.

Municipalities, both large and small, must comply with multiple environmental regulations. Most of the regulatory programs are delegated to the state by the U.S. Environmental Protection Agency (EPA). This means that as long as the state enacts requirements that are at least as stringent as the federal standards, the state may administer the program. The delegation is formalized in State-EPA Agreements which are reviewed annually. The environmental regulations that most often affect small communities include:

- Drinking water monitoring and treatment;
- Wastewater treatment, sludge and pretreatment;
- Developing, upgrading, or closing solid waste landfills;
- Recycling (state laws);
- Implementing air quality attainment and maintenance programs;
- Underground storage tanks; and
- Environmental cleanup of contaminated sites.

Any community may need to work on complying with one, some, or all of these regulations at once. The size of the community affects how easily the city can comply with multiple regulations.

The majority of cities are small but at the same time most people live in the large cities. In Oregon, 77 percent of the incorporated cities have population less than 5,000. However, 87 percent of Oregonians in incorporated areas live in a city with more than 5,000 people. This means that much of the state is sparsely populated with many small communities. In addition, population growth has been concentrated in large communities. Between 1980 and 1990, 57 percent of Oregon's small towns grew. At the same time, 93 percent of the cities with greater than 5,000 population grew. What we see in Oregon is big cities getting bigger and smaller communities in aggregate growing, but at a slower rate. This may exaggerate the distinction between large and small cities in Oregon.

One important constraint to complying with environmental regulations at all levels of government in Oregon is the property tax limitation which passed by a statewide vote in 1990 (Ballot Measure 5). Until 1991, Oregon used income tax to fund general state government and used property tax to fund local government and schools. There is no sales tax. Ballot Measure 5 placed a limitation on the property tax rate and, over a five-year period, shifts to the state General Fund to make up the shortfall. For the state this means a drastic reduction in funds available for state government programs. For local government there is a cap of $10 per

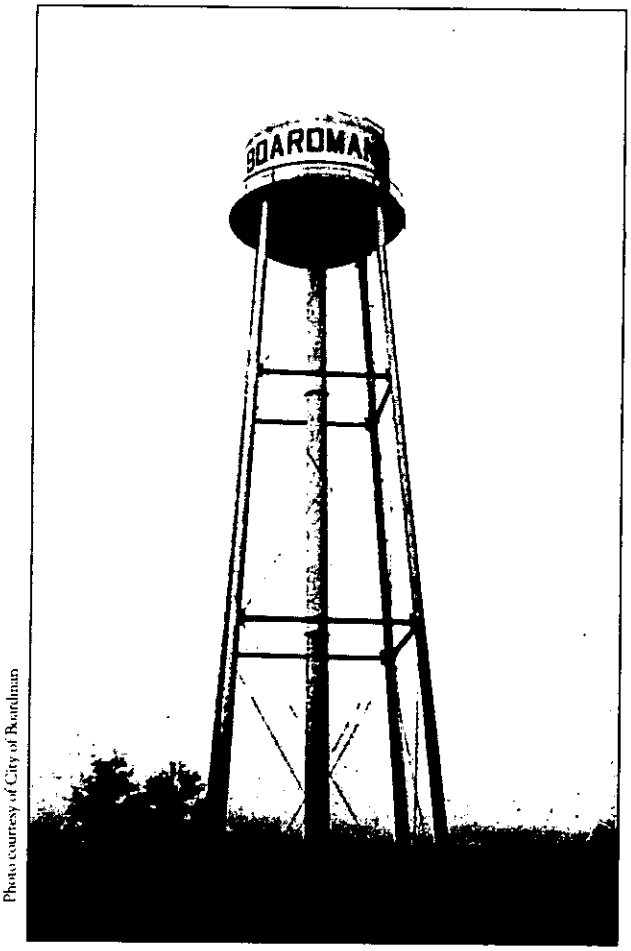

Photo courtesy of City of Boardman

The Boardman drinking water system will need improvements to meet population growth and future requirements.

$1,000 of assessed value on property tax. If the combined levies of all overlapping local jurisdictions raise the rates above $10 per $1,000, the rates are compressed on a pro-rated basis to the $10 limit for local government. Many small cities are at or approaching the limit.

This ballot measure creates some confusion about what falls under the limitation. There is a current court case on whether stormwater drainage fees are considered a tax under the limitation. It is also possible that sewer fees may be held to be a tax under the rate limitation.

Under the limitation, after the rate of $10 per $1,000 of property value is reached, the only way for communities to increase property tax revenue is if the assessed property values rise. In many communities where timber operations are closing, the assessed values are not likely to increase. Furthermore, several counties and cities receive shared revenues from timber sales on federally owned lands in their vicinity. As timber harvests decline, local jobs and taxes decline as do the shared revenues from the federal government.

Measure 5, in combination with new regulations, has brought the issue of multiple mandates to the forefront; but to blame the cities' problems entirely on financial restrictions would not be accurate. There is a need to look at the requirements in terms of risk and benefit and determine the best strategy to comply with the laws.

Most cities are juggling multiple environmental requirements. The most common problems are related to drinking water and wastewater treatment. Drinking water and wastewater treatment standards apply to all cities regardless of their technical and financial resources. The burden to meet the standards may be disproportionate for small cities because it creates a reverse economy of scale. If a small city is to establish a water quality monitoring and treatment program, it may represent a bigger percentage of the budget and mission than for a larger city. This is because it will cost more per gallon per minute to filter and treat water in a small drinking water treatment plant than in a large one. This is similar to buying wholesale as opposed to retail. Bigger cities become wholesale purchasers of environmental services. It is important to note, though, that while these savings are passed on to the citizens, the per capita costs for environmental protection are not necessarily always lower in big cities, due to the complexity of big city problems. However, per capita income tends to be higher in big cities, enhancing the ability to purchase complex systems. For example, Portland will spend approximately $500 million to $1 billion over the next 20 years on its combined sewer overflow system. These tremendously costly systems would not be required in a small city.

The wholesale purchaser concept is important because small communities notice it and may be particularly burdened by the requirements. Because many cities cannot keep up with the requirements, they face being out of compliance with federal and state regulations. Noncompliance subjects the city to formal enforcement

action by a state agency, or by EPA if the state does not take action.

For example, when a permit or standard is violated, the Department of Environmental Quality (DEQ) issues a Notice of Permit Violation. This requires the permittee to submit either certification that the facility is in compliance or a proposal for bringing the facility into compliance within a reasonable amount of time. If the permittee fails to provide the certification or plan, or if the plan is not implemented properly, the permittee is likely to receive a civil penalty. Penalties are allowed to be a maximum of $10,000 per day of violation. A matrix is used to determine the actual fine assessed. In 1992, five small cities received civil penalties from DEQ, most for water quality permit violations. The fines ranged from $300 to $1,800. While penalties are a potent incentive to bring about compliance, cities do not choose to be in noncompliance. Rather, noncompliance is the result of overwhelming infrastructure needs and a lack of the technical or financial wherewithal to address them.

Goals and Objectives

Because small cities struggle with compliance, DEQ is proposing the creation of a Livable Communities program. The term "livable communities" connotes cities with clean air, water, and land–cities where a person can live in comfort and safety. It also implies cities that are able to maintain and provide services in a way that does not overly burden citizens with fees and threaten cities with costs that could potentially drive them to disincorporation (though none have to date).

The goal is to achieve compliance at a cost the community can afford. The Livable Communities proposal is a state effort to help cities achieve compliance with environmental standards under programs that have been delegated by the EPA to the state. When a program is delegated to a state, the state has authority to administer the program as it chooses, as long as the state laws are at least as stringent as the federal laws. There are limits, though, to how far the state may deviate from the federal mandate when it applies the rules to individual entities. If the EPA decides that the state has not administered the program properly, it may take over the enforcement for that particular entity. This threat is acted upon occasionally and, as a result, it is a tool to maintain consistency among the states. For the Livable Communities project, the state will try to provide extensions when there is authority to do so and if the cities and state agencies agree.

To achieve the goal, an interagency team would be assembled to assist communities in prioritizing environmental mandates and setting a schedule that is financially feasible. The objectives would be to:

- list and evaluate the responsibilities of the city;
- assess the cost of compliance, ability to pay, and availability of grants and loans;
- prioritize the responsibilities based on health and environmental risk; and,
- write orders with a compliance schedule that protect the city from fines.

It must be emphasized that noncompliance is not an option. Every city must comply with the standards established by the state and EPA. The only flexibility is in the timing. Though this program does not provide additional grants to help cities, the Environmental Project Team will be able to assist cities in preparing applications. Assistance combined with deadline flexibility is a way for the state to help stretch state and local dollars and to help keep cities in compliance.

Project Description

DEQ's proposal submitted to the legislature requests a total of three positions to staff the Environmental Project Team. There would be one Project Coordinator and two Environmental Specialists. The request is for $383,018 for a two-year period. This is requested to come from lottery funds. Although lottery money is dedicated to economic development activities, this proposal is considered economic development because when cities do not meet standards, there are limitations to growth. Furthermore, if cities are able to meet their requirements in an economically feasible way, they are better places to establish businesses.

The Environmental Project Team would include staff from each of the environmental and public health agencies which affect local governments. In this budget process, only DEQ has formally requested full-time staff positions dedicated to the project. In upcoming budget cycles, it is anticipated that other agencies will make similar requests and expand the capacity of the Project Team. For the first two years of the Livable Communities project, staff may be located at the DEQ or Economic Development Department, or possibly at the Health Division.

The Project Team would also convene an advisory committee including representatives from the League of Oregon Cities (LOC) to assess the needs of cities and to choose the first cities to participate in the project. The advisory committee will refine the process, but it is anticipated that the project will include the following steps.

1. Meet with citizens and community officials to assess needs and concerns. — The first step would be for the relevant agencies and city representatives to hold several meetings for sharing information and determining the priorities. The purpose of the first meeting would be for the Project Team to listen to all of the city's concerns. DEQ would help the city encourage all interested citizens to participate. The Project Team could assist with advertising meetings in the local papers and by sending a mailing to local citizens who have been put on DEQ mailing lists.

2. Consult with agency staff to evaluate concerns, range of requirements, and timeframes. — The Project Team would thus serve as a liaison between state and local government. The Project Team would also work with other agency staff to develop a complete list of available grants, loans, and instructions for applying.

3. Prioritize list of responsibilities. — Relative risk assessment and risk-based priority setting exercises take at least two years to complete when performed at the statewide or big-city level. These projects require intensive outreach efforts as well as technical analysis. For the Project Team to offer assistance while simultaneously requiring a complicated analysis would make little sense; instead, the Project Team will need to use a very simplified method of relative risk assessment.

The prioritization process will begin with the listing of all environmental compliance requirements that need to be met. For each task on the list, the Project Team will help the city determine the following:

- Number of people exposed to the health risk from noncompliance
- Duration of the exposure
- Health effects of noncompliance
- Inventory of ecological effects of noncompliance
- Effects on other communities
- Cost of compliance options

The Project Team will work with the city to evaluate the relative risk of noncompliance with the identified regulations. There would be another open meeting to discuss the current risks as well as the risks and benefits of extending compliance deadlines. The Project Team, the city, and interested citizens should be able to reach consensus on which mandates should be addressed first. There no doubt will be initial disagreement, but the Project Team will endeavor to help all interested parties reach a final agreement on the compliance strategy.

4. The Project Team will analyze the city's ability to pay for each project. — The Project Team will use available statistical measures of community-wide wealth and adjust them for various community-specific factors. This method focuses on the community's "marginal" ability to take on additional pollution-related programs. This method is analogous with the public debt market's approach to evaluating a municipality's ability to repay new municipal debt offerings.

Readily available "measures of wealth" include per capita income, median family income, or median effective buying income. These measures provide a simple picture of a community's overall wealth. Income measures are the basis for measuring qualification for numerous federal programs including funding assistance through grants and loans.

In the context of the Livable Communities Program, these measures can serve as a straightforward starting points to evaluate a community's

general ability to pay for mandated programs. The Project Team will adjust these measures by taking into consideration other available and applied for resources, other demands already placed on the community, the varying impacts of different fees and taxes on different community constituent groups, and the future financial prospects of the community in relation to its financial needs. The Project Team will work with the city to provide a list of available financial assistance and timeframes. For example, if the federal government begins to provide large grants for sewer construction as part of the economic stimulus package, that information can influence the order of action.

5. *Write compliance orders.* — The Project Team will work with the agencies and, if necessary, the Attorney General's Office to write compliance orders that will protect the city from state penalties for noncompliance and reduce the chances of citizen lawsuits. There is a public participation requirement, meaning that the general public must be alerted to and have a chance to comment on the terms of the order. The ability to write compliance orders is already available to state agencies. No new regulations would be required. One order would be issued for each environmental problem. In general, the compliance schedules may typically contain the mileposts outlined below.

COMPLIANCE SCHEDULE

The city of X shall complete necessary improvements in the wastewater treatment plant to attain compliance with the requirements of the Clean Water Act and _____ statutes, in accordance with the following schedule:

- *By no later than ____, City X shall submit a draft feasibility plan.*
- *By no later than ____, the City shall submit a final approvable feasibility plan.*
- *By no later than ____, the City shall submit engineering plans and specifications.*
- *By no later than ____, the City shall start construction.*
- *By no later than ____, the City shall complete construction and attain compliance.*

History

The "Problem Statement" section mentioned some of the regulations that apply to cities. The impacts these regulations have on cities is what truly drives this proposal. Over the years, regulatory agencies have listened to the problems of small communities in meeting the myriad of environmental requirements. The Livable Communities proposal is a response to their needs.

In order to give a history of the problem, three different cities are described below. Powers, Toledo and Boardman are different in their resources and problems. What they have in common is that they have small populations and they must meet multiple environmental mandates. Together they give a picture of why the Livable Communities project is needed. They represent the types of cities that may benefit from the proposed plan when it is implemented.

The city of Powers, Oregon is very close to receiving a civil penalty for failing to comply with the Clean Water Act. The population of Powers dropped from 819 in 1980 to 682 in 1990. The small town is isolated, close to the Oregon Coast, and has poor road access. Many of its citizens are retired and the biggest employer is the U.S. Forest Service. DEQ is monitoring Powers' sewage treatment system, which is over 25 years old and in need of repairs and upgrades. Excess water in the system due to infiltration and inflow has caused approximately 300,000 gallons per day of raw sewage to be discharged into the Coquille River during certain times of the year. The city has also failed to submit the required infiltration and inflow reports to DEQ. Powers was also ordered by DEQ to close its open burning landfill and replace it with a transfer station.

Additionally, Powers has been ordered to install a filtration treatment system for its drinking water. The system will cost approximately $500,000. In 1991, the citizens defeated a bond measure for revenue bonds to fund the filtration system. The city may fail to meet the

schedule established by the Health Division, and the problem could be referred to the EPA for enforcement.

Toledo, Oregon, is located toward the Coast and has a population of 3,210. In cities like Toledo, the public works directors and staff must handle a variety of responsibilities. For example, the person responsible for filing reports and applications is also the person who mows the grass where the wastewater is sprayed. Everyone must be a "Jack of all trades."

The city is growing. It is close to Newport, home to the very popular new coastal aquarium. Toledo is a mill town and in the 1980s, when the economy was bad, the city cut back on infrastructure investment. Now it needs to provide water and sewers to a growing population. The sewer fund must be spent on day-to-day operation rather than on improvements.

Toledo has an old dam, sewer, and drinking water system. While it is a challenge to keep the old system intact, Toledo also must meet new standards. The city just finished a $2.2 million sewer renovation project, but it will likely need to spend an additional $2 million to keep raw sewage from being discharged into the bay every winter. Furthermore, the water reservoir dam needs approximately $70,000 worth of repairs for leaks. The drinking water treatment plant upgrades will cost approximately $750,000. This is just a partial list of the needed investments. Toledo is bumping up against the $10 per $1,000 tax limit, which hampers the city's ability to make all the improvements.

Boardman, Oregon, is located along the Columbia River, east of the Cascade Mountains. Boardman provides a very different example of a city handling multiple requirements. In the 1960s, the whole city moved up from a flooded area near the river. Thus, their sewer and drinking water systems are newer than in many other small communities. Their

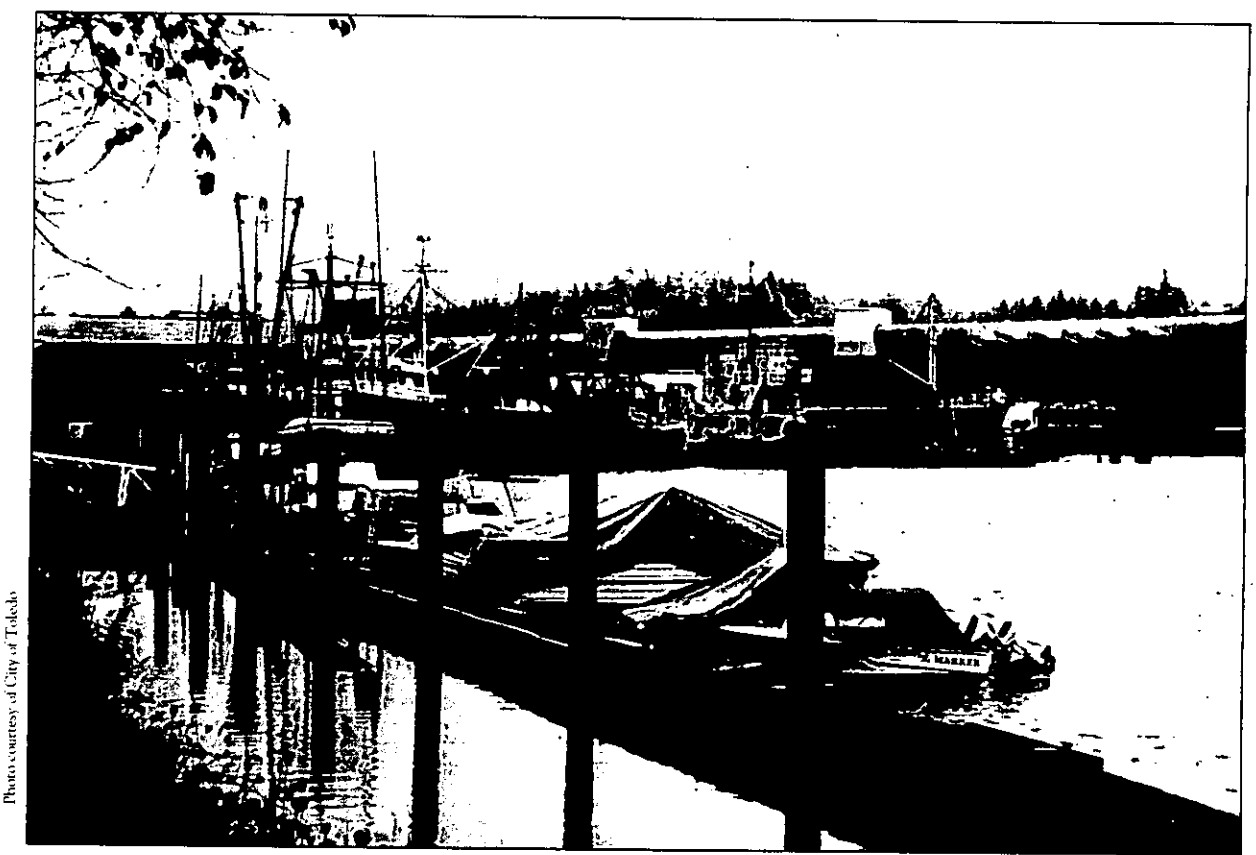

Photo courtesy of City of Toledo

The coastal city of Toledo, Oregon, population approximately 3,250, will need to provide new water and sewer facilities to an increasing population and a projected increase in tourism.

wastewater and drinking water systems are 15 and 17 years old respectively.

Though the systems are relatively new, they are starting to show some signs of aging, and the city will begin to look at improvements in the next several years. The city is challenged by the ongoing need to maintain trained personnel and to monitor for contaminants. They have a four-person staff in public works, two of whom go to the Eastern Oregon Wastewater Short School in order to maintain their operator certification. It is hard for Boardman to compete against the wages that other cities are able to offer.

Boardman is different from Powers and Toledo because the city is not yet at the point of having to make large investments in several environmental projects simultaneously. The city is trying to anticipate and preempt problems. For example, it has begun a wellhead protection program for its groundwater, though the state does not yet require it. Boardman expects population growth and will need to meet costly environmental requirements in the future. They may need the flexibility and assistance that the Livable Communities Project offers.

Powers, Toledo and Boardman are good examples along a spectrum of possible city responses to regulation. Toledo has the desire to meet the requirements, but lacks the resources to meet new standards and still maintain the existing infrastructure. This is an ideal city to work with because there is opportunity to help and a desire to receive assistance. Boardman is a city that will not need the Livable Communities services for several years, but it may need the Project Team to help it set priorities and schedules in two or three years.

The examples of Powers, Toledo, and Boardman highlight two major areas of responsibility: drinking water and wastewater. Most cities are facing problems because of requirements in drinking water and wastewater treatment. In order to grasp the challenges that cities face, it is important to understand the mandates.

The 1986 Safe Drinking Water Act increased the number of contaminants to be monitored from 23 to 111 by 1995. Currently, the Health Division has completed standards and regulations for 60 contaminants, bringing the total to 83. Prior to the addition of the new standards, monitoring costs were close to $400 per sample site, but the new standards create a monitoring cost of around $2,000 per sample site. When contaminants are found, the city must either install treatment devices or locate other sources of water at great expense.

Many sewage systems were built in the early 1970s and are now in need of major repairs or overhauls. In addition to these large maintenance needs, there are also some regulatory changes which have a significant impact on small cities. Among these are requirements to meet chlorine standards, sludge regulations, and total maximum daily load limits on streams.

The state is able to provide technical and financial assistance to help communities meet the requirements and obtain necessary loans and grants. However, resources are limited. Requests for state Revolving Fund (SRF) loans exceeded available funds by nearly $28 million in 1993. Furthermore, the SRF loans are allocated based on severity of the pollution, not on financial need. Some of the most severe sites are in urban areas that are part of or adjacent to large cities.

DEQ developed the idea of the Livable Communities project as a way to provide assistance during these times when demand for grants and loans far exceeds the supply. The state cannot provide more money, but it can give cities a more coordinated approach to regulation. Since the drinking water, wastewater, and water resources programs are mandated in separate federal and state laws and operated by different agencies, cities may believe there is a lack of coordination in the water arena. The agency heads make efforts to coordinate their programs, but since the statutes are separate at the federal level, there are inherent barriers to coordination. Beyond the water arena, within one agency (DEQ) cities may deal with more than one division simultaneously.

Cities have expressed their frustrations independently to agencies and commissions, and collectively through the League of Oregon Cities. In 1992, DEQ and LOC held a series of meetings with a facilitator to create a process for dispute prevention. Representatives from the Department

and the League discussed their working relationship. The assessment was that there were frequent breakdowns in communication and cooperation. Over a period of several months, the group developed a process for dispute prevention by using an early warning team to alert the DEQ and LOC as problems arise. They also agreed to articulate to others in the organizations the need for communication and respect.

The Livable Communities project, though not part of the process, came out of the DEQ-LOC dialogue. It was clear that small cities have special problems that must be addressed with more than the dispute prevention process. The LOC is supporting the Livable Communities proposal.

There are two related proposals that will enhance the Livable Communities project: 1) Safe Drinking Water Act Capitalization, and 2) Wastewater Treatment Financial Assistance Fund. These are combined in one proposal submitted by the Economic Development Department for $20.3 million in lottery funds for the 1993-1995 biennium. According to a 1991 study, $1.4 billion is needed for all 3,446 public drinking water systems in Oregon to meet all new requirements. This proposal will make additional funds available in grants and loans.

The Wastewater System Improvement Fund will finance wastewater collection and treatment facilities for municipalities that "fall between the cracks" of existing financing programs. It will also allow the Oregon State Treasury to issue revenue bonds secured by money in the fund to finance projects for wastewater collection and treatment, limiting the principal amount of outstanding revenue bonds to $200 million.

If these funding proposals are approved by the Legislature, they will greatly enhance the ability of the Project Team to help small communities reach compliance. Even without these related proposals, the Livable Communities project will be very helpful for small cities.

A proposal may be developed out of the EPA Region X office in Seattle to establish a pilot project to help small communities with priority setting and integrated environmental planning. The plan is very similar to Livable Communities. It will enable small cities to use limited resources to address the highest priorities first. The difference is that EPA would present the pilot project as a model for other communities to use, independently from EPA resources, to create their own long-term strategies to address problems. Ultimately, the pilot projects are to include emphasis on sustainable development by integrating environmental and economic planning considerations. The Livable Communities project will complement EPA's efforts because it will focus on delegated programs in Oregon, while it would make sense for EPA to focus on communities in states with fewer delegated programs.

Obstacles

One obvious obstacle to establishing the Livable Communities program is that there are severe budget constraints at this time. As mentioned earlier, Ballot Measure 5 causes the state General Fund to pay for schools. This has created the need for budget cuts in all agencies and has generated an interest in a hiring freeze. In the current climate, it is difficult to create new programs, even if they are efficient and help the economy. That the Livable Communities proposal made it into the Governor's budget shows that the idea has merit.

Another challenge to making this program work will be in setting priorities. In 1987, EPA published a report called *Unfinished Business*. This was a comparison of 31 environmental problems using four categories: human cancer risk, human non-cancer health risk, ecological risk, and welfare risk. In 1990, EPA's Science Advisory Board published a report called *Reducing Risk: Setting Priorities and Strategies for Environmental Protection* which provides an evaluation of the findings in *Unfinished Business* and strategies for reducing risk. The Science Advisory Board identified important problems in ranking risk. These include insufficient and uncertain data, inadequate methodology to measure the risk and value of natural resources, and, finally, that inevitably value judgements will be made. For example, how would one rank the risk of cancer against the risk of reproductive disorders?

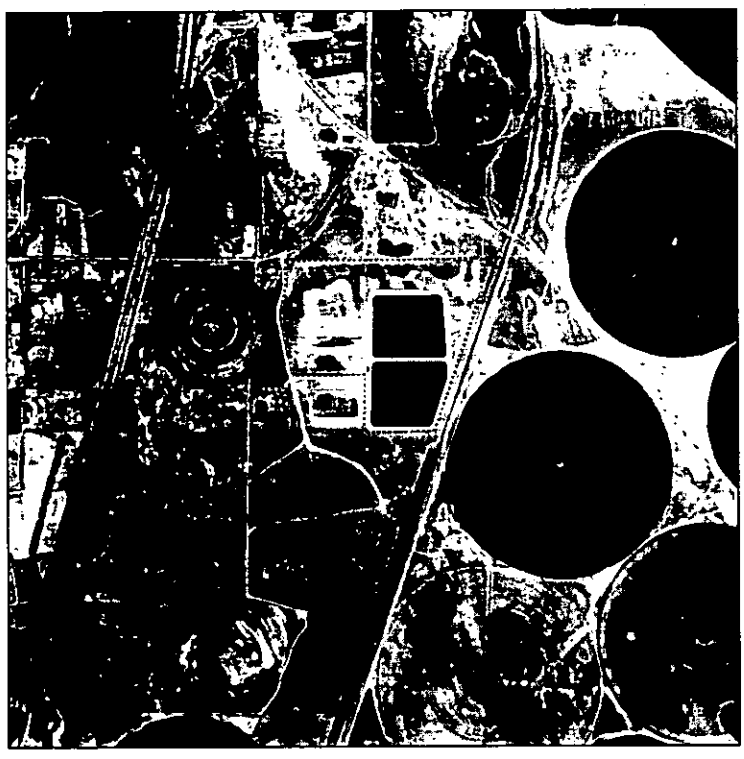

Photo courtesy of City of Boardman

Aerial photo of Boardman's wastewater treatment facility, likely to undergo improvements in several years.

If it is difficult for the Science Advisory Board and EPA to rank risks, it is difficult for cities to do so as well. It can take several years to complete a full relative risk study. Even when it is complete, it takes a long time for the public to accept the findings, and many people never do. If a city is having problems meeting environmental requirements because they lack financial and technical resources, the community could also have trouble completing a risk comparison. Furthermore, they would not have time. Thus, for the Livable Communities project to succeed, the advisory committee will need to be diligent in their efforts to create a relatively quick and easy method of ranking the priority projects.

Another obstacle will be found in ensuring interagency agreement. The natural resource agencies and the Health Division are very cooperative, but there is an inherent potential for conflict in working out the final agreements between the cities and the regulatory agencies. The Health Division might hesitate, for example, at having a city upgrade its sewers before it upgrades its drinking water system. There may be tension between divisions of DEQ (though this is not likely), which regulate most of the environmental problems that will be negotiated. This obstacle can be mitigated or overcome by making sure that all relevant agencies are active on the advisory committee and by ensuring that the Project Team communicates regularly with the different agencies and divisions.

A potential obstacle may be that the Livable Communities project may show that some federal regulations do not make sense. There are many reports from several states that document requirements that should be eliminated because they are irrelevant in many areas of the country and because they do not enhance environmental protection. The Project Team will need to document these situations if they arise and be prepared to respond to complaints about the regulations.

Proposed Evaluation

In general, success will be measured by the number of small communities in compliance with environmental regulations. More specifically, the following points should be considered in the evaluation:

- How many cities started the process and how many succeeded in participating?

- How many cities chose to participate, but were not able to be served by the Project Team?
- How much time did the Project Team need to spend with each city?
- What was the cost to the state per city and what was each city's cost?
- Did the city save money or spend more because of the extensions?
- Was there a reduction in environmental and/or health risk?
- Did the process increase local participation in decisionmaking?
- Did the process improve city-state relations?
- Was the compliance order effective in reducing legal liability?

Advice

Small communities have regularly expressed frustration with multiple environmental requirements. Knowing that the Livable Communities proposal is being considered has already generated appreciation and a greater desire to cooperate. Other western states should pursue similar projects as a way to generate good will and to achieve greater compliance, even during times of budget constraints.

In order to do it right, it will be important to articulate to small cities what is negotiable and what is not. It will also be important for all involved agencies to agree to work with small communities as a group represented by the Project Team. Finally, the cities as a group must take some ownership of the project and help shape the process for setting priorities. If all of these components are handled properly, the program will lay a foundation for better city-state relations and greater compliance.

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Using Comparative Risk to Set Environmental Priorities: Arizona and Rocky Mountain Tribes Tailor the Tool

by Katherine Kramer.

Introduction

As the West struggles to assert its own set of priorities for environmental management, several western states, including Washington, Colorado, California, Hawaii, and Texas, have turned to the "comparative risk process" as a tool to sharpen their own environmental policies while strengthening their relationships with the federal government. Two new projects are breaking environmental and political ground. They include a unique effort linking nine Indian tribes in the north central United States entitled the Tribal Comparative Risk Project and the Arizona Comparative Environmental Risk Project.

Much has been said about the differences between the environment in the West and the environment in the rest of the country. While pointing out the differences fosters much needed debate, developing tools that address these differences is a vital next step. The comparative risk process is one important tool which is finding broad applicability in the West.

Comparative risk is a process and a set of analytical methods used to rank environmental problems systematically and to devise management strategies to address those problems. Comparative risk can assist with developing an understanding of a discrete environment based on human health risk, ecological system risk, and economic and social threats.

In the Tribal Comparative Risk Project, nine tribes are undertaking the comparative risk process through data collection, risk analysis, risk ranking, risk management, and risk communication for their tribal lands. The Tribal Project involves nine district governments – nine Nations – working together to achieve economies of scale in data gathering and analysis and to learn from each other through the process. The comparative risk process emphasizes local values and mores, therefore each tribe will produce a unique analysis of their environmental problems.

The tribal representatives added several new environmental issues to the usual list of considered environmental problems: environmental contamination of foods harvested from local ecosystems, impacts on traditional tribal lands and values, and land use and population. The economic and social damages analysis will consider damages to Indian values and culture in addition to economic damages.

The Arizona comparative risk project is part of the overall Total Quality Initiatives being undertaken by the Arizona Department of Environmental Quality (ADEQ). In total quality approaches, agencies seek to "do the right things, right." The comparative risk project in Arizona is a critical component in determining what "the right things" are for the state in environmental management and regulation. Through the comparative risk project and its significant public participation component, ADEQ will be involving its 'customers' in determining the priorities for environmental protection. This total quality framework for the Arizona comparative risk project provides new direction for the evolving comparative risk paradigm.

Two other enhancements to the comparative risk process are being undertaken by Arizona: a public values assessment and a new fundraising approach. These new aspects of the project will provide valuable lessons for the comparative risk process.

While the comparative risk process has been implemented in over 20 states, cities, and tribes, the new projects are adapting the process to their own purposes and needs. This flexibility is a key attribute to the success of the comparative risk process. Western states are using the process

to assert their own priorities and to encourage flexible treatment from the federal government.

Background on Comparative Risk

Our understanding of environmental problems has evolved since our first national crises. Thirty years ago our goals were obvious – to attack the most visible pollution. Now, with environmental laws addressing most major pollution and the most visible contamination under control, new goals are needed. In order to establish these goals, new mechanisms are necessary to help set priorities for environmental action. Comparative risk is one such tool being applied across the nation to assist with environmental management. It is a particularly appropriate tool for the West, where our environment and our values vary across the region.

Through comparative risk, states can use advanced techniques to determine threats to ecosystems and address them on a prioritized basis.

The western environment is very different from the eastern United States. Most of the West is arid, which mandates different priorities and different management strategies than for non-arid lands. In addition, water ownership and usage policies of the West differ from those of the East. A high percentage of land in the West is owned by the federal government, which influences the management approaches in these areas. Finally, more independent tribal nations exist in the West than in the East or South, which leads to different environmental values, priorities, and management approaches.

Comparative risk has been applied successfully in the West. Colorado and Washington have completed projects. Hawaii, California, Arizona, Texas, Seattle, Utah, and Tribes are currently engaged in projects. Several other western states are planning projects.

Comparative risk projects look at human health, ecological risks, and threats to economic and social values as guideposts to ranking environmental problems. The projects use a traditional risk assessment approach to the human health analysis. For both ecological risk and economic and social values, EPA has suggested new approaches. States have adapted these innovative approaches to their local needs.

In the first phase of a comparative risk project, participants identify available data sources, analyze the data using human health and ecological risk assessment methods, collect information on the economic and social values of the community for the economic and social damages component, and rank the environmental problems for each type of risk. This exercise educates the participants about the broad range of environmental problems while giving them a consistent analytical framework in which to compare the problems. The process also makes explicit the values which go into the participants' decisionmaking.

In the next phase, participants devise environmental management actions to address the most serious problems. The risk management process helps people see how they can maximize risk reduction by using different approaches or shifting resources to different problems. Although the process, information, and ranking are important

first steps, completing the risk management phase ensures that projects lead to future action. Good communications is an important aspect of both the first and second phases.

EPA's Science Advisory Board, a group of independent scientists and academicians, endorsed the comparative risk process in their *Reducing Risk* report of 1990. According to the Board, *"[c]omparative risk provides decision makers and the public with the best technical and scientific knowledge available on the relative risks posed by different environmental problems and the options to reduce those risks."*

The Tribal Comparative Risk Project

In the summer of 1992, Region VIII Environmental Protection Agency (EPA) officials realized that a comprehensive picture of environmental problems on tribal lands did not exist. The six-state region consisting of North Dakota, South Dakota, Montana, Wyoming, Colorado and Utah, includes 35 tribes and 20 reservations. EPA officials proposed the comparative risk process as an appropriate first step to collect baseline data for these lands.

The tribes and EPA officials started the comparative risk project for several reasons. First, the project would help pull together a comprehensive data base for the tribal lands and uncover information gaps. Next, the project would provide a forum for discussions about environmental issues within each tribe. The tribal environmental officials would have a vehicle to communicate with members and the EPA about risks, values, and the future of the reservations' environment. In addition, the tribes could highlight environmental issues that need immediate attention and focus their efforts on them. Regional and federal environmental officials could use the information from the project to identify areas for cooperation with the tribes.

The first comprehensive discussion of the comparative risk project took place in September, 1992. The tribes were invited to attend a training session on comparative risk in Denver. The participants learned about the comparative risk process to determine if it would be useful to them. Long discussions were held on the goals of the project and the costs and benefits to the participants.

Attendees at the workshop returned home to present the comparative risk process to the governing bodies of the tribes and determine if their tribe would participate. The tribes that have agreed to participate are from the Southern Ute,Wind River, Blackfeet, Fort Belknap, Flathead, Fort Peck, Cheyenne River, Pine Ridge, and Yankton Sioux reservations..

The goals of the project were delineated by the tribal representatives at the workshop. The goals are:

- Identify the relative risks of environmental problem areas in EPA region VIII and set priorities among them;
- Reduce risks by using results of the risk analysis to guide planning and develop and integrate tribal environmental programs to set priorities for capacity-building and to define and support decisionmaking;
- Use the results to communicate with the public, tribal leaders and staff, and federal and state agencies, legislatures, and leaders to influence actions toward reducing risks; and
- Use a team approach among the Native American Tribes of Region VIII, with EPA assistance, to identify and to evaluate the environmental risks faced by the tribes and to mobilize efforts to reduce risks and to build equity for tribal environmental programs.

The environmental problems list for the project is similar to the national list devised by EPA. However, the tribes reviewed the list and made changes to address their unique situations. The tribal representatives identified three new issues: environmental contamination of foods harvested from local ecosystems, impacts on traditional tribal lands and values, and land use and population.

Pat Padia of the Northern Ute Tribe noted in a background paper submitted to the comparative risk tribal representatives that the economic and social damages are different for Indians. These differences include:

- ***Sense of tribalism/cultural identity*** — *"Despite the massive disruptions and dislocations of the past five centuries, Indian tribes remain for*

the most part, a people tied to the land. Relying upon a particular parcel of land for livelihood and structure, tribes have far more to lose from environmental degradation than the typical less-rooted urban American."

- ***Aesthetic*** — *"Due to the intangible value that tribes place on the environment and its terrestrial habitat, it is difficult to measure or quantify the spiritual or traditional losses."*
- ***Economic well-being and peace of mind*** — *"If well managed, the rural landscape of Native America has enormous values (e.g., cultural/traditional, scenic and economic benefits) for both Indians and non-Indians."*
- ***Future risks to reservation environments*** — *"Based on the National Census reports, among the fastest growing population groups on a fixed land base are Native Americans. This trend will place additional pressures on limited reservation resources."*
- ***Lack of tribal infrastructure*** — *"While EPA's Indian Policy has established the necessary framework for creating a strong Tribal-EPA partnership, most or all tribes continue to suffer from the lack of adequate funding to enable them to develop the infrastructure, resources and expertise to adequately address environmental protection for our lands."*

The tribal comparative risk project recognizes the unique environmental values and problems that exist on tribal lands in the West. Therefore, the project enables the residents of the reservations to set their own environmental priorities for their lands. The tribes, many of which are just starting an environmental management program, will begin their program with a strong emphasis on data collection and analysis, and an explicit discussion of the values that should drive local environmental management.

Arizona Comparative Environmental Risk Project

A complex mix of environmental challenges and opportunities led Arizona to undertake a comparative risk project. As one of the fastest growing states in the country, Arizona has experienced the pains of rapid growth. As an arid state, Arizona has maximized its usage of scarce water within the state and has altered ecosystems as a result. Arizona has spectacular scenic resources including the Grand Canyon, Saguaro National Monument, and the Petrified Forest National Monument among others. The southern third of Arizona is Sonoran Desert, which is an extremely fragile ecosystem. Approximately 87% of the land in Arizona is controlled by federal, state, and tribal governments. Therefore, intergovernmental cooperation is required to ensure the best environmental management.

The Arizona project has brought several unique, new directions to the comparative risk process. The Arizona Department of Environmental Quality (ADEQ) is implementing a total quality involvement (TQI) plan of which the comparative risk process is a component. A Public Values Assessment, an innovative project element, as well as citizen committees and town hall meetings, provide for substantial public involvement in setting the state's environmental priorities. In total quality terms, the Project is involving and listening carefully to its customers. In addition, the Arizona Comparative Environmental Risk Project has developed a funding strategy that includes the use of nongovernmental funds.

The goals of the project are to :

- Use the ranking of environmental risks as a basis for state priorities for environmental protection;
- Use comparative risk assessments to improve management and protection of Arizona's environment;
- Assess and compare environmental risks in Arizona by integrating technical information and public values;
- Build a broader understanding of environmental problems and risk among the general public and a better understanding of public environmental values within state government; and
- Encourage effective action regarding environmental problems by nongovernmental entities and individual members of the public.

For the last two years, the Arizona Department of Environmental Quality has strived to improve its management and structure. The approach has been based on total quality

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An Arizona scenic vista.

involvement. Under this approach, ADEQ is systematically evaluating each program, identifying increases in productivity, improving relationships with customers, and defining and documenting work processes.

The comparative risk project is vital to the overall department TQI process. The total quality process and the comparative risk process both depend on public participation. The information collected during the public values assessment will help the department improve citizen satisfaction.

The outreach component of the comparative risk project will also guide the department in improving the delivery of services. Under TQI, agencies strive to "do the right things, right." The comparative risk project in Arizona will determine what "the right things" are for the state in environmental management and regulation. Through the comparative risk project and its significant public participation component, ADEQ will be involving its 'customers' in the determination of priorities for environmental protection.

Other comparative risk projects have completed statewide opinion polls and have polled their citizen advisory committees, but none have undertaken a public values assessment as comprehensive as the Arizona approach. The assessment will be qualitative, utilizing interviews and focus groups in order to collect more detailed information. The public values assessment will also research the variability of values and perceptions among different segments of the public in Arizona.

The public values assessment will provide the project's Public Advisory Committee with a much more in-depth view of the environmental values of the citizens of Arizona. The Committee will then be able to integrate the broader values of the citizenry with its own values to achieve better consistency of views.

The funding of any comparative risk project has always been problematic. Though the US Environmental Protection Agency provides base funding, its contribution does not cover the total costs of most projects. Arizona has devised a unique way to bridge this gap.

ADEQ is joining forces with another state agency called the Commission on the Arizona Environment. The Commission was established to bring diverse interest groups together to

debate important environmental policy issues. The Commission has established a special fund for private contributions for the comparative risk project because they view it as an important vehicle for policy debate.

The Project has outlined strict guidelines under which it will accept donations. No donor may give more than $50,000, and a donor's participation on any of the projects' committees cannot be tied to financial support. A steering committee consisting of representatives of public and civic organizations, environmental and health professionals, business and industry, academic experts and the Governor's Office has been established to ensure that financial contributions will not dictate or influence the outcome of the project. The general public is also encouraged to make contributions.

Conclusion

Both the Tribal Comparative Risk Project and the Arizona Comparative Environmental Risk project bring new ideas and new frameworks to the comparative risk process. The result will be a more useful tool that cities, states and tribal governments in the West and across the country can use to determine their environmental priorities.

Both comparative risk projects provide for greater local control over environmental issues and, through Environmental Protection Agency funding, have provided opportunities for strengthening state-federal relations. The projects provide data to support new initiatives that could reallocate resources among environmental problems. The projects also give governors and tribal leaders the data and science to support new directions in environmental decisionmaking.

Comparative risk has an excellent track record in the West. Washington and Colorado experimented with the comparative risk process in the late 1980s and achieved successes with public education, strategic planning, and changes in direction.

The Arizona and the Tribal projects have refined and advanced the comparative risk process, giving new emphasis to areas such as integration of Total Quality Management and the emphasis on local values. As these projects are completed over the next year, new tools will be available for others to use to improve environmental management in their state.

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Financial Incentives to Reduce Urban Automobile Pollution: Portland's Smog-Free Proposal

by Katharine Russell Raphael

Introduction

The 1990 amendments to the Clean Air Act are forcing leaders in the Portland, Oregon, metropolitan area to intensify the search for effective and politically viable air pollution control strategies. Because Portland is close to attainment of federal air quality standards, it may soon submit a maintenance plan and request redesignation to attainment status by the Environmental Protection Agency (EPA). The maintenance plan will outline strategies that will ensure attainment of federal air quality standards for ten years from the date of approval. There is no deadline for submittal of the maintenance plan, but its acceptance by EPA is an essential step toward Portland's redesignation to attainment and the removal of stringent control requirements for new industry which increasingly impede economic growth in the Portland metropolitan area.

Past efforts to mitigate pollution in the Portland metropolitan area have included controls on both industrial and mobile sources, but the predominant source of pollution today is the motor vehicle sector, which accounts for approximately 50% of Portland's human-caused air pollution. In 1992, a diverse group of Portland-area leaders gathered to create a package of recommended strategies for reduction of motor vehicle emissions for inclusion in a maintenance plan. The Governor-appointed State Task Force on Motor Vehicle Emission Reductions in the Portland Metropolitan Area recommended an emission fee as one of these strategies.

If implemented in Portland, the emission fee would be a fee assessed on all private automobiles registered in the Portland metropolitan area. The fee would be calculated by measuring the amount of emissions emitted by a vehicle, determining a fee per mile based on the measured emissions, and multiplying the fee by the number of miles driven since its previous assessment. In Portland, this would occur every two years.

The emission fee appealed to the Task Force because of its two-part effectiveness. First, since the fee is based on the actual polluting potential of an individual car, it encourages drivers to change their driving behavior. Since the fee assesses drivers for the amount of pollutants they actually emit into Portland's air, the driver of an inefficient car driven daily would pay a substantially higher fee than the owner of an efficient car seldom used. The first part of the fee strategy acts as a disincentive to emitting by encouraging drivers to reduce their cost by keeping their cars well-maintained, reducing the number of miles they drive, and choosing an efficient car when purchasing a new vehicle. If paid as a lump sum at the time of vehicle registration, and if clearly identified as an air pollution fee, the emission fee can educate polluters on how their behavior directly affects the environment. Second, revenue generated by the fee would be used to expand transportation alternatives and to offset the fee's effects on low-income drivers. The anticipated change of behavior resulting from the disincentive of the fee and the incentive of improved transportation alternatives is projected to curtail emission of carbon monoxide and smog-producing gases from motor vehicles.

At this writing, no other state has implemented an emission fee on motor vehicles, so its actual benefits, as well as its societal acceptance, have yet to be determined. But the Portland-area Task Force selected the emission fee because it was the most acceptable strategy to diverse interest groups, it is cost-effective, and its two-pronged effect on drivers is projected to make significant reductions in harmful emissions.

Portland Air Quality Problems

The Portland metropolitan area currently does not meet EPA's air quality standards for carbon monoxide (CO), and lower-level ozone. Carbon monoxide is emitted directly from pollution sources, while lower-level ozone (smog) is formed from emissions of volatile organic compounds (VOCs) and nitrogen oxides (NOx). Regulatory emission reduction strategies that are already in place or pending implementation, such as vapor recovery at gasoline terminals and gas stations, the motor vehicle inspec- tion and maintenance program, changes in gasoline, and progressively more stringent federal emission standards for new motor vehicles, are expected to bring Portland's ozone and carbon monoxide levels into attainment by the Clean Air Act deadlines of 1993 and 1995, respectively. Yet there is a race between the success of state and federal regulatory strategies and growth in population and vehicle miles travelled per capita projected for the Portland metropolitan area.

Over the next 15 years, the population of the Portland metropolitan area is expected to grow by 37%, or 500,000 new residents, according to Portland's Metropolitan Service District's 1989 Regional Forecast. Unless there is a change in the status quo, these residents will encourage suburban development that is already underway – development that is outside of frequented transit routes and is putting pressure on the transportation system for additional circumferential highways that connect outlying suburbs. Not only will population growth increase the number of cars on the roads, but suburban development will intensify the need to use the vehicles, increasing the amount of emissions. EPA estimates that the amount of motor vehicle travel in the United States has quadrupled since 1950. Portland's own studies support this trend.

Vehicle miles travelled is growing at a much faster rate than population in the Portland metropolitan area. Vehicle miles travelled (VMT) is defined as the total number of miles travelled

Photo courtesy of Oregon DEQ

The Portland metropolitan area faces potential future growth impediments if emissions are not offset by better air quality strategies.

by the total number of vehicles on the road. Oregon Department of Transportation (ODOT) records indicate that traffic grew over four times as fast as population in Oregon between 1970 and 1990. From 1980 to 1990, the number of vehicle miles travelled in the Portland metropolitan area increased by 40%, while population increased by only 8%. ODOT projects VMT on the state highway system in the Portland metropolitan area to increase from 5.34 billion miles in 1990 to 9.40 billion miles in 2010, an increase of 76%, or 2.9% per year.

The maintenance plan for the Portland area must demonstrate the ability to offset the expected increase in emissions caused by population growth through emission reduction strategies. If Portland does not meet the 1993 and 1995 deadlines for carbon monoxide and ozone, or fails to submit an approvable maintenance plan and subsequently exceeds air quality standards, it will be downgraded from EPA's 'marginal' rating to 'moderate,' and further growth impediments will be prescribed. New and expanding industry will have to comply with steeper, more costly offset requirements and the region will have to reduce emissions sharply. The motor vehicle emission control strategies recommended by the Task Force would circumvent these growth impediments by meeting federal air quality standards and allowing for industrial expansion through a planned emission growth allowance.

Photo courtesy of Oregon DEQ

While the predominant source of Portland's human-caused air pollution comes from the motor vehicle section, high-emission industries may be forced to comply with more costly air quality regulations as well.

Task Force Recommendations

Over the next 15 years, growth in population, vehicle miles travelled, use of paints and solvents, use of lawn and garden equipment, and the use of other sources of VOCs and NOx are expected to push Portland's air quality above federally mandated levels if emission control measures are not implemented. Through extensive modeling provided by the state's Department of Environmental Quality (DEQ) and Portland's Metropolitan Service District (Metro), the Task Force determined that, by the year 2007, the strategy package needs to account for a 35.6% reduction in VOCs and 20.2% reduction in NOx from on-road motor vehicles (assuming all of the reductions come from on-road motor vehicles). (The year 2007 was selected by taking into account the time needed to develop and submit the maintenance plan, two years for EPA approval of the plan, plus the first ten years that an area is expected to stay in attainment.)

At their final meeting, the Task Force took a straw vote to identify mutually agreeable strategies that could be included in the maintenance plan. The Task Force then discussed the feasibility of those strategies receiving the most votes, and tallied their emission benefits to see if a combination of strategies achieved the 35.6% and 20.2% reductions. Those strategies that received virtual consensus from the Task Force for the base plan, and whose numbers met reduction needs, are shown in Table 1 on the following page.

TABLE 1

BASE STRATEGY	EMISSION REDUCTION % VOC	% NO
California 1994 Emission Standards for sale of new gasoline powered lawn and garden equipment.	6.1%	0.0%
Improvements in Portland area vehicle inspection program:		
High Option (Enhanced) Vehicle Emission Inspection	17.5%	9.0%
Eliminate Exemption for Many Older Cars; and	2.4%	0.8%
Expand Vehicle Inspection Boundary.	1.0%	0.5%
Phased-in Vehicle Emission Fee based on actual emissions and mileage driven.	5.0%	5.5%
Pedestrian, Bike, Transit friendly land use for new construction.	5.2%	4.4%
Mandatory Employer Trip Reduction Program (50 or more employees).	1.2%	1.1%
TOTAL EMISSION REDUCTION:	37.1%	20.6%

The most innovative strategy in the package is the phased-in vehicle emission fee. On its own, the emission fee is expected to make a 5.0% reduction in VOCs and a 5.5% reduction in NOx. (These percentages are directly tied to the cost range of the fee, as well as the beneficial use of revenue for emission reduction projects and programs.) Yet strategy number 4 – pedestrian, bike, and transit friendly land use – is most effective only when coupled with an implementing strategy, such as the vehicle emission fee, because transportation-oriented land use provides access to transit, while the fee provides the demand to use transit. When land use and emission fee strategies are implemented together, as in the recommended base strategy package, the total percentages of projected emission reductions almost double, increasing to 10.2% VOCs and 9.9% NOx. Paired with transit-oriented land use, the emission fee is expected to effectively provide almost one-third of the projected VOCs emission reduction need, and almost half of the projected NOx emission reduction need by the year 2007.

Advantages of the Emission Fee

The emission fee is a unique emission reduction strategy for the Portland metropolitan area because it is market-based. In the past, DEQ has imposed regulations to curb emissions. But market-based strategies are becoming increasingly viable options, primarily because of their ability to make significant reductions in emissions of both VOCs and NOx in a cost-effective manner. Advantages of the emission fee include:

- The emission fee will make polluters pay for environmental harm caused by their pollution.
- The emission fee will effectively change individual behavior for long-term benefits in emission reductions.
- The emission fee will generate revenue to expand transit alternatives and to mitigate hardship effects on low-income drivers.
- The emission fee is cost-effective for individuals and the region.

- The emission fee is easy to implement through inspection and maintenance programs already in place in the Portland area.
- The emission fee is effective in addressing all vehicle trips, not only commutes, reducing annual vehicle miles travelled (VMT).
- The emission fee was acceptable to the diverse group of the Task Force.

Beginning with industry, environmental regulations are making polluters increasingly accountable for the air they pollute. Today, industrial plants are required to pay emission fees through the purchase of permits and, in non-attainment areas like Portland, are required to install costly emission control devices. These measures can cost industry up to $10,000 per ton of emissions reduced. Drivers of motor vehicles, on the other hand, are a significant part of the pollution problem but do not pay for the amount they pollute. Instead, the costs are passed on to others through health impacts, job-growth restrictions, and taxes to support clean-up programs. The emission fee is an attempt to share the cost burden of pollution – to make the polluter pay, whether they own an industry or drive a vehicle.

The emission fee strategy and the corresponding expected changes in behavior are cost-effective for individuals. Regulatory options, such as reformulated fuels and federal regulations that apply to car manufacturers, increase an individual driver's costs with no corresponding savings. The emission fee, on the other hand, provides significant savings to individuals by reducing the actual cost of driving. DEQ determined that driving a single occupancy vehicle, considering gas, oil, wear-and-tear on tires, insurance, and overall depreciation, costs drivers approximately 33 cents per mile. Because a significant portion of this cost is in overhead – the semi-annual insurance, monthly car payments, and depreciation, for example – the mile-by-mile, cost per trip is largely unseen. An individual who uses public transportation or car pools can save money through reducing maintenance and wear-and-tear on his or her own vehicle when it is used less often, and by spending less on fuel.

The emission fee allows individuals to react in a way that is most cost-effective for themselves. Regulatory measures, by contrast, are less responsive to individual differences and are less efficient in changing behavior. The emission fee internalizes costs that were previously external, binding personal behavior to costs incurred. By internalizing the real costs of driving that are currently subsidized, individual drivers may reduce their current excessive consumption of resources and their annual transportation expenses.

The region will save money because a reduction in vehicle miles travelled will reduce the need to build additional highways to accommodate expected regional growth. Individuals and the region will also benefit from decreased time spent on congested highways. The emission fee solves two problems with one cost-effective answer: it can help to improve air quality while reducing VMT and related traffic problems.

Disadvantages of the Emission Fee

Disadvantages of the emission fee as a means for improving air quality include the following:

- It is difficult to predict results, as all estimates are based on modeling and no region in the country has instituted the emission fee strategy for air quality control.
- It could have a negative impact on low-income drivers.
- It is extremely difficult to sell the concept of fees or taxes to Oregonians. This year the state legislature and Oregonians are struggling with budget cuts imposed by Measure 5, a statewide property tax limitation passed by initiative in 1990. The loss of revenue is forcing drastic cuts across the board, especially in public schools. The legislature is attempting to find a way to compensate for the loss of revenue, and a sales tax of some kind seems to be inevitable. Knowing that they will have to ask residents to vote on a new tax, legislators are extremely hesitant to increase vehicle fees as well, especially when, on the average, the emission fee could triple what drivers currently pay.
- It may be difficult to establish appropriate, cost-based fees. In a politicized process, the

temptation will be to set fees arbitrarily to punish drivers, rather than simply internalizing external social costs.

- On-road vehicle emissions are estimated to be a smaller part of the problem in 2010 because of uncontrolled growth in area sources and non-road vehicles.
- The emission fee addresses all trips when rush hour traffic may really be the problem.
- The emission fee affects a driver's pocketbook only once every two years, so it is not a daily reminder to reduce emissions by driving less.
- Calculating the emission fee is complicated.
- The emission fee does not charge for trips originating outside of the region.
- It is less effective than other strategies in reducing vehicle miles travelled.
- The emission fee may involve complicated rule-making to provide a credit for vehicle miles driven outside of the region.

Steps and Obstacles in Implementation of the Emission Fee

Step #1, Task Force Consensus — The first major step in considering the emission fee as a viable air pollution control strategy for inclusion in the maintenance plan was for it to receive a strong majority vote by the Task Force. This in itself was a big step because of the diversity of Task Force members and the interests they represent.

On March 11, 1992, Governor Barbara Roberts appointed the 24-member Task Force on Motor Vehicle Emission Reductions in the Portland Area to fulfill the requirements of House Bill 2175, adopted in 1991. HB2175 specified that the Task Force be comprised of representatives from a broad range of organizations, including the state legislature, local government, environmental and transportation organizations, and public and private industry.

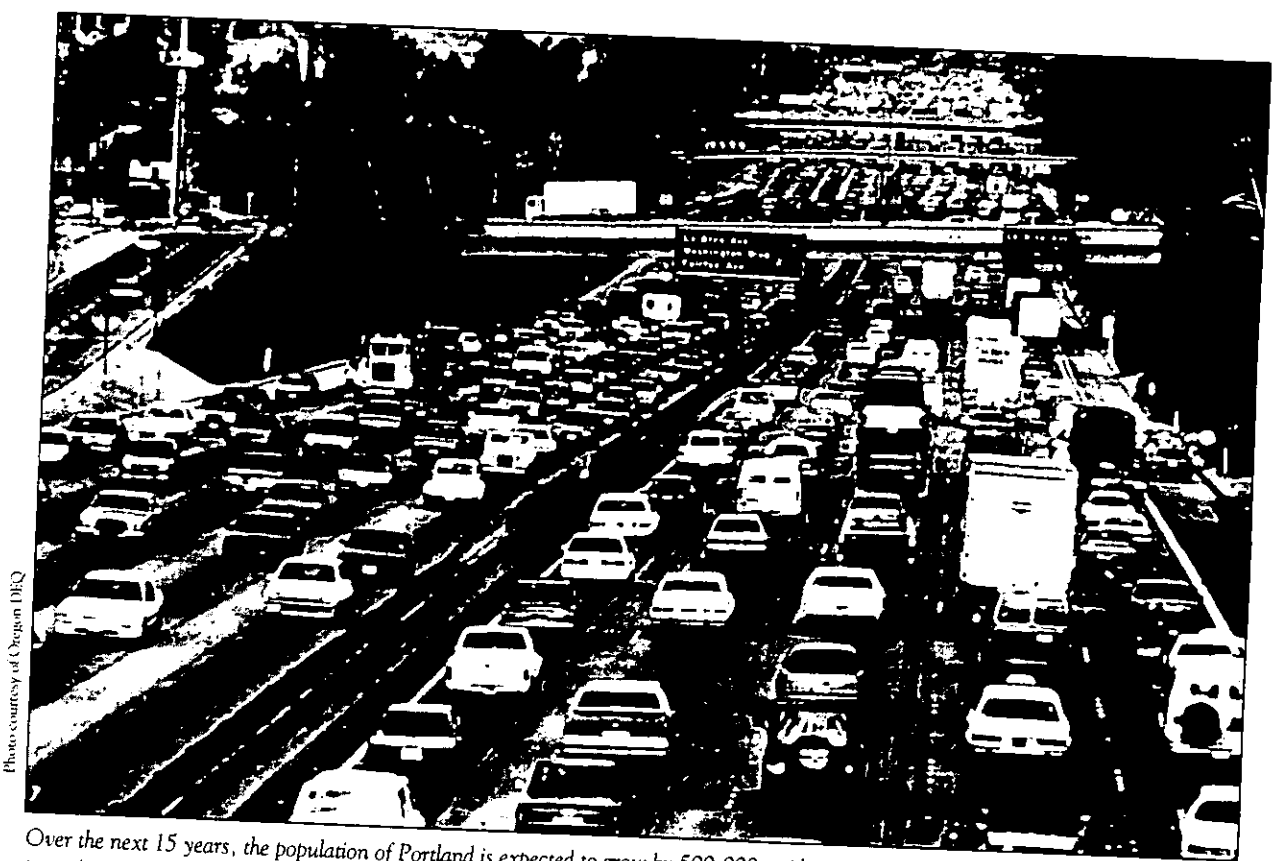

Photo courtesy of Oregon DEQ

Over the next 15 years, the population of Portland is expected to grow by 500,000 residents which will put more pressure on its transportation system and may exacerbate air quality problems without new air quality strategies.

It was important that the Governor make the appointments to ensure that the Task Force would be independent from DEQ and Metro, the region's primary air and transportation regulatory agencies. The Governor also gave appointments to the Task Force a measure of prestige, enabling the participation of key players.

Task Force members introduced their own concerns and opinions freely and frequently, continuously guiding the proceedings toward overall consensus. Representatives from industry, for example, were very vocal about the necessity of creating a maintenance plan, and were very concerned that the Task Force reach that goal. The threat of increased emission offset requirements and costly emission control devices was a prime motivator for their participation. Industry representatives supported the emission fee above other strategies because, unlike parking fees and other approaches, it does not burden large employers – the exact constituency motor vehicle emission reduction strategies are meant to relieve from current and impending emission control burdens.

The environmental representatives on the Task Force agreed with industry on the imperative for creating a maintenance plan. This underlying impetus allowed consensus to be reached by previously divergent groups. The emission fee was acceptable to environmental representatives on the Task Force because it supports and encourages transit-friendly land use which, in turn, improves air quality. Representatives from the Oregon Environmental Council, 1000 Friends of Oregon, the Oregon Department of Energy, and DEQ all agree that individual polluters must begin to take responsibility for their actions, and the emission fee is a way to do this.

The other vocal interest represented on the Task Force was the American Automobile Association (AAA). The AAA representative – its lobbyist – was hesitant to accept any strategies that directly or indirectly discouraged use of automobiles. For this reason, he often stood alone, isolated from consensus. Although the emission fee did pass by a majority vote, his vote was not among those that passed it.

Overcoming their diverse backgrounds, representatives from government, industry, and environmental groups agreed that the emission fee was the cost-effective way to achieve all objectives. The emission fee's big numbers in the reduction of ozone precursors, and the $119 million saved by the overall, five-part plan – a savings that is in large part due to the emission fee and resultant land use – are just two advantages that led to its passage through the first major obstacle: the Task Force.

Step #2, The State Legislature — The emission fee requires approval by the state legislature because it is fee based. Not only does testimony need to convince legislators that a maintenance plan must be adopted to avoid industrial impediments that could stifle economic growth, it must convince legislators that the emission fee is an effective strategy to do this. As expected, the legislature is turning out to be a significant obstacle.

Measures were taken at the very beginning to grease the wheels of the legislature with the appointments of two influential legislators to the Task Force: Senator Ron Cease, a Democrat from Portland, and Congresswoman Delna Jones, a Republican from neighboring Aloha. In the 1993 legislative session, Senator Cease is Chair of the Senate Agriculture and Natural Resources Committee, and Representative Jones is Chair of the House Revenue and School Finance Committee. Both committees potentially could take up the emission fee bill during the legislative session. Consequently, it was crucial that Senator Cease and Representative Jones buy into the emission fee strategy through participation in Task Force proceedings. Both legislators voted for the emission fee in the final Task Force vote.

Other influential Task Force participants are helping to promote the emission fee bill in the state legislature. Since the emission fee would significantly benefit mass transit (additional funds), major industry (removal of growth impediments), land-use planners (transit-oriented development), and air quality, the participation of executives from mass transit, private industry, and environmental organizations on the Task Force creates a committed, strong, and diverse lobbying group.

At this writing, the emission fee has been introduced to both the House and the Senate in the Oregon legislature. A special task force of Portland-area legislators was established on the House side to hear HB2419. After three hearings and intense lobbying efforts, the House Special Task Force dropped the emission fee in favor of regulatory alternatives: changing the maintenance plan target date from 2007 to 2006, doubling the employer trip reduction program requirements, directing DEQ to adopt regional parking ratios for new parking spaces that will reduce the potential vehicle trip generation from future growth by 10%, and possibly requiring additional fuel taxes and a flat registration fee. This is only the first step in the bill's long journey through the legislature, however, and many believe that the emission fee may be reinstated along the way.

But House Bill 2419 – the emission fee bill – represents only half of the battle in the legislature. Passage of the emission fee would activate fee assessment but, in Oregon, fees assessed on vehicles are restricted to the State Highway Trust Fund, a fund earmarked for highway use only. Use of funds for any other purposes, such as expanding transportation alternatives, requires a constitutional amendment. A constitutional amendment will open up the Fund to allow for the funding of transportation alternatives – transit, car pool programs, and more – and to provide fee relief options to low income vehicle owners. With the new recommendations by the House Special Task Force, the constitutional amendment bill may now be reworked to allow registration fees to be used for transit.

Although it is not necessary to spend fee revenue on any particular transit project in order for air quality gains to be realized (approximately 75% of the emission reductions will occur simply through the direct incentives/disincentives provided by the fee), there is a political need to change the state constitution so that motorists will see a direct connection between the fee they pay and improvements to the transportation system, including transit. It is also necessary to invest fee revenue in transit because of the need to improve transportation alternatives to meet the expanded demand caused by the entire package of vehicle emission control strategies.

State legislators are primarily concerned with public support, and brought up two major concerns during the emission fee bill's first hearing: the effect of another fee or tax on the public, and the fee's effect on low income drivers. It is not easy to address the first concern, as increasing drivers' fees conflicts with the need to raise new taxes to replace property taxes curtailed by Measure 5.

With regard to the second issue, House Bill 2419 specifically allows fee relief to low-income drivers. Even without a constitutional amendment, there are several proposed options that will mitigate the fee's effects on low income households without reducing its effectiveness:

- fee credits for transit passes;
- fee credits for vehicle emission repair;
- fee credits for old car buy backs;
- basic travel mileage allowance;
- hardship fee waiver; and,
- lower fee scale.

Legislators are searching for alternative strategies to meet air quality standards. Other sources, such as motorboat engines, construction vehicles, and snowmobiles are currently unregulated and will increasingly become a greater source of air pollution as federal regulations make on-road vehicles cleaner. Unfortunately, the Clean Air Act prevents any state other than California from regulating these non-road motor vehicles and engines.

Step #3, Nuts & Bolts of Implementation — Because the emission fee has not been

TABLE 2

AVERAGE FEE	FEE RANGE	MULTIPLE
$100	$10-1000	100x
$200	$20-$500	25x
$250	$25-$350	14x

implemented anywhere in the United States, DEQ has only been able to postulate on how the fee will be implemented.

The first major step in implementation – included in HB2419 – was determining the actual cost and range of the fee, which is directly tied to the emission fee's effectiveness. The Task Force decided that in the first year of implementation, the fee would range from $5 to $125, with a $50 average. By the year 2000, the fee would range from $20 to $500, with a $200 average. The critical factor is the range of the fee, creating a significant difference between the fee paid by the cleanest, low-mileage vehicle and the dirtiest, high-mileage vehicle. The average fee mainly affects the amount of revenue generated and, consequently, the amount of transit and trip-reduction incentives that can be provided. A reduction in the average fee can be compensated for by an increase in the range. Based on the limited amount of modeling data available, DEQ and Metro estimated that each of the following fees' ranges will achieve approximately a 5% reduction in VOCs and NOx as shown in Table 2 on the previous page.

These examples will only achieve a 5% reduction if fee revenue is reinvested in transit alternatives. If the revenue is not used, the range becomes even more significant in achieving desired reductions.

The emission fee could be implemented in the Portland metropolitan area relatively easily because of the inspection and maintenance program already in place. Portland is one of only two cities in Oregon that currently has an ongoing inspection and maintenance program. The following are implementation details worked out between the Oregon Division of Motor Vehicles (DMV) and DEQ for use if the emission fee becomes law in 1993.

Beginning in January,1994, the vehicle inspection information insert currently mailed with registration renewals will be modified to include information about the odometer readings DEQ will be recording when the vehicle is inspected. It will also inform drivers about what they can do to reduce the impending emission fee they will be subject to when they renew two years hence. DEQ will begin the recording process by collecting odometer information on vehicles registered in 1994 within the area designated for collection of emission fees. This will occur at already existing DEQ inspection sites. While conducting the vehicle inspection, the inspector will record the vehicle's odometer reading on a computer. Sometime prior to January 1, 1996, the odometer information will be uploaded to DMV's vehicle records.

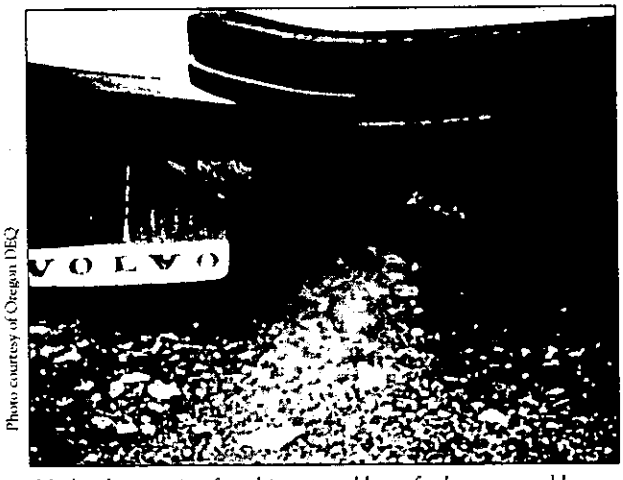

Photo courtesy of Oregon DEQ

Under the emission fee, drivers would pay for harm caused by their pollution.

Beginning January 1, 1996, persons returning to register their cars will again have their odometer readings recorded in DEQ's computer. (By this point, DMV and DEQ will have interfacing computer systems that will allow information to be exchanged between both computer systems. Coincidentally, Oregon's DMV is about to install a new computer system that will be able to handle these new requirements, at little added cost to DEQ.) At this point, DEQ will have installed enhanced emission tests applicable to newer vehicles. In a basic inspection, if vehicles "pass" the emission test, they will pay a smaller cost per mile than if they "fail" the emission test. In an enhanced emission test, the amount of emission will be measured in grams per mile, and related directly to a fee per mile so that the less a vehicle emits, the less the driver will have to pay per mile. In Oregon, it is speculated that basic emissions tests will be utilized for vehicles made prior to 1985; enhanced emission tests will apply to all

vehicles manufactured since 1985 and contain electronic control systems.

Once the DEQ attendant measures a vehicle's emission rate, and reads the odometer, the attendant will calculate the individual's fee by multiplying the emission rate cost times the number of miles driven since the previous odometer reading two years prior. This information will be entered into DEQ's computer, which will then be downloaded onto DMV's computer and handed, in written form, to the driver of the vehicle. The driver will then pay the fee by mailing the bill, with DMV's registration form and fee, to DMV.

There are many "what ifs" that arise regarding implementation of the emission fee strategy. DEQ and DMV proposed answers for a few of these:

- Vehicles registered within the metropolitan area, but which are not subject to inspection (such as cars built prior to 1974), will still be subject to an emission fee. This fee will be pre-established according to a scale that estimates emissions according to the model-year of the car. Vehicle owners will have the option of having their vehicles inspected if they believe they can get a lower fee.
- If a vehicle title is transferred on a vehicle that is registered within the metropolitan area, and the vehicle remains in the metropolitan area, DMV will inform the new owner of the desirability to take the vehicle to DEQ and establish a new base mileage. When the new owner establishes a new base mileage, DEQ will notify DMV, which will notify the previous owner of the emission fee owed. If that owner fails to pay the fee, DEQ may assess civil penalties. However, this will not in any way hold up title transfer from the previous owner to the new owner of the vehicle. If the new owner fails to establish a new base mileage, the fee will be prorated based on the percentage of the registration period each person owned the car.
- Similar processes will be implemented for vehicles that are rendered inoperable due to collision when the title is surrendered.
- If a title is transferred on a vehicle that was registered within the metropolitan area, and the new owner does not reside in Oregon, DMV will notify the previous owner that fees are due and will provide enforcement information to DEQ if fees due are not paid. DEQ will impose penalties if the old owner is apprehended.
- If a vehicle owner moves out of the district, they must notify DMV of the move so DMV will send the final emission fee bill. If a person does not notify DMV, DEQ may assess civil penalties, and the emission fee will be based on a default baseline established by DEQ, which may incorporate the actual move date.
- When a person moves into the metropolitan area, the driver will have the option of going to DEQ and having a new base mileage established. If they do not, the emission fee will be based on a pre-established base mileage which may incorporate the actual move date.

The emission fee will be required of all passenger cars and light trucks (under 8,000 lbs.). Exempt vehicles will be the same as those already exempt from inspection by DEQ, such as mopeds, motorcycles, government- and state-owned vehicles, motor homes, commercial busses, etc. Privately owned vehicles that are driven a significant amount outside of the Portland metropolitan area, such as vehicles for salespeople or vacation vehicles, may be given credit if the driver keeps detailed records of mileage and gas receipts for gas purchased a certain number of miles outside of the Portland metropolitan area.

If an area wishing to implement the emission fee does not have inspection and maintenance programs already in place, the fee could be determined by the model and year of the car, and self-reported odometer readings. This method could be considered to be unfair, however, as older model vehicles may have newer, more efficient engines. This implementation strategy also limits a driver's ability to lower the fee; a driver's only response is to drive less, rather than also attempting to better maintain personal vehicles. Self-reporting one's mileage may also be problematic, unless there are spot-checks and heavy penalties to discourage incorrect reporting.

Another implementation scenario is a "feebate." This is a revenue-neutral strategy, unlike

the plan approved by the Governor's Task Force. In this strategy, a driver with very low emission rates and mileage, who's final emission tally is above average, will receive a cash rebate. Those drivers with below average emission rates – drivers of inefficient cars with high annual mileage – will be taxed. Fee revenue from the below average group will pay for rebates to drivers with low emissions. In this scenario, all drivers have the incentive to drive less and improve their vehicles' efficiency, as the amount of the rebate will increase relative to reduced emissions.

Step #4, Proposed Evaluation — HB2419, the emission fee bill, has built-in checks that will determine whether the fee is meeting emission reduction goals. The bill states that DEQ and DMV will jointly evaluate methods of interagency enforcement of payment of the emission fee. In addition, the bill specifies that *"[o]n or before January 1 of each odd-numbered year, the DEQ shall submit a report to the Legislative Assembly setting forth the progress made in maintaining attainment with the federal air quality standard for ozone in the Portland metropolitan area, the effectiveness of the vehicle emission fee in reducing motor vehicle emissions and the need to continue implementation of existing and new emission reduction strategies to maintain attainment with such standard."*

Advice for Other States

Regardless of the emission fee's success or lack thereof in Oregon's legislature, a majority of participants in the Governor's Task Force believed that the emission fee is a viable air pollution control strategy, and offer advice to those interested in pursuing it:

- Legislators' main concern about the emission fee appears to be the voters' reaction to a fee in light of Measure 5 and an impending sales tax. States considering the emission fee, therefore, should be aware of their own budgeting predicaments. Statewide financial difficulties could prematurely doom an otherwise feasible pollution control strategy.
- Local leaders, legislators, and the public should all be educated about the Clean Air Act and the threat of EPA restrictions and controls on areas that do not comply. There must be a sense of urgency that pushes acceptance of a maintenance plan, and if recommendations are going to be innovative, like the emission fee, then education will help the public to understand why they, too, must pay. Task Force participants believe that a more comprehensive and longer-term public education program may help to carry the emission fee through obstacles in the state legislature. Education should include the fact that all major metropolitan areas in the country are wrestling with achieving attainment through air pollution control strategies; no one area is immune to EPA's mandates and penalties.
- Task Force members also recommend that a cross-section of the community be involved in strategy selection procedures. This enables consensus from different groups who previously may not have agreed upon other issues, creating a broad base of support for air pollution control strategies.

The author of this paper, Katharine Russell Raphael, is a freelance writer living in Portland, Oregon.

Oregon's DEQ has published a final report on the findings and recommendations by the Governor's Task Force on Motor Vehicle Emission Reductions in the Portland Area.

For copies of this report, and more detailed information, please contact:

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Tradable Air Permits to Reduce Point and Non-point Source Pollution: Southern California's RECLAIM Project

by Rodney T. Smith

Problem Statement

Traditionally, air pollution regulation has followed a two-stage system of command and control. In the first stage, regulators determine the air quality standards needed to protect the public health and safety. In the second stage, regulators determine which pollution control devices firms must install and place concentration limits on specific processes. The collection of all required actions and concentration limits make up the plan for how an area will attain air quality standards.

The installation and operation of pollution control devices alone has required a substantial and growing investment of resources. In 1989, for example, the U.S. Council on Environmental Quality estimated that, between 1979 and 1988, cumulative operating costs and capital costs (e.g, interest and depreciation) for air pollution control in the United States totalled $662.7 billion (1992 dollars). Total costs incurred in 1988 equalled $82.5 billion, two-thirds greater in real terms than the total costs incurred in 1979. Over this time period, annual total costs grew 5.6 percent per year faster than the general price level.

Command and control regulation has come under increasing criticism. Are the costs imposed by regulators excessive? Are there cheaper and more effective ways to control air pollution? As the magnitude of resources invested in pollution control grows, more individuals become inclined to answer these questions in the affirmative. For many, the fundamental problem resides in the structure of command and control regulation.

Because regulators ultimately tell firms and individuals how to control pollution, the rulemaking process becomes the sole forum for determining the effectiveness and cost of alternative methods of pollution control. Decisions are shaped by the "facts" entered into the rulemaking record as interpreted by regulators. There is an understandable tendency to limit the scope of allowed actions. Few expect the outcome to be the least-cost method of achieving effective pollution control. Even fewer characterize rulemaking as a forum for encouraging flexible approaches to effective pollution control.

Perhaps the most severe problem with command and control regulation is that firms and individuals do not have an economic stake in effective pollution control. Once rules and regulations are promulgated, the sole economic

Photo courtesy of Stock Imagery

RECLAIM hopes to improve air quality protection by providing market-based incentives for industrial emitters to curtail emissions.

reward for a firm meeting regulatory standards is the avoidance of fines and penalties. A firm receives no reward for undertaking any actions not required by regulation. If a firm happens to discover a cheaper method for controlling pollution, it may need a change in regulations before it can implement the new method. The uncertainty of regulatory approval and the certainty of the cost from regulatory delay place an economic burden on innovation.

The economic signals for participants are clear. During the rulemaking process, argue that regulations imposed on yourself are not as cost-effective as regulations imposed on others, preferably competitors. After rulemaking, seek exemptions and variances. If unsuccessful, invest modest amounts, at most, in finding better ways to control pollution.

Concerns have also been raised about the effectiveness of traditional command and control regulation. Despite the investment of substantial resources in pollution control, a significant portion of the country's population still lives in areas whose air quality does not meet federal air quality standards. Especially in the West, the prospect for continued population and economic growth will both increase the cost of attempting to meet federal standards and reduce the prospect that air quality standards will, in fact, be attained.

Goal

Market-based incentives for pollution control exploit a natural division-of-labor between regulators and the private sector. Let regulators set air quality objectives. Provide the private sector with the responsibility and the incentives to determine how best to achieve them. In other words, regulators would maintain their role in the first stage of traditional command and control regulation, but change their role in the second stage. As described below, the regulator's new role is to design, implement, and enforce a system of tradable emission reduction credits. As a result, the regulator abandons the second stage of traditional command and control regulation in which decisions about pollution control are made through detailed regulatory rulemaking.

The goal is to beat the performance of traditional command and control regulation. Improved performance is measured by lower compliance costs, while achieving real, quantifiable reductions in the level of actual emissions. With increased flexibility of pollution control and reduced compliance costs, improvements in air quality may occur under a system of market-based incentives with fewer adverse impacts on an area's economy and employment base than under traditional command and control regulation.

To achieve the goal, the regulator must undertake four actions. First, it must establish an initial allocation of maximum allowed emissions. Second, it must define how parties can create tradable emission reduction credits when they limit their actual level of emissions below maximum allowed levels. Third, it must define the rules and allowable transactions under which parties may acquire credits. Fourth, it must monitor actual emissions to assure that emission levels do not exceed the maximum allowed amounts as modified by trading.

A suitably-designed scheme can provide firms and individuals with economic incentives to pursue effective pollution control. Parties with the lowest-cost means of controlling emissions will have an incentive to control pollution in order to sell credits to other parties with higher-cost means of controlling emissions. In effect, transactions in the emission credit market will allocate responsibility for pollution control at a lower cost than possible under command and control regulation. Parties also have an economic incentive to discover cheaper methods of pollution control. If successful, they create additional emission credits which either can be sold to other firms or be used to offset the purchase of credits from other parties.

Project Description

The RECLAIM program adopted by the South Coast Air Quality Management District is an example of market-based incentives for air pollution control. Instead of specifying equipment or concentration limits, the program imposes mass emission limits for a facility as a whole. The mass emission limits for facilities decline on

CONTRIBUTION OF EMISSIONS FROM STATIONARY SOURCES

(PERCENT)

ACTIVITY	NO_X	ROG
Fuel Combustion	92.0	2.5
Solvent Use	0.1	68.0
Petroleum Processing	15.0	3.0
Industrial Processing	4.0	6.0
Miscellaneous Processing	0.3	8.0
Waste Burning	0.6	0.5

average over time in order to attain federal and state air quality standards in the South Coast Basin. Companies will be allowed to achieve their required emission reductions through a choice of add-on controls, the use of reformulated products, and the purchase of emission reduction credits from others.

Several statutory provisions in federal and state law place limitations on the permissible scope and form of the program. These requirements include:

1. ***Enforceable*** — the program must result in quantifiable, actual emission reductions;

2. ***New and modified major sources*** — program must comply with lowest achievable emission rate;

3. ***Federal new source offset requirements*** — program must, at a minimum, meet requirements on an aggregate basis by all new and modified sources;

4. ***Federal and state technology requirements*** — program must demonstrate, by aggregating emissions from sources, that federal and state requirements for existing sources to employ reasonably available control technology and best available retrofit control technology are met;

5. ***Statutory mandated technology*** — program must require each source to comply with statutory mandates of specific control technologies and of specific emission limits designed to prevent localized health impacts;

6. ***No backsliding*** — program must not allow emissions backsliding on an aggregate basis.

The precise meaning of many of these restrictions has not been previously determined. In the end, courts will be guided by the interpretations of the District, the California Air Resources Board (which has provisionally approved RECLAIM), and the federal Environmental Protection Agency.

In designing the program, the District followed five criteria when analyzing program options. First, enforcement mechanisms for RECLAIM must be as reliable as enforcement mechanisms for command and control regulation. Second, emission reductions under RECLAIM must equal or exceed overall emission reductions under the District's 1991 Air Quality Management Plan (AQMP). Third, RECLAIM's implementation costs must be less than the 1991 AQMP. Fourth, RECLAIM's job impacts must be less than the 1991 AQMP. Finally, no adverse public health impacts should result from the adoption of RECLAIM.

RECLAIM initially will cover stationary sources that hold District permits for emission of Reactive Organic Gases (ROG) and Nitrogen Oxides (NOx). In the South Coast Basin, stationary sources account for about half the total emissions of Reactive Organic Gases and about one-fourth the emissions of Nitrogen Oxides. Fuel combustion accounts for 92 percent of NOx emissions from stationary sources and solvent use accounts for 68 percent of ROG emissions from stationary sources (see table above). The District may extend RECLAIM to include Sulfur Oxides (SOx).

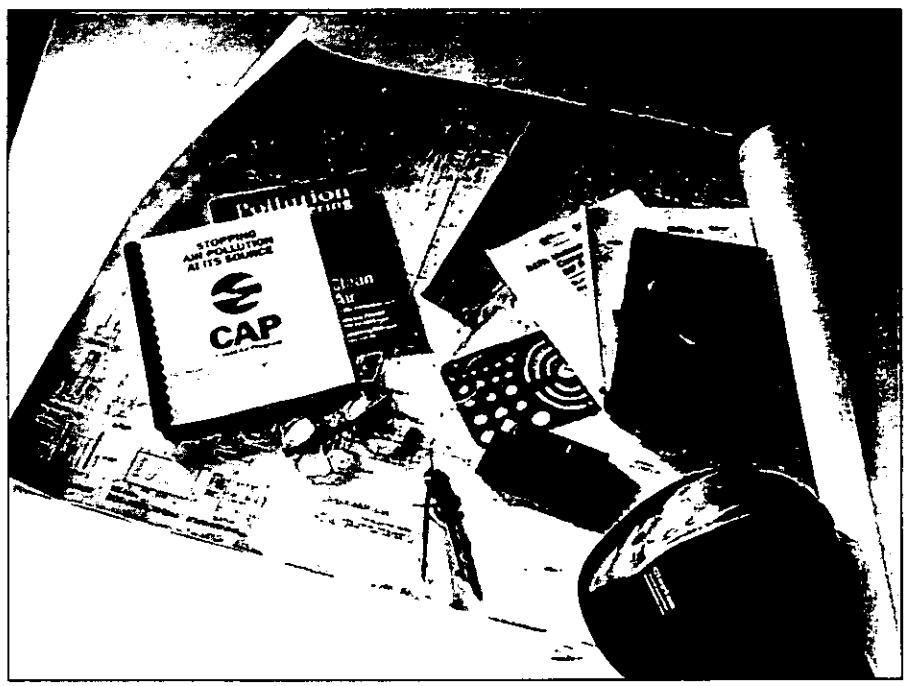
Currently, there are approximately 65,000 permitted NOx and ROG emission sources at about 32,000 facilities. About 80 percent of the facilities have one or two permitted sources. Certain essential public services, restaurants, dry cleaners, and gasoline dispensing facilities are exempted; they will remain under command and control rules. Of the remaining 5,220 facilities with permits for NOx emissions and 12,810 facilities with permits for ROG emissions, only permitted facilities that emit at least 4 tons annually will be eligible in the initial phase of the program. In 1990, the eligible facilities accounted for 95 percent of the emissions from the 5,220 facilities with NOx permits and 86 percent of the emissions from the 12,810 facilities with ROG permits. The inclusion of facilities with emission rates below 4 tons/year will be considered in a second phase of the program.

RECLAIM represents a "revolutionary" change in the method of regulatory control. Facility permits replace traditional equipment permits, emission rates, and retrofit control rules. Based on the "bubble" concept, a facility permit will detail all emission sources but set mass emission limits for the entire facility. The permit will specify annual reduction targets for the next ten years. All actions used to achieve the annual emission reductions target will be treated as amendments to the permit. The permit will also specify quarterly emission limits and will include compliance, tracking, monitoring, and reporting requirements.

Maximum allowed emissions depend on a "baseline allocation" based on an initial level of allowed emissions adjusted by an annual reduction rate. The reduction rate is different for each facility and is calculated so that the Basin generally attains federal and state air quality standards by the year 2010 or earlier. In effect, therefore, the District will translate its previous Air Quality Management Plans and statutory requirements for attainment of federal and state air quality standards into maximum allowed emissions for each permitted facility.

The baseline allocation is set based on facility production between 1989 and 1992. Each facility is allocated adequate emissions to manufacture at peak rates for the 1989 to 1992 timeframe, assuming this facility meets all adopted rules in effect by 1994. Credit is also given for facilities which have recently acquired offset credits.

Three other methods of adjustments were considered: (1) actual reported emissions



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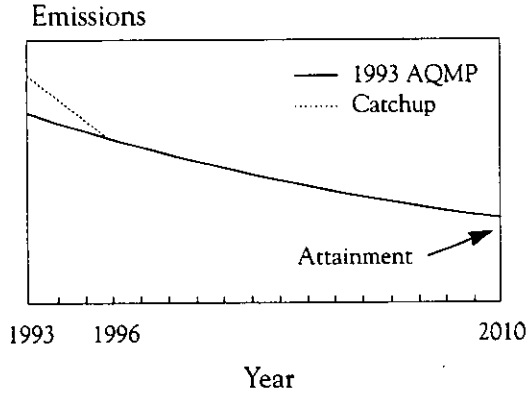
RECLAIM would encourage new and expanding companies to install air pollution prevention devices from the outset.

FIGURE 1

PROFILE OF BASELINE ALLOCATION



averaged over a three-year period (1989-91), (2) highest actual reported emissions over the three-year period, or (3) permitted emissions for sources which have previously provided New Source Review offsets.

The annual rates of reduction in baseline allocations are calculated to achieve the equivalent reductions in air pollution as stated in the 1991 AQMP. Each facility is allocated a 2003 emissions allocation which corresponds to the facility meeting future proposed rules. Facilities that have already moved to meet some future AQMP rules end up with a 2003 allocation close to its 1994 allocation. Facilities are required to reduce emissions linearly from their 1994 allocation to their 2003 allocations.

The trading credits are based on verified reductions of emissions at a facility below the allowed levels. Ownership of NOx and ROG emission reduction credits will be reflected in the facility permit. Credits may be used for siting new sources and/or achieving annual emission reduction targets. Reductions through add-on control equipment will be evaluated for compliance under District rules. Reductions through non-physical modifications (such as reduced throughput) will be addressed in a registration process.

Facilities may sell emissions out of any quarter of the year, but the emission reduction must occur at the seller's facility prior to the start of that quarter. Trades do not require prior District approval. Once the credits are sold, the seller must comply with its reduced permitted emission level. The credits will be constrained by geography. In general, credits may not be sold for use "upwind."

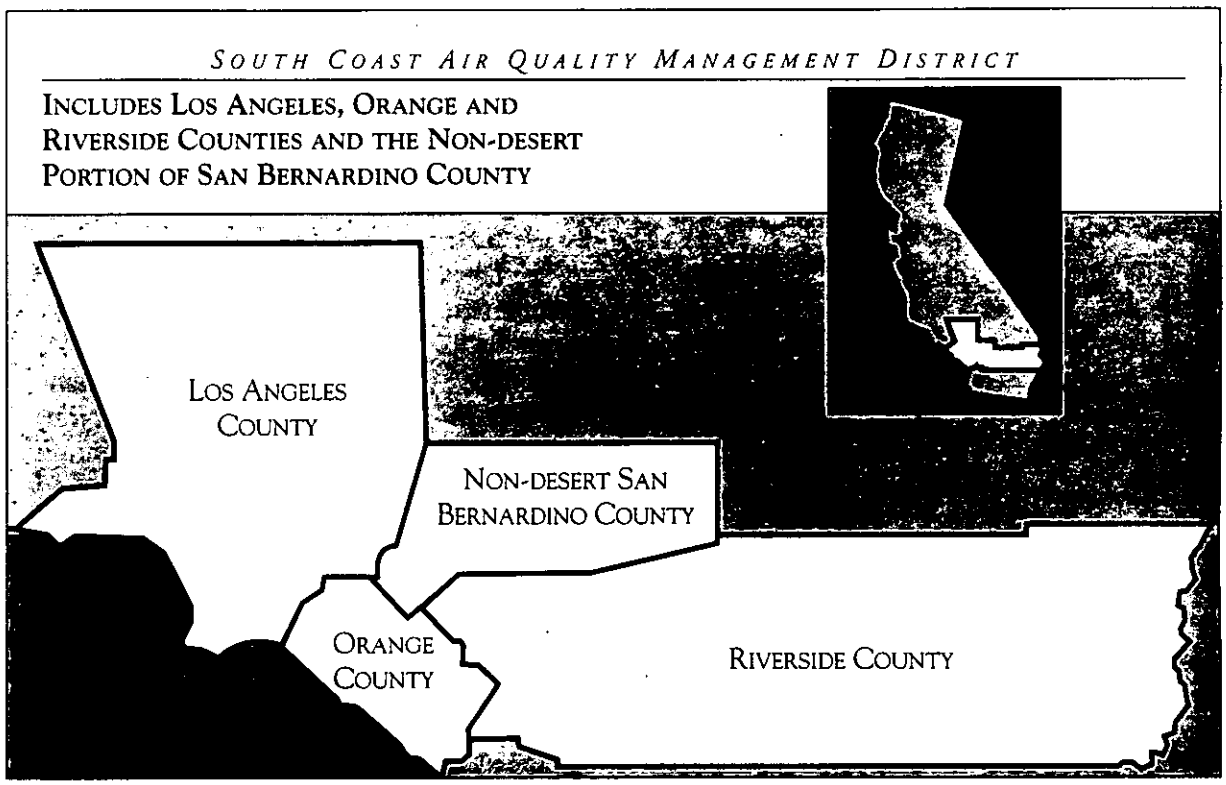
The District's compliance program will attempt to assure that emission reductions are real, permanent, and enforceable. It will be based upon current information used to report emission fees and to evaluate permits, real time monitoring, quarterly and year-end accounting reports, and inspections and penalties. If a facility exceeds its allowed level of emissions, it must increase its emission reductions in the following year by the amount actual emissions exceeded allowed emissions and pay penalties that will be determined during rule development.

To evaluate RECLAIM, the District proposed annual and three year audits. The annual evaluation will assess regional emissions, socioeconomic effects, and public health impacts. The three-year audit would assess the advancement of new technology. With each three-year audit, a three-year sunset clause will be considered so that, if RECLAIM fails to meet its goals, the program would be suspended.

History

RECLAIM represents a natural evolution of air pollution regulation towards market-based incentives. As the compliance costs and concerns over effectiveness of regulation have grown, federal and state policymakers have turned with interest toward alternatives for traditional command and control regulation.

In 1982, for example, the federal Environmental Protection Agency started a lead additive trading program for refineries as part of EPA's program to reduce lead additives in gasoline. Under the program, each refinery received an initial quarterly quota based on current production. Quotas were reduced periodically until the final lead content standard was achieved. Inter-refinery trading occurred because the cost of lead substitutes varied greatly among refineries. Trading was active; about 10 to 50 percent



of the total number of rights available in a given quarter were traded. It has been estimated that the program saved more than $226 million in compliance costs in comparison to command and control regulation.

The 1990 Amendments to the Clean Air Act represents a landmark development in the movement toward market-based incentives. Section 172(c)(6) provides that each implementation plan submitted by a state for a non-attainment area shall:

"include enforceable emission limitations, and other control measures, means, or techniques (including fees, marketable permits, and auctions of emission rights), as well as schedules and timetables for compliance, as may be necessary or appropriate to provide for attainment of such (ambient air quality) standard in such areas."

The 1990 Amendments also provide that if certain areas fail to meet overall reductions in emissions of 15 percent in ROG and NOx within six years and 3 percent annually thereafter, the state must submit a revision of its State Implementation Plan containing an economic incentive program which is adequate to achieve the required emission reductions. According to Section 182(g), the program may include:

"a nondiscriminatory system, consistent with applicable law regarding interstate commerce, of state-established...system of marketable permits ...the use of which contributes to ozone formation..."

Finally, and perhaps most prominently, Title IV allows EPA to establish and implement a market-based allowance trading system as part of a comprehensive program to control SOx and NOx emissions from utilities in the East, Midwest, and southern United States. Under the program, EPA will initially allocate 8.95 million allowances to the 110 affected utilities.

The California Legislature has also expressed support for the consideration of market-based incentive programs when it passed AB 1054 in 1992.

A market-based incentive program (including emissions trading) may substitute for current command and control regulations and future air quality measures for attainment, provided that the market-based incentive program:

- results in an equivalent reduction in emissions at less cost;

- provides comparable level of enforcement and monitoring to ensure compliance;
- will not result in a greater loss of jobs or more significant shifts from higher to lower skilled jobs;
- will not delay, postpone, or otherwise hinder attainment; and
- will not result in disproportionate impacts, measured in terms of required emission reduction, and measured on an aggregate basis, on those stationary sources included in the program compared to other stationary sources in the District's attainment plan.

AB 1054 also included provisions specific to any market-based incentive adopted by the South Coast Air Quality Management District, including the requirement that a program consider "a spectrum of sources" – mobile, area, and stationary.

Obstacles

Tradable emission schemes are simple in concept, but difficult to design and implement in practice. Two basic issues were faced in the development of RECLAIM: definition of baseline allocations and enforcement.

The definition of baseline allocations determines both total allowed emissions in the District and the distribution of allowed emissions among participants in RECLAIM. As a result, alternative definitions of baseline allocations yield different degrees of pollution control as well as distribution of potential trading credits. Parties have a substantial stake in the outcome.

RECLAIM creates a new asset–tradable emission credit–which has significant market value. For example, the District estimates that, by 1997, the price for an emission reduction credit for NOx will average $2,800 per ton (1987 dollars) and for ROG $40,900 per ton. The definition of the baseline allocation will determine, in part, the initial allocation of valuable emission reduction credits. The greater a firm's baseline allocation, for example, the fewer credits it must purchase or the more credits it will have available for sale. As a result, the more favorable one's treatment in the baseline allocation, the greater their economic return from substituting RECLAIM for command and control regulation.

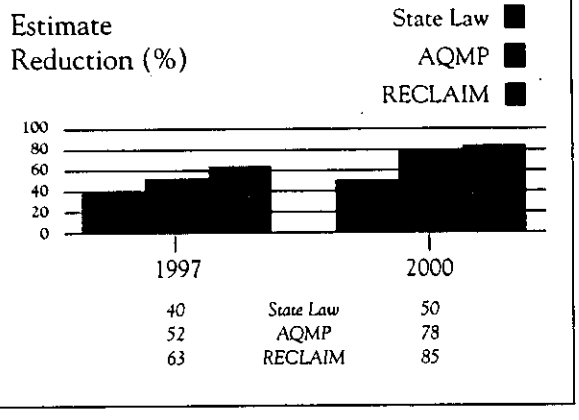
As already described, the District used the emission targets from its 1991 AQMP to define initial baseline allocations, which are ultimately based on a 1987 inventory of actual emissions. A different approach was proposed by the "Regulatory Flexibility Group," a coalition of Southern California businesses and associations. The Group recommended that post-1976 equipment should receive an allocation equal to the permit level of such equipment and pre-1976 equipment receive an allocation equal to the highest annual emissions in the 1987-1991 period.

The District itself has observed that "*the largest obstacle facing the design of any market incentive question is enforcement.*" The specifics of the District's plan, however, has been the center of criticism by a coalition of environmental interests ("The Coalition for Clean Air"), which generally supports the concept of the RECLAIM for, initially, NOx. In particular, they are concerned that the District lacks effective methods to monitor compliance because the District, in their view, plans to rely on reports of compliance by firms.

From an economics perspective, enforcement will play a critical role in the development of the market for emission reduction credits. Unautho-

FIGURE 2

ESTIMATED REDUCTION IN PER CAPITA OZONE EXPOSURE



Source: South Coast Air Quality Management District

rized emissions will reduce the value of credits, much like the issuance of additional shares of stock in a corporation dilutes the value of outstanding shares. In the end, the market value of credits will reflect the certainty and magnitude of punishment for violations as much as it will reflect the cost buyers of credits will incur if they install additional control technology.

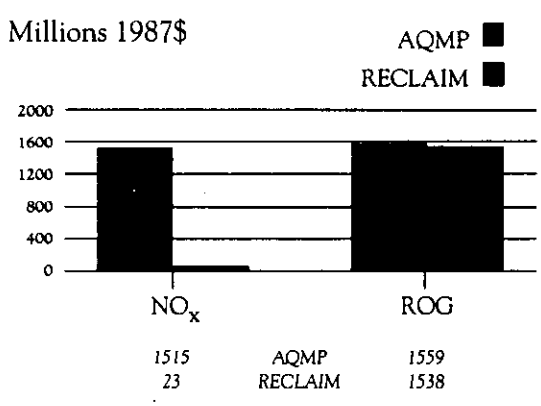
Evaluation

The District anticipates that implementation of RECLAIM will outperform command and control regulation. However, the unexamined consequences of constraints from federal law and issues awaiting resolution during rule development will have a significant bearing on whether the anticipated benefits of RECLAIM will be realized in practice.

Implementation of RECLAIM will result in different air quality improvements and public health impacts than the 1991 AQMP. Peak regional ozone concentrations will be similar under RECLAIM and 1991 AQMP. However, RECLAIM performs better than the 1991 AQMP in exceeding the required reductions in per-capita exposures under the California Clean Air Act (see Figure 2). Under state law, per-capita exposures must be reduced 40 percent by the year 1997 and by 50 percent by the year 2000. The 1991 AQMP will exceed these reductions – 52 percent by the year 1997 and 78 percent by the year 2000. RECLAIM is estimated to do even better. Emissions of Fine Particulate Matter (PM10) will be slightly higher than planned for in the AQMP – by about an average of 2 percent at five regional monitoring stations.

FIGURE 3

COMPLIANCE COSTS — 1994 TO 1997
AQMP VS. RECLAIM



Source: South Coast Air Quality Management District

Implementation of RECLAIM will have its greatest effect in terms of its estimated savings in compliance costs to meet air quality objectives. Between 1994 and 1997, cumulative compliance costs under RECLAIM are estimated at $1.6 billion (1987 dollars), about half the cumulative costs under 1991 AQMP of $3.1 billion. Virtually all of the cost savings occur in the control of NOx (see Figure 3). Estimated cumulative compliance costs for ROG under RECLAIM and 1991 AQMP are virtually the same.

Two statutory restrictions may adversely affect the ability of RECLAIM to achieve the advantages of regulation by market-based incentives. Under federal law, new sources must still meet Best Achievable Control Technology (BACT) and acquire emission reduction credits for its emissions. While the latter requirement is consistent with a policy of market-based incentives, the former requirement is not. In situations where existing sources could further restrict emissions at a lower cost than new sources could install BACT, the statutory provision prevents the type of economically beneficial transactions that form the case for a policy of market-based incentives. This statutory restriction reduces the demand for emission reduction credits by new sources. The consequent reduction in the market value of credits will reduce the economic incentive for existing sources to reduce emissions.

The second issue is related to concerns about shutdown of facilities. Especially in the Los Angeles area, there are economically marginal, high polluting, aged facilities. For such facilities, the best economic decision may be to shutdown these plants and sell the credits. To deter job loss, proposals exist to limit the saleable credits to the amount that would have been allocated if

these facilities had installed BACT, which they have not. In addition, a percentage of the sales proceeds would be dedicated to labor retraining. The District has deferred action on this issue until rule development.

While these proposals may constitute good politics, they may also constitute bad policy. Economically-marginal, high-polluting facilities are, by definition, a low-cost source of reducing emissions. By placing restrictions on the sale of credits and taxing transactions in credits, regulators may, in fact, perpetuate the operation of these facilities. In the end, this may be a "jobs" policy with high economic and environmental costs.

Perhaps the greatest problem with RECLAIM involves its sunset policy. Understandably, the District has retained the option to suspend RECLAIM if it proves unworkable. With any policy innovation, such a reservation is inevitable. Unfortunately, by not specifying the "backstop" to RECLAIM, the District may reduce incentives of parties to engage in the activities envisioned by the proponents of RECLAIM.

Recall the fundamental idea of RECLAIM: use economic incentives to stimulate investment in pollution control and long-term changes in operations. By definition, investments are guided by long-term considerations. Perceptions of a significant risk that RECLAIM may be terminated weaken the "market-based incentives" of the program. Parties will not engage in activities with 20-year returns based on a policy that may not exist in five years.

Fortunately, there is a way to nurture the "incentives" of RECLAIM while keeping policy options open. If the backstop to RECLAIM were to be economically significant emission charges, then long-term investments in emission reductions may still be attractive. While RECLAIM exists, the return will be earned in terms of emission credits, which have economic value. If RECLAIM is suspended, the return will be earned in terms of smaller payments of emission fees. In its comments on the program, the Clean Air Coalition proposed appropriately high emission fees as the backstop to RECLAIM.

As already stated, enforcement is also critical to the program's success. Until final rules are developed, RECLAIM's enforcement policy remains unspecified. From an economics perspective, requiring make up emission reductions in future years does not, alone, constitute an effective enforcement policy. Given that violations may either never be detected or at least remain undetected for a significant period of time, penalties must have a significant element of "punitive damages." Violations are the economic equivalent of unauthorized use of another's property; in this case, encroachment on the value of others' emission credits. Therefore, penalty payments should be based on multiples of the market value of credits. For example, if there is a one-in-three chance of detecting unauthorized emissions then, when caught, violators should pay penalties equal to at least three times the market value of an emission reduction credit – how much more depends on the time delay between violation and punishment.

Finally, the decision to exempt facilities whose emissions fall below a threshold (4 ton/year) may represent a significant limitation in the scope of the program. While these facilities emit a small share of total emissions, they also represent the source of growth in total emissions in the basin. Obviously, the definition of a threshold must balance the gains from including facilities in RECLAIM versus additional administrative costs. The District plans to revisit the threshold question during RECLAIM's second phase.

Conclusion

The debate over environmental policy has cast the choice between command and control regulation versus market-based incentives. In fact, the policy design question involves the proper mix of the two. RECLAIM is justifiably known as a bold step in the direction of market-based incentives. It represents an interesting mix of command and control with market-based incentives. The program's progress warrants close study.

It is important to understand, however, that RECLAIM is still an idea, not a policy. Its actual

effects will be shaped by the specifics of rule development. How the District addresses the "shutdown problem," enforcement, thresholds, and scope of the scheme will provide valuable experience and lessons for other areas. And, perhaps most significant, the experience of RECLAIM in action will offer first hand evidence on the practicality and consequences of creating market approaches to environmental regulation.

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Water Marketing: The California Water Bank

by the California Department of Water Resources
David N. Kennedy, Director; Douglas P. Wheeler, Secretary for Resources

Problem Statement

The problem facing most of California in early 1991 was a forecasted serious water shortage brought on by four years of preceding drought. Low rainfall and runoff, accompanied by low storage in most reservoirs, resulted in forecasted water deliveries to urban and agricultural water users at record low amounts. In the case of the California State Water Project, less than 300,000 acre-feet was forecasted to be available for delivery to meet a demand of 3,500,000 acre-feet. This translated into no water for agricultural users, and only ten percent to urban users. This had the makings of an unprecedented water supply crisis. Similar but less severe conditions also prevailed into 1992.

These severe shortages translated into the need for stringent water rationing plans for cities, and severe cutbacks in agricultural production (including threats to the survival of permanent crops such as trees and vines). In early February, Governor Wilson announced that water conditions were sufficient to meet health and safety needs in 1991, but that the severity of the ongoing drought would result in significant economic losses to both agriculture and industry. Concerns were raised about providing minimum carryover storage in reservoirs to protect against the possible continuation of the drought into 1992.

Fish and wildlife resources were considered to be in critical shape as well. Significant concerns were raised about the ability to adequately control water temperatures in northern California rivers to avoid serious losses to migrating winter-run salmon, a species already listed under the federal Endangered Species Act. Concerns were raised about providing even minimal water supplies to waterfowl refuges in the Central Valley of California, which had suffered depleted supplies for much of the drought but which still had to accommodate millions of Pacific Flyway waterfowl.

Goals & Objectives

The overall goal was to decrease water use by agricultural water users in northern California who had near-normal water supplies, and make the conserved water available to urban, agricultural, and fish and wildlife water uses in other areas. This was proposed to be accomplished by voluntary reallocation of water supplies through specific actions. The objective was to meet critical water demands to reduce the serious economic and environmental losses that were likely to occur under forecasted water deliveries.

Project Description

California's statewide Water Bank was created to provide centralized control for water transfers and to coordinate the distribution of water through state and federal water distribution systems. The intent of the program was to work with regions in order to meet urban, agricultural, and fish and wildlife needs in areas adversely affected by the drought.

History

In early February, 1991, as California experienced its fifth year of drought, Governor Wilson established a Drought Action Team, made up of prominent state and federal officials. The Governor asked the Team to coordinate efforts to combat the effects of the drought, to encourage local governments to prepare and implement emergency plans, and to provide him with periodic reports and recommendations for actions to remedy the effects of the drought. The Drought Water Bank was established in the same month as a central component of that effort.

TABLE 1 — SUMMARY OF FACTS

1991 CALIFORNIA DROUGHT WATER BANK

PURCHASES

WATER SOURCE	ACRE-FEET (rounded)
Fallowing	*410,000*
Ground Water	*260,000*
Surface Water	*150,000*
TOTAL	**820,000**
Delta Water Quality Requirements, Technical Corrections	*-165,000*
NET SUPPLIES	**655,000**

ALLOCATIONS

Urban Uses	*307,000*
Agricultural Uses	*83,000*
State Water Project	*265,000*

WATER PRICE COMPONENT	AMOUNT ($/Acre-Foot)
Basic Purchase Price	*$125*
Other Purchase Costs, Delta Requirements, Technical Corrections	*$45*
Administration	*$5*
TOTAL	***$175****

California Department of Water Resources, May 1993

**plus delivery costs*

Criteria for establishing critical water needs for urban and agricultural areas were established in 1991. Urban critical needs were defined as those water needs that existed in areas that had less than 75 percent of normal water supplies. Agricultural needs were defined generally as those water needs to maintain the survival of permanent crops such as trees and vines, as well as other high-value crops that were already planted. The criteria for critical needs were refined further in 1992, based on the 1991 experience.

1991 Drought Water Bank

A summary of purchases, allocations, and prices for the 1991 Drought Water Bank is shown in Table 1 above.

Initial Water Bank purchases were from farmers who agreed to fallow crop lands and transfer the resulting crop water savings to the Water Bank. Over time, purchases have encompassed the following three types of water sources:

- fallowing crop lands and transferring the irrigation supply;
- purchasing "surplus" reservoir supplies from local water districts – chiefly from Yuba County Water Agency's Bullards Bar Reservoir; and,
- using ground water in substitution for surface water.

Water Bank fallowing amounts were based on the consumptive use of fallowed crops. For example, the consumptive use of tomatoes expected to be met by applied irrigation water was 2.5 acre-feet per acre. This formed the basis of payments to farmers, who were offered a fixed price per acre to fallow individual crops. Consumptive use figures were not used for ground water exchange or reservoir storage releases, since we could measure actual water quantities pumped or released.

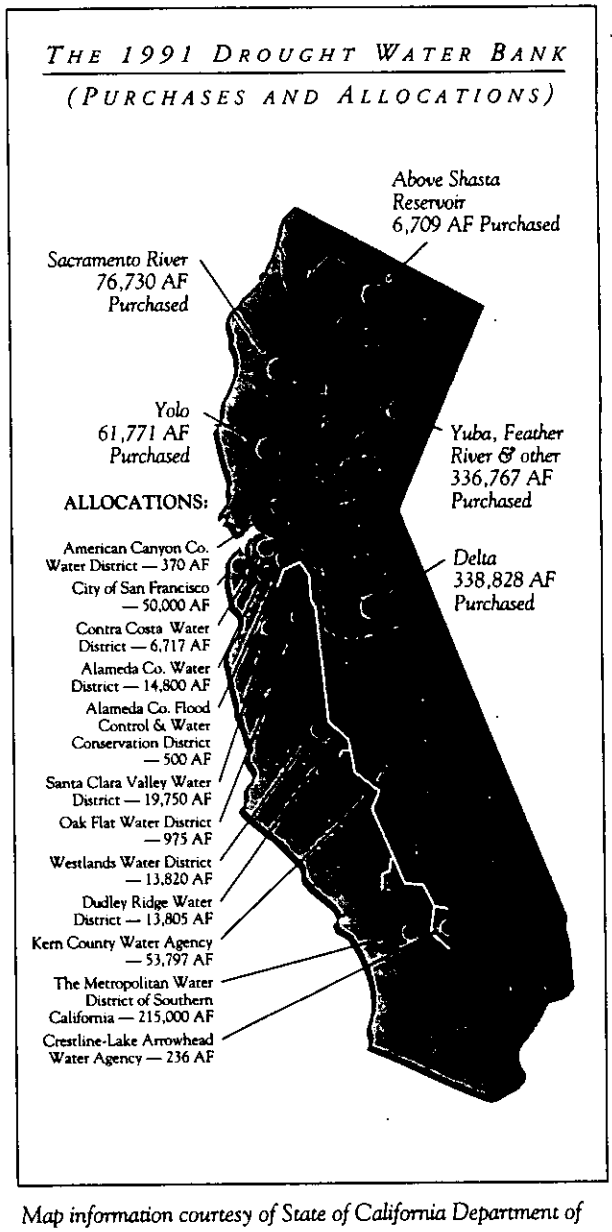
The 'purchase' price of $125 per acre-foot of water was based on a detailed look at farm budgets, talking to potential buyers and sellers, and getting advice from agricultural economists and others knowledgeable about water use. This price was subsequently used for most purchases in all categories, since this was viewed by potential sellers as the value of purchased water during 1991. The price generally covered costs plus profit, or the opportunity costs of the purchased water. A small amount of water was purchased at the end of the program for as low as $30 per acre-foot.

The 'selling price' was set at $175 per acre-foot to account for the purchase price of the water, a decrease in the purchased supply to meet a proportional amount of the water quality obligation to protect the Sacramento-San Joaquin Delta, technical corrections to initial assumptions regarding crop water savings, and contract negotiation and administration costs. In addition, transportation costs to move the water from the Delta to areas purchasing the water were paid by the buyer.

No water was specifically purchased for environmental purposes as part of the 1991 Bank. However, operations were tailored to have the least detriment and most benefit to fish through careful timing of reservoir regulation, releases, and export pumping. During 1991, the California Department of Fish and Game also purchased water for wildlife refuges outside of the Drought Water Bank either as part of a Bank purchase contract or through separate purchases.

The total amount of water purchased as part of the Water Bank amounted to about 820,000 acre-feet through some 350 contracts, an unprecedented amount for temporary water transfers in California. Subtracted from this total were the reductions described above due to Delta water quality requirements and technical corrections. The net deliverable supplies amounted to about 655,000 acre-feet. Some 307,000 acre-feet of this was allocated to urban users, and 83,000 acre-feet went to agricultural users. The remaining 265,000 acre-feet was purchased by the State Water Project (SWP) as carryover storage as a reserve against a continuation of the drought.

California water law provides for a number of types of water rights, and each is treated differently under a water transfer proposal. Appropriative rights acquired prior to 1914 are within the jurisdiction of the courts. Appropriative rights acquired since 1914 are subject to the jurisdiction of the California State Water Resources Control Board (SWRCB). Riparian rights are generally not transferrable since they are associated with the riparian land, though there are a few circumstances under which riparian rights



Map information courtesy of State of California Department of Water Resources.

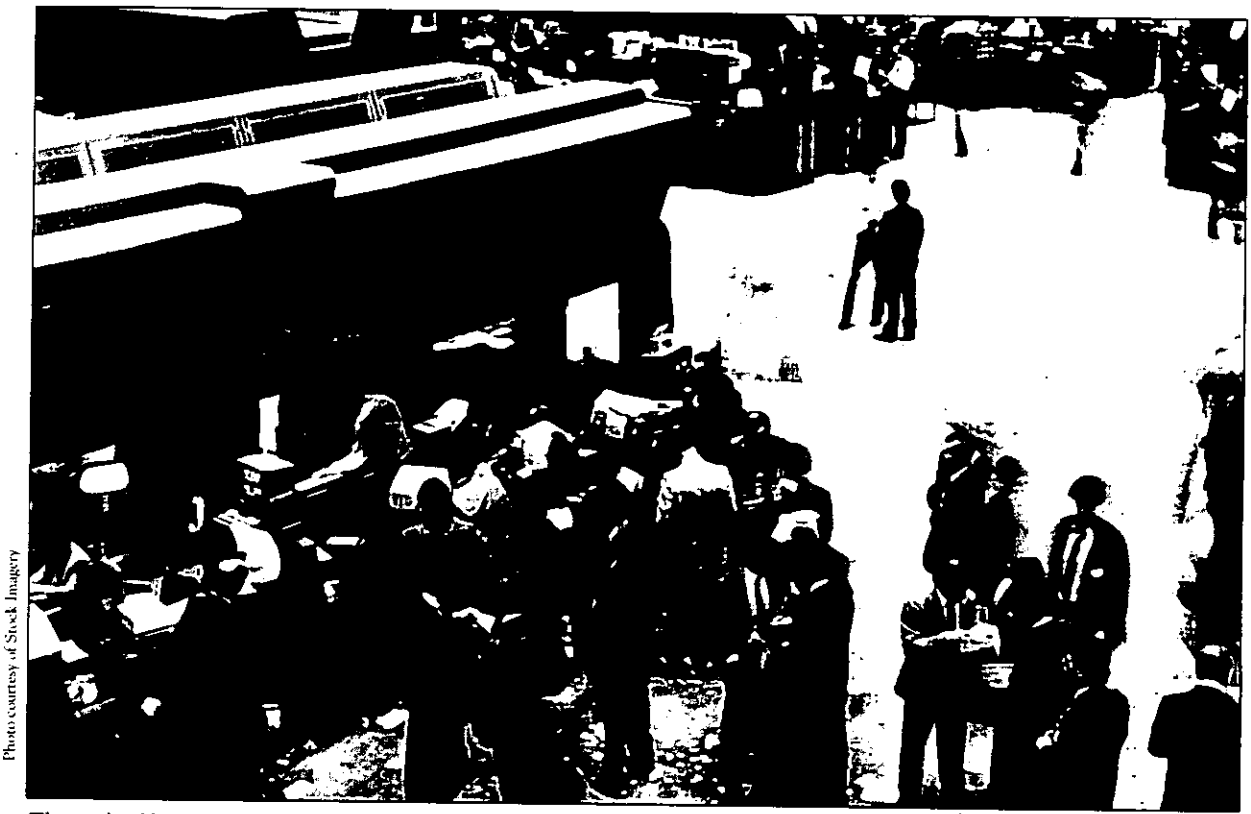


Photo courtesy of Stock Imagery

The market-like approach of the bank dispelled the myths that farmers would not sell water and that cities would buy so much that rural and agricultural economies would be hurt.

can be transferred. Groundwater is not regulated in most of California, although there is a separate legal requirement that no groundwater be exported out of specific basins without adoption of a groundwater management plan and concurrence of local voters.

The 1991 Drought Water Bank involved transfers of water from all of these sources, either directly or by exchange/substitution. Transfers involving groundwater were generally transfers of surface water, which was replaced by groundwater. Transfers of pre-1914 appropriative water rights were made with water users who had water right settlement agreements with the federal Central Valley Project (CVP). Such transfers were accounted for as part of the 1986 Coordinated Operation Agreement between the CVP and SWP.

Transfers involving riparian users were even more complex. The CVP and SWP are the last downstream appropriators on the Sacramento River system. Riparian landowners were paid not to exercise their rights and fallow their land. The CVP and SWP took the risk that intervening riparian diverters would not take this freed-up supply, which was subsequently pumped by the two water projects from the Delta. This procedure was only made possible by virtue of the circumstances that the SWP and CVP were also the only appropriators held responsible by state and federal law to maintain water quality in the Delta. Thus, the SWP and CVP were the only diverters who could arrange for water transfers involving riparian water users.

1992 Drought Water Bank

A summary of purchases, allocations and prices for the 1991 Drought Water Bank is shown in Table 2 on page 44.

The 1992 Drought Water Bank was established in March, 1992. Water shortages were not as severe for the SWP as in 1991, but just as severe for the CVP. Demands on the Bank ultimately ended up at about 160,000 acre-feet, and all of these demands were met. The mix of buyers was different than in 1991. Urban users

purchased 39,000 acre-feet, while agricultural users were allocated 95,000 acre-feet. Purchases by urban areas were driven by demand, which was lower in 1992, due to increased supplies from the State Water Project and other sources. Agricultural purchases were affected by price, which was much lower in 1992. Some 25,000 acre-feet were purchased by the California Department of Fish and Game (DFG) for use on wildlife refuges. DFG funds were made available by a drought relief fund established by state legislation. As with the 1991 Bank, operations of the 1992 Bank were designed to provide the least damage and most benefit to fish through a combination of timing of reservoir regulation, releases, and export pumping from the ecologically sensitive Sacramento-San Joaquin Delta.

In many respects, the 1992 Bank was similar to the 1991 Bank. A key difference was that no land was fallowed. This was done for several reasons. First, the 1991 Bank was criticized for fallowing more than 150,000 acres, resulting in likely third-party economic impacts to local communities. Second, concerns were raised about potential adverse wildlife impacts associated with fallowing land, since the program also required that land be disked or otherwise maintained to reduce weed growth. Studies were commissioned in the fall of 1991 to investigate both issues, and a respite while studies were underway helped to keep these issues manageable.

A third reason was based on the initial 1991 strategy to purchase water on a "cost plus profit" basis, which resulted in the $125 per acre-foot price offered for fallowed land. The precedent for this specific price carried over into purchases for ground water and reservoir storage, resulting in a higher price for water from such sources than was merited by a "cost plus profit" strategy. Based on the success in purchasing water from non-fallowing sources as compared to the demand for water in 1992, it looked likely that fallowing was not a necessary source and that lower purchase prices could be negotiated.

As shown in Table 2, purchases were held to a much lower price level. The lack of fallowing in 1992 allowed the research to continue without having to deal with the widespread controversy that might have resulted if fallowing had proceeded without learning from earlier experiences.

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California's 1991 and 1992 water banks facilitated transfers from areas unaffected by the drought to areas with critical needs.

Obstacles

The 1991 Bank was preceded by a decade of water transfers legislation. Ironically, initial purchases were slow to get underway due to fears that sellers might jeopardize their water rights despite legislative assurances. New legislation (which confirmed existing law) helped to get the process going. Another obstacle was a legal requirement which limited transfers of water from water districts with "surplus" supplies. Districts were fearful that if they declared a portion of their supplies to be "surplus" in a prolonged drought, the water would be deemed to be unnecessary at other times. In fact, the water supplies were developed through conservation measures (fallowing, ground water substitution),

and were not "surplus" under any interpretation. The law was quickly amended to allow such transfers to proceed.

Another obstacle was precedent. A large-scale water transfers operation was new to California, and there was not widespread confidence among initial sellers that their interests would be protected and that they would get paid. The success of the 1991 Bank was due largely to trust and goodwill among buyers and sellers, with strong support for success from state government. The precedent of the 1991 Bank made implementation of the 1992 Drought Water Bank fairly straightforward.

Financial concerns constituted another obstacle. The 1991 and 1992 banks had separate financial structures, and each had advantages and disadvantages. The 1992 Bank is perhaps the model that worked best. The state needs to have initial funding to begin the process and execute the first few contracts. Buyers want to limit cash advances until they are assured that water will be forthcoming. Sellers want a down payment to cover their initial expenses, and want periodic payments as they incur costs. And finally, the state needs to have the money on hand to make payments when they are due.

During 1991, the fast pace of the Bank and the number of separate transactions made for a real challenge to keep buyers and sellers informed of factors such as price, contractual requirements, legal restrictions, accounting requirements, payment provisions, and land fallowing procedures. The Department of Water Resources formed a "Water Purchase Committee" of buyers which met more than 40 times to keep in touch with the process and details of the transactions. The Water Purchase Committee also passed judgement on prices to be paid and contractual provisions.

Sellers were kept informed by individual Bank staff. Each staff member was assigned as

TABLE 2 — SUMMARY OF FACTS

1992 CALIFORNIA DROUGHT WATER BANK

PURCHASES

WATER SOURCE	ACRE-FEET (rounded)
Fallowing	*000*
Ground Water & Conservation	*161,000*
Surface Water	*32,000*
TOTAL	***193,000***
Delta Water Quality Requirements	*-34,000*
NET SUPPLIES	***159,000***

ALLOCATIONS

Urban Uses	*39,000*
Agricultural Uses	*95,000*
Department of Fish & Game	*25,000*

WATER PRICE COMPONENT	AMOUNT ($/Acre-Foot)
Basic Purchase Price	*$50*
Other Purchase Costs, Delta Requirements, Technical Corrections	*$17*
Administration	*$5*
TOTAL	***$72****

California Department of Water Resources, May 1993

**plus delivery costs*

the primary contact with several sellers, and kept them informed of all necessary details. Even so, rumors of possible rule changes and contractual provisions made for a hectic process for the first month of the Bank until the major issues were settled. Thereafter, sellers were kept informed by letters and individual staff contacts.

The 1992 Bank involved a much lower amount of water and only about 20 sellers. Most sellers had participated in the 1991 Bank, and the drought water bank process had already been established. Prior to the 1992 Bank, Department of Water Resources staff made changes in contract language, accounting processes, and other matters based on problems encountered in the 1991 Bank. It was fairly easy to keep buyers and sellers informed during 1992, and many of the contractual and policy issues had been settled in advance.

Proposed Evaluation

Several conferences were held in the fall of 1992 to explore the lessons learned from recent water transfers. Most of the focus of both conferences was the state drought water bank. Research findings were presented on third party economic impacts, environmental impacts, and benefits to purchasing regions. There was widespread discussion of the appropriateness of a government water banking operation versus a "free market" approach.

A number of key conclusions came out of these conferences. First, it was widely recognized that water transfers will continue to play an important role in meeting water needs in California. Second, impacts to the local economy of the source areas (characterized as third party impacts) are real but hard to quantify, and efforts should be made to avoid or reduce such impacts. Third, it is essential that water transfer decisions be made on the amount of "real water" available for transfer, recognizing the physical connections between ground and surface water. Fourth, public policy on transfers is evolving and will need to continue to change. Finally, there is a need for the state to provide more assistance to non-bank water transfers, including a determination of the amount of water available to be transferred.

California's water banking experiences point out the same sets of problems encountered by other states. These problems include third party impacts, legislative and/or social barriers, the uncertainty of a market mechanism when a large number of parties is involved, adequate determination of the amount of water available for transfer (taking an overall view of the hydrologic cycle over time), and other matters.

The 1991 Drought Water Bank was examined in a detailed study conducted by the RAND Corporation. One of the issues that was brought up was the motivation on the part of farmers to sell water. A great deal of effort was made to assure that water was purchased that otherwise would have been used. The price was set at a level that made it more profitable for the farmer to sell his water supplies than to grow a crop. Initially, there were few farmers interested in selling, due to substantial legal uncertainties and a perception that the price might go up as the drought persisted. These barriers were overcome through quick changes in California law and a contractual commitment to pay early sellers a higher price if the price later increased. Effort continues on the matter of determining the amount of "real water" that is available to buy and sell.

The 1991 and 1992 drought water banks handled each transfer proposal on a case-by-case basis, although most fell into 5-10 general categories. There is probably much to be learned in sharing experiences (technical, legal, policy) of different categories of transfers among the western states. In particular, the matter of transferrable water is a crucial one in California. There are also difficulties that arise from large-scale transfers, which single out California's recent experiences from other states. Other states have more institutional experience in managing transfers as well.

Advice

Advice from this case study falls into two general categories: third-party impacts and the need to be ready. These are discussed separately below.

Third-party Impacts — Local economic impacts in selling regions need to be addressed in specific ways. Options need to be developed to

limit impacts from the outset. One approach includes a shift from high water use crops to low water use crops, which is preferable to fallowing. Local farm support industries (seed and fertilizer suppliers, truckers, harvesters, farm labor, etc.) need to have some advance warning to have some chance to adapt to change. Impacts are also different with short-term transfers than with long-term transfers. In mid-1992, the report of the National Research Council (NRC), *Water Transfers in the West*, identifies "third party impacts" as potentially significant, and goes as far as suggesting that "third parties" be a part of the water transfer negotiations. But the NRC report focused on long-term transfers, and assumes that the timing of negotiations is not a critical factor. On the other hand, recent California experience is with short-term transfers, where timing is crucial and there is limited time for negotiations among the primary parties themselves.

Finally, local government needs to be involved in the process. Fiscal pressures on local government can result from increased general assistance (welfare) due to increased unemployment, which itself can result from water transfers. Advance notice can help, but strategies may need to be developed to reimburse local government for such increased costs. The strategies would need to be different for short-term and long-term transfers, and would depend on the nature of the transfer.

Need to be ready — The California Environmental Quality Act requires preparation of an *Environmental Impact Report* before a government action with potential significant environmental impacts can be carried out. California is completing such a report in anticipation of bringing back the Drought Water Bank in future years.

Other needs include development of prototype contracts for use with buyers and sellers, maintenance of lists of potential sellers, coordination with the USDA farm programs, and keeping the public informed. There is a continuing need to educate people about the issue of "real water" available to be transferred, and a willingness to make that evaluation on a case-by-case basis as needed.

The 1991 and 1992 Drought Water Banks were limited to the concepts of crop fallowing, ground water exchange, and reservoir storage releases. Other means of developing drought water supplies have also been proposed. These include industrial water conservation, development of more efficient irrigation systems, and shifting to less water-intensive crops. These additional options are discussed in the following paragraphs.

Industrial Water Conservation — Water can be conserved through implementation of water-saving measures, particularly with industries that are water intensive such as canneries. While real water savings are likely, the measures would take some time to implement since they would require design and construction measures and would likely be capital-intensive. Industrial water conservation is probably a tool best used to reduce overall base demand, and would be in place well before a drought period.

More Efficient Irrigation Systems — This option would also save water, although much would depend on physical circumstances. Lining irrigation canals makes sense where water would otherwise go to the ocean or be lost to subsequent use. There is also the time value of water to consider. For example, lining a canal in an area where seepage percolates to usable ground water may not save water, but would make more surface water available for the short term. Like industrial water conservation, however, installation of more efficient irrigation systems is likely to be capital intensive and thus more likely to be installed to reduce base demand.

Shift to Less Water Intensive Crops — This option has the promise of offering substantial water savings without the local economic and environmental downsides of crop fallowing. The Department of Water Resources is conducting a crop shift demonstration project throughout 1993 in the Sacramento-San Joaquin Delta to examine specific benefits of this approach.

This Case study was prepared by the California Department of Water Resources, David N. Kennedy, Director, Douglas P. Wheeler, Secretary for Resources.

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Carbon Offsets: A Cooperative Approach to Cleaner Air

by Bill Edmonds

Problem Statement

Global Warming

Gases such as carbon dioxide and methane, which collectively are known as greenhouse gases, are emitted to the atmosphere from a variety of sources. These gases add to the concentration of naturally occurring greenhouse gases. This increase, according to many scientists, is likely to affect the earth's climate. Because it is very difficult to predict changes in climate, there is considerable uncertainty regarding the amount of warming that might occur, its timing, and the potential impacts of any warming.

The National Academy of Sciences (NAS) reports that "*even given the considerable uncertainties in our knowledge of the relevant phenomena, greenhouse warming poses a potential threat sufficient to merit prompt response.*" The report continues: "*...the panel believes that substantial mitigation can be accomplished at modest cost. In other words, insurance is cheap.*"[1] Insurance, in this case, refers to a portfolio of methods PacifiCorp has investigated to reduce or offset carbon emissions.

Impetus for Action

Ongoing scientific debate and public concern about global warming are likely to lead to some type of regulation of greenhouse gases. The most common of these greenhouse gases is CO_2. U.S. emissions of CO_2 come from three nearly equal sources: transportation sources, utility generation and other industrial/residential sectors. While there continue to be considerable scientific uncertainties about a possible rise in global temperature, it is likely that a policy on greenhouse gases will be developed prior to there being certainty on these scientific questions.

There are several policy instruments under consideration for regulating greenhouse gas emissions. The two most frequently discussed are: a carbon tax; and an emissions cap with provisions for selling credits for emissions reduction activities. While reasonably simple to implement, there is great uncertainty as to the level of taxation necessary to achieve a given reduction target for greenhouse gas emissions. Estimated tax levels to achieve carbon reduction range from $30 to as high as $500 per ton of carbon.

Emissions caps and the selling of emissions reduction credits are novel approaches for controlling greenhouse gases and are currently being tested under the 1990 amendments to the Clean Air Act (CAA). The CAA set a cap on sulfur dioxide emissions and created a market for the sale and purchase of emission allowances. The law requires that SO_2 emitters have an allowance for each ton emitted. After the initial allocation of allowances, regulated entities are free to buy and sell allowances. The goal is to use the market to achieve the nation's SO_2 target in the cheapest way possible.

The emissions cap approach would allow emitters to directly reduce emissions or to take actions to offset the impact of their emissions.

Another strategy for greenhouse gas reductions is the concept of carbon offsets. Carbon offsets through tree planting programs are the focus of this study but should not be seen as a single solution to a complex problem. Emissions from a CO_2 source also may be offset by reducing other sources of greenhouse gases away from the plant in ways such as replacing gasoline powered automobiles with ones that pollute less or by recovering deep mine methane gas before it escapes into the atmosphere.

Utilities such as PacifiCorp also may address CO_2 emissions with activities such as increasing

their customers' conservation of energy and adding renewable resources, such as wind and solar, to their mix of resources. Conservation, the use of renewables, and finding low cost offsets are all part of a comprehensive carbon strategy.

Because an offset strategy alone is not likely to be a prudent strategy for addressing carbon emissions, PacifiCorp also has developed aggressive goals to help customers increase their energy efficiency and to develop additional cost-effective renewable resources. Increasing energy conservation, adding renewable resources, and exploring low-cost offsets taken together make up a "portfolio" of actions to address CO_2 emissions.

The carbon offset pilot projects combined with these other initiative constitute the company's carbon strategy. The offset projects are necessary to begin developing a record of carbon offset costs and exploring various questions regarding project implementation. These data on offsets have not yet been gathered and would be critical for developing offset projects on a large scale.

Carbon offsets are not required by regulators but several entities have been experimenting with offsetting emissions from their plants. The first offset project was developed by Applied Energy Services (AES) of Virginia, an independent power producer. The goal of the project was to completely offset the emissions from one of the company's coal-fired power plants through a $2 million overseas project. The offset project, administered by CARE, an international relief organization, involved helping Guatemalan farmers plant trees. This project and others by AES have been the most ambitious efforts to put the theoretical concept of offsetting carbon into practice.

With international projects, it is possible to offset large quantities of carbon at low cost. However, the benefits of working domestically include greater ease of verification and spin-off benefits to local communities. PacifiCorp is the first company to administer an offset project involving rural planting here in the U.S.

The crew leader inspects a seedling planted as part of the PacifiCorp pilot project to increase planting on non-industrial woodlots.

Applicability to Policymakers

While this case study is written from the perspective of a private company working to develop possible compliance options, the study should be instructive to policymakers at all levels of government who are considering their next steps in the area of global warming policy.

Dilemma Facing Policymakers

The context for developing policies concerning global warming is complex. It involves actors from all levels of government; from ongoing international negotiations related to the Climate Change Convention to the efforts of cities developing global warming strategies.[2]

As policymakers enter this complex arena of scientific uncertainty and overlapping jurisdiction, it is important to develop guiding principles that will help in the development of a consistent regulatory framework. While it will be hard for all interests to agree on these "golden rules," one guiding principle that will be less controversial is that low-cost CO_2 reductions should be made first. And carbon offsets, if developed properly, may provide the best way to implement this rule. The range of options to address carbon emissions, which includes offsets, conservation and the use of renewable resources, is all part of the strategy adopted by PacifiCorp.

Opportunity for Partnerships with Public Agencies

There is no regulation of carbon and no currently developed market for carbon offsets. Even without a clear view of what lies ahead, it appears clear that a fully operational offset market would bring new opportunities to public partners. These "partnering" opportunities could include the following:

- A public agency is charged with planting trees on under-stocked lands but faces cuts in federal cost-share programs. Private funding for carbon offsets may provide a source of additional capital for tree planting where it would not otherwise occur.
- A municipal landfill is venting methane to the atmosphere because it is not cost-effective to pipe the methane to a market. Carbon offsets may make it economically viable to develop a methane recovery system.
- An oil-producing well that vents natural gas, because the gas cannot be economically marketed, could use carbon offsets to make the transport of gas to market economical. The flaring of gas at the well-head instead of venting gas to the atmosphere also would result in a reduction in greenhouse gas emissions and is more practical for remote wells.
- A publicly owned vehicle fleet is a perfect candidate for conversion to alternatively fueled vehicles (i.e., electric, compressed natural gas, etc.), since they are centrally fueled and drive only short distances. Substantial up-front costs, however, serve as a barrier to conversion. Private sector entities could help pay for the conversion of vehicles to alternative fuels and receive credit for the reduction in carbon emissions.

Goals & Objectives

The goals of PacifiCorp's program to test and demonstrate offsets include gathering information from the pilot projects and contributing our lessons to policymakers exploring various mechanisms to regulate carbon. The program's three goals are as follows:

Goal 1, Evaluate costs — Test specific offset methods to determine which techniques are most cost-effective.

To demonstrate to policymakers that carbon offsets are a viable approach in addressing carbon control goals, it must be clear that offsets provide a mechanism to achieve more reduction for less money. One of the yardsticks for comparing various methods to reduce carbon emissions is the cost in dollars necessary to reduce one ton of carbon. One benchmark for a cost-effective offset is the estimated cost of a carbon tax that is contemplated (for carbon stabilization) which is somewhere between $30 and $100 per ton of carbon.

One method CO_2 sources may use to lower costs of carbon control is to develop partnerships with other entities that want to develop offset projects to realize benefits other than carbon reductions. States, local governments and

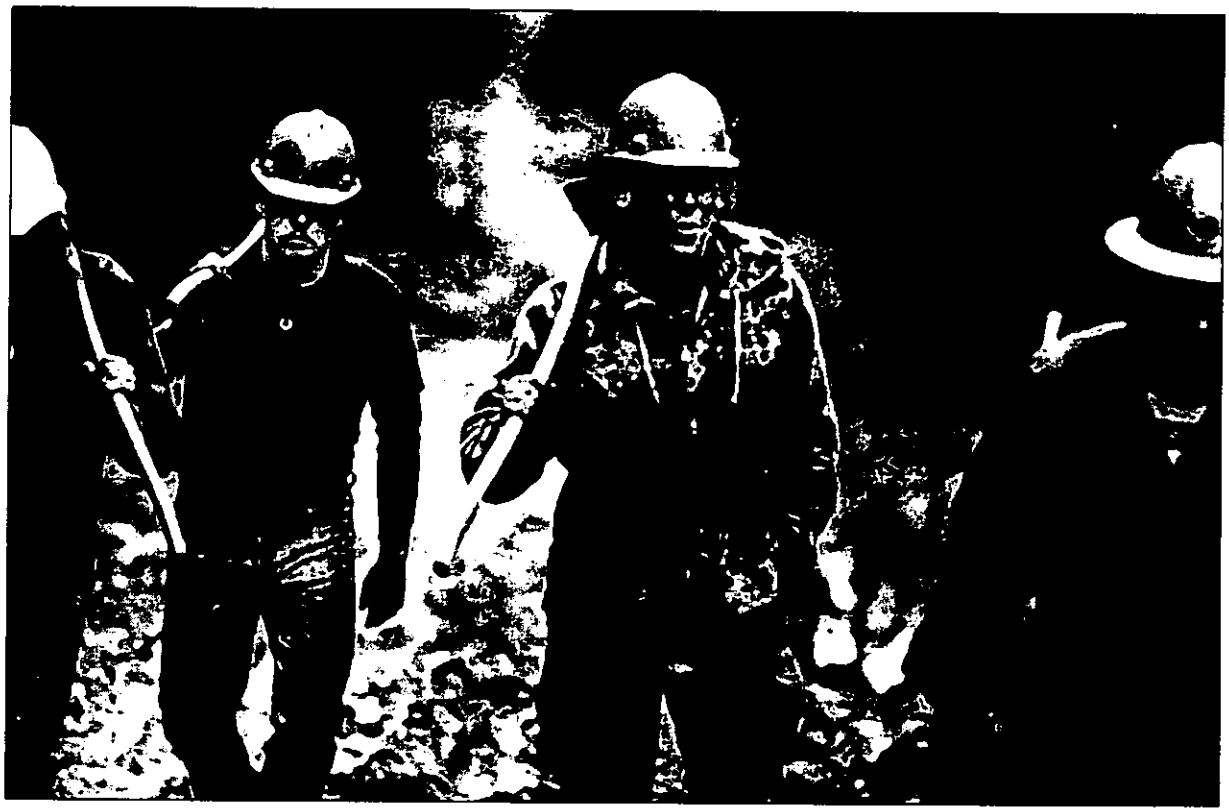

Photo courtesy of PacifiCorp

Workers fought the elements during a spring planting of 108 acres near Grant Pass, in southern Oregon.

non-profit agencies may find a source of funding to meet goals that are ancillary benefits of carbon offset projects.

Goal 2, Assess delivery — Explore implementation questions of offset projects and develop partnerships to aid in delivery.

Implementing carbon offset projects is a new challenge. If carbon offsets become part of a regulatory scheme, it will be important that regulated entities understand the steps necessary to develop a project that will result in "countable" carbon offsets. While no guidelines have been developed to determine a good offset project, PacifiCorp expects projects will meet regulatory scrutiny only if projects pass a series of tests which may include:

- Will the concept work to sequester carbon?
- Will the carbon remain sequestered for as long as is estimated?
- Are there clear measures of project success?
- Can we scientifically measure the carbon?

Besides the answers to these questions, we expect the pilot projects to help us evaluate a variety of delivery mechanisms. By developing projects with non-profit organizations, state agencies, and other private companies, we will analyze the specific challenges presented by each arrangement and be better prepared to move into large scale carbon offset projects using the most promising delivery mechanisms.

Goal 3, Develop policy — Contribute results to the policy process as policymakers consider options for addressing carbon emissions.

The data studied in our pilot projects is of interest to PacifiCorp to help in possible future project development. It also serves a larger purpose, as our work helps policymakers with real data on specific offset projects. Along with our efforts, environmental groups, independent power producers, and other utilities are exploring the use of carbon offsets.

The Energy Policy Act of 1992 requires the Energy Information Agency to develop an inventory of national emissions for each greenhouse gas and a baseline for these emissions (based on emissions from 1987 through 1990). The new law also

requires the Department of Energy to develop guidelines for voluntary reporting of any reductions from a variety of measures including: tree planting, use of renewable energy, energy efficiency, use of alternatively fueled vehicles, and methane recovery. While this new law does not require companies to reduce carbon emissions, the Department of Energy is busily developing guidelines that will be used to direct efforts in the voluntary program and may eventually be used in future regulations to address carbon emissions.

Besides these overall goals of the program, PacifiCorp developed specific criteria for project selection. The best carbon offset projects performed well across the following criteria:

- Provides net addition to the carbon store (must not be action that would happen anyway)
- Has low carbon cost, in dollars per ton
- Provides ancillary benefits to our customers and the communities we serve
- Allows for "turn-key" operation that does not require substantial administration time of the utility
- Shows some potential to be replicated on a larger scale
- Tests a variety of offset technologies

Based on these criteria, PacifiCorp selected and implemented two pilot projects and will develop two or three additional projects this year. The company budget for each pilot project is $100,000.

Project Description

Pilot Project 1 — Rural Tree Planting in Oregon

PacifiCorp is working with the Oregon Department of Forestry (ODF) to increase planting on non-industrial lands. Planting lands with Douglas fir that would otherwise remain unplanted appears to be one of the most cost-effective methods for offsetting carbon. Although other utilities are working to develop offset projects, PacifiCorp is one of only several entities working to offset carbon through the use of domestic forestry.

Background — A survey of non-industrial woodlots in western Oregon suggests there are more than 600,000 acres of non-producing or under-productive private forest land. This land represents a tremendous potential for sequestering additional carbon as it is, in many cases, excellent timber land.

One of the primary hurdles to moving the land into forest production is the substantial capital required to cover the costs of preparing and planting the land. Reforestation of a 100 acre parcel, for example, will cost between $30,000 and $100,000 depending on the techniques used and the quality of the land.

There are federal programs available to help landowners plant their lands, but they are limited to financing a total of only about 7,000 acres per year in Oregon. Each year the demand for these programs exceeds the supply. Additionally, the existing federal programs include restrictions which reduce the number of landowners eligible for these federal dollars.

Mechanism — To increase planting on under-stocked lands, PacifiCorp provides up-front funding to property owners. In return for funding assistance, the landowner signs a contract with PacifiCorp which stipulates that the trees will not be cut for a set period of time. The contract offers landowners alternative options; either they are paid 75 percent of their up-front costs for a guarantee that they will not cut the trees for 45 years, or they are paid 100 percent of their costs for a guarantee of 65 years. Our goal is to plant 350 acres this year, and we hope to continue the program at a similar level for the next planting season.

Property that qualifies for the program must pass several tests to make certain that our program does not end up planting trees that would be planted anyway. First, the land cannot have been cut just recently. After trees are harvested in Oregon, the Forest Practices Act (FPA) requires that landowners replant their land. Lands that must be replanted under the provisions of the FPA do not qualify for funding under the PacifiCorp program because reforesting these lands does not result in a net increase in stored carbon. Second, the land cannot require significant clearing prior to planting. Not only does the clearing of existing trees increase the cost of reforestation, it also limits

the amount of carbon "credit" that will be earned by the project, since the carbon released by clearing must be considered in our calculation. For this reason, only lands with grass or light brush are allowed in the program.

The contract signed by landowners also binds future landowners, and there is a penalty provision in the contract that requires repayment of PacifiCorp's contribution (plus 9 percent interest annually) if the trees are cut prior to the agreement.

Partnership — PacifiCorp developed a partnership with the Oregon Department of Forestry (ODF) to administer the program. ODF has a cadre of Service Foresters who are well acquainted with non-industrial landowners in their county. The Service Foresters, along with the Forest Extension Service, served as the delivery mechanism for the new program.

Non-industrial landowners own parcels less than 5,000 acres and are widely scattered throughout the state. As a group, they are difficult to reach and tend to be wary of committing their land to restrictive contracts. Certainly, the best way to have sold the new program was through the existing institution of the Service Foresters.

The Oregon Department of Forestry is an ideal partner for the carbon project because of the broad policy objectives that can be achieved as tangential benefits. Stocking under-stocked lands, if implemented on a large scale, helps enhance watersheds that provide habitat for fish and wildlife, creates new jobs to reforest lands, and, over the long term, helps to increase the supply of timber to an area hit hard by timber supply restrictions. Although the PacifiCorp pilot project is modest in scale, the state looks forward to the possibility that a small project will grow into a larger effort, which in turn will generate substantial investment in planting on underproducing forest lands.

A larger reforestation effort may be spearheaded by the state of Oregon. A bill supported by Oregon's Secretary of State proposes the creation of a Forest Resource Trust. The proposal could provide an investment of up to $150 million to reforest 250,000 acres over the next 15 years. The Trust would be funded through a partnership of public and private dollars and would assist landowners with up-front capital. PacifiCorp may find an opportunity to invest in the Trust in return for carbon offsets.

Landowners participate in the PacifiCorp pilot program for a variety of reasons. The first participant's land was burned the previous year in the 17,000 acre Evan's Creek Fire. Though he planned to replant a portion of his land, he could not afford to tackle the entire task. Federal cost share programs, which are always short of funds to meet the needs of landowners, were not available to the program participant. The PacifiCorp program resulted in the reforestation of land devastated by the fire. The land, according to the Oregon Department of Forestry, would not have regenerated into Douglas fir forest, but instead would have grown into light brush. Thus, the Douglas fir planted by the program add to the net carbon stocks.

Evaluation of the project — Even with the experienced Service Foresters working to implement the program, it still was difficult to sell the new "agreement" to non-industrial landowners.

The largest obstacle was finding a contract that would meet PacifiCorp's needs for verifiable carbon offsets and yet not be overly onerous for the landowner. The first contract, floated as a trial balloon, offered landowners a 75% cost-share in return for a 65 year agreement. It didn't fly. The second-generation contract, which offered the flexibility of two alternative provisions described earlier, met with greater success. At this writing, we have planted over 170 acres and have landowners with over 700 acres who are either reviewing the contract or have signed up for the next planting season.

We have also hired Dr. Mark Trexler, of Trexler and Associates, to review the projects and determine the carbon value of the pilots. Dr. Trexler has determined that the carbon benefit of the rural tree planting ranges from $2/ton of carbon to $15/ton, depending on how the cost is calculated. These figures are based on empirical stand yield tables for the planting area, combined with estimates from the literature on

non-merchantable biomass and soil carbon accumulation for Douglas fir.

Pilot Project 2 — Urban Shade Tree Planting in Salt Lake City

PacifiCorp is working with a non-profit, Tree-Utah, to plant urban shade trees in approximately eight neighborhoods in the Salt Lake valley. Shade trees provide most of their carbon benefit by creating shade and thus reducing the use of air conditioners, which in turn reduces carbon emitted at power plants.

Background — Increasing the number of shade trees in an urban environment is one way to combat global warming. The primary benefit of urban trees is that they provide shade which directly reduces the need for air conditioning. Urban trees also transpire water, reducing the so-called "heat island effect," which serves to cool an urban area, further reducing air conditioning load. In some locations, urban trees can help insulate a house from cold winter winds. As is true with all trees, the urban shade trees also absorb CO_2 as they grow.

Photo courtesy of PacifiCorp

Most deciduous trees are planted on the west side of houses, but TreeUtah and PacifiCorp will test the cost benefits of planting shade trees in numerous settings.

Mechanism — PacifiCorp became interested in developing a pilot project to test the use of urban trees to sequester carbon. The Salt Lake City location was selected primarily because of the presence of a sophisticated non-profit that could serve as a partner in the project. Salt Lake City is also the largest city with cooling load served by PacifiCorp.

The mechanism for planting trees in an urban setting was developed in close partnership with TreeUtah, as well as the city and state urban foresters. Neighborhoods were selected to maximize carbon benefits. The most ideal neighborhood for a tree planting is one that has central air conditioning but has little or no landscaping. We found that, in Salt Lake, this ideal neighborhood was very difficult to find and that we had to settle for many locations that used evaporative (or "swamp") coolers. Since evaporative coolers use about one-fourth the energy of a central air conditioning system, trees planted around a swamp cooled house will result in substantially higher costs per ton of avoided carbon emissions.

After neighborhoods were selected, letters were sent to households and an organizational meeting was held to discuss the program and to go over details involved in tree planting and stewardship of their trees. Once landowners agreed to participate, TreeUtah walked the neighborhood to pick appropriate species for each specific site.

The planting itself was a flurry of backhoes, front-loaders, and volunteers with shovels – all choreographed by TreeUtah. For our first planting of 120 trees, TreeUtah marshalled over 200 volunteers from several public high schools, a halfway house, and the community at large, to plant trees around low income multi-family dwellings.

All home-owners were asked to sign a "Tree Care Agreement" upon receiving a tree. The Agreement outlines the responsibilities of the homeowner to care for the tree. Unlike the project in Oregon, where we required a contract with participants, we opted to educate landowners

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At a recent planting, over 200 volunteers planted 120 urban shade trees that in time will cool the neighborhood and reduce electricity demands.

about proper tree care and to use the agreement as a concrete demonstration of their commitment.

Partnership — The delivery mechanism for the project required finding a non-profit that is capable of organizing substantial community plantings. The larger urban tree programs around the country also use the model of utility support of an existing non-profit.

Cooperation between a non-profit and a utility may have its obstacles. One utility representative from California suggested that the capabilities of the two organizations differed dramatically. Non-profits are fast moving but do not always track accounting details. Conversely, utilities are often skilled when it comes to tracking expenses but much less adept at moving quickly. In her words, the relationship from the non-profit perspective *"...is like dancing with a gorilla."*

However, the partnership between PacifiCorp and TreeUtah has been, for the most part, a masterful dance. Besides funding support, the utility has been able to provide help in a variety of areas, from calling up customer mailing labels to operating a backhoe on planting day. The organizational tasks involved in getting the volunteers in place, planting the trees, and educating homeowners about tree care were all handled by TreeUtah.

Evaluation of the project — The magnitude of the carbon benefit of urban forestry is highly site specific and depends upon length of cooling season, temperatures, air-conditioner penetration and efficiency, housing stock characteristics, as well as the source of electricity for cooling. At a typical density of three trees per residence, the trees themselves absorb some 40 pounds of carbon per year on average. The strategic placement of three trees on the southern and western exposures of a house has been measured to reduce cooling energy requirements by 13 to 52 percent. In Sacramento, increased tree cover could reduce household carbon emissions by 450 pounds per year.

Two main variables determine the cost of carbon from an urban forestry program: the cost of

the tree-planting and the magnitude of the energy savings. Unfortunately, the significant cost of tree planting is incurred at the time of planting, but significant energy-saving benefits are generally quite a few years off. A simple but effective program might provide small trees for $10-$20 apiece. A more sophisticated program – including education, ongoing maintenance, etc. – could run costs up to $50 to $100 per tree.

The trees planted in the pilot project are both small and large. In modeling the shading effects of these trees, we take into consideration that there will be about a 15-year delay before experiencing their conservation benefits. The carbon costs for our Salt Lake City program are running higher than in some estimates for urban programs because of the predominance of evaporative cooling in neighborhoods without landscaping. The PacifiCorp program will use a sophisticated model to estimate energy savings from the program. The model takes in information on housing characteristics and then grows the tree next to the house to estimate savings over time. PacifiCorp will be working both with Mark Trexler and with Greg McPherson, of the U.S. Forest Service, to more fully evaluate the carbon savings from the pilot project.

Besides carbon costs, PacifiCorp is using the project to test a variety of other project variables. The most important of these may be the use of variable tree size. A large 8' tree costs approximately $100 in a nursery, but TreeUtah purchases them wholesale for about $50. The large tree comes with burlap around its root ball and takes power equipment to move into place. A much smaller tree, contained in a 5 gallon pot, may be purchased for less than $20. During the planting, the tree may be picked up at a central staging area and brought by a landowner to his or her house.

Clearly, the choice of tree is critical in determining the organizational needs of a project. Most urban foresters, who are familiar with the vandalism in public places, favor the use of larger trees. With an eye to the budget for the project, our utility would like to use smaller trees in many locations. Some with experience in planting urban trees suggest the small trees will catch up with the larger ones in several years because their roots are not damaged in planting. In the pilot we will be testing the use of both large and small trees to determine which ones have a better survival rate and to measure the growth rates of the trees.

Advice

PacifiCorp's offset project should provide insight for policymakers at all levels of government as they consider the next step into policy on greenhouse gases.

1. Continue to consider offsets as a viable approach — Policymakers may disagree about the abilities of different offset projects to result in a real offset in carbon emissions. The Department of Energy is developing offset guidelines that will begin to clarify the criteria for judging offset projects.

PacifiCorp's projects and others like them are intended to show that offsets offer one piece of an overall carbon strategy. These projects may also show that offsets are one of the least expensive pieces, and therefore should be among the first measures implemented. Policies should therefore be developed that allow continued consideration of offsets.

2. Develop public-private partnerships — The pilot projects are most cost-effective if partnerships are developed to take advantage of the strengths of a variety of organizations. As PacifiCorp's pilot projects demonstrate, a rural tree-planting project is far easier to implement with the assistance of local foresters from the state to locate and communicate with non-industrial landowners. Equally so, without the organizational skills of TreeUtah, a shade tree program would require a large utility staff and a tremendous amount of administrative time.

3. Favor projects with ancillary benefits — Project sponsors developing carbon offset projects will favor projects with benefits other than carbon because these projects will have more appeal in the communities they serve. Public policymakers should be on the lookout for projects that meet societal goals and have carbon benefits, but for any number of reasons cannot be accomplished. The addition of carbon offset value may change the equation. With an

interested partner, policymakers may find a viable way to recover methane from a landfill, convert vehicles to less polluting fuels or even plant trees on under-stocked lands.

Conclusion

This case study on carbon offsets is unique among those featured by the Western Governor's Association because it features the work of a private company to develop an innovative approach to an environmental question. PacifiCorp's work to explore carbon offsets is one example of the benefits to a member of the regulated community in exploring possible compliance strategies in advance of regulation. The two projects described in the case study, along with the offset work of other entities, may help show the way to a low cost strategy for addressing carbon emissions.

PacifiCorp's work also is notable because the company could not have developed the two pilot projects efficiently if it were to have acted alone. Partnerships with a state agency and a non-profit organization helped the company move quickly and efficiently into an area where the company had little expertise.

It is likely that carbon offset projects will be developed through public-private partnerships. There is an opportunity, therefore, for public agencies to leverage their dollars to meet their own policy goals by attracting dollars spent to offset carbon. If future carbon regulation includes an option of offsetting carbon, public entities should be prepared to participate in those projects where the goals of private entities to offset carbon goals match well with the objectives of public agencies.

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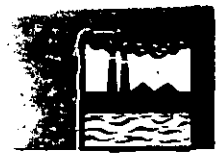
[1]National Academy of Sciences, Policy Implications of Greenhouse Warming, p. 67.

[2]Portland, Oregon along with 11 other cities from Europe and North America participated in the Urban CO_2 Project sponsored by the International Council for Local Environmental Initiatives.



Public-Private Partnerships to Reduce Hazardous Waste: The Pollution Prevention Partnership

edited by Kerrigan Clough

Executive Summary

It started with a breakfast meeting. In 1989, senior representatives from industry, regulatory agencies, and public interest groups began to meet over early morning coffee. At first, they sought a dialogue between industries and regulatory agencies–turning potential foes into teammates. Later, this "breakfast club" evolved into the Pollution Prevention Partnership. The goal: working together to prevent pollution at its source.

By 1990, the Pollution Prevention Partnership formed a non-profit organization, including in its membership: Martin Marietta, Coors, Hewlett Packard, Public Service of Colorado, EPA Region VIII, the Colorado Department of Health, the Colorado Public Interest Research Group, the League of Women Voters, and environmental consultants Geraghty and Miller. The Partnership set high standards for reducing pollution in Colorado's industries by making it easier for regulatory officials, public interest spokespeople and industry representatives to meet and forge new solutions to environmental problems.

"...Much of the impetus for such improvements has come from a series of breakfast meetings bringing key executives together with regulatory officials and environmentalists to discuss ways of reducing emissions without cutting profits...."

—The Denver Post, June, 1992

The Partnership has reduced the quantity of hazardous materials used and disposed in Colorado. The first major project, called "SolvNet," focused on 1,1,1 Trichloroethane (TCA). TCA poses severe health and environmental hazards. The Partnership set a goal to reduce the use and release of this industrial "solvent-of-choice" by 70%. Partnership members methodically searched for acceptable alternatives, testing over 50 compounds. By making changes in processes, materials, and business methods, they exceeded their goal. Pollution prevention – by reducing solvent use – reduces burdensome regulatory compliance, taxes, and surcharges. Prevention decreases health risks to employees. With escalating costs for disposal, and "end-of-pipe" waste control, Partnership members will save millions of dollars in future years because of their solvent reductions.

The work has not stopped there. The Partnership is reaching beyond its membership to all of Colorado. Members conducted technical workshops for industry representatives. They hosted a luncheon for Colorado corporate executives and worked with the Waste Minimization Assessment Center, at Colorado State University, to perform waste assessments at small to mid-sized industries in Colorado.

Prevention is the key to minimizing pollution's effects on the environment. Obviously, regulatory officials and public interest representatives want to promote pollution prevention. But, industries have also received word that prevention is the most cost effective way to limit pollution, and interest is growing. People across the country have called inquiring about the Partnership. Colorado companies are requesting membership. Government has also committed to prevention through the recent passage of the Colorado Pollution Prevention Act of 1991. A similar Partnership is beginning now in Utah.

Having succeeded in TCA reduction, Partnership companies now seek to reduce other hazardous chemicals. Not only is the agenda growing, but so has the membership by adding AT&T and Kodak during 1992. The Partnership – a Colorado non-profit corporation – has non-profit, tax exempt status from the Internal Revenue Service under section 501 c(3) of the Federal Code. Prevention unleashes a vital, new

way to protect the environment. The Pollution Prevention Partnership leads the way in tapping its potential.

What is the Pollution Prevention Partnership?

Purpose

The Colorado Pollution Prevention Partnership is a non-profit, voluntary alliance of government, business, and public interest groups organized to develop and promote pollution prevention and waste minimization in Colorado industries.

Partnership Goals

- Strengthen the working relationship between the private and public sectors.
- Improve capabilities of both sectors for anticipating and avoiding environmental problems.
- Pool resources and achieve measurable reductions by using pollution prevention methods.
- Exchange information and expertise. Transfer information to member companies, other medium and small-sized companies, and the general public.

The Partnership was originally formed in 1989, with membership from the United States Environmental Protection Agency (USEPA) and the Colorado Department of Health (CDH); industry representatives from Martin Marietta, Coors, Hewlett Packard, and Public Service of Colorado; public interest representatives from the Colorado League of Women Voters and the Colorado Public Interest Research Group (COPIRG); and Geraghty & Miller environmental consultants. New members include AT&T and Kodak of Colorado.

Background

Initiated in 1989, from informal breakfast meetings, the Partnership wanted to find common ground between public and private agencies. It wanted to develop practical solutions to environmental problems. Discouraged by the normal confrontation between the organizations represented, Partnership members sought new arenas in which to work cooperatively. They implemented a program of voluntary goals which benefited each group. They identified pollution prevention and waste minimization as their mission, and education of the values of prevention as an important theme.

The regulatory agencies traditionally meet the public mandate to control hazardous and environmentally harmful substances using "command and control" regulatory and enforcement tools. Through "partnering" and "pollution prevention," agencies can meet environmental objectives while avoiding confrontational approaches. When pollutants are eliminated or reduced, so is much of the need for permitting, compliance, and enforcement actions.

Industry constantly seeks cost-effective ways to comply with growing regulation. Through prevention, industry can reduce operating costs,

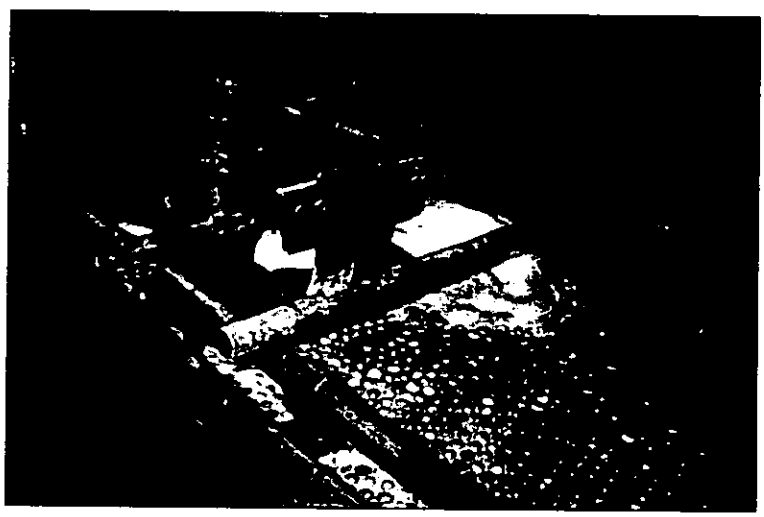
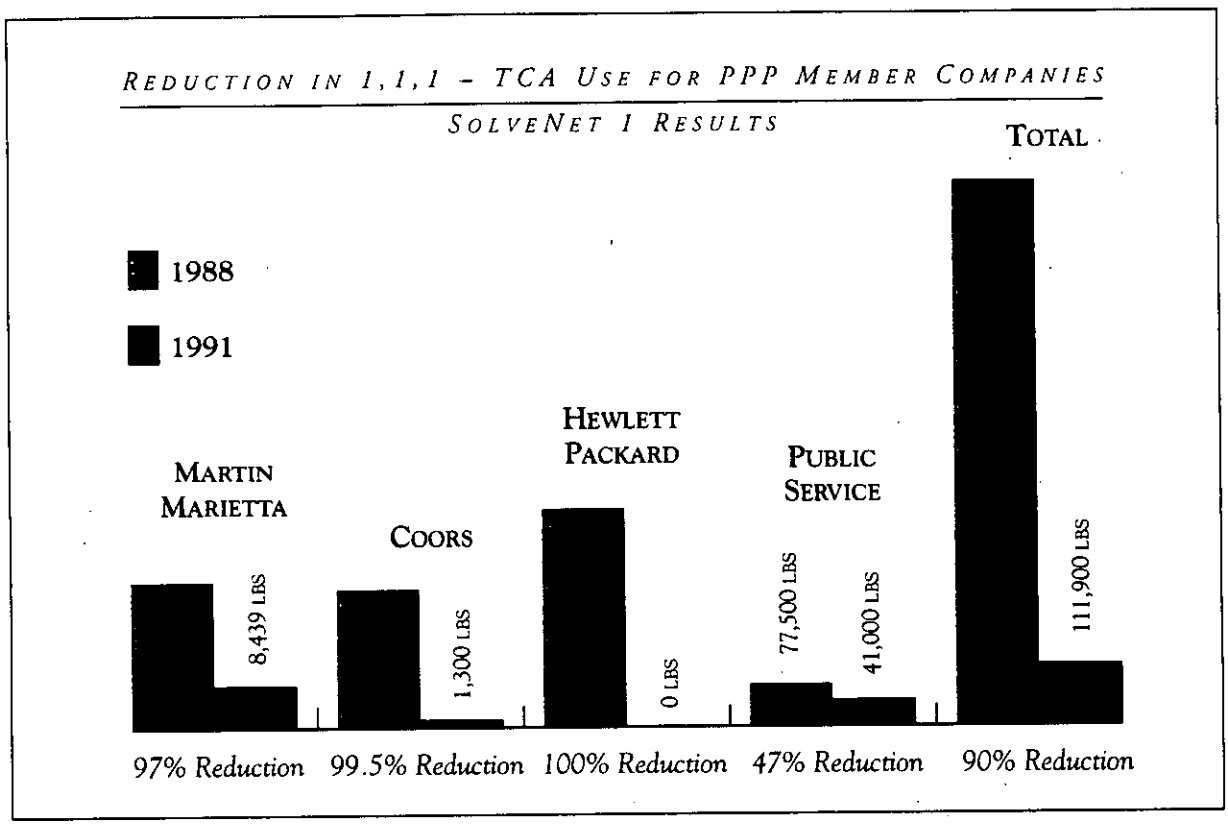


Photo courtesy of Colorado State University

Plastic balls in plating bath reduce loss of plating solution at Columbia Chrome in Colorado. The primary waste is a plating bath sludge.



minimize exposure to environmental regulations, and reduce long-term environmental liabilities.

Public interest groups strive to protect the public and the environment from harmful substances. Through prevention, they join a team which seeks effective and lasting answers to environmental protection.

SolvNet: Reducing TCA Use Through Pollution Prevention

Objective

Early in 1990, the Partnership members agreed that a substantive, documented effort to reduce pollution should be the number one goal of the group – only through real environmental improvement would the Partnership achieve success. After evaluating many opportunities the members decided to tackle a serious, important problem; the growing use of toxic organic solvents in industrial processes. TCA (1,1,1) Trichloroethane was targeted because it is such a ubiquitous hazardous solvent. The Partnership named the effort "the SolvNet project."

In the SolvNet project, the four member companies committed to significantly reducing use of TCA. TCA is widely used in industry to clean equipment and metal surfaces before further processing. It is a major ozone-depleting chemical. Companies in the SolvNet group decided to cut their combined TCA use 70% by December, 1991. They used 1988 as their base year. The pollution prevention measures they used were:

- ***Process modification*** — eliminate the need for TCA
- ***Chemical substitution*** — finding safe alternatives
- ***Good operating practices*** — reducing the use at the source.

These steps were the foundation of SolvNet and a hierarchy of pollution prevention strategies, because SolvNet serves as a prevention model for reducing other hazardous chemicals – a model to the Partnership and to other companies. Each company developed internal strategies to reduce TCA, and they shared their findings in technology transfer workshops.

Measuring Success

The Colorado Public Interest Research Group (CoPIRG) analyzed TCA use and emissions for the base year 1988, and for 1991. The Partnership companies provided data from SARA Title III Right to Know reports. As part of their responsibilities to the Partnership, CoPIRG documented SolvNet results. Four companies reduced their annual use of TCA by a combined total of 1,016,100 pounds, which represents a 90% reduction from 1988.

TCA Reduction

The companies in SolvNet reduced TCA by modifying processes and substituting non-toxic solvents. Intensive research revealed that TCA could be effectively replaced with various aqueous (water-based) cleaners that are environmentally preferable. Through prevention, the four companies reduced solvent air emissions and the volume of liquid waste generated. They also cut solvent and disposal costs for TCA and related wastes. And, they reduced the potential for future liabilities related to TCA use.

Martin Marietta modified its production process to use an aqueous based cleaner to reduce TCA use. Coors eliminated the use of TCA at its can plant and glass bottle plant by using citrus-based solvents and other substitutes. Hewlett Packard eliminated TCA in the manufacturing of printed circuit boards by using sodium carbonate. PSCO had the challenge of reducing TCA use at its decentralized facilities where it was an ingredient in cleaning fluids. They achieved reductions primarily through alternative cleaning products and employee education.

Conclusions

SolvNet succeeded because companies eliminated TCA before use rather than attempting to recycle or dispose of it after use. The companies developed safer substitutes which greatly reduced the threat to worker and public health. In addition, TCA elimination significantly benefits the environment.

Although the new Clean Air Act requires that all companies eliminate their use of TCA by the year 2000, this project shows that other states and companies can follow the Pollution Prevention Partnership example and eliminate their use of TCA earlier.

Photo courtesy of Colorado State University

The Partnership is beginning to work with small business. Don Wilson, owner of Precision Auto Body, explains how a gravity-fed paint gun preserves paint.

Getting the Word Out About Pollution Prevention

Word is spreading about the Pollution Prevention Partnership. It sparks interest and commitment from public and private organizations to anticipate and avoid environmental problems, achieve measurable reductions in pollution through prevention, and share information and technology. The Partnership wants to make pollution prevention the business standard in Colorado. To keep spreading the word, the Partnership developed a Technical Assistance Program.

In a time when many firms often choose to act secretly, the members of the Partnership freely share their successes and failures regarding reduction of toxics. So far, the Technical Assistance Program has completed several exchanges. A CEO luncheon introduced the Partnership to the industrial community. Dr. Harry Edwards of the Waste Minimization Assessment Center, at Colorado State University, completed two on-site waste assessments at local companies. Member companies gathered for a technical interchange regarding solvents. Coors and Martin Marietta sponsored workshops to exchange technical information. Also, PSCO included pollution prevention information in two mailings to business and residential customers. And, the Partnership sponsored several workshops with the Colorado Department of Health. Many people also heard about the Partnership's efforts through a slide presentation given at conferences and meetings.

CEO Luncheon

A luncheon for CEOs of Colorado's most significant users and emitters of ozone-depleting chemicals gave new legitimacy to pollution prevention in the state. Sponsored by the Pollution Prevention Partnership, and addressed by Governor Roy Romer, Peter Coors, and Del Hock of PSCO, the luncheon hosted over 75 guests from 31 companies. At the gathering, the Partnership sought to motivate Colorado's business executives to show leadership to improve Colorado's environment though pollution prevention.

Then USEPA Deputy Administrator Hank Habicht and Del Hock and Robert McMullen from the Partnership explained the benefits of prevention to the environment and to industry. They shared case studies and challenged all companies to initiate prevention programs that would reduce the use of harmful solvents. The Partnership offered its assistance and invited other companies to share in its goals. The Partnership members called the attending companies after the luncheon. Several companies inquired about membership in the partnership because of the luncheon.

To explore the possible economic benefits of pollution prevention for small companies, USEPA paid for two waste assessments performed by the Waste Minimization Assessment Center, at Colorado State University. Dr. Harry Edwards' team visited a manufacturing shop which makes

Photo courtesy of Colorado State University

Silkscreens are presently cleaned with organic solvents. The use of water-base inks or less hazardous cleaners would reduce pollution.

cabinets from sheet metal, and an integrated circuit manufacturer. The team suggested changes in process and cleaning which would reduce hazardous waste by an average of 55%, and cut air solvent air emissions by an average of 84%. Both facilities have implemented most of Dr. Edwards' recommendations.

From a purely economic perspective, these two audits have shown it is good business to invest in pollution prevention. The one-time cost to implement process changes was $14,700 for the metal fabrication facility with a resultant annual savings of $11,300, thus providing for actual dollar savings after just 1.3 years. Savings for the circuit manufacturer came even quicker; with one-time implementation costs of $52,900, annual savings are $47,800 for a 1.1 year return on investment. Few business investments produce such stellar economic results.

Technology Transfer Workshops

During the summer of 1991, the Partnership hosted two technology transfer workshops open to Colorado companies. The first – regarding metal finishing – was held at Martin Marietta and attended by almost 40 people representing 10 companies. Coors hosted the second workshop on refrigerant recycling. Both workshops allowed member companies to share their pollution prevention successes and failures. Non-member companies gained valuable information including waste minimization, recycling, and process alteration strategies. They could begin to use pollution prevention technologies without lengthy and costly research.

The Pollution Prevention Partnership cosponsored two workshops with the Pollution Prevention and Waste Reduction Program at the Colorado Department of Health. The first was held on November 7, 1991, and addressed alternatives to the use of toxic solvents for industrial cleaning processes. The second was also co-sponsored by the Automotive Services Association of Colorado and was held on February 27, 1992. The two workshops attracted an average of 60 participants and were very well received. More joint ventures are planned in the future.

The Partnership has been busy over the last couple of years. Word is getting out about the benefits and successes of pollution prevention. Companies in Colorado and around the country are taking notice and asking questions. Two new companies (AT&T and Kodak) have joined the partnership, and have accepted new pollution prevention challenges.

The Partnership is also providing advice to a budding pollution prevention partnership in the State of Utah. The Director of the Utah Department of Environmental Quality (DEQ) convened a kick-off meeting on October 28, 1992, at the State Capitol. Attendance included representatives from Amoco Oil, Geneva Steel, Hercules, Kennecott, Hill Air Force Base, Tooele Army Depot, the University of Utah, the Utah Manufacturers Association, and the Utah Petroleum Association. The group decided there is potential for success and has formed a Utah Pollution Prevention Partnership Industry Workgroup chaired by Shelly Cordon Teuscher of the Utah Petroleum Association. The Utah partnership has formed two task groups; one to focus on reduction of the use of solvents and the other to promote pollution prevention awareness in Utah. The State DEQ is actively working with the member companies to help ensure success and U.S. EPA has offered its assistance.

SolvNet II

The Partnership is looking ahead to more hazardous waste reduction through voluntary prevention in SolvNet II. Since each member company uses different hazardous materials, reduction goals need to be customized. In SolvNet II, each company chooses chemicals to reduce over the next 3 to 5 years. They will accomplish one-third to two-thirds reduction, in emissions or use, through pollution prevention measures. The member companies submitted reduction plans to the PPP Advisory Committee, and all have begun implementing the plans.

Kodak of Windsor, Colorado, and AT&T of Northglenn, Colorado, have joined the Partnership under SolvNet II. They have adopted voluntary reduction programs at their facilities.

SolvNet II will make significant changes in the way Colorado does business. It will significantly reduce hazardous materials used and hazardous wastes generated.

This report was edited by Kerrigan Clough, Acting Deputy Regional Administrator, USEPA Region VIII, 999 18th St., Suite 500 Denver, CO 80202 (303) 293-1616.

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Creating a State Strategy for Habitat Protection: The California Biodiversity Plan

by the Resources Agency of California
Douglas P. Wheeler, Secretary for Resources

Problem Statement

Biologically and socially, California is perhaps the most diverse of the fifty states. Its natural diversity – which is overlain with rapidly growing population levels, conversion of wildlands for development and agriculture, complex patterns of public and private land ownership, and intricate networks of land use laws and institutional relationships – creates a challenging environment for addressing the conservation of biodiversity.

California's ecosystems, or "bioregions," range from the alkali desert of Death Valley, to the rain-drenched redwood forests of the North Coast, to the high and dry Modoc Plateau, to the dewy mountain meadows of the Sierra Nevada. Within these natural systems are found as many as 400 distinct habitat types and an unusually high number of plants and animals. There are an estimated 8,000 species of vascular plants in California, of which 4,900 are endemic – that is they are found only in California. California is home to some 821 vertebrate species, including 368 bird species, 214 mammals, 129 species of reptiles and amphibians, and 110 species of fish.

As of July, 1992, California had 108 listed and 12 candidate animal species under the State and Federal Endangered Species Acts (ESA). A number of species have been added since then. As of September, 1992, 213 plants were listed as endangered, threatened, or rare under the State ESA and the State Native Plant Protection Act. An estimated 35 animal and 38 plant species or subspecies have become extinct or have been extirpated in the state.

© Perry Conway

As development increasingly encroaches into California's natural ecosystems, new habitat protection strategies must work to balance human and ecological needs.

At the same time, California is home to an increasing abundance of people. In the decade of the 1980s, California's population grew at nearly three times the national rate (26.0% vs. 9.8%). The state grew by 670,000 people in 1991, and by 570,000 people in 1992 – rates of increase lower than most of those of the 1970s and 1980s, and very likely to be lower than those of the foreseeable future. The total population of the state in January, 1993, was 31.5 million. In April, 1993, the state Department of Finance announced that the state's population was expected to double to a total of over 60 million people by the year 2040.

Since the early 1970s, a major component of the state's growth has been a surge in the growth of its rural counties. From 1950 to 1985, more than 4.8 million acres of forest and rangeland were converted to intensive urban and irrigated agriculture uses. During this period, there was a loss of 4% of the redwood cover type, 7% of valley foothill hardwood, 11% of coastal scrub, and 26% of grassland. In addition to conversions driven by growth and agricultural expansion, other impacts on habitat and biodiversity include water use, grazing, timber management, and air and water pollution.

Land ownership patterns are an important element in biodiversity conservation. Approximately half of California is in public ownership, including 20.4 million acres managed by the U.S. Forest Service, 17.1 acres managed by the Bureau of Land Management, 4.7 million acres managed by the National Park Service, and 1.1 million acres in state and county parks. Nearly 12 million acres, or 12% of the state, are preserved in parks, wilderness areas, and wildlife refuges. Since these lands are managed to serve such public interests, the predominance of public land ownership provides a potential asset in the conservation of the state's biodiversity.

Finally, there are widely varying goals, mandates, laws, clientele pressures, and historical traditions under which California's public and private land mangers and public agencies operate. While the State and Federal Endangered Species Acts provide a crucial backstop to the loss of species, they sometimes cause significant management disruptions and costs as a result of their inflexibility, their single-species focus, and their failure to mandate action until the 11th hour. In addition, there are other state and federal laws that impose major land management restrictions.

These complex circumstances of ecosystem diversity, species diversity, growth and resource use pressures, institutional diversity, and legal entanglements create the need for a more coordinated, multi-species strategy for the conservation of bio-diversity and sustainable economic growth and development.

Objectives

In general, the goal of California's coordinated strategy of conservation grounded in biological diversity is to improve the management of its vast and varied natural resources. This will mean an increase in the quality and/or the quantity of individual species and habitat throughout the state. At the same time, a more anticipatory, preventive approach to resource management will enable the state to move beyond the controversy and gridlock that often characterizes current species-by-species, agency-by-agency management – as typified by the ESA – and to provide certainty in planning for both environmental and societal needs.

Memorandum of Agreement on Biological Diversity

The operating framework of California's strategy for coordinated biodiversity conservation is an unprecedented Memorandum of Understanding (MOU) on biological diversity between ten state and federal land managing agencies and the University of California (UC), which was signed in September, 1991.

The MOU established an Executive Council on Biological Diversity, which is chaired by the California Secretary for Resources and composed of the directors of the signatory agencies. By early 1993, the membership of the Council had increased to 24 signatories. They are: eight directors of state departments, seven county supervisors representing regional associations of county supervisors, six regional heads of federal agencies, the director of the California

Association of Resource Conservation Districts (CARCD), the UC Vice President of the Division of Agriculture and Natural Resources, and the Secretary for Resources.

In general, the purpose of the MOU is to promote cooperation and coordination between signatories in the development and implementation of biodiversity conservation. The Council is designed to establish statewide goals for the protection of biodiversity; encourage cooperative projects and the sharing of resources; and cooperate in areas such as biodiversity-related policies and regulations, land management, land use planning, and resource restoration.

Additionally, the Council is intended to promote locally derived solutions to regional resource problems and to encourage the development of "bioregional councils" in each of the state's ten unique "bioregions." These smaller councils are themselves to encourage the development of watershed or landscape associations within their respective regions. In practice it appears that many local associations are forming first and may later confederate, forming bioregional councils.

The Council meets quarterly to review continuing programs and projects related to the Council, facilitate communication between signatories, and recommend future policies and actions. Representatives of non-signatory agencies, as well as private interests, are invited to participate in these meetings.

The Council's authority is derived solely from each director's administrative authority over his/her agency and the continuing commitment of each to cooperate with the other signatories in conserving biological diversity. The MOU does not extend, modify, or supersede existing statutory direction of the signatory agencies. The Council has no legislative authority and no regulatory authority of its own.

The development of bioregional councils and watershed associations around California is being pursued by several signatory and non-signatory agencies. Much of it is locally-initiated and directed, and this is the objective of the Council. All of the activity is being monitored – but not necessarily overseen – by the California Department of Forestry and Fire Protection (CDF). Several examples of these activities follow.

In the Sierra Nevada, the Resources Agency and other agencies sponsored a "Sierra Summit" conference designed to bring together conservationists, industry representatives, government officials at all levels, and others in order to identify and develop strategies to address the environmental and economic needs of the mountain range. Since that event was held in November 1991, the Sierra bioregion has witnessed a great deal of organizing and activity under the aegis of biodiversity. The CARCD is implementing pilot conservation action plans in two unique watersheds – one in the northern Sierra and one in the southern Sierra. The organization is also working with local RCDs to provide biodiversity and leadership training to directors and employees of local RCDs, and to produce a prototype geographic information catalog referencing sources of data on the Sierra Nevada. Concomitantly, CDF and the California Department of Conservation are producing a computer bulletin board system for the Sierra Nevada. It will be publicly accessible and will contain such resources as the text portions of the CARCD's bioregional geographic information catalog.

In the Klamath bioregion of northwestern California, CDF has entered into a contract with the UC Cooperative Extension to conduct an outreach program to facilitate the development of biodiversity discussion groups. One of the primary challenges in this process has been to help community participants understand and act with the knowledge that the process is locally based and that the development of biodiversity conservation is largely in their hands.

In the western Mojave Desert of southern California, the Bureau of Land Management (BLM) is working in conjunction with the U.S. Fish and Wildlife Service (USFWS), the Department of Fish and Game (DFG), and local counties and municipalities in developing a multi-agency coordinated management plan focused on the protection of the desert tortoise and the Mojave ground squirrel and their habitats. The plan covers nine million acres of both public and private lands and seeks to find a regional solution for balancing the

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Past approaches to wildlife protection which focused on single species like this endangered California Condor have been too expensive and often too reactionary to be effective.

need to protect the tortoise and the squirrel with the need for planned community expansion and the wise use of the region's natural resources.

A similar effort is being conducted by BLM and DFG in the southern San Joaquin Valley. The San Joaquin Valley has the largest concentration of threatened and endangered species in the nation. Federal, state, and local agencies, along with representatives from the oil and building industries, agriculture, and conservation organizations are developing a strategy to better coordinate and achieve conservation goals for threatened and endangered species and their habitat, while enhancing economic growth and development.

Natural Communities Conservation Planning Program

The most advanced, comprehensive application of conservation management grounded in biodiversity is Governor Wilson's Natural Communties Conservation Planning Program (NCCP).

This is a state program – apart from the MOU – designed to employ ecosystem planning in order to anticipate and prevent the controversies and gridlock that result from the listing of threatened or endangered birds or animals under the ESA. It is a voluntary, cooperative approach to protecting wildlife and habitat before it becomes so fragmented or degraded by development and other use that a listing is required. The goal is to conserve – in reserves large enough to ensure their continued existence – native plants and animals and the land and water on which they depend. This will allow for both reasonable, compatible development and certainty in planning for developers and conservationists alike.

Such ecosystem planning represents evolution in scientific understanding about how to deal with species conservation by intervening early enough to protect an entire ecosystem or natural community and its interdependent species. It is also important because it requires cooperation and collaboration among all involved parties, including landowners, conservationists, the scientific community, and government at all levels.

Experience over the 20-year life of the Federal ESA has shown that the results of listing species individually as threatened or endangered under

the ESA often does not achieve its objectives. Such listings – despite extensive regulatory powers available under the law – do not necessarily assure the long-term survival of the species and can have serious economic consequences in affected regions. This is because dealing with a single species without considering the complex interrelationships of the ecosystem and the habitat may mean that the species continues to decline despite stringent regulation.

The dual goals of long-term species protection and economic development are to be achieved by NCCP through the establishment of permanent, legally-enforceable conservation strategies designed for specific habitat and species. These plans will set out the conservation needs of the targeted habitat area and will identify areas that are appropriate for compatible growth and development. The plans will be developed voluntarily by landowners (who enroll their land in the program), conservationists, and government at the local, state and federal levels.

The program works because of the solid underpinning of the ESA. Land managers and local governments are willing to commit to conservation voluntarily in order to avoid the potential disruption of the ESA's species-by-species protection process, which can disrupt economic activity for years. Thus, the Communities Conservation Planning Program (NCCP) is not fully an alternative to the ESA, but rather is an effort to supplement it. Indeed, it is the prospect of listings that creates the incentive for landowners to participate in the NCCP program. Without the very real threat of the regulatory power and control that accompany a listing, NCCP could not work.

The program was first announced by Governor Wilson in April 1991 as part of his "Resourceful California" conservation agenda. It was given statutory authorization through state legislation - AB 2172 – that was signed into law by Governor Wilson on October 10, 1991. The Coastal Sage Scrub habitat of Southern California was selected shortly thereafter as the subject of the first NCCP pilot program.

This habitat, which is most prevalent in Orange, Riverside, and San Diego Counties but which is also found in Los Angeles and San Bernardino Counties, is the home of a songbird called the California Gnatcatcher and more than 50 other potentially threatened or endangered species. Because of the great pressure for development of this high-priced land and of the likelihood of future listings under the ESA, many landowners in the region have been eager to cooperate in the NCCP. Thus, it represents an important and obvious example of the need for multi-species protection, and of the conflicts between species protection and urban growth.

There are between 250-350,000 acres of Coastal Sage Scrub habitat in the region of the NCCP program. (This represents approximately 10% of the historic habitat.) Of this area, over 200,000 acres have been formally enrolled in the program by landowners and local governments, including most of the habitat in Orange and San Diego Counties. The enrollments have been made by over 70 private landowners and numerous local governments, including the counties of Orange and San Diego and the City of San Diego.

The entire available habitat is being broken down into as many as 10 to 15 "subregions." Each of these subregions will be the subject of scientific study and a unique conservation plan. And, taken together, these subregional plans will ensure the protection of the remaining habitat, the Gnatcatcher, and the other species that inhabit it. The most important criteria in this process of developing the subregional plans will be the biological quality and the location of the available Coastal Sage Scrub habitat.

When, during an 18-month period concluding in late 1993, the time comes for the establishment and implementation of the final plans, the state will utilize a wide range of actions to do so. These actions may include purchase of land by the state or local governments, transfers of lands, selling of easements, imposition of regulatory restrictions, and a variety of other strategies.

In March, 1993, the U.S. Secretary of the Interior Bruce Babbitt announced the listing of the Gnatcatcher as a "threatened" species under the Federal ESA, giving formal recognition to Governor Wilson's pioneering effort and applauding its anticipatory, cooperative

nature. Babbitt employed Section 4(D) of the Act, which gives the USFWS the special authority to define the conditions under which a "take" may be authorized for a threatened species. The Secretary, thus, has given the state the authority to continue the program and the development of the long-term NCCP plans in conjunction with the program's Scientific Review Panel. In effect, the federal government has endorsed ecosystem conservation and become a full partner in its application by the state.

NCCP holds great promise for resolving the type of "economic train wrecks" caused by the Endangered Species Act that Secretary Babbitt has cited. It provides a means by which to protect California's extraordinary natural diversity while meeting the needs of its human population. It may also provide a model for the rest of the country.

History

The state of California's strategy of conservation grounded in biological diversity builds on a number of previous efforts to encourage cooperation on resource management issues.

In 1971, a number of state and federal agencies signed an agreement to develop guidelines for Coordinated Resource Management and Planning (CRMP) on a local watershed level. Since then, more than 80 CRMP plans have been developed in California.

Another cooperative effort by many of the same agencies is the Interagency Natural Area Coordinating Committee, which was formed in the mid-1970s to help identify important natural areas.

However, it was not until the introduction of Governor Wilson's program in 1991 that the State contemplated or implemented an overall strategy for biodiversity conservation or ecosystem planning.

Obstacles and Evaluation

The obstacles to the state's ambitious strategy are formidable.

While the Executive Council is able to communicate ideas and objectives regarding the conservation of biodiversity and to recommend legislative solutions, there are obvious limits to what interagency and intergovernmental cooperation can accomplish. The Council has no authority to legislate or to modify the existing statutory direction of any agency. Thus, as in the case of NCCP or the potential reauthorization of the Federal ESA, state or federal legislation is necessary in order to give statutory foundation to new practices or regimes of natural resource management.

Because biodiversity represents for many a completely new approach and orientation, some constituencies, institutions, and individuals are very wary of it. Environmental interests worry that the Executive Council and bioregional councils may compromise away some of the environmental protection inherent in existing governmental plans, policies, and regulations. Industry and private property rights groups express concerns that the opposite might happen, that actions taken by the agencies involved would reduce their choices in managing their lands.

At an institutional level, obstacles stem from the complexity of government. The federal, state, and local governments are made up of many agencies with highly specific functions and often conflicting regulatory or management jurisdiction over ecosystems. Each department is bound by its own enabling legislation, regulations, mission, and traditions. Trying to get such entities to work together, where there is little or no tradition of doing so, is difficult. Biodiversity conservation aspires to establish a new tradition of intergovernmental and interagency cooperation and to have each agency see itself as a part of an entire, coordinated system. Plans and actions of natural resource agencies must be as integrated as the processes of nature itself if there is to be hope in succeeding in conserving biodiversity while allowing growth and maintaining a healthy economy.

Advice and Conclusion

Several pieces of advice can be distilled from both California's experience with both the Executive Council on Biological Diversity and the

Natural Communities Conservation Planning program. Broadly they are:

1. Strive for inclusiveness and consensus in promoting bioregional strategies and approaches. While the U.S. Supreme Court has not yet addressed the potential conflict between private property rights and the conservation of biological diversity, it has recognized the legitimacy of both. Thus, cooperation with and collaboration between traditional adversaries must be sought. Landowners, conservationists, government at all levels, and others must be included in the development of planning strategies.

2. Efforts must be taken to avoid the appearance – and the reality – that a "top-down" approach to biodiversity conservation is being pursued. Ultimately, the desire and the push for a new, improved, coordinated management of natural resources must come from the people of a particular region, not merely from government "bureaucrats." As in the case of a cooperative body like the Executive Council, it must always be made clear that it has no power to override existing legal authority and is responsive to elected officials at all levels of government.

3. Recognize that government agency participants are both enabled and constrained by the laws they operate under. This may mean that, despite their best intentions, agencies may be limited in the extent to which they may be able to cooperate as a result of strict legal mandates that force them to take potentially significant unilateral actions.

4. Pull out the carrot, not the stick. Make it clear to landowners, local government, and community organizations that public agencies have significant positive resources to bring to bear on biodiversity conservation problems – e.g., money, staff, and expertise – and not just restrictive sanctions.

5. The need for scientific data increases exponentially when the focus moves from individual species to habitat, ecosystem, or bioregion. Be prepared for substantially greater information needs and for the time and expense necessary to gather data. In California, we have enlisted top academic biologists to consult with state and federal agencies, and have also sought and received valuable input from field biologists that advise landowners and environmental groups.

6. Breaking new scientific and policy frontiers creates controversy. Taxonomists use relatively well accepted rules for defining species. But the definition of habitats or ecosystems, and the location of their boundaries, often cannot be settled by well accepted scientific rules. Be prepared for controversy about any definition and boundary that is chosen. When attempting to protect a multitude of species, it is unreasonable to expect the same degree of precision that is possible in protecting just one.

7. Create new roles for the federal government. By itself, the federal government cannot rescue endangered species or conserve biological diversity and foster compatible economic development. It must find new ways to provide incentives and assistance to states and localities. It must experiment with preventive approaches to wildlife conservation. The federal agencies cannot do it alone; but similarly, state and local governments cannot do it without creative support and assistance from Washington.

Conclusion

Much work remains ahead before the real promise of the California's biodiversity conservation strategy is fully realized. These efforts are long-term and continuous, not a one-shot plan or project. The need for interagency and intergovernmental cooperation and coordination in the conservation of biodiversity in California will increase with time.

This report was submitted by the Resources Agency of California, Douglas P. Wheeler, Secretary of Resources

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International Cooperation to Protect Habitats: The Great Plains Initiative

by Michael Orr

Introduction

Here in the West, the environment and the economy are inextricably connected. It is indeed difficult to imagine that we could afford to protect our fragile landscape without a prosperous economy. At the same time, much of our economic productivity depends directly or indirectly on the health of our natural resources.

In the 20 years since the U.S. signed the Threatened and Endangered Species Act (ESA) into law, the West has greatly improved the protection of its landscape and wildlife. However, the traditional approaches for protecting our lands have not always held the relationship between the environment and economy in a sustainable balance. In fact, past approaches have sometimes led to painful clashes between those who want to conserve our resources and those who earn a living by developing them. More recently, additional conflicts have arisen between different private sector groups which rely on the same declining resources for the economic livelihood. These collisions, referred to as "train wrecks" by some, have pitted conservationists against many workers, property owners and business sectors. As a result, the public debate has been polarized, and the issues oversimplified.

Conflicts that sometimes result from the listing of a single species under ESA can best illustrate the potential for disruption created by conventional natural resource management policies. Most often, as in the case of the Spotted Owl in the Pacific Northwest, after a species has been listed under ESA, there is little room to address the economic and environmental issues at hand. By the time the Spotted Owl had been listed, the situation had reached the crisis stage. The public debate had regressed to "owls vs. jobs" or "the environment vs. the economy." This scenario reveals the painful consequences of reactive approaches to managing our lands and habitat; the listing did not reflect a sudden change in ecological conditions, but was the result of a long-term decline of a species and its natural habitat which could have been mitigated early on.

Problem Statement

On the Great Plains, there are over 300 species of plants and animals that have been identified as candidates for listing under ESA. And relative to other regions of the West, little publicly owned land exists. In Plains states that have inventoried their natural resource areas, the proportion of open space protected under federal, state, and private ownership is roughly 2%. These areas are generally small and isolated from one another, and thus provide insufficient habitat to support native species over the long term. This combination of private land ownership, fragmented habitat, and declining species should be viewed as a challenge to develop collaborative and proactive conservation strategies tailored to meet the needs of people and wildlife alike.

Although it is possible that the residents of the Plains will never experience the degree of economic disruption connected to the decline of a single species that occurred in the Pacific Northwest, ignoring the decline of species opens the door to avoidable conflicts. If a number of those species are listed, the cumulative effect to the Plains' economy may be equally significant.

To head off these crises on the Plains, natural resource policy must broaden its scope, and develop proactive strategies for managing our lands. On the federal, state, and local levels, natural resources and economic development are often managed in complete isolation from one another. To forge efficient and effective strategies, these issues must be addressed together. Only by bringing all of the stakeholders together

will it be possible to understand the complexity of the issues, and develop comprehensive solutions to resolve them.

The economic vitality of rural towns on the Plains is also at risk. Although row crop agriculture and rangelands still define the landscape of the Great Plains, they no longer dominate the region's economy as they have in the past. In many rural areas on the Plains, the sum of other economic activities outweighs that of agriculture. Increased urbanization and declining economic development of rural communities have augmented the economic disparity between metropolitan and rural areas on the Plains. As a result, a growing number of Plains residents, especially young adults, are being pushed out of their rural communities and pulled into metropolitan areas by powerful socioeconomic forces.

Clearly, conservation policies must not exacerbate this trend. Some management practices, like ecotourism, actually have the potential to reverse it by cultivating the appeal of the rich culture and heritage of the Plains. They may give life to the Plains' image among urban Americans and foreign visitors. Too often, the Plains have been thought of as undesirable to visit – a place to fly over, or drive through as quickly as possible.

Historically, the Plains were dominated by tallgrass prairies in the East and shortgrass prairie in the West. These prairies were initially deemed the "Horizontal Yellow" by Native Americans who had the privilege to cast an uninterrupted gaze over them. In the early 19th century, the Plains were briefly known as the "Great American Desert" until water management and favorable cycles in the climate yielded remarkable agricultural productivity. Their rich soils have earned the region a reputation of being the "bread basket of the world."

Photo courtesy of Stock Imagery

The endemic Ferruginous Hawk population is in decline on the Plains. Through a multi-species approach of protecting the habitats of the rodents on which they feed, the hawk would also benefit.

But the Plains' wealth is not limited to its agriculture, history, and culture. Although 90% of the tallgrass prairie has been replaced by agriculture, and the shortgrass prairie has been altered, biologists suggest that the Plains still contain much of what is unique about the biodiversity of the West. Three hundred and thirty of the 435 bird species that breed in the U.S. do so on the Great Plains. The 12 identified as endemic and 20 that evolved primarily on the Plains, plus a host of native plants, invertebrates, fish, amphibians, reptiles, and mammals, are considered especially important to the biotic integrity of the region. In addition, the Plains contribute to the overall biodiversity of the continent by providing critical flyways for migratory birds.

To manage this wealth of ecological resources, new strategies must be less fragmented and less piecemeal than those currently in place. The typical way to protect environmental integrity has been to focus on individual species and local sites without consideration of the larger ecological system. Yet managing for individual environmental characteristics often leads to the detrimental exclusion of others. These narrow focuses also limit the ability of federal, state, and local agencies and landowners to work with the broader array of factors that can lead to a species' decline.

Land managers, landowners, and policymakers have access to new information on the way ecosystems function. Ecologists and biologists have revealed that ecological processes are intertwined across local, state, and international boundaries, as well as jurisdictional boundaries such as those that define the fish and wildlife, water quality, and agriculture agencies on the Great Plains. Because nature does not adapt to these arbitrary lines, it is necessary to develop dynamic models to manage across them holistically. Federal, state and local agencies and landowners will gain by adapting to the bioregions established by nature.

In recent years, the need for a sustainable, ecosystem-based approach has been gaining increased attention among policymakers and resource managers alike. Some say that consideration of innovative, comprehensive strategies signals a paradigm shift in natural resource policy. There exist, however, other problems and challenges that policies must address to create effective models for the sustainable management of ecosystems. They include a lack of commonly understood terminology and, for the Plains, a lack of integrated data and information to guide regional decisionmaking.

The failure to develop commonly understood terminology has created confusion among various groups and individuals who are often pursuing similar goals. For example, to manage across entire Great Plains ecosystems, it is first necessary that all interests understand the ecosystem concept. Many scientists contend that conceptually an ecosystem can range from a rotting acorn to the entire universe. In this context, it is possible to think of the Plains as an ecological unit in and of itself. But to effectively manage the resources of the region and protect habitat, it is necessary to identify specific geographic areas based on distinct environmental characteristics which suit the needs of those who want to understand and improve the landscape.

Other terminology-related problems arise in the attempt to define and understand words like "biodiversity," "sustainability," etc. Use of these terms is ubiquitous, but their meanings often differ. While this issue may seem trivial, it has been a troublesome barrier to communication and the development of common ground.

To develop an effective regional policy to address the decline of native ecosystem integrity of the Great Plains, it is necessary to first compile sound data and information to help identify priority areas. The lack of a comprehensive and understandable set of data has been one of the primary impediments to the proactive management of ecosystems. If train wrecks are to be avoided, land managers must first know what species are in decline, where these trouble spots are, and whether or not there are existing programs that are addressing them.

These problems – the potential for crisis and subsequent polarization of interests, reactive strategies, limited cross-jurisdictional capacity, declining species and habitat, struggling rural communities, few comprehensive regional policies, absence of commonly understood terminology, and limited data and information – can seem

overwhelmingly complicated when considered as a whole. But they must be addressed comprehensively if the modern West is to create better ways to protect its lands, wildlife, and people.

Goals and Objectives

The encompassing goal of the Great Plains Initiative is to promote the health and well-being of the Great Plains by demonstrating that both economic and environmental interests can be served by preventing the decline of species and their ecosystems. The objectives of the Initiative are:

- to encourage cooperation rather than conflict;
- to promote a viable and sustainable economic future compatible with healthy natural resources ;
- to decrease future endangered species listings;
- to enhance certainty and predictability for planning and development for local and state governments, land owners and land users in relation to land use decisions, and;
- to build consensus among residents and managers of Great Plains' resources in designing their own solutions to foreseen challenges to the health of Great Plains ecosystems.

Project Description

The Great Plains Initiative is an experimental program designed to research and develop

The participating Great plains states encompass an area which comprises nearly one third of the entire U.S. continental land mass.

Photo courtesy of the Colorado Historical Society

The Plains are characterized by periodic droughts every 20-30 years. Without the continuance of soil conservation strategies, the Plains will be vulnerable to severe erosion.

management strategies which can be implemented at the state and local level to promote the sustainability of the region's ecosystems and human populations. The participating states encompass an area which comprises nearly one third of the entire U.S. continental land mass. Although the Plains' eastern boundary is not always agreed upon, for GPI, the eastern edge of the Plains originates in the western parts of Minnesota, Iowa, Missouri and the eastern parts of Oklahoma and Texas. The Plains extend westward to the front range of the Rocky Mountains. They reach well into Canada, encompassing the southern regions of the provinces of Alberta, Saskatchewan, and Manitoba, and drop into northern Mexico.

The Great Plains Initiative will not become a large operational program. Rather, it is designed to set new processes in motion and help improve coordination among those already in place. By using the carrot instead of the stick, GPI will guide and empower local actions rather than control them. The "carrot," in this case, will be a range of different management options or incentives which landowners and local agencies may choose to adopt to prevent future regulation.

Its intent is to foster the stewardship of the region by providing local communities and states with the necessary information base, management tools, and institutional linkages to make more integrated, informed, and cost-effective natural resource decisions.

The Initiative is comprised of federal, state and local agencies, tribes, and nongovernmental organizations and landowners. A framework document has been developed to communicate the intent of the Initiative among the different participants. Although the formal structure is still in its formative stages, it is comprised of four basic entities:

- ***GPI Sponsors*** comprised of leaders of involved groups, governments, organizations, and agencies who have the capacity and commitment of their organization to contribute to the success of the Initiative and provide general direction on the Initiative's goals;
- ***A Coordination Group*** comprised of staff representatives and individuals from each entity present in the GPI Sponsors and other individuals or groups who express an interest in and commitment to GPI to provide staff

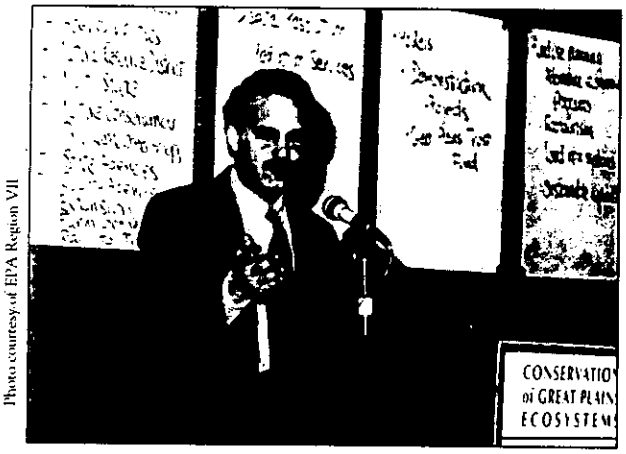


Photo courtesy of EPA Region VII

Rich Harwood, from the Harwood Group speaks at the "Conservation of Great Plains Ecosystems: Current Science Future Options" conference.

support and create opportunities for carrying out the goals of the Initiative, including cooperative projects;

- ***Working Groups*** to work and advise on specific issues such as the development of economic, social and environmental information and data, the development of management options and strategies, and the development of education and outreach materials; and,
- ***Local Demonstration Groups*** comprised of partnerships that include landowners, local government, and representatives of involved agencies and organizations to carry out demonstration projects that exemplify the goals of GPI.

Because GPI is, at the time of this writing, still in the information gathering stage, most of the work groups and all of the demonstration groups have yet to be assembled. The coordination, or working group, meets regularly to assess findings, identify the necessary courses of action, and develop future strategy.

GPI has identified three primary issues on which efforts have focused. They include the loss of native ecosystem integrity, the development of management guidelines for sustainable development, and techniques for working across jurisdictional and interest lines on a bioregion basis. Work to date has followed several primary tracks.

Data Collection

To develop a proactive protection strategy for declining native ecosystem integrity on the Plains, the Initiative has based its initial strategy on the organized and systematic compilation of regional data. This data not only identifies areas headed for problems, but also helps state and federal agencies to make their natural resource decisions from a regional and multi-jurisdictional perspective.

A data work group, led by The Nature Conservancy (TNC), has drawn on state Heritage Inventory data to plot candidate, threatened, and endangered species on a map of the region. Currently, TNC, The Western Governor's Association (WGA) and The U.S. Fish and Wildlife Service (USFWS) are investigating alternative possibilities for mapping habitat, although there are few existing sources which adequately document this declining resource beyond high-profile, localized areas. The most promising sources of information reflecting declining trends on the regional level are likely to be found in federal inventories on migratory and endemic birds. The data work group is currently locating these and other sources of data, which it may tap as different needs arise.

It is important to note that these efforts constitute one phase of a more sophisticated mapping strategy planned for the Plains. GPI intends to assess protection needs more accurately in the region through the application of more advanced mapping methods. GPI is currently evaluating the ways to incorporate "gap analysis" (a process of identifying unprotected areas and species) and more advanced GIS (Geographic Information Systems) mapping.

TNC and WGA have also undertaken an effort to identify approximately 25 of the most ecologically sensitive areas on the Plains. TNC state field offices have collaborated to determine the locations and needs of the trouble spots. As will be discussed below, the Western Governors' Association has analyzed an inventory of current federal and state natural resource projects on the Plains. The areas identified by TNC and WGA offer site-specific opportunities for action through demonstration projects which embody GPI's objectives.

Because GPI is assuming a proactive approach to natural resource management, data must also help to assess future risks to Great Plains'

ecosystems and economies. EPA has begun an effort to develop 'stressor' information to target areas where urban development, pesticides, toxic chemicals, nutrient pollution (agricultural non-point sources), and agricultural development could exacerbate ecological decline. EPA also plans to conduct research on socioeconomic and demographic trends on the Plains which may influence the development of conservation strategies.

Developing Management Options

The U.S. Fish and Wildlife Service, the Province of Manitoba, and WGA have conducted and analyzed questionnaire-based inventories of related projects underway on the Great Plains. A mix of USFWS regional offices, and state and provincial agriculture, parks, natural resources, environment, and wildlife agencies and governors' offices have responded to the surveys. Currently the locations of the identified projects are being mapped.

The purpose of the inventories is twofold. First, the inventories provide GPI with a current (but not exhaustive) directory of specific projects, their location, and their goals. When coupled with the map of the candidate and declining species, the inventory can help match current projects with the ecological needs of the area. These map overlays may also reveal areas of duplicated effort, and/or pinpoint locations in need of preventative actions which may require cross-jurisdictional cooperation.

Second, the inventory has been designed to serve as a research mechanism. WGA has distilled valuable information from which it has begun to develop regional guidelines for ecosystem management and sustainable development. The information includes the common characteristics of successful efforts, productive methods and techniques for management, and potential obstacles. From the projects incorporated in the inventory, GPI can create a list of potential demonstration or prototype projects. The list of projects have similar characteristics (e.g. partnership-based, ecosystem approach, habitat oriented, etc.). They differ in terms of location, size, type of habitat, and stage of development. Within the

The Cheyenne Bottoms wetlands in Kansas provide a stopping ground for thousands of migratory birds each spring and fall.

next several months, the Initiative hopes to form partnerships to test various strategies.

GPI has accumulated and assessed a significant amount of information in addition to the inventories and data. In April, EPA Region VII sponsored a conference in Kansas City, MO entitled *Conservation of Great Plains Ecosystems: Current Science, Future Options*. The conference brought scientists from across the Plains together with all levels of stakeholders to share current social, economic, and ecological information on the Plains, and develop solutions to problems in the region.

The symposium's findings are too extensive to list in detail for the purposes of this case study. But, among the most useful outcomes were: a map which breaks the plains into bioregions or ecosystems based on vegetative cover; information on the status of these different ecosystems; socioeconomic information on agriculture, demographic trends, and the Plains' economy; studies of endemic species and habitats; implications of potential changes to the Farm Bill; and technical information on management practices, landscape conservation, aquatic systems, etc.

Expanding the Information Base and Developing a Communications Strategy

Besides initiating several pilot projects, GPI will pursue two other key tasks in the upcoming months – expanding the information base on emerging management tools and developing a communications strategy. By defining and assessing the applicability of existing and emerging management strategies such as restoration, riparian management, mitigation banking, land acquisition, conservation easements, incentive programs, transferable development rights, and habitat conservation plans, GPI will develop a useful toolbox. This toolbox will help local land managers, landowners, organizations, and agencies incorporate the appropriate techniques to meet their goals.

The objectives of the communications strategy will be to expand the participating partners, craft a public involvement plan for local governments and landowners, develop public involvement materials, and strengthen GPI's internal communications.

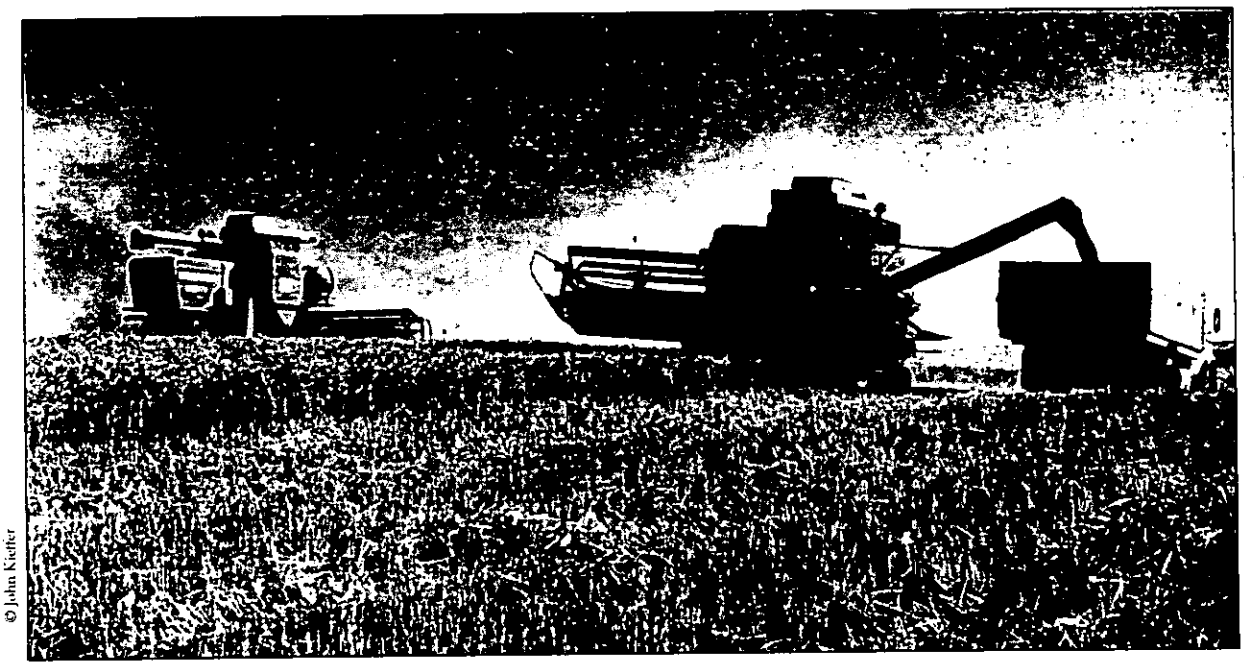
History

When Mike Hayden was Governor of Kansas, the state, federal government, and private conservation organizations agreed to invest $18,000,000 in the long-term restoration of a critical wetlands area known as Cheyenne Bottoms. In peak seasons, the Bottoms' rich and nutritious habitat teems with 320 species of birds, five of which are endangered. The area is one of North America's most important staging grounds for the migratory shorebirds which cross the continent annually via the central flyway.

As the renovation project began, Governor Hayden understood that the Bottoms was only one element in a bigger ecological system. He was concerned that if other states, Canadian provinces, and Mexican states didn't also protect their parts of the flyway, the restoration of the Bottoms alone would not be sufficient to protect the migratory birds. He asked WGA to serve as a convener of relevant parties to assess the ecological health of the entire flyway, and develop a proactive strategy to protect it.

In a speech delivered at the Western Governors' Association annual meeting in June, 1991, Mike Hayden, by then Assistant Secretary of Interior for Fish Wildlife and Parks, challenged WGA to develop a blueprint for ecosystem-wide natural resource management on an international scale for the flyway. From the outset, the project was designed to make sure that economic and social issues are linked to natural resource strategies in the West. In a follow-up meeting in Winnipeg, WGA staff and provincial, Mexican, territorial, federal and state representatives met to explore different methods for international cooperation. Assistant Secretary Hayden soon pledged support for the Initiative, providing the resources and biological expertise from the U.S. Fish and Wildlife Service.

The western governors officially embraced the project in June, 1992, and Governor Mike Sullivan of Wyoming agreed to become the lead governor for the initiative.



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Wheat harvest on eastern Colorado's plains.

The Nature Conservancy (TNC), the International Association of Fish and Wildlife Agencies, and the Environmental Protection Agency added their support for the project. Since then, the Initiative has gained the participation of a number of other groups and agencies including the Soil Conservation Service, the Army Corps of Engineers, the National Park Service, the Forest Service, the Bureau of Land Management, the Bureau of Reclamation, the National Association of Conservation Districts, Great Plains Agricultural Council, and the National Cattleman's Association. GPI has met several times with representatives from the Mexican and Canadian border states to explore methods for international cooperation.

To date, the history of the Great Plains Initiative can best be described as an experimental program of inquiry and adaptation. Many of the initial meetings were productive brainstorming sessions geared to expose all of the pertinent ecological, economic, and social issues. For example, an initial scientific brainstorming meeting identified the trends of concern on the Plains which provided a general direction and strategy for the data group's efforts and, in part, the EPA sponsored science conference. A meeting with numerous agricultural organizations generated ideas on ways to include agricultural interests on the Plains. The different issues and ideas which emerged from these early brainstorming meetings forced GPI to address the bigger and more challenging issues comprehensively. GPI responded by broadening its scope rather than falling back on easier, more limited approaches.

As GPI developed and revised its framework document to communicate the intent of the Great Plains Initiative, it was also undergoing a process of self-invention. As drafts evolved, they reflected an Initiative which, in its efforts to confront all of the issues as a whole, was forging an innovative blueprint. The Sponsors are now poised to test its strategies.

Challenges and Opportunities

Many of the obstacles and challenges GPI is facing in developing new ways to resolve economic and ecological problems on the Plains have been discussed in the previous sections of this chapter. Yet there are several which merit more attention:

Limited Models

The first of these challenges was the limited number of models for state-led, wide-range

ecosystem management. While the North American Waterfowl Management Plan and the Partners in Flight project are excellent examples of partnership projects in proactive habitat protection across large regions, they are geared toward protection of a limited set of species and their needs. The Initiative will complement these programs by comprehensively addressing the health of natural communities, the issues and agencies which must be a part of solutions, and broadening all aspects of problem prevention on the Plains.

The Multi-Agency, Cross Jurisdictional Approach

To address the complexity of the issues involved in ecosystem management and sustainability in a region as large as the Great Plains, it is necessary that a cross-section of governments, agencies, organizations, landowners, and other stakeholders engage in the development of workable strategies. Most policymakers, land managers and other interests enthusiastically endorse this multidisciplinary approach. However, because GPI is somewhat of a break from the past for many, there are a number of challenges to confront.

One of these challenges was to bring together a host of diverse entities with different mandates, perspectives, and political traditions to work on a related set of issues through a mutually accepted course of action. Through the partnership that has developed, GPI has been able to take advantage of a broad spectrum of strengths and abilities, and has benefited from the array of insights provided by the different participants. For example, The Nature Conservancy has made an integral contribution to the Initiative through its mapping ability. EPA and the USFWS have committed significant resources and organizational and biological expertise. The International Association of Fish and Wildlife Agencies has provided valuable strategy insights. Agricultural and landowner organizations helped GPI to understand the issues from the landowner perspective. Without forums like GPI, these different perspectives and capabilities could remain isolated from one another.

International Cooperation

While GPI has explored new avenues for international cooperation in wildlife and habitat protection, the Initiative still faces a number of challenges. These include overcoming cultural and language barriers to sharing information across borders, understanding each other's decisionmaking systems, setting international goals and priorities, and strengthening subnational relations.

Funding

An obvious future challenge to the development and implementation of the goals of GPI is funding. On the state level, it may be politically difficult for states to justify future spending on projects that cross their borders, even though GPI may suggest how and where states can spend their natural resource dollars within their own boundaries to the benefit of the entire region. However, the WGA state questionnaires have shown that every Plains state is involved in ecosystem management, suggesting an opportunity for multistate cooperation.

Another funding challenge relates to the way in which states have traditionally allocated their natural resource funds. Because most fish and wildlife revenues come from the sale of hunting and fishing licenses, states may be limited in their ability to fund the management of nongame species. Also, developing proac-tive strategies to protect declining, rather than already threatened and endangered species which often have a charismatic appeal, may require states to spend funds where they have not in the past. This approach, however, can provide a more sensible and cost- effective way to manage our lands.

Landowner Hesitation

In the WGA questionnaire, state agencies identified another challenge to ecosystem management on the Plains–the reluctance of some landowners to embrace the objectives of GPI. Compared to the public land states farther west, there are few locations where privately owned lands do not play a major role in natural resource projects.

Because the recent public debate has been, at times, polarized on natural resource issues, and

words like environment, ecosystem, and biodiversity, etc., have become stigmatized among some, it is possible that some landowners will be uncertain about adopting the management strategies advocated by GPI, even if they do make good financial sense. Due to the involvement of a number of farmers, ranchers, and their organizations, GPI understands and respects this hesitation. The Initiative also recognizes that there is more common ground between conservationists and landowners than ever before.

Most landowners want to act in an ecologically sensitive manner but they also need to make a living. While protecting wildlife and habitat is often seen to benefit the interest of the public, it often does not provide economic benefits to the farmer or rancher. To address the challenge, GPI must continue to both solicit landowner support and find ways to help them benefit. GPI provides an opportunity to demonstrate that large tracts of privately-owned lands, when accompanied by carefully examined management practices, can serve as conservation areas while yielding economic gain for landowners. Many ranchers and farmers on the Plains remind us that, as a group, they were among the first conservationists in the U.S.

Proposed Evaluation

The Great Plains Initiative draws on the wisdom of the old adage *"an ounce of prevention is worth a pound of cure."* In part, the Initiative is a response to environmental and economic clashes elsewhere in the West and the potential for them to occur on the Plains. It reflects a general perception that environmental crises must be avoided and a sense of optimism for the future of the Great Plains. Yet, as a result of GPI's proactive approach, a degree of difficulty arises in the attempt to quantify success. For if the ultimate success is averting "train wrecks," how can one begin to measure the avoided economic disruption?

There are a number of yardsticks however, by which the Initiative may gauge its success. These potential yardsticks can be described in two categories, internal and external, and could be evaluated on both the regional and local levels.

GPI may evaluate its performance success by:

- examining the ability to maintain cross-jurisdictional agreement to work toward mutually accepted goals;
- surveying the effectiveness of the compiled data and its application in addressing regional environmental, social, and economic issues;
- assessing the institutional effectiveness in cooperating, avoiding duplication, and filling gaps; and,
- monitoring the efficiency of resource uses.

The initiative may gauge its external performance by:

- evaluating the ability to obtain local commitment geared towards species in decline, diminishing habitats, and communities on a project-by-project basis;
- monitoring local receptivity and application of new information including data and management techniques; and,
- tracking the growth of pilot and demonstration projects, local initiatives, and future demonstration projects aligned with GPI.

Along with these potential yardsticks, participants may also evaluate other tangential benefits derived from GPI.

Advice

The Great Plains Initiative has the potential to serve as a model for other ecosystem-wide natural resource programs in the West and throughout the U.S. At this developmental stage, GPI must be prudent in offering solutions – for the blueprint has not been entirely tested. However, GPI has developed a foundation which can provide valuable insights for policymakers considering similar initiatives. The following lessons can provide the foundation for action, and are part of a sequential process toward success:

- Identify and welcome the participation of any stakeholder who has an interest in the identified region, and the capacity to make a substantive contribution to the project.
- Maintain institutional flexibility; projects should be able to embrace and adapt to unforeseen issues introduced by new partners.

- Draw on both the collective strength of the partnership, and the unique abilities of individual partners.
- Articulate and document mutually accepted common goals and objectives clearly and concisely while at the same time accommodating partners' other individual objectives. This process will help to build a true sense of collaboration among different participants.
- Recognize the fact that all participants will not be able to attend every meeting but should be kept in the informational loop through a regular newsletter or information update.
- Decide from the onset that the determining factor in identifying on-the-ground projects should be supported by data rather than opinion. This can create consensus and prevent future disagreements based on differing opinions.
- Solicit landowner contributions to strategy development to develop effective ways to protect ecosystems across private lands.
- Develop useful and commonly understood terminology that is meaningful to all interests.
- Recognize the successes as well as the shortcomings of past approaches and ongoing efforts.

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Addressing the Abandoned Mine Waste Problem: A Blueprint for State Action

by Fred Banta and Joe Danni with general oversight provided by Gary Broetzman

Introduction

Purpose

The purpose of this Blueprint is to provide decisionmakers with examples of the essential elements of a state-based program to clean up inactive and abandoned noncoal mine sites. The Blueprint identifies the significant issues, presents program ideas and principles and provides examples, where possible, to illustrate how those ideas and principles could be put into practice. This Blueprint is not intended to be an exhaustive examination of the issue with a list of specific recommendations; rather it is intended to be a catalyst to stimulate discussion, to generate more ideas and to provide a starting point for individual states to develop or further refine their IAM programs.

Background

Mining has had a profound effect upon America and the West. It helped significantly to build the economies of the western states from the early 1800s through the present day. The minerals recovered from western lands have been used to support virtually every facet of American life. Duane Smith captured the essence of this great effort:

> *"Mining contributed mightily to accelerating American growth, to underwriting American industrialization, to shaping the American economy, and to creating modern America, a twentieth century world power. As hardly insignificant side effects, the industry helped to open and settle the West, promoted urbanization, and fulfilled the American dream of opportunity and a better life for hundreds of thousands of people."*
>
> — Duane A. Smith, *Mining American – the Industry and the Environment.*

Unfortunately, another legacy of that great effort is the degraded environment that was left behind. Hills and valleys were deforested to support the mining and milling operations, waste rock and low grade ore were left on the hillsides barren and exposed to the elements, and rivers and streams were altered and the water polluted from the mining operations and their remnants. Hundreds of miles of streams and thousands of acres of land remain today in an unreclaimed condition in the West from more than a century of mining (WGA *Scoping Report*, 1991).

The western states and its mining industry have responded, in part, by learning how to reclaim land disturbed by modern mining operations and by establishing reclamation laws requiring that reclamation take place. What has not been fully addressed is the cleanup and reclamation of thousands of inactive and abandoned mine sites, which continue to be a source of environmental degradation. The effort necessary to clean up and reclaim these sites is the subject of this Blueprint.

A few clarifications are necessary to understand some of the concepts and terms in this

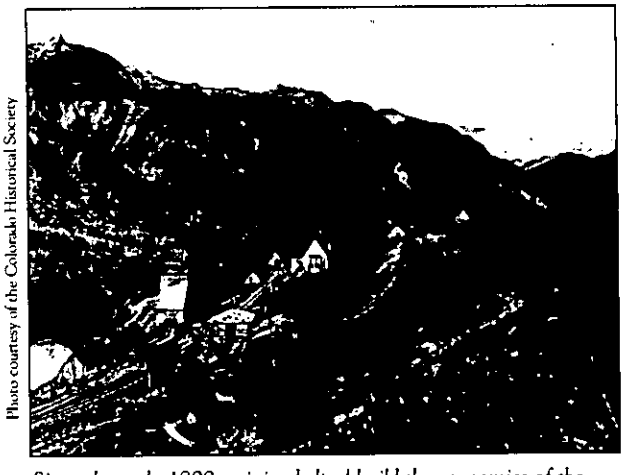

Photo courtesy of the Colorado Historical Society

Since the early 1800s mining helped build the economies of the western states and foster the development of the entire nation.

Blueprint. First, why use of the term "inactive and abandoned mines" (IAM)? Many old mine sites still have mineral value, but remain in a degraded condition. The ability to recover those remaining minerals is dependent upon technology and the economy. The potential for future mining of those sites is acknowledged through the use of the term "inactive." Abandoned sites are those that have been explored with no ore body defined, or that have been fully exploited with no future mining potential. Abandoned sites have been left unreclaimed, and the owner is unable to manage the site or is not known.

Second, this Blueprint only addresses noncoal mines. The cleanup and reclamation of coal mines has been the target of an aggressive Abandoned Mined Land (AML) program established under the federal Surface Mining Control and Reclamation Act (SMCRA). References will be made to this program in the Blueprint as it relates to efforts or influences thinking regarding the cleanup and reclamation of noncoal inactive and abandoned mines.

It should be noted that SMCRA provides that coal mining states can use their share of the AML program revenue to safeguard and eliminate hazards at noncoal mine sites. Use of the revenue for this purpose began in the early 1980s. The effort resulted in a wider recognition of the problems associated with western noncoal sites. However, because SMCRA AML monies were initially restricted to safeguarding and hazard reduction, the environmental problems associated with noncoal sites were not corrected under this program. Recent amendments to SMCRA allow some coal mining states to use AML monies for hardrock mine cleanup and reclamation. However, it must be emphasized that only coal producing states benefit from the AML program. States that do not produce coal, yet have had extensive mining of other minerals, do not receive AML monies.

Since no comprehensive national program exists for correcting environmental problems caused by abandoned noncoal mines, ad hoc efforts began in the early 1980s to clean up and reclaim these sites. These efforts have used both public and private resources. Today there are several collaborative efforts directed at reclaiming noncoal mines. It is an important element in addressing difficult policy issues. Collaboration requires initiative, ingenuity, and creativity that can be stifled under large bureaucratic programs. Project managers are skilled at bringing together different private and public sector interests to plan and complete a project. These skills have been developed in the West, and continuation of the collaborative spirit is a principle theme supporting this Blueprint while recognizing a need for a more comprehensive approach.

The IAM Blueprint

The IAM blueprint would provide for effective cleanup by including the following elements:

- Establish an institutional structure which provides collaborative participation of all key interests and program accountability:
  - Projects are initiated at the state and local levels
  - Memoranda of Understanding among all participating state and federal agencies and public and private interests
  - A citizens board to oversee program development, prioritization of areas, and distribution of IAM funds
  - A lead state agency selected to administer the program with public or private sector project managers elected on a project by project basis as provided in the MOUs
- Establish overall program policies and goals and develop a system for identifying, ranking, and selecting geographic priority areas.
- Create a dedicated IAM funding mechanism (federal IAM funds, if available), private sector incentives, and partnerships to complement prevailing regulatory and remedial programs for comprehensive IAM cleanup. Sites eligible for IAM funding support are those with no continuing regulatory responsibility.
- Develop a statewide inventory of IAM problems and needs. Where federal funding is involved, conduct such inventory consistent with national criteria.
- Formulate overall criteria or methodology for area-specific analyses utilizing public involvement for setting cleanup goals, compiling

baseline information, identifying remedial actions, and integrating with cleanup actions for other sources of contamination.

- Establish administrative procedures for effectively managing the program, for implementing timely cleanup activities, and for conducting follow-up performance evaluations and any maintenance.
- Establish incentives related to such topics as reducing CERCLA liability to maximize the potential for public and private sector involvement.

Partnership and Stakeholder Involvement

"The utilization of a collaborative approach is critical. In my opinion, the absence of this is what has doomed Superfund as an effective program, and is threatening the Endangered Species Act with failure. The disenfranchised tend to be surly and unresponsive partners."

— R.K. Urnovitz of the Oregon Mining Council

A principal tenet of the IAM Blueprint recognizes the absolute necessity of involving all interested and affected constituent groups. Consensus-building involvement must be early, consistent over time, and provide the opportunity to discuss and implement creative solutions. Individuals or organizations with a stake in IAMs must be involved in the design and policy stages or they will be reluctant participants or adversaries in the implementation stage. Public involvement requires that traditional adversaries be willing to experiment with, if not adopt, some non-traditional ways of dealing with one another.

"Reformers have built their movement on the twin pillars of aggressive advocacy (lobbying) and litigation. This dual track pursuit of their objectives has resulted in polarization; often the alienation of affected local parties, and the isolation of corporate America. There is another way ... and that is a proactive investment strategy geared to partnering the public sector - federal and state agencies - with the private sector conservation groups and corporate America."

— Amos S. Eno, Executive Director
National Fish and Wildlife Foundation
Oct. 30, 1992 speech

An example of such a cooperative, partnership approach to address IAMs is the Big Blackfoot project. This watershed in Montana, the location of Norman McLean's novel *A River Runs Through It*, is the site of a cleanup effort where the Fish and Wildlife Foundation *"has arranged $200,000 of two-to-one matching funds..."* The Orvis Company *"has committed to raising up to $50,000 from its company, its directors, and its customers"* and both organizations are building on the partnership effort between federal and state agencies, foundations, corporations, private businesses, and individual contributors. (Autumn 1992 – *Trout Unlimited*)

Public involvement is inclusive. The appropriate federal, state, and local government agencies are "at the table" with mining industry and public interest groups.

At the state level, public involvement is a feature of each phase of crafting a solution – program development, prioritization and project selection, and site specific implementation.

An example of public involvement in program development is recently passed legislation in South Dakota. A 1993 session bill will create an "abandoned mined lands advisory committee" comprised of representatives from the Department of Environment and Natural Resources, South Dakota School of Mines, State Historical Preservation Center, mining industry, environmental groups, federal government (likely the U.S. Forest Service), and "citizens at large."

The input of the Colorado Inactive Mine Reclamation Program Advisory Council has helped set priorities and has been an integral feature of project review for the state IAM program since 1982. Like the South Dakota proposal, a cross-section of constituency groups comprise the Council including federal agencies, state agencies, local agencies, environmental groups, universities, local interest groups, and the mining community.

Federal and state agencies, private companies, and individuals have also been essential to successful site-specific activities. The 1992 *Report on Clean Water Act* (CWA) Section 319 Activities, prepared by the Colorado Water Quality Control Division of the Department of Health contains many references to public and

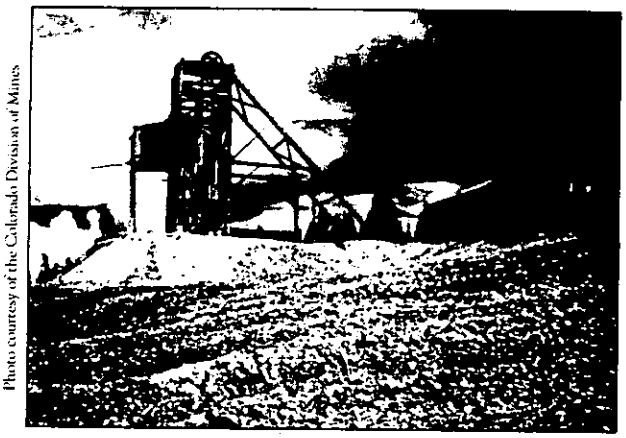

Photo courtesy of the Colorado Division of Mines

Future restoration and/or remining of inactive sites depends on resolving liability, technology, and economic issues among others.

agency involvement in IAM cleanup activities. For example, the Chalk Creek/St. Elmo project involved 12 participating agencies that provided funding, consulting services, materials, equipment, revegetation services and citizen volunteers to move, reshape, cap, and revegetate IAM waste piles and plant sedges and other wetland vegetation to stabilize the site and create riparian habitat. The Animas River project is located in *"one of Colorado's most severely impacted river basins"* and, in addition to the Colorado Division of Minerals and Geology and the Colorado Water Quality Control Division, it involves 11 field crews including teams from the Bureau of Reclamation, Bureau of Land Management, Bureau of Mines, U.S. Forest Service, Sunnyside, Homestake and Solution Gold mining companies, and the Colorado Division of Wildlife. (*Annual Report*, Section 319 Activities FY92- Colorado Department of Health).

Public participation or partnerships in designing and implementing IAM remedies implies the opportunity for equal input and involvement from all members. However, it is necessary that one agency or one individual within an agency assume a leadership or "champion" role. Even the most well-crafted IAM state program will struggle unless the "right people" or individual is given responsibility for the program. A credible, respected and committed leader is a required component of an IAM program. Furthermore, that individual must be given the latitude to lead the development of creative programs through public involvement and should be rewarded if the programs are successful.

Policy Issues

Liability

"We will do no more old mine rehabilitation until liability issues are resolved."

— William Crooks, Executive Director
California Central Valley Regional
Water Quality Control Board

Regardless of the initiative and commitment to develop partnerships and involve stakeholders, some institutional barriers need to be addressed. This is discussed further in the following section.

The Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) is considered an impediment to abandoned mine reclamation activities by many.

In the mid-1980s government agencies and private parties became concerned about the liabilities they could incur under CERCLA if they participated in the reclamation and cleanup of even a small portion of an IAM site. This fear stifled government and private initiatives to clean up sites and discouraged mining companies from purchasing old sites.

The liability issue does not involve those that already own a property and wish to clean up, reclaim, or remine. Due to ownership, those property owners already have a responsibility and liability. Liability is a significant concern for third parties that wish to participate in an IAM site either because there is a potential for economic gain or an opportunity to improve the quality of the environment. These third parties do not want to become involved if it means accepting CERCLA liability. As an example, liability controversy over the abandoned Penn Mine in Calaveras County, California, led the Regional Water Quality Control Board to return to state coffers $1 million earmarked for preliminary remediation at the site.

The recent Memorandum of Understanding (MOU) between the Environmental Protection Agency (EPA) and the state of Colorado may be

a breakthrough. Although the MOU pertains only to cleanups under Section 319 of the CWA, EPA strongly implies that similar agreements between EPA and the states could be reached. In general terms, the MOU specifies that its purpose is "*to implement a procedure by which the state and its agents would receive protection from liability pursuant to the CERCLA ... while engaged in cleanup of abandoned or inactive mines under Section 319 of the CWA.*[1]"

"No such agreement has been produced in the nation before now. This MOU has generated considerable interest in states that have water quality problems stemming from inactive mine sites. The MOU will encourage participation in inactive mine site remediation by industry, local government, and volunteers through a program that builds partnerships and public ownership of solutions, free from confrontation and litigation."

— Karen Hamilton,
EPA Region 8 Water Division

Congress has recognized, to some degree, the stifling effect of CERCLA and amended SMCRA to remove some liability concerns from states' efforts to reclaim abandoned coal mine lands.

"No State shall be liable under any provision of Federal law for any costs or damages as a result of action taken or omitted in the course of carrying out State abandoned mine reclamation plan approved under this section."

— Surface Mining Act [405(1)]
added by PL 100-71

This language is a start, but it does not apply to private sector initiatives. Similar but expanded language pertaining to the issue of liability is found in proposed 1993 federal legislation (S.257 and H.R. 322) to reform the hardrock 1872 Mining Law. Both pending bills assert that "*no State, or a contractor for such state engaged in approved reclamation work under this subtitle, ... shall be liable under any provision of Federal law for any costs or damages as a result of action taken or omitted in the course of carrying out an approved State abandoned minerals mine reclamation program under this section.*" Regardless of the eventual fate of this legislation, the effort to address IAM site cleanup liability in this or a similar fashion should be preserved and perhaps expanded to explicitly include private parties conducting cleanup under approved state programs.

CERCLA liability is "*the single most important obstacle*" to remining. (Gold Fields and AMAX comments on EPA's Strawman II for regulating mines under the Resource Conservation and Recovery Act).

As a practical matter, remining of an inactive site will not occur unless:

- Liability is based upon defined responsibility
- There is economic value in the old wastes
- The technology exists to extract those values
- Environmental improvement is accomplished

An example of an effort that appears to have addressed the preceding issues is Solution Gold Ltd.'s treatment of old mining waste material as "remining and environmental restoration." The operator of the Solution Gold project, which treats waste that remains from historic mining operations in an area near Central City, Colorado, sought and obtained approval for an existing mine site to serve as an "off-site repository for Superfund mining waste." The concept is to treat CERCLA mine waste materials in the same manner as old dumps and mill tailings in the immediate area.

In January 1993, Solution Gold was granted conditional approval by the EPA to receive "*non-CERCLA geologic material excavated from building foundations or from the removal of dumps and mill tailings as part of an excavation or building permit issued by local government.*" Conditional approval was granted for the receipt of CERCLA site material. Affected state agencies developed a MOU with respect to the management and disposal of mining related wastes. "EPA *viewed the off-site repository activity as closely related to the operation of a Subtitle D landfill for industrial waste. In order to get approval to receive Superfund mining waste, the Subtitle D requirements became the criteria for construction*" of facilities.[2]

The Solution Gold example would seem to indicate that remining only occurs under rare circumstances and with a great deal of perseverance and risk taking on the part of the developer. There is little reliable quantitative data available about the nature and extent of abandoned sites that could be environmentally and economically

remediated by remining. Many historic, abandoned sites are small and scattered with limited economic potential. Large sites are often already included in the list of CERCLA sites. In other words, there may not be that many properties that can be economically remined even with incentives unless there are sufficient new reserves in the immediate area to justify incorporation of old sites into a 'new' mine.

Liability is typically considered when new reserves are developed in the vicinity of old sites. For example, the Robinson Project of Magma Nevada Mining Company involves significant remining activities but it was permitted by the State of Nevada as any other *"normal mining operation."* A Magma publication said:

"... operations will also result in the reclamation of surface disturbances on both public and private land that otherwise would not be subject to state or federal requirements. Magma will utilize waste rock dumps and other surface disturbances ... abandoned prior to the effective date of Nevada reclamation law, thus triggering reclamation under state regulations."

The August 1991, Western Governors' Association (WGA) study of *Inactive and Abandoned Noncoal Mines* suggested several incentives for remining. In addition to CERCLA liability exemptions, the report identified CWA variances, bonding incentives, tax incentives, preferential purchasing of remined minerals, and priority permitting assistance. All of these incentives are impeded in implementation by what the authors of *Incentives to Encourage Re-Mining and Reclamation of Abandoned Mined Lands In Appalachia: Policy Options* characterize as a *"general lack of trust among the essential parties (making) it difficult to achieve consensus and agreement."*

They expand the issue by asserting that:

"the origins of the mistrust have very little to do with the remining issue. Environmental interests demand iron-clad legislation with a strong federal presence. Lack of trust makes it difficult to develop a mutually acceptable, site-by-site decision mechanism for evaluating 'trade offs.'"

While the authors are referring to remining activities for coal, the same attitude hurdles can be found in addressing any remining activity.

Even though a significant lack of trust impedes developing remining options, it does not preclude it entirely. Early public involvement and a committed and fair facilitator or facilitating agency could provide the primary recourse.

Cleanup And Reclamation Objectives

Another issue that arises from liability considerations is whether regulatory standards should be applied to the cleanup and reclamation of IAMs. This is particularly critical when the private sector is involved. Under this Blueprint, acceptable levels for physical and chemical site parameters are determined by the reclamation objective and cleanup goal for the geographic area. This may be driven by the classified use for the geographic area (e.g., surface or ground water basins), but should be tempered by technical and economic considerations.

Cleanup and reclamation objectives become an issue if the site is to be remined or redeveloped for another land use by a private party. The question is whether the property has to be reclaimed to meet the regulatory standard. If the government cleans up the site, it may not be required to meet the regulatory standard. However, a private sector project site could be remined, but application of the prevailing quality standards could make it uneconomical. For such cases, an alternate reclamation standard should be established.

Pennsylvania provides an example for the establishment of an alternative standard for remining under the state clean water program.

In Pennsylvania, an attainable water quality standard for remining an abandoned coal mine can be established through a "best professional judgement process." The numeric standard is determined through a series of steps, which evaluate the technical and economic viability of achieving different qualities of effluent.

This process was established only for coal mines through amendments to the CWA. This Blueprint recommends a similar process to encourage practical cleanup goals and private sector participation. The process for establishing cleanup and reclamation objectives should be the same whether it is a government or private-initiated project.

Program Elements

Geographic Area

One of the Western Governors' Environmental Policy Council principles is to take an ecosystem approach to solving environmental problems. To embrace this principle, this Blueprint describes a geographic approach to the cleanup and reclamation for IAMs. IAMs are viewed as a feature and possible source of pollution within a watershed, airshed, or other appropriate geographical area. The geographic approach requires that the area is assessed for environmental quality and cleanup and reclamation objectives are established. The IAM is assessed and its contribution to the degradation to the geographic area is determined. An IAM that is a significant source of environmental degradation in the defined area is given a higher priority for cleanup than an IAM in another area that is not as degraded. An IAM program is viewed as one piece of the overall cleanup of the geographic area; albeit it may be the major or only piece in some areas.

This approach recognizes that two or more IAMs with similar site characteristics could be ranked differently for cleanup priority based upon the sites' impacts on the environmental quality of their defined areas.

Defining the geographic area is a regional or local concern. For example, in Colorado it may be appropriate to define the problem on a watershed basis, but in a dryer climates, such as Arizona and Nevada, the concern with groundwater may warrant defining the problem on the basis of groundwater basins.

This approach requires a program mechanism for the following:

- Identification of the geographical area.
- Characterization of the environmental quality within a geographical area. Some IAM funds would be necessary to assist in the characterization.
- Identification of all sources of pollution contributing to the degradation of the geographic area.
- Characterization of the pollution loading from those sources.
- Determination of the methods and costs of controlling pollution for the sources.
- Identification of private and public programs and funds available for the cleanup of the geographic area.
- Determination of the benefit derived from cleanup of IAM within the geographic area.
- Establishment of a decisionmaking body responsible for the authorizing funds for the cleanup of IAM(s) within the geographic area. This might include defining the conditions to be met to make funds available.

The cleanup of Colorado's Upper Arkansas River is an example of using a geographic approach to resolve an environmental problem. In this case the state, local, and federal governments teamed to evaluate the Upper Arkansas watershed and identify the sources of water quality degradation. The agencies involved included the Colorado Department of Natural Resources, Colorado Division of Wildlife, the Colorado Inactive Mines Program, the Colorado Department of Health, the Bureau of Reclamation, EPA, the United States Geological Survey and the United States Fish and Wildlife Service.

It had been generally recognized that the water quality of the Upper Arkansas had been degraded over many decades. The interested agencies met to discuss a large cleanup initiative. A MOU was developed and executed and the scope of the area to be addressed was agreed upon. The major sources of pollution were identified and projects necessary for cleanup are now being developed.

The Upper Arkansas case also illustrates the complexity of environmental problems. Correction of the water quality problems from decades of pollution requires more than just shutting off the source from IAMs. Several years or decades may be necessary for the chemistry of the stream to recover. This underscores the necessity for the assessment of all pollution sources in defined geographical areas rather than just IAM sites.

This approach is implicitly an inventory based on geographic areas. The IAM inventory would be a sub-set. This approach helps establish priorities for cleaning up specific geographic areas. Areas that rank higher based upon environmental

quality and risk factors would be a higher priority for cleanup. From the perspective of the IAM program, consideration would be given to funding IAM cleanup at the higher priority area first. This would be based upon the judgement of the decisionmakers and underscores the need for flexibility in determining priorities.

Eligibility

For this Blueprint, eligible sites for IAM funds are noncoal sites that have been abandoned or left in an inadequate reclamation condition prior to the date of enactment of reclamation laws. For non-federal IAM programs, this can be established on a state-by-state basis. The eligibility cutoff date would be different for each state because some states passed reclamation laws in the early 1970s, whereas others have yet to pass them. Also, funds for the program can be generated (on a state-by-state basis) from mineral commodities that are recognized as a principal source of environmental degradation. Ownership is also a criterion for eligibility.

Florida is a case in point. Florida has established the Non-mandatory Land Reclamation Trust Fund (NLRTF). Eligible lands are phosphate mines left in an unreclaimed condition prior to 1975. Florida limited eligibility to the phosphate sector because phosphate mines were the most problematic. Under the Florida program, only owners of the land are eligible to request reimbursement for reclamation planning and obtain funds for construction. On a state-by-state basis it may be possible to establish funds for defined mining sectors.

Where federal IAM funds become involved, eligibility is a more difficult issue. First, dates of eligibility become important. Under the definition above, some states would have eligible only those sites which were mined prior to the enactment of a state noncoal reclamation law. In states such as Montana, Colorado, and Wyoming, these would be sites mined prior to the early to mid-1970s. In states such as Nevada, New Mexico, Arizona, Idaho, and California, the sites eligible would be those mined and abandoned in the 1980s and 1990s.

Second, under a federal IAM fund, the list of mineral commodities eligible for funds is greatly expanded. The basis for fund eligibility cannot be based upon any single commodity, as in the case of the coal AML or Florida's NLRTF, but must be based upon environmental degradation associated with any noncoal mining operation.

Third, the location of lands eligible is important. If the funding source is from those mines and states subject to the 1872 Mining Law, then only states in which those mines are located should be eligible for IAM funds.

For this Blueprint, an eligible operation for federal funding would be a noncoal site:

- mined prior to the date of inspection,
- without continuing responsibility under state or federal reclamation laws, and
- in a state where land was mined under the 1872 Mining Law, if the source of funding is from fees and royalties collected under that Law.

Whether the site has continued industrial (could be remined) or commercial (could be a casino site) value would not affect eligibility, but would be an issue to be addressed in putting together the project plan. Where there is private sector interest in a site, public funds could provide the reclamation seed money to allow the private sector initiative to move forward.

Inventory

It has been well established that a large number of IAMs exist and that these sites have degraded and continue to degrade the environment (see WGA Report, 1990). An inventory is an assessment tool used to characterize the IAM sites and to provide the necessary baseline for decisionmaking.

The objectives of an inventory include:

- statewide application and acceptance,
- characterizing the source of pollution (both physically and chemically), its toxicity and the risk to human populations and the environment,
- characterizing the area impacted, i.e. stream miles, acres of disturbed land, etc.,
- characterizing the nature of safety risks, i.e. unstable structures, open holes, unstable highwalls and waste piles, etc.,
- preliminary identification of technical solutions, and

- preliminary estimates of the cost of reclamation.

Several noncoal IAM site inventories are being conducted at the present time at both the federal and state level. The inventories are not standardized. At the federal level, the Bureau of Land Management (BLM), U.S. Forest Service (USFS), and the National Park Service (NPS) are the primary agencies conducting inventories. EPA and the Bureau of Mines also have IAMs or related inventories. The WGA *Scoping Report* (1991) describes the efforts of several states to inventory IAMs.

Inventories are more accurate when technology is effectively used to obtain basic data. States have used fixed-wing aerial photography and other remote sensing technology to collect data from these sites in a cost-effective manner.

The development of a national inventory of inactive and abandoned mines is a controversial issue. The inventory process used for abandoned coal mines by the federal Office of Surface Mining, Reclamation and Enforcement has been strongly criticized for excessive expenditures to collect data, for delaying the reclamation of sites, and for its use as a basis to apportion funds among the states. Western states have been opposed to the use of the inventory as a basis for apportioning funds, and have cautioned against an elaborate national inventory system which focuses resources upon data collection rather than site cleanup. Nonetheless, if an inventory serves a funding purpose, then several significant issues must be resolved regarding the selection of data elements to characterize the site, use of quality control to assure comparability between the state and federal inventories, and how to best use the existing inventories. Development of a national inventory should not delay the cleanup of sites that have already been identified as a priority.

Two steps are necessary to prepare an inventory. First, a national effort needs to be initiated to establish the data elements that will be used to characterize a site. Any new inventories initiated would need to use those data elements. Second, a thorough review of the existing inventories needs to be conducted to assess them in terms of data quality, accuracy, and comparability. The use of similar data collection methods and technology improves the comparability of data from state to state and is essential to make the national inventory process productive. The WGA *Scoping Report* (1991) discusses this issue at length.

Funding

"It is not yet evident, either, whether the government, most likely the federal one, is willing to underwrite the enormous expense of cleaning up previous environmental pollution and damage. The industry can reasonably be expected to pay for current and future programs; it should not be expected to finance reclamation for the past two hundred years. Although environmental impact may have increased over the last century, it did not suddenly begin with the California gold rush or with Montana copper."

— Duane A. Smith
Mining America – the Industry and the Environment, 1800-1980

"Mining Law Reform also can provide significant economic benefits by creating jobs to clean up hundreds of thousands of abandoned mines. This program can be funded by a mineral royalty and rental fees, at no cost to the taxpayers."

— *The Mineral Policy Center in The Last American Dinosaur - The 1872 Mining Law*

Funding is likely the most contentious issue to be resolved in implementing an IAM program. Most proposed funding mechanisms focus on the mining industry as the primary if not the only source of program dollars.

In addition to CERCLA funds, federal funding for noncoal IAM projects within the states currently is derived from SMCRA revenues or demonstration projects under Section 319 of the CWA. Coal producing states have used part of their SMCRA funds to develop inventories of noncoal sites and to remedy some noncoal safety hazards. States, such as Wyoming, which have certified completion of coal reclamation can use SMCRA funds to address environmental hazards at noncoal sites. Some states, particularly Colorado, have been aggressive in utilizing CWA Section 319 matching funds on a project-by-project basis. A recent MOU between EPA and the state of Colorado regarding CERCLA liability should impact future 319

cleanup efforts positively (see liability section). It must be clarified, however, that the 319 funds are limited and are available for only a small portion of the IAM sites.

Current federal funding sources previously referenced include:

- SMCRA establishes an Abandoned Mine Land Reclamation Fund to be used primarily for reclamation of abandoned coal mining sites. However, under limited circumstances, states are allowed to use a portion of the allocated funds on noncoal sites.
- Clean Water Act Nonpoint Source Demonstration Project Grants (Section 319) – Matching funds are provided through CWA to implement management programs for the control of nonpoint source pollution, including pollution associated with abandoned mines.
- The Comprehensive Environmental Response, Compensation and Liability Act authorizes the EPA to use "Superfund" monies to undertake short-term "removal" actions and longer-term "remedial actions" at sites that present a substantial danger to health or the environment. This typically applies only to IAMs on the National Priorities List.

Some states have instituted funding mechanisms to address abandoned noncoal mine sites. Florida was discussed above. Similarly, through an annual fee on claim filings, the Nevada Department of Minerals inventories and ranks problem sites and oversees a program to "secure" dangerous sites. The focus is almost entirely on public safety through activities such as sealing, fencing, signing, and public education. Legislation in New Mexico would create an *"inactive or abandoned mine closure fund."* The South Dakota legislature adopted legislation to partially fund a noncoal abandoned mine fund from fees currently being paid by the surface gold mining industry into a ground water protection fund.

Many western states impose a severance or related production tax on the extraction of noncoal or metallic minerals within state borders. With the exception of limited use of the Montana Resource Indemnity Trust Tax, those taxes are rarely dedicated in whole or in part to IAM programs. Part of the philosophy of severance taxation is to derive revenues from non-renewable resources to address the current and future impacts, both social and environmental, that can arise from mineral extraction. From a public policy standpoint, the use of state severance taxes to address IAMs would appear to be quite logical. However, existing and over-riding demands on state general fund revenues seems to preclude diverting monies from these sources given current state economic conditions. Nevertheless, the western states with hardrock severance taxes should deliberately review the reasons why severance taxes were imposed in the first place and consider future re-direction of those funds.

Mining law bills introduced in this Congress would establish a *"trust fund to be known as the Abandoned Minerals Mine Reclamation Fund."* The primary funding source for IAMs contemplated in federal legislation is a royalty on metal mines. Imposition of a royalty will be a contentious issue. Proponents of a royalty argue that the industry *"pays nothing to the government for the gold or other metals removed from public lands."* They further contend that royalties can be used to aid deficit reduction and to put people back to work reclaiming abandoned mines in regions with high unemployment. Opponents of a royalty argue that it would promote the concentration of the industry into fewer and larger companies, raise cash costs to levels that would threaten the economic vitality of United States gold mines, transfer royalty income from state and private royalty owners to the federal government, and hit United States based operators harder than foreign-based United States operators.

The appropriateness of a royalty and at what levels are royalties or rentals punitive and economically counter-productive is outside the purview of this study. However, it is appropriate to recommend that, if Congress imposes a royalty on the minerals industry, a significant portion of these revenues generated should be dedicated to an abandoned minerals cleanup fund.

In the final days of the 102nd Congress, legislation was passed (P.L. 102-381), which required mining claim holders to pay an annual holding fee of $100 per claim. Twenty percent

of the revenues are directed toward additional funding for the Department of Interior and 80 percent applied toward deficit reduction. The Clinton administration proposes to *"permanently extend hardrock mining holding fees."* As with royalties, the merits of a holding fee on hardrock mining will not be debated here. However, if a holding fee remains in place, serious consideration should be given to redirecting the eighty percent portion into an abandoned mine reclamation program. If it is assumed that 20 percent of the holding fee remains with the Department of Interior for administration and if it is also assumed that one-half of the existing claims are relinquished due to the imposition of the $100 per claim fee, then the holding fee would raise approximately $46 million annually.

Conclusion

"All (IAM) success stories have involved multi-party, multi-program participation."

— Rob Walline, EPA Region XIII

The common denominator for any successful IAM program or project seems to be the amount of early and consistent effort dedicated to developing partnerships and collaboration with stakeholders. These activities provide the cornerstone upon which the rest of an IAM program can be built. The assumption cannot be made that partnerships are developed and collaboration occurs without a conscious, focused effort to make them happen.

In September, 1992, The Colorado Center for Environmental Management formed an IAM Advisory Committee comprised of representatives from state regulatory agencies throughout the West, Federal agencies (e.g. EPA, BLM, Bureau of Mines), universities, mining companies, and environmental organizations. The Committee reviewed general principles to guide IAM programs at its February 23, 1993 meeting. With the caveat that stakeholder collaboration is an important feature of all the principles, these principles recommended a guide for the development of state IAM programs:

- Programs need to be developed on a state-specific basis and focus on all mine-related sources of contamination within selected priority geographic areas.
- The criteria for ranking problem areas should be defined within each state depending upon the combined, relative importance of safety, public health, and environmental factors. A statewide assessment (inventory) of sources provides the basis for the actual prioritized ranking.
- Cleanup goals would best be defined on a geographic basis, although some goals could be set on a statewide basis.
- A state-specific program should include a comprehensive framework (including authorities and funding) for implementing the most efficient remedial actions within a defined area. The framework should creatively build upon existing regulatory, remedial, and funding programs.
- State and federal agencies need to merge their collective efforts to attain efficient, coordinated cleanup solutions. This entails establishing

Photo courtesy of the Colorado Division of Mines

Currently, no comprehensive program exists for reclaiming abandoned noncoal mines like this one in Cripple Creek, Colorado.

methodology for selecting priority areas and establishing formal and informal working relationships.

- Within a geographic area, state programs should pursue the most efficient set of remedial actions for accomplishing cleanup regardless of source ownership and consistency of cleanup levels among the IAM sources. Where pollution sources other than IAMs exist, they should be integrated into the cleanup actions.
- Remedial actions should emphasize and include, wherever possible, management practices and passive treatment technologies that lead to practical levels of remedial investments and minimal ongoing operational costs.

This Blueprint presents ideas, principles and examples that can be included in a state-based IAM program. States with existing IAM programs may find this information useful for improving their programs. States without such programs should examine this information to assist them in initiating program development. Beyond that, states may want to examine these ideas, principles and examples in more depth to best apply to their specific circumstances. A logical next step would be to establish state-based pilot programs to develop and implement these concepts in one or more states.

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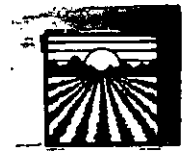
[1]Memorandum of Understanding between the Colorado Department of Health, The Colorado Mined Land Reclamation Division and the U.S. Environmental Protection Agency for CERCLA liability of Clean Water Act Section 319 Projects, Jan. 3, 1992.

[2]*The Druid Mine Case* – A Case Study in Reming, Maxine Short, unpublished paper, n.d.



Increasing the Capacity to Resolve Environmental and Other Public Disputes: A Regional, Transboundary Approach

by The Transboundary Initiative

Introduction

Environmental policy is approaching an impasse in the American West. Policymakers and resource managers are finding it more and more difficult to offer proposals or take action without being challenged. At the same time, stakeholders – including business and industry, citizen and environmental groups, Native Americans, and local, state, and federal governments – are demanding more meaningful participation in public decisionmaking processes. This atmosphere of potential gridlock is not unique to any resource or institution but influences proposals for economic development and growth management, water use and management, public land management, intergovernmental relations, hazardous waste management, and nearly every other environmental arena.

The sources of this emerging impasse are multi-faceted. Environmental disputes are typically characterized by issues that cut across jurisdictional boundaries. Multiple, often competing interests are usually at stake. Information tends to be incomplete and contradictory. Social, economic, and environmental impacts are often uncertain and difficult to predict. Existing forums for meaningful public involvement are limited and adversarial in nature. Finally, while many decisions are made in an effort to resolve environmental disputes, the underlying problems are rarely resolved and the disputes continue in other forums.

In light of the complexity of environmental disputes and the limitations of conventional forums for public decisionmaking (including legislative proceedings, administrative hearings, and judicial forums), several individuals and groups have been experimenting with more collaborative approaches to resolving environmental disputes. These approaches, which include negotiation and mediation, are designed to resolve disputes or potential disputes through cooperative, face-to-face interaction among the affected interests. Perhaps the most fundamental difference between conventional and collaborative approaches is that collaborative approaches seek consensus – that is, the affected interests strive to reach agreement on the formulation of a problem and its solution. This method of reaching closure contrasts to conventional processes where a decision is reached through voting (majority rules) or through some individual or body making a unilateral decision (a designated government board, administrative agency, or judicial body).

Collaborative approaches tend to result in lower transaction costs, greater satisfaction with outcomes, less strain on continuing relationships, and less recurrence of disputes when compared to conventional approaches to resolving public disputes. They are designed to supplement conventional forums for public decisionmaking, and typically result in advisory recommendations. The principles and techniques of collaborative problem solving can be adapted to nearly any public dispute. In the environmental context, collaborative processes can help resolve disputes by providing a forum to:

- Incorporate all affected interests or stakeholders in the decisionmaking process;
- Address issues according to appropriate problemsheds, regardless of jurisdictional boundaries;
- Jointly assess social, economic, environmental, and other risks associated with environmental and natural resource management;
- Jointly identify scientific and technical information that is essential to resolving environmental disputes;
- Integrate diverse and often competing and

THE TOOLS OF COLLABORATIVE PROBLEM SOLVING

COLLABORATIVE PROBLEM SOLVING — *the process of resolving a dispute or potential dispute through cooperative, face-to-face interaction among the affected interests.*

CONSENSUS — *a mutually acceptable agreement or decision that is reached by the affected interests through a process that integrates the interests of all concerned parties. Consensus contrasts to processes where a decision is reached through voting (majority rules) or through some individual or body making a unilateral decision (a designated government board, administrative agency, or judicial body). Consensus does not require unanimous consent; a consensus agreement may not satisfy each participant's interests equally, and each participant may not support the agreement to the same degree. However, once an agreement is reached, each of the parties is committed to its implementation.*

NEGOTIATION — *a relationship between two or more parties who voluntarily come together to educate each other about their needs and interests in an attempt to resolve a perceived or actual conflict.*

FACILITATION — *the use of a neutral third party to promote effective information exchange, negotiations, and group decision making. A facilitator is impartial to the issues being discussed; rarely contributes substantive ideas; and has no decision making authority. The facilitator focuses on the process and procedures of dispute resolution and decision making.*

MEDIATION — *an extension of facilitation where the neutral third party meets privately and confidentially with the disputants in an effort to identify opportunities and obstacles to a negotiated settlement. The mediator may shuttle back and forth between the parties, carrying messages and clarifying needs and interests. The mediator also facilitates face-to-face meetings of the parties.*

conflicting legislative mandates; national, tribal, state, and local interests; and social, economic, and environmental variables; and

- Create the necessary incentives and systems to ensure that solutions are implemented.

In short, collaborative problem solving is our best hope for building sustainable communities in the American West.

Experience with Collaborative Approaches

Collaborative approaches have been used to resolve a variety of environmental and other public disputes. According to a study that examined cases of environmental mediation in the United States between 1974 and 1984, the majority of issues involved land-use disputes of various kinds.[1] Other categories, in descending order of the number of cases, were natural resource management and use of public lands, water resources, energy, air quality, and toxics. Since 1984, collaborative techniques and processes have been increasingly used to resolve issues over growth management, transboundary issues, Indian reserved water rights, and Superfund cleanups.

In Canada, environmental mediation has been used to resolve issues over hydroelectric power development, regional waste management, local waste disposal siting, and various economic development projects.[2] Negotiation, mediation, and other tools of collaborative problem solving are increasingly being applied to help resolve international environmental disputes.[3]

While the use of collaborative processes to address environmental issues is becoming more widespread, this is not to suggest that it is a panacea. Nor are all attempts to resolve environmental disputes through negotiation and mediation successful in terms of reaching agreement.

Collaborative processes are not only being limited to specific environmental issues. In some sectors, they are being institutionalized in an effort to reform the political culture of public decisionmaking. The Alternative Dispute

Resolution Act of 1990[4] and the Negotiated Rulemaking Act of 1990[5] reflect efforts in the United States to integrate collaborative processes into the federal government. The National Council of State Dispute Resolution Programs illustrates a commitment at the state level to institutionalize collaborative problem solving.[6] In Canada, both the federal and provincial governments have created consensus-based "roundtables" to explore the connections between the economy and the environment.[7] While the mandate of the roundtables is broader than encouraging collaborative approaches to resolving public disputes, they serve as institutionalized forums for pursuing sustainable development through collaboration and consensus building. In addition to these relatively large-scale programs, there is also a growing interest in designing "dispute resolution systems" to address the stream of disputes that characterize many arenas of public policy, such as water use and management.

Toward a Regional, Transboundary Approach

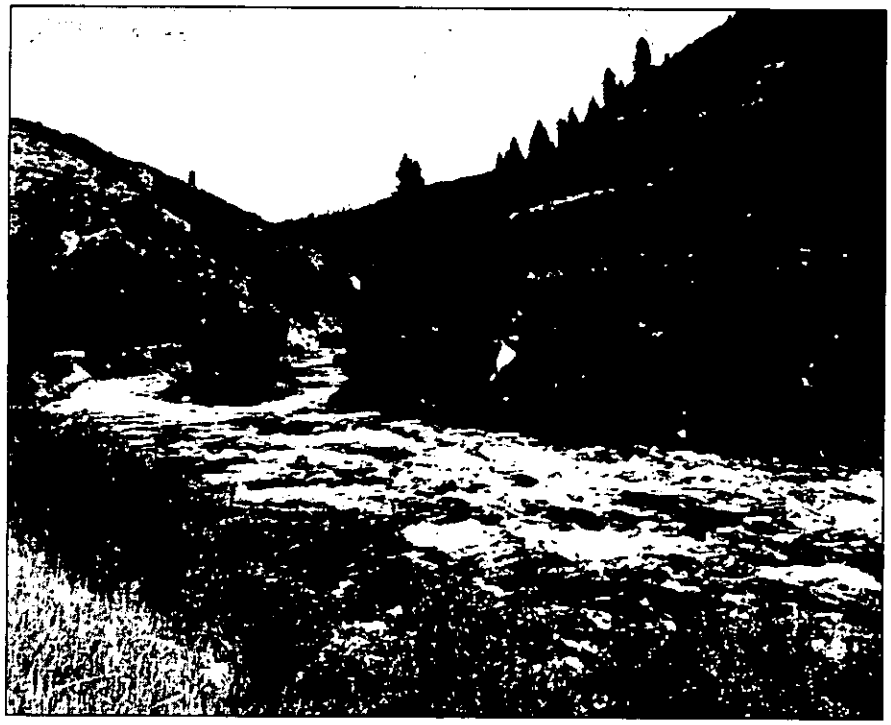
In light of the history of environmental dispute resolution, the public and private sectors in the provinces of Alberta, Saskatchewan, and Manitoba; the states of Idaho, Montana, Wyoming, North Dakota, and South Dakota; and the First Nations[8] throughout this region are coming together to increase the capacity of each jurisdiction and the region as a whole to resolve environmental and other public disputes through collaboration and consensus. This effort, which is referred to as "The Transboundary Initiative," is unique. Although there are other regionally based dispute resolution organizations in the United States, The Transboundary Initiative is the first attempt to create a dispute resolution organization that will include the public and private sectors in two different countries, multiple states and provinces, and First Nations.

Why have all of these interests come together to create a regional, transboundary dispute resolution organization? While there may be very few "transboundary" environmental or economic issues that link all or some of these jurisdictions, there are nevertheless several compelling reasons for the multiple jurisdictions to work together to increase the region's capacity to resolve environmental and other public disputes.

To begin with, the citizens within the region have much in common. They are bound by the open space, natural beauty, and rural character of life. They are also linked by common debates over natural resource management, environmental protection, local economic development, and intergovernmental relations, including First Nations.

The multiple jurisdictions within the region also share a common interest in less costly, more participatory approaches to resolving public disputes. Based on an inventory of dispute resolution activities within each jurisdiction, the region as a whole has had considerable experience in addressing environmental issues through collaborative processes.[9] In Alberta, collaborative techniques have been used to address issues related to the expansion of two world-scale synthetic crude oil facilities and the development of a Clean Air Strategy. In Wyoming, issues related to national forest management, wildlife management, interstate water management, coordinated resource management, and utilities have been addressed through collaborative processes. In Idaho, two highly sensitive issues – endangered species protection and wilderness designation – have been addressed through collaborative processes. In Montana, negotiation, facilitation, and other collaborative approaches have been used to address issues related to Indian and federal reserved water rights, interstate and intrastate water policy and planning, national forest management, coordinated resource management, energy policy and planning, and economic development. Both Saskatchewan and North Dakota, along with the other jurisdictions mentioned above, have expressed an interest in resolving future environmental issues through negotiation, mediation, and other types of collaboration.

In addition to these specific cases, several of the jurisdictions in the region have created specific institutions or programs to foster collaborative problem solving. In North Dakota, a coalition of public and private sector leaders created the North Dakota Consensus Council in 1990. This nongovernmental organization provides a forum for diverse interests, including



The Payette River in Idaho.

public and private leaders and citizens, to build consensus on issues of public interest. In Idaho, Governor Cecil Andrus created a task force on alternative dispute resolution in 1992. The purpose of the task force is to "provide a structure to coordinate and foster the development and use of alternative dispute resolution in Idaho." In addition to this task force, both the University of Idaho and Boise State University have active programs designed to promote the use of collaborative methods of problem solving through research, training, and networking.

In Montana, Governor Marc Racicot and Lt. Governor Dennis Rehberg are in the process of creating a center for dispute resolution. The center, which is expected to emerge in the summer of 1993, will be designed to encourage and facilitate collaborative approaches to resolving natural resource issues in the state. The 53rd Montana legislature also recently passed the "Montana Negotiated Rulemaking Act," which creates a framework for developing administrative rules and regulations through collaboration and consensus building. Finally, the provincial Department of Justice in Saskatchewan has created a Mediation Services Branch that is designed to improve the understanding and acceptance of mediation as a valid means for resolving disputes. The Mediation Services Branch provides training and mediation services.

Another motivating force for The Transboundary Initiative is that each jurisdiction within the region is faced with similar opportunities and obstacles for integrating collaborative problem solving into public decision-making. According to the dispute resolution inventories that were prepared for each jurisdiction, one of the major challenges within each jurisdiction is education – simply raising the awareness and understanding of collaborative processes and techniques for resolving public disputes.

Finally, the participants in The Transboundary Initiative believe that each jurisdiction within the region can benefit from the dispute resolution "experiences" and "resources" of the other jurisdictions. By leveraging these experiences and resources, the participants hope to create a critical mass of expertise that can be shared throughout the region.

A Brief History of The Transboundary Initiative

Realizing the potential of a cooperative effort, the Governors of Montana and North Dakota sent a letter to the National Institute for Dispute

Resolution (NIDR) in December, 1991, expressing an interest in creating a regional approach for resolving environmental and other public disputes. After several discussions with NIDR and other interested parties, including the Western Governors' Association (WGA), the proposal was expanded to include the public and private sectors in the states of Idaho, Montana, North Dakota, South Dakota, and Wyoming; the provinces of Alberta, Saskatchewan, and Manitoba; and the region's First Nations.

From January through May, 1992, representatives from the two governor's offices, NIDR, WGA, the Minnesota Office of Dispute Resolution, and the NDCC developed and refined the proposal. Toward the end of May, 1992, the NDCC, on behalf of the region, submitted an application to NIDR for a grant to support The Transboundary Initiative. In June, 1992, NIDR awarded the region $50,000 to initiate a transboundary dialogue on collaborative problem solving in the central region of North America. The $50,000 was awarded as a matching grant, which meant that the region had to generate additional funds prior to spending any of the funds provided by NIDR.

During the next several months, the NDCC sent out letters to many private foundations in Canada and the United States in search of matching funds. Toward the end of 1992, WGA committed $10,000 to The Transboundary Initiative as part of a project to evaluate innovative strategies for resolving environmental problems in the American West. At about the same time, The Network: Interaction for Conflict Resolution, a non-government organization in Canada that promotes collaborative problem solving, contributed another $7,500 to the project.

With these matching funds in hand, representatives from throughout the region began in January, 1993, to design a strategy for increasing the region's capacity to resolve environmental and other public disputes through collaboration and consensus building. To initiate this effort, each jurisdiction within the region prepared an inventory of its dispute resolution experiences, resources, and needs and opportunities. These inventories provided the foundation for a three-day meeting held in Bismarck, North Dakota in March, 1993. During this meeting, which was attended by representatives from each jurisdiction in the region with the exception of South Dakota and Manitoba, the participants began to define an agenda for the initiative based on common experiences, needs, and opportunities for collaborative problem solving. This initial agenda, which is described below, will be adapted to emerging needs and opportunities as additional people, particularly representatives from the First Nations and the private sector, become involved in The Initiative.

To date, The Initiative has been shaped by participants from the NDCC, The Network, and NIDR, all nongovernment organizations; the Dispute Resolution Project of the federal Department of Justice in Canada; the provincial governments of Alberta and Saskatchewan; and the Governor's Offices in Idaho, Montana, and Wyoming.

The Initial Agenda of The Transboundary Initiative

The mission of The Transboundary Initiative is "*to increase the capacity of each jurisdiction and the region as a whole to resolve environmental and other public disputes through collaboration and consensus building.*" The objectives are to:

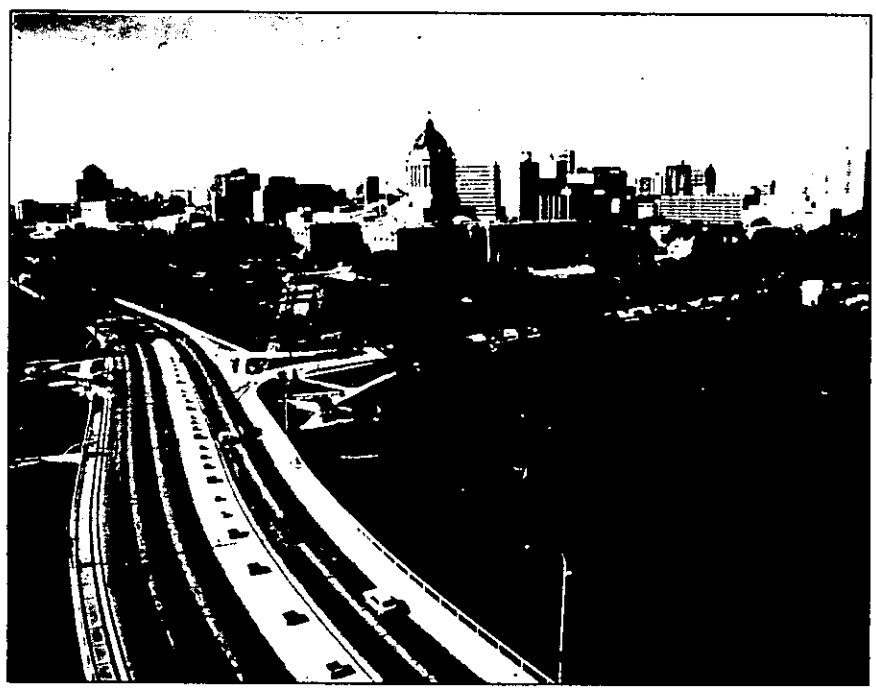
- Provide education and training (through workshops, conferences, seminars, and research and reference materials) on collaborative approaches to resolving public disputes.
- Design collaborative processes, at the request of affected interests, to address disputes or potentially complex, multi-party issues.
- Facilitate or mediate public disputes or potentially complex, multi-party issues at the request of affected interests.
- Design dispute resolution systems for public situations that are characterized by chronic or recurring disputes.

The Transboundary Initiative will build on the region's experiences to resolve public disputes through collaboration. It will seek to make the most efficient use of existing dispute resolution resources within the region. It will support and supplement existing dispute resolution

efforts throughout the region. The Transboundary Initiative is not designed to replace existing forums for developing and/or implementing public policy in any of the jurisdictions. Nor is it designed to allow individuals and groups from one jurisdiction to influence the resolution of disputes within other jurisdictions.

The initial agenda of The Transboundary Initiative includes a mix of specific projects and administrative activities. The inventories of dispute resolution activities within each jurisdiction will be completed, published, and widely distributed. Reference materials are being prepared on negotiated rulemaking and litigation impact statements in an effort to educate people on these topics. The participants are working with numerous interests to assess the need for a conference and training workshop on cross cultural communication and collaborative problem solving. The participants are assessing opportunities to help implement innovative regional programs that may benefit from collaboration and consensus building, such as WGA's Great Plains Project and the Park City Principles for water quality. Finally, the participants are exploring the value of a policy dialogue and workshop on building sustainable communities throughout the region.

The participants of The Transboundary Initiative are also engaged in a variety of administrative activities to create and maintain the emerging organization. The Initiative has not "incorporated" and does not have any formal bylaws or organizational structure. It is, however, guided by several emerging principles in terms of governance, staffing, and funding. The Initiative is currently directed by participants from each jurisdiction. Several of the existing participants are talking with representatives of the First Nations, business and industry, citizen and environmental groups, and other affected interests in an effort to broaden representation. The Transboundary Initiative will be governed by a broad-based group that represents each jurisdiction in the region along with the diversity of interests affected by environmental and other public disputes. This "Board of Directors" or "trustees" would publicly support the objectives and projects of The Initiative; provide strategic leadership and direction for the organization; and assist in raising funds for specific projects. The Board would not formally approve or reject any agreements that emerge from collaborative processes facilitated by The Initiative. It would only review such processes for lessons learned.



In Canada, environmental dispute resolution has been used to address a number of environmental disputes, and is being used increasingly on an international scale.

The administration and staffing of The Transboundary Initiative is decentralized, although the NDCC has served as a focal point and coordinated activities to date. This decentralized form of organization reduces administrative costs and allows each of the jurisdictions to maintain ownership and identity with The Initiative. Initial funding, as explained earlier, has come from the NIDR, WGA, and The Network. In addition, the participating jurisdictions have contributed several in-kind services, particularly staff. In the future, the participants will seek funding for specific projects from appropriate public and private organizations and foundations. It may also seek operating funds from these same sources.

As The Transboundary Initiative continues to evolve, create a track record, and establish its credibility, the need for a formal charter and rules of operation will be evaluated. At this point, however, the participants agree that a more open and adaptive system of governance is appropriate given the unique public-private, multi-jurisdictional nature of The Initiative.

To evaluate its performance, The Transboundary Initiative will rely on several indicators of success, some more measurable than others. If The Initiative is retained to facilitate or mediate a particular dispute, the measures of success will include questions such as – Were agreements reached? Were the agreements implemented? Were relationships among the participants improved? It should be emphasized that even when parties fail to reach agreement on a particular issue, a collaborative process may still be successful in terms of establishing communication channels, generating information, building trust among diverse interests, and developing working relationships – all of which are essential for reaching agreement on future disputes. The Initiative's participants will create meaningful measures for the larger objectives of increasing the capacity of the region to employ collaborative approaches to resolve environmental and other public disputes.

Obstacles and Opportunities

The effort to create a regional, transboundary approach for resolving environmental and other public disputes has encountered several obstacles. While these obstacles are at times frustrating, they also provide opportunities for learning and developing creative solutions to common problems. The following list of "obstacles and opportunities" has emerged during the initial stages of The Transboundary Initiative. They may provide some guidance to other jurisdictions contemplating regional, transboundary initiatives for collaborative problem solving.

Lack of a Model — Perhaps the greatest obstacle, as well as the most challenging opportunity, is the lack of a model for creating a dispute resolution organization that includes the public and private sectors in two different countries, multiple states and provinces, and First Nations. In response to the lack of such a model, the participants have relied on their collective wisdom and the insights and experiences of public and private leaders and dispute resolution professionals across North America.

Communication — One of the most significant obstacles to a regional, transboundary project is communication. Initiating and maintaining communication among participants in different jurisdictions and time zones is both time consuming and expensive. However, it is absolutely critical to keep all affected interests informed and involved. To date, the principal mediums of communication have been the telephone, telefax, and mail. Telephone communication, particularly multi-party conference calls, are expensive. In addition, it has been time consuming and expensive to bring all the participants together for working sessions, given the expansive distances and limited travel services throughout the region. These obstacles have been overcome by the commitment of the participants to a common agenda. The participants are also exploring the feasibility of using computer-based systems to facilitate and enhance communication.

Lack of Resources — In addition to the challenge of communication, the lack of resources, particularly funding, can be a major obstacle to initiating a regional, transboundary project. Several of the participating jurisdictions have very limited financial resources to contribute to this project. On the other hand, individuals from all

jurisdictions have volunteered hundreds of hours to bring this project to fruition. While The Transboundary Initiative has been supported by funds from NIDR, WGA, The Network, and the participating institutions, the need for long-term, stable funding is a major issue, particularly in light of uncertain state and provincial budgets.

Diversity of Participants — To initiate a public/private, multi-jurisdictional approach to resolving environmental and other public disputes, it is essential to incorporate the diversity of interests, perspectives, experiences, and talents throughout the region. While it is often difficult to maintain the flexibility and adaptability required for such integration, it is also a unique opportunity to learn from one another and to build on the collective experiences of the region.

Different Political Cultures — A subtle but significant obstacle in designing The Transboundary Initiative is the differences among political cultures and the prior relationships among jurisdictions. The social and institutional context for discussing public policy and making public decisions varies among the First Nations, provinces, states, and local governments, not to mention the multiple interest groups affected by public disputes. These variations in political culture create significant opportunities for misunderstanding and miscommunication. It is imperative to be sensitive to and respect such differences while trying to forge a common agenda.

Uncertainty, Suspicion, Anxiety, and Reluctance — In the process of contacting representatives of different jurisdictions, or sharing the idea of a transboundary initiative with colleagues and leaders within one jurisdiction, there has been some initial reluctance to embrace and support the idea. This reluctance appears to stem from suspicions about the purpose and "agenda" of The Initiative; general anxiety about multi-jurisdictional projects; and uncertainty over the benefits, costs, and outcomes of the project. In short, there is a constant tendency to resist both "new approaches" and "multi-jurisdictional initiatives."

The participants have used several techniques for overcoming this inherent reluctance to The Transboundary Initiative, including open and candid communication; admission of ignorance about different political cultures; active listening; a willingness to ask questions and learn about different jurisdictions; a willingness to modify plans to reflect unique local concerns; and consistent modeling of cooperative behavior.

Finding Jurisdictional Proponents — In addition to overcoming initial suspicions about The Transboundary Initiative, it has been essential to identify energetic proponents that possess the vision, experience, tenacity, and connections to nurture the idea in their jurisdiction. While this has been a very dynamic and time consuming process, it has expanded the network of individuals and organizations interested in The Initiative.

Commitment of the Leadership — If a regional, transboundary approach for resolving environmental and other public disputes is to be viable, it must be continuously nurtured by the public and private sectors in each jurisdiction. This challenge is complicated by periodic changes in the political leadership of each jurisdiction. In an effort to build confidence, develop a sense of pan-partisan ownership, and minimize surprises related to The Transboundary Initiative, the participants are establishing contacts with the public and private leadership in each jurisdiction. The Governor's Offices in Idaho, Montana, and Wyoming are already aware of the project and are actively involved in shaping The Transboundary Initiative. Individuals from the provincial governments in Alberta and Saskatchewan are working to inform senior officials in those provinces. Individuals from the NDCC and The Network are establishing contacts in South Dakota and Manitoba.

Emerging Lessons

Based on the region's experience to date, several lessons begin to emerge on how to approach regional, transboundary initiatives for collaborative problem solving.

- Go slowly. Take on doable projects. Recognize that such initiatives are novel in most cases, which not only provide laboratories for learning, but create a certain amount of uncertainty and therefore reluctance.
- Respect different political cultures while trying to develop a common regional agenda.

- Develop a common vocabulary. Realize that language is often a window to political culture.
- Involve all affected interests, including public and private leaders and non-government organizations, in the development and governance of the regional, transboundary initiative. This will increase ownership in the final product and enhance the chances for successful implementation.
- Share the goals, opportunities, and obstacles of creating a transboundary initiative with other regions and professionals as often as possible. Outsiders can often provide valuable insights and help refine ideas and strategies.
- Realize that initial ideas are likely to be modified as more people become involved. Take advantage of these opportunities to learn.
- Build on personal relationships and friendships whenever possible. This helps create a sense of community, belonging, and place.
- Respect and respond to the financial and other constraints of participating individuals and jurisdictions. The objective, once again, is to keep all affected interests, particularly energetic supporters, involved in the process.
- Leverage resources by creating integrated funding packages for specific projects.
- Understand the existing regulatory framework to determine how collaborative approaches might enhance and be incorporated into such processes.
- Recognize that initial failures often provide the foundation for future successes. Don't be afraid to make mistakes. Take advantage of the opportunities to learn and adapt to new information, needs, and opportunities.
- Start small and build on successes.
- Document the successes and failures.
- Celebrate small successes.
- Recognize the contributions of all participants. Share the credit.

Conclusion

Speaking about the American West, Wallace Stegner has written in *The Sound of Mountain Water* that *"When it fully learns that cooperation, not rugged individualism, is the quality that most characterizes and preserves it, then it will have achieved itself and outlived its origins. Then it has a chance to create a society to match its scenery."* The Transboundary Initiative represents one example of trying to create this "culture of collaboration" by developing "habits of agreement." It provides a unique opportunity for citizens within the region to begin developing a common sense of community, place, and belonging. Collaborative problem solving is not a panacea to the West's environmental and economic problems. However, it can supplement and compliment the more conventional forums for addressing public issues, and, as mentioned earlier, is our best hope for building sustainable communities in the West.

Several individuals contributed to the ideas presented in this chapter. Matthew J. McKinney (Montana Department of Natural Resources and Conservation) served as chief editor and writer. Bill Diepeveen (Alberta Environmental Protection Services), Larry Spears (North Dakota Consensus Council), Tom Fee (National Institute for Dispute Resolution), and Sylvia McMechan (The Network: Interaction for Conflict Resolution) contributed valuable material. Other participants in The Transboundary Initiative, including Ken Acton (Saskatchewan Mediation Services), Rachel Baxter (Canadian Department of Justice), Joel Hamilton (University of Idaho), and Rod Miller (Office of the Governor, Wyoming) reviewed numerous drafts of the chapter and provided significant insights and suggestions.

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1. For a history of environmental dispute resolution, see Gail Bingham, Resolving Environmental Disputes: A Decade of Experience (The Conservation Foundation, Washington, D.C., 1986). See also Larry MacDonnell and An Painter, eds., "Environmental Dispute Resolution," special issue of Natural Resources Journal 28 (1988).

2. For an overview of environmental dispute resolution in Canada, see Barry Sadler, "Environmental Conflict Resolution in Canada," Resolve 18 (1986).

3. See Jon Martin Trolldalen, International Environmental Conflict Resolution: The Role of the United Nations (World Foundation for Environment and Develop-

ment, United Nations Institute for Training and Research, and National Institute for Dispute Resolution, 1992).

4. Public Law 101-552, 1990.

5. Public Law 101-648, 1990.

6. In 1984, the National Institute for Dispute Resolution, a non-profit organization that provides funding and technical services to catalyze dispute resolution efforts, launched a national experiment to create public offices of dispute resolution. See William R. Drake, "Statewide Offices of Mediation," Negotiation Journal (1989). To date, twelve such offices have been created. The first four state offices, which were created in 1984, include the New Jersey Center for Public Dispute Resolution; the Hawaii Center for Alternative Dispute Resolution; the Massachusetts Office of Dispute Resolution; and the Minnesota Office of Dispute Resolution. The second group of offices, which were created from 1988 to 1990, include the Ohio Commission on Dispute Resolution and Conflict Management; the Oregon Dispute Resolution Commission; and the Florida Growth Management Conflict Resolution Consortium. Finally, from 1992 to 1993, NIDR helped create The California Center for Public Dispute Resolution; the Texas Public Policy Dispute Resolution Center; the New Hampshire Program on Consensus and Negotiation; the Maine Consensus Project; and The Transboundary Initiative. The National Council for State Dispute Resolution Programs was created in 1993 to serve as an ongoing forum for these offices to share experiences and learn from one another.

7. In response to the final report of the World Commission on Environment and Development, Our Common Future: From One Earth to One World (Oxford University Press, 1987), Canada's federal government established a National Roundtable on the Environment and the Economy. Shortly thereafter, each province in Canada created a similar Roundtable. Membership on the roundtables include representatives from government, industry, environmental advocacy organization, and business. Each of the three prairie provinces has its own Roundtable, with a secretariat to support its activities. in 1992, the National Roundtable on Environment and Economy created a Task Force on Sustainable Development and Consensus Decisionmaking, which was created in 1992 by the National Roundtable on Environment and Economy. The purpose of the Task Force is to investigate how collaborative approaches to resolving multi-stakeholder conflicts, particularly environmental disputes, could be effectively used. For more information on this effort, contact the National Roundtable on Environment and Economy at 1 Nicholas Street, 15th Floor, Ottawa, Ontario, K1N 7B&; (613) 992-7189.

8. The term "First Nations" is used in this article to refer to indigenous people in both Canada and the United States. It is being used as one term to capture the meaning of Native Americans and tribal governments – widely used in the United States – and aboriginal people – commonly used in Canada.

9. These inventories will be published by The Transboundary Initiative in the near future. For more information, contact the North Dakota Consensus Council, Inc. at 1003 Interstate Avenue, Suite 7, Bismarck, North Dakota, 58501-0500; (701) 224-0588.

Negotiating Conflict and Fostering Innovation: The Truckee-Carson-Pyramid Lake Water Rights Settlement

by Julia Doermann

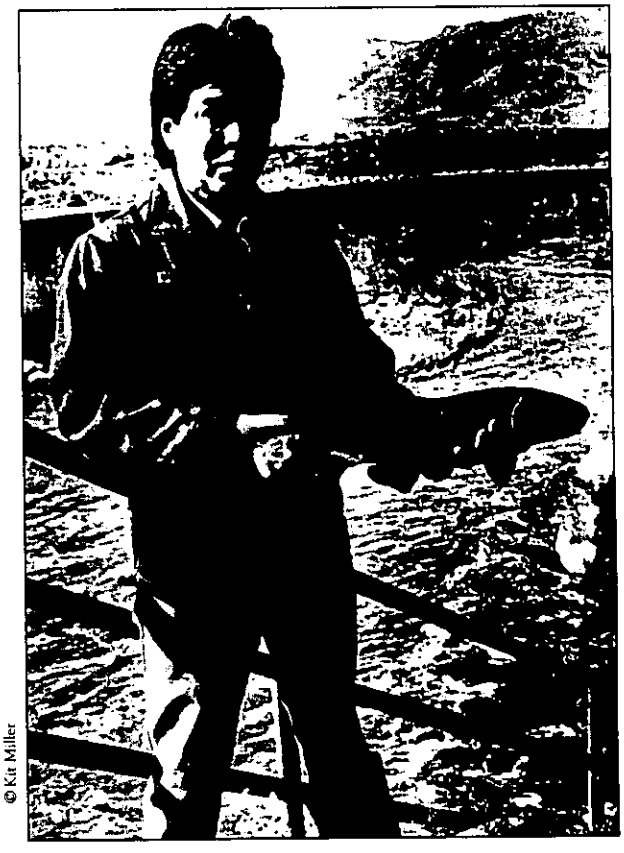
Problem Statement

The Truckee and Carson Rivers arise in California and flow into high-desert lakes and wetlands complexes in western Nevada. The two rivers were originally discrete basins, but because of a Bureau of Reclamation project built at the turn of the century, the Truckee River basin and the Carson River basin are now connected by the Truckee Canal that carries, on average, half the flow of the Truckee River diverted at Derby Dam below Reno, Nevada.

Over the century, the combination of demands from allocated water rights and the environmental water needs in the Truckee-Carson River basin have grown to exceed the supply of the two rivers. As a result, numerous disputes between a range of water right holders have occurred over the water quality and the flows in the rivers. Changing values over water in recent years have empowered non-right holders as well.

The basin encompasses a large and diverse set of interests, yet this diversity is not much different from that found in other river basins throughout the West. For example, the Truckee-Carson Basin includes two states (California and Nevada), a growing metropolis (Reno-Sparks), two tribes (the Pyramid Lake Paiute Tribe and the Fallon Paiute Shoshone Tribes), a private utility that generates hydropower and provides water to the growing metropolis (Sierra Pacific Power Company), a federal reclamation project (the Newlands Project) operated by a non-federal irrigation district (the Truckee-Carson Irrigation District (TCID), a Navy air base, and a number of smaller communities that depend primarily on agriculture, recreation, and tourism (Tahoe, Fallon, Churchill County, Fernley and others). It is also home to a federally listed endangered species (a fish called a cui-ui), a threatened species (the Lahontan cutthroat trout), an internationally significant wetlands complex (the Stillwater Wildlife Refuge, the Carson Sink and Pasture, and other Lahontan Valley wetlands), and, in the midst of Pyramid Lake, a wildlife refuge (the Anaho Island National Wildlife Refuge supporting one of the largest nesting colonies of American white pelican in North America).

The federal government is a player in the basin. The Bureau of Reclamation oversees the Newlands Project and TCID, the Bureau of Indian Affairs has responsibilities to the two tribes, and the U.S. Fish and Wildlife Service has obligations under the Endangered Species Act and



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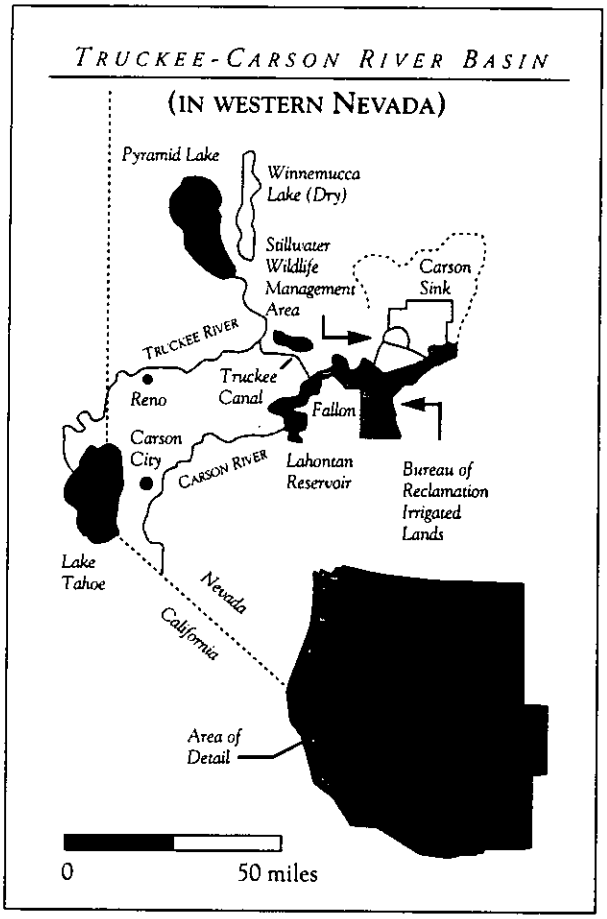
Dion Barlese, a technician at the Marble Bluff Fish Facility, displays a Cui-ui (Chasmistes cujus) spawning from Pyramid Lake up the Truckee River.



Map adapted from National Research Council, Water Transfers in the West: Efficiency Equity and the Environment.

other federal wildlife protection and environmental laws for the species' recovery and for managing units of the National Wildlife Refuge System in the basin. Fallon Naval Air Station, also located in the valley, leases approximately 2,000 acres of irrigated land to farmers to grow primarily alfalfa and pasture to reduce blowing dust, a hazard to flight operations, and for fire control benefits.

These players' relationship to the waters of the Truckee-Carson and to each other is intertwined and complex. Disputes over water use have been going on for more than eighty years. Numerous protracted court cases have sorted out some of the different rights of various users but always in a piecemeal approach. None solved the problem of the declining fish populations, nor met the cultural and economic needs of the tribes – responsibilities of the federal government.

In recent decades, water demands continued to grow. Drought has exacerbated shortages in the basin. The court cases on the books were clearly not comprehensive enough to solve the numerous conflicts around water use in the basin. Yet recent court outcomes had demonstrated and affirmed that power between the users had become more balanced, and that most interests could obstruct, if not stop, each other. With most of the basin's inhabitants (both human and non-human) feeling the pain of gridlock, it was clear a comprehensive approach was needed.

History

The physical context of these water conflicts is complex, which is one reason why solutions are elusive.

The Setting

The Truckee and Carson Rivers flow east from California's Sierra Nevada Mountains into two closed Great Basin Systems at the western edge of the Great Basin desert in Nevada. The Truckee originates in Lake Tahoe and flows to its terminus, Pyramid Lake, a unique high-desert lake. The Carson River originates south of the Truckee and flows into historically-expansive wetland complexes, now the Carson Sink, the Stillwater National Wildlife Refuge, Stillwater National Management Area, Carson Lake and Pasture, and other Lahontan Valley wetlands (see map at left).

Historically, the entire annual flow of the Truckee, an average of more than 600,000 acre-feet (AF), ran into Pyramid Lake, and the lake supported large populations of cui-ui and Lahontan cutthroat trout. A cui-ui is a large, long-lived, omnivorous lakesucker found only in Pyramid Lake. The original strain of Lahontan cutthroat trout in Pyramid Lake went extinct in the 1940s. The subsequently stocked strain is found in the Great Basin of Nevada, Oregon and California.

Cui-ui are obligate spawners and historically migrated up from the lake to spawn in the lower Truckee River and then migrated quickly back into the lake. The original Lahontan cutthroat trout spawned as well. The current strain is entirely fishery dependent and is managed as a sport fishery by the Pyramid Lake Paiute Tribe. The Pyramid Lake Tribe, whose reservation encompasses Pyramid Lake and the lower

Truckee River, attaches cultural and economic significance to these fish.

In the past, other local tribes, the Fallon Paiute Shoshone Tribes, lived adjacent to historic wetlands in the Lahontan Valley and had an equally important cultural relationship to these marshes.

Modifications To the System

In the early 1900s, one of the first reclamation projects in the West, the Newlands Project, started to divert flows from the Truckee River to support irrigation. Derby Dam was built below the cities of Reno and Sparks, Nevada to divert, on average, about half of the flow of the Truckee. A small dam on the Truckee River outlet to Lake Tahoe provided upstream storage for the Project, and water diverted at Derby Dam was stored in Lahontan Reservoir on the lower Carson River near Fallon, Nevada to augment the flows of the Carson River to meet irrigation demands.

As much as 73,000 acres of Lahontan Valley farmland are supported by this project, including several thousand irrigated acres within the Fallon Reservation. Much of this was done at the expense of extensive and diverse wetlands in the Lahontan Valley.

Impacts of Lahontan Dam

These Lahontan Valley wetlands at the turn of the century fluctuated from an annual average of 100,000 to as much as 300,000 acres, depending on the flows of the Carson River. In 1911, Lahontan Dam was completed for storing the flows of the Carson River and Truckee diversions for the Newlands Project. Without the flows of the Carson, the Lahontan Valley wetlands have depended solely on irrigation return flows and spills as their source of supply. This has resulted in an 85 percent reduction of these wetlands. Nevertheless, this wetland ecosystem remains a critical inland stopover for migratory birds on the Pacific Flyway, and is recognized for its international importance through its inclusion in the Western Hemisphere Shorebird Reserve Network, one of only four such sites in the United States.

Impacts of Diversions from the Truckee River

Other impacts of the Newlands Project included the permanent loss of expansive wetlands (an

Agricultural fields near Pyramid Lake irrigated by water supplied from the Newlands Reclamation Project.

average of 27,000 acres in size) at the now-dry Winnemucca Lake, previously a National Wildlife Refuge adjacent to Pyramid Lake, and the nearly 80 foot drop in elevation of Pyramid Lake. This drop in lake level caused the formation of a delta at the mouth of the Truckee River. Because the cui-ui and cutthroat trout need to spawn but could not overcome the obstacle of the delta for upriver passage except by some cui-ui in above-normal flow years, fish populations were decimated. Declining quality of spawning habitat due to a reduction in water quality from increasing upriver use, channelization for flood control, and increased erosion and sedimentation further contributed to the demise of the fish species. In 1967 the cui-ui was federally listed as an endangered species, and in 1970 the stocked strain of Lahontan cutthroat trout was listed as threatened.

Implications

The average rainfall in the Truckee-Carson basin is nine inches per year and the available surface supplies are fully appropriated by adjudications begun in the Reclamation era. Therefore, the way the Newlands Project used water has significant implications for the health of Pyramid Lake, the Lahontan Valley wetlands, and the species that rely on them. This is not straightforward, however.

The amount of water withdrawn from the Truckee-Carson system to meet water demands for the Newlands Project is a function of the efficiency of the irrigation water distribution system. Greater conveyance inefficiency may mean more water for the wetlands. However, historically these wetlands were supported at the expense of Pyramid Lake. Yet when the Newlands project had to adhere to operating criteria and procedures (OCAP) in 1967, which required greater efficiency to reduce the diversion requirements from the Truckee River in order to increase flows into Pyramid Lake, it also reduced the spills and agricultural drainage flows that support the Lahontan Valley wetlands.

The OCAP not only have implications for the quantity of water supporting the wetlands, but also the quality. Concentrations of naturally occurring trace elements such as arsenic, boron, lithium, molybdenum, mercury, and selenium increase due to evaporation as diluting flows drop off. This, in fact, has occurred since 1967 when irrigators in the Truckee-Carson Irrigation District (which operates and manages the Newlands Project) were increasingly required to improve their conveyance efficiency under the operating criteria and procedures (OCAP) so that diversions from the Truckee could be minimized. As the water efficiency of the Newlands Project increased, flows to the Lahontan Valley wetlands diminished. Now, some of the natural trace elements are found in toxic concentrations in the wetlands, causing deformities and chronic die-offs of migratory waterfowl, fish, and wildlife.

Other Demands on the Truckee-Carson System

In the last few decades, there has been tremendous population growth in California and Nevada, the two states that support the Truckee and Carson Rivers. Both make extensive use of the water from the two rivers for recreational, irrigation and municipal uses. The Truckee is also used by a private utility, the Sierra Pacific Power Company (Sierra Pacific), for hydropower from its hydroelectric facilities in California and Nevada on the Truckee above Reno. Sierra Pacific is also responsible for providing the Reno-Sparks area with water for municipal use. The Reno-Sparks metropolitan area in Nevada is growing rapidly, and depends heavily on this Truckee River water.

Early Water Conflicts

The Pyramid Lake Tribe fought for decades to protect lower-river flows, water quality, and its livelihood and cultural heritage in the Pyramid Lake ecosystem. Protracted and repeated litigation was initiated by the tribe (and the United States as its trustee) on numerous fronts starting as early as 1913.

There were victories and setbacks for the Pyramid Lake tribe. Some of the litigation resulted in new upstream storage being built, clarification of water rights, or payments to the

tribe. These did not solve the problem of water for the endangered cui-ui, however. When the tribe went to court to get a reserved right for Pyramid Lake in 1983, the U.S. Supreme Court rejected their claim.

In a subsequent case, however, the Court reserved Stampede Reservoir – one of four upstream federal storage facilities in California on the Truckee that were intended to supply water for a full range of purposes – only for cui-ui spawning. This was significant because Sierra Pacific was expecting to use it to meet the municipal and industrial needs of the burgeoning Reno-Sparks metropolis. This decision put Sierra Pacific and Reno-Sparks in a position where they needed to negotiate some agreement with the Pyramid Lake Tribe.

This decision also demonstrated the role that the Endangered Species Act was going to play in the basin, and the powerful position that the Pyramid Lake Tribe now occupied. This new balance among players, some of whom had much weaker voices not long before, ultimately provided an incentive for most of the water users to address basin-wide problems comprehensively and to explore creative solutions that would promote both efficiency and equity.

History of Negotiations

Two attempts at settlement, one in 1985 and one in 1986, both failed. This was a significant indication of the balancing of power among players in the basin. The view was that if a senior senator could not get his explicit departing wish of a ratified interstate compact between California and Nevada, in spite of his strong connections to the Administration, then there was little hope of a settlement. Among the reasons given for these failed attempts was the perception that a former Nevada senator came to the table with biases and a personal agenda. Further, the settlement attempts were done piecemeal rather than trying to sort out all of the problems as a whole. Even though there was a lot of pressure for a settlement, both settlement efforts were thwarted by parties who had "veto power" but had not been brought into the process or had not consented to the outcome.

With the election of Senator Reid of Nevada and his interest in finding solutions to the problems in the basin, new life was breathed into the possibility of a negotiated settlement. Other leadership emerged simultaneously. Joe Ely had become Pyramid Lake's tribal chairman in the mid-1980s. He was both astute and trusted by the tribe. Sue Oldham from Sierra Pacific was the first of the previously united Nevada (non-tribal) interests that was willing to negotiate with the Pyramid Lake Tribe.

Concurrently, there was a sense of crisis among most interests. Everyone was aware that there was not enough instream water to meet existing needs. A drought further limited those supplies, which heightened anxieties in Reno-Sparks, and exacerbated die-offs of waterfowl in the wetlands as they were crowded into a smaller area and contaminants were further concentrated. There were no cui-ui spawning, and there were concerns about the voluntary interstate compact coming apart.

Project Description: Negotiation

Senator Reid came to this tangle of issues unaligned with any one party in the Truckee-Carson basin. He knew that many of these issues were ticking timebombs and most were dependent on solving a number of issues simultaneously. However, the number of players and issues to be resolved were overwhelming.

He decided to look at the two combined basins and identify only the critical players to initially negotiate. These were the major water right holders as well as the parties who each held the power to undo any settlement that did not have their consent. This meant he invited from this "problemshed" the Pyramid Lake Tribe, Sierra Pacific, Nevada, California, TCID, and representatives from the Department of Interior because of their responsibilities to the tribes, endangered and threatened species, and the reclamation project.

During the first stages, the meetings were closed to the public. However, there was regular communication with the broader community and an interest in its concerns. The Senator's approach was to try to get the primary parties to

put together the major building blocks, and later to build on that foundation by bringing in the other interests individually.

Goals and Objectives

The goal of the negotiation process was to have a settlement that would pass as a whole – no pieces could get Congressional approval without all of the other pieces.

Certainly, Senator Reid's goal was to reach a settlement to which all parties were agreeable. The Pyramid Lake Tribe came to the table wanting clear title to the bed and banks of Pyramid Lake. They also sought money for fisheries and habitat restoration, and for an economic development fund. They favored the reoperation of the reservoirs on the Truckee system to improve its efficiency. Finally they wanted to recoup water for Pyramid Lake that they claimed was illegally diverted by TCID between 1973 and 1987, an amount that was recently estimated at one million acre-feet of water. This was the subject of a court case at the time as well.

Sierra Pacific, the utility responsible for providing water to the area, was looking for upriver storage for a drought supply for Reno-Sparks. With all of the other local sources of water allocated, Sierra Pacific was eager to find a way to use some of Stampede's water to meet the Reno-Sparks area's growing need for drought protection.

At the time of the invitation to negotiate, California and Nevada were voluntarily adhering to their negotiated interstate compact that allocated water from the Truckee and Carson rivers between the two states. Though the two states had voluntarily complied with the compact since 1970, it had never been congressionally ratified due to concerns expressed by the Pyramid Lake Tribe and the federal government. The primary concern was that the compact would conflict with their efforts to secure water to repair environmental damage to Pyramid Lake caused by the Newlands Reclamation Project. The states were eager to have their compact congressionally ratified for the certainty ratification would provide.

Pyramid Lake and exposed shore due to a decline in water level.

The Newlands Reclamation Project wanted the status quo. However, it was at the center of most of the intra- and interstate controversies, particularly those regarding the condition of Pyramid Lake and the Lahontan Valley Wetlands. With more senior water rights than most of the other stakeholders and a determining role in the health of the wetlands, Newlands held the key to resolution of many of the basin's problems. Most of the stakeholders, as well as the Lahontan Valley Wetlands Coalition representing 16 environmentally oriented groups, were interested in exploring acquisition and transfers of water rights, opportunities for improving efficiency through the OCAP, and other approaches to freeing up irrigation water for other uses.

Another controversy regarding the Newlands Project was that the Fallon Tribes were to be serviced by the project, yet water was never forthcoming despite federal obligations under P.L. 95-337. The Secretary of Interior had been directed, as his first priority, to complete the irrigation system on the original reservation's 4,640 acres and extend the system to bring into cultivation an additional 1,800 acres.

Under the stressed conditions regarding water availability in the basin, the prospect of serving "new land" for the Fallon Tribes with water from the Truckee River created the potential for pitting the Pyramid Lake Tribe against the Fallon Tribes. This was something that people were sensitive to, yet the Fallon Tribes were not at the table for negotiations of the Truckee-Carson-Pyramid Lake water settlement, and TCID did not represent their interests.

Nevertheless, the Fallon Tribes were in their own negotiations to rectify the problems that remained unaddressed after P.L. 95-337. In their own negotiations, they sought a settlement fund for economic development and for the financial capability to undertake the work on the irrigation system that was to have been done by the United States.

Obstacles

The first obstacle emerged fairly early in the negotiations. It was clear that the Pyramid Lake Tribe and TCID were having difficulty reaching any agreement. To move beyond this standstill, TCID and the Pyramid Lake Tribe agreed to disagree and to pursue their differences later in the courts. Though TCID stayed at the table, they were not active in the negotiations.

Another obstacle was the Department of Interior. In the early stages, each bureau had a spokesperson at the table. However, the bureaus had inconsistent and often conflicting missions and perspectives. After this became apparent in the negotiations and during hearings held in Washington, D.C., the Secretary of Interior, Manual Lujan, appointed Bill Bettenberg as the representative of Interior. Bill Bettenberg did not come with an affiliation with any of the bureaus previously at the table, and was able to provide authority and unity to Interior's position. This was critical to coming up with a solution that could endure.

An obstacle that was not remedied during the negotiations was the unwillingness of the Office of Management and Budget (OMB) to provide the bottom-line dollar figure that would be acceptable to the Administration to make the settlement whole (e.g. to cover costs of the Pyramid Lake Tribe's fisheries and development funds, the Fallon Tribes' development fund, and other federal costs). Fortunately in the end, this did not undo the group's efforts though it had this potential.

The Settlement

The Preliminary Settlement Agreement

During the early stages of negotiation, the Pyramid Lake Tribe and Sierra Pacific negotiated what became the "Preliminary Settlement Agreement." It called for new management of all storage facilities on the Truckee to improve efficiency of the system. The goal was to improve spawning conditions for cui-ui and, at the same time, provide water to serve the Reno-Sparks area during drought periods. The agreement's primary focus was on the operation and use of Stampede Reservoir. This agreement acknowledges that the timing of water needs for fish and for drought supply may not overlap because cui-ui usually do not spawn during droughts. Therefore,

potentially more than one use could be met with Stampede's storage. The Pyramid Lake Tribe agreed that the reservoir could serve other needs providing it has sufficient water during the spring of most years to augment the lower Truckee River flows for spawning.

The agreement allows Sierra Pacific to accrue water credits in Stampede Reservoir for drought protection for Reno-Sparks. During drought periods, water can be used from Stampede as long as there is adequate supply to meet spawning needs in other years. Among the conditions for using Stampede water for drought protection is one that the Reno-Sparks area must develop a water conservation plan which may require the installation of water meters, the adoption of increasing block rates for water use, and the ability to achieve a 10 percent reduction in water demands in drought years.

The Rest of the Negotiated Settlement

Following the Preliminary Settlement Agreement, the Pyramid Lake Tribe, California, Nevada, and Sierra Pacific negotiated the settlement of the remaining major issues. Although these negotiations were successful, the resulting bill, S. 1554, did not become the final act, but instead became the foundation for it.

Numerous environmental and other concerns, including a more focused federal interest, were addressed and incorporated during committee mark-up following the introduction of S.1554. It was during this process that many of the interests that were not at the table during the negotiation process were able to provide input. This was arranged by Senator Bradley's staff, and done in consultation with all of the parties in the negotiation.

At the last minute, S.1554 was tacked on to the Fallon Tribes' water rights settlement, seeing that the former vehicle for moving the Pyramid Lake settlement might not pass the Congress. The ultimate result of the negotiation, the committee mark-up process, and the attachment of S.1554 to the Fallon settlement was congressional enactment of the two water rights settlements in toto, which include the following major provisions.

Interstate Allocation

The Truckee, Carson, and Tahoe basins were allocated between the two states in a manner acceptable to the United States and the Pyramid Lake Tribe, adhering to the spirit of the 1970 interstate compact.

The Operating Agreement

The settlement directs the Secretary of Interior to negotiate and develop an "Operating Agreement" to be signed by Nevada and California, the Pyramid Lake Tribe, and Sierra Pacific that will modify the existing operation of the reservoirs on the Truckee system. The ultimate goal for the Operating Agreement is to achieve the greatest possible coordination of reservoir operations, including privately owned reservoirs, in order to execute the changes made to the management of Stampede Reservoir under the Preliminary Settlement, satisfy vested and perfected water rights on the Truckee system, and satisfy instream beneficial uses of water in the Truckee such as fish and wildlife habitat, recreation, and water quality.

This directive also authorizes the Secretary to permit storage of non-project water in federal water storage facilities in the Truckee River basin in exchange for fees. This opens up opportunities for storing non-project water upstream where evaporative and conveyance losses are significantly lower than in Lahontan reservoir. It also creates an environmental fund that will be credited with revenues primarily received from Sierra Pacific in exchange for storage space, as well as other revenues from non-project water storage, surplus interest earnings from the Pyramid Lake Tribe's fishery fund, and any donations. This fund can be used to benefit Lahontan Valley and Pyramid Lake fish and wildlife (e.g. to assist in financing water acquisitions as provided elsewhere in the Act).

Reoperation may result in minimizing Truckee diversions because water is often diverted and stored at Lahontan Reservoir to meet the water needs that exceed what the Carson River can provide. These diversions presently take place without knowing exactly what the Carson can provide. With the opportunity of storing water

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Interior Secretary Bruce Babbitt and Mark Mix, a technician at the Marble Bluff Fish Facility measure an endangered cui-ui on Cui-ui-ticutta Day.

in the upper Truckee basin reservoirs, releases as well as downstream diversions can be more precisely related to the actual needs.

Settlement Funds

Three funds are established under the act to satisfy part of the federal trust responsibilities. These are the Pyramid Lake Paiute Fisheries Fund, the Pyramid Lake Paiute Economic Development Fund, and the Fallon Paiute Shoshone Tribal Settlement Fund. The $25 million Fisheries Fund is for the operation and maintenance of the tribal fisheries facilities at Pyramid Lake, as well as for the restoration, maintenance and management of the Pyramid Lake fishery to benefit the cui-ui and Lahontan cutthroat trout. This will be done in accordance with plans prepared by the tribe in consultation with and the concurrence of the U.S. Fish and Wildlife Service and approved by the Secretary. The Pyramid Lake Tribe assumes complete financial responsibility for the tribal fishery facilities located at Pyramid Lake, excluding Marble Bluff Dam and Fishway, and must release all claims against the United States for previous damage to the fishery.

A $40 million Pyramid Lake Paiute Economic Development Fund is also established. Both principal and interest from the fund are available for tribal economic development in accordance with a plan developed in consultation with the Secretary of Interior. This plan must also be consistent with the fishery restoration goals of the plans for the tribe's fisheries fund.

The Fallon Tribes receives a settlement fund of $43 million to provide the financial capability to rehabilitate and improve the existing irrigation system on the reservation, and to acquire lands with active water rights or active water rights alone. By allowing the acquisition of just active water rights, or "wet water," the settlement ensures that the tribes' rights can be fulfilled without expanding actual water use in the basin.

Endangered and Threatened Species: Recovery and Enhancement Program

Aside from the Preliminary Settlement's provisions for water from Stampede Reservoir during spawning season, the settlement further authorizes the Secretary of the Interior to acquire water and water rights from willing sellers in the basin to assist the conservation and recovery of the Pyramid Lake fishery. In addition, studies and recovery plans must be expeditiously developed and implemented, including those for the rehabilitation of the lower Truckee River.

Wetlands

The conflict between protecting the lake level and protecting wetlands led to an acquisition program for water rights to support the wetlands. The settlement authorizes and directs the Secretary of the Interior to acquire water and water rights from willing sellers to augment irrigation returns and other incidental flows to sustain on average approximately 25,000 acres of primary wetland habitat within the Lahontan Valley. The financial requirement to achieve this is left unspecified but is likely to be well in excess of $30 million. Purchases will be supported, in part, by funds made available through the Lahontan Valley and Pyramid Lake Fish and Wildlife Fund.

Cost-Sharing

A conflict over the source of funding for the acquisition program was settled with a cost-sharing agreement between the federal government and Nevada. Of the total amount required, at least $9 million dollars of state funds will be used to acquire water and water rights, and for other protective measures to benefit Lahontan Valley wetlands.

Evaluation

Progress on the implementation of the settlement is promising. There have been no surprises as the parties have worked through the first stages of implementation. Funds have been appropriated on schedule, and Environmental Impact Statements (EISs) are underway. Parties are negotiating the next layers of details to effect implementation. The Fallon Tribes have reached agreement with the Secretary of Interior pertaining to the management and use of their settlement fund. Agreements for the management of Anaho Island National Wildlife Refuge have been completed. Plans for the recovery of the cui-ui and Lahontan cutthroat trout have been developed, and the plan for the cui-ui is beginning to be implemented. In fact, this spring the cui-ui spawned for the first time in six years, an event that was marked by a Cui-ui Day celebration which was attended by Secretary of Interior Bruce Babbitt, Senator Reid, tribal elders, and approximately 300 attendees.

Water rights are being purchased for the wetlands. The Nature Conservancy (TNC) and the U.S. Fish and Wildlife Service have acquired approximately 11,000 AF of water from willing sellers for wetlands, of which about 7,000 AF have actually been transferred to the wetlands. The prescribed goal is to acquire and transfer enough water to sustain 25,000 acres of wetlands, or about 100,000–125,000 AF of water annually from all sources.

Recognizing that this could have significant impacts on the community has caused TNC to work with Churchill County, the U.S. Soil Conservation Service and other entities to develop criteria for determining which sites to target for water and/or land acquisition in order to minimize possibly adverse impacts. Among other things, the criteria consider the land's productivity and its suitability for development consistent with community goals.

Many of these pieces will take time to negotiate and put in place. Some are factors upon which the success of the settlement is contingent. These include the development of an Operating Agreement for the upper Truckee basin reservoirs to maximize their collective efficiency, the resolution of the Newlands Project OCAP (which are presently frozen until 1997) and their contingent inducements. Furthermore, many of the provisions of the agreement must await the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA) processes as well.

Nevertheless, progress on these fronts is occurring. For example, negotiations on the Truckee River Operating Agreement (TROA) began in 1991 and continue at present. Portions of a draft agreement have been prepared, though a number of significant items have not yet been negotiated. Interim agreement negotiations for storing privately owned water in Stampede Reservoir is likely to begin soon. The EIS for TROA is being prepared and is expected to be done in late 1995.

The true test of success will be, in the end, how and whether the pieces are implemented. One of the real strengths of the settlement appears to be the framework it has provided within which remaining conflicts can be addressed and resolved. It is flexible and allows creativity in problem solving. Much of the present focus is negotiation and consensus-building within current law and authorities. Some solutions will take further legislation to enable; others may need to be sorted out in court.

Examples of some of the ideas being discussed include "decoupling" of the Truckee from the Newlands Project at Derby Dam, which would result in satisfying the requirements of the cui-ui recovery plan. It would also meet the Pyramid Lake's water quality needs and solve Reno-Sparks water quality problems. As much as this might appeal to the Pyramid Lake Tribe and to Reno-Sparks, it also would reduce the opportunities for some creativity to deal with problems in the both the Truckee and Carson basins.

A similar proposal is an "operational decoupling" of the two systems. Many of the benefits of this idea are demonstrated by a model developed by the Environmental Defense Fund. By reducing storage targets at Lahontan reservoir, dependence of farms and wetlands on Truckee River water are dramatically reduced. By increasing storage of water in the Upper Truckee, greater opportunities are created for sharing water between Reno-Sparks and Pyramid Lake to meet greater demands, water management is improved by reducing evaporative and conveyance losses, and the wetlands and Newlands project get weaned off of Truckee flows and become more dependent on the Carson. Further, this proposal would allow for a credit storage system that would benefit a number of uses in both the Truckee and the Carson basins, but would accrue the greatest benefit to Pyramid Lake and the municipal and industrial uses in the Reno-Sparks area.

Another creative mechanism being discussed is conjunctive or reciprocal use. This would involve acquiring water rights for wetlands but allow them to be interruptable. In most years the water would be available for the wetlands, but in spawning years this water would be managed for cui-ui spawning.

An idea that has been discussed for some time but never seriously engaged is the idea of water leasing from the Newlands Project. The idea is being promoted by a new organization of Newlands Project water right holders called the Truckee-Carson Leasing Authority. Leasing project water and not selling it appeals to this group as a way to hold onto their water rights and generate a revenue stream. The emergence of this group of irrigators was prompted by their acknowledgment of the changes taking place in the way reclamation project water is being viewed locally as well as nationally, and exploring ways to allow changes that are compatible within an agricultural community.

These are just some of the ideas being discussed as ways to put the pieces together efficiently and equitably.

Advice

Lots of advice was offered from participants' experience in the negotiated settlement.

Timing

"If you're not ready, don't do it," offered Joe Ely, former tribal chairman for the Pyramid Lake Tribe. There needs to be motivation to settle, both to get the critical players to the table and to make an agreement stick. If the players are not ready or the situation is not ripe, success is much less likely.

Crises can be a motivator as can litigation. Though litigation is expensive, it is sometimes a necessary component to motivate parties. For example, an explanation for the Fallon Tribes'

less powerful position in the settlement negotiations was, "*the Fallon Tribes didn't have a lot of lawsuits in the balance.*"

Finally, the Endangered Species Act can be a significant motivator in settlements.

In terms of how a settlement will be implemented, there is a timing and ripeness element to selecting tools and mechanisms that will work as well. For example, ideas such as leasing have been around for awhile but politically infeasible. Now, however, the climate in Congress regarding reclamation project water use and the circumstance around the settlement have caused this idea to emerge as a serious option.

Facilitator

A facilitator that is fair, unaligned, able to listen, and who has been given authority from the interests being represented at the table is critical. The negotiator also has to understand the pieces and share the feeling of motivation.

There must be the political will both on the part of the facilitator as well as the parties. Senator Reid was seen to have taken a great political risk in tackling this settlement with relatively little to gain personally. This commitment to the process earned the respect and trust of many.

Parties

The forum should represent the "problemshed." To make the numbers more manageable, negotiate with only those that can make or break the agreement. Then let other affected parties have an opportunity to participate. People with front line authority to take action need to be involved. In the case of a federal agency such as the Department of Interior with its different bureaus and their different purposes, it is important to have a person that brings a unified message and the authority to make it work.

Process

"Be there, acknowledge the legitimacy of issues and concerns, ask and answer questions, and don't expect it to be an easy process," was advice offered by Bill Bettenberg, the representative from the Department of Interior.

An effective process is likely to be expensive and time-consuming. Parties must be motivated by having a stake in the outcome so that a mutual commitment exists to reach a resolution. Often, parties become stakeholders as a result of a threat to their interests (e.g., application of the Endangered Species Act). Complex problems may need to be tackled a piece at a time with progress being incremental. These successful steps should be celebrated.

Deal at a level of detail that can survive implementation. Pieces can be added as time goes on. For example, this is why water quality was not dealt with in the settlement and is being dealt with now. It was seen as potentially bogging down the rest of the settlement and was not critical to the settlement of numerous other issues.

Look for multiple legislative pathways and leave as many options open for moving legislation. For example, without the Fallon Tribes' settlement, the Pyramid Lake settlement would have died.

One component to achieving successful implementation is public relations work which should begin early, since grass roots support is vital. Another is frequent communication among all parties. A third is buy-in by secondary parties, those with a role but without "veto power" in the settlement. Though they may not be critical players, they can slow down implementation. For example, the few sections of the Act that are lagging in implementation are pieces resting on the shoulders of secondary parties who were less highly invested in the settlement. The most notable example that many parties express frustration with is the failure of the Army Corps of Engineers to implement even pilot restoration projects on the Lower Truckee River. As a result, $450,000 has been requested by for the U.S. Fish and Wildlife Service to assist in these efforts during FY94.

Outcomes

When making decisions or trying to solve problems, put the process for dealing with change into the agreement. A condition on any settlement that it must pass with all pieces in tact induces a commitment to the whole by all the parties. The outcome should contain flexibility to adapt to changing conditions, changing

needs, and changing values. The settlement should also ensure the cohesiveness to survive implementation, changing parties, and new developments. An ideal outcome takes a holistic basin or system perspective.

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The Unfinished Agenda

The Western Governors' Environmental Policy Council recognized that the principles and tools described here need to be applied to other issues. Further work on the following topics would yield more strategies, principles, and tools to improve environmental management in the West:

- the integration of regulatory and pollution prevention tools across environmental media;
- the improvements in the measurement of environmental results;
- the interface of water quality and water quantity management;
- the principles and methods for addressing emerging concerns about environmental equity; and
- the development of greater state and local capacity for environmental and resource management strategies such as those described in the report.

This appendix was prepared by the Western Governors' Association staff. It is meant to represent types of models and opportunities for environmental innovation in the West. It is not a comprehensive listing, nor did time permit any thorough evaluation of how well these mechanisms are working. Information on some projects is very minimal here, but this should not be taken to indicate that the project described is unimportant.

The information was compiled by surveying western state environmental and natural resource directors on new approaches they were implementing or considering. That information was supplemented with a literature search on environmental innovation. Any omission of other relevant and important models or opportunities in the region is completely accidental.

Program Descriptions

Point and Nonpoint Trading to Reduce Phosphorous Pollution: Dillon Reservoir and Cherry Creek Projects

Goal: Prevent phosphorous-related water quality degradation of Lake Dillon and Cherry Creek Reservoir in Colorado by implementing trading schemes for point and nonpoint sources of phosphorous.

Timeframes for Results:
Dillon Reservoir: Program is operational.
Cherry Creek Reservoir: Phosphorous reductions have already been achieved, trading can now begin.

Contact:
Bill McKee, Senior Planner, Colorado Department of Health, Water Quality Control Division, (303) 692-3583.

Summaries: A "bubble approach" has been taken in the management of phosphorous in Lake Dillon in the mountains of Colorado. Instead of state and federal regulation for point sources and local handling of nonpoint sources, all sources are managed together. The plan calls for trading between point and nonpoint sources. The removal of 2 lbs of nonpoint phosphorous will generate a credit of 1 lb phosphorous for point sources. The goal is to maintain phosphorous loadings at current levels despite local growth. Local governments implemented the idea by enacting land use ordinances addressing septic system maintenance, erosion controls, and regulations limiting the proximity of new construction to streams.

The Summit Water Quality Committee (Phosphorous Club) was organized by the Northwest Colorado Council of Governments, and includes representatives from the state and county, local towns, ski areas, mining interests, EPA, and the Denver Water Board. EPA and the state have endorsed the bubble approach. A future development may be trading between point source dischargers, whereby one discharger may trade part of its phosphorous allocation which is not used to another entity which is approaching full use of its allocation.

Rapid growth and development pressures on treatment plants discharging into Cherry Creek Reservoir led to the creation of the Cherry Creek Water Quality Authority. The Authority is composed of members from the county, local communities, and water and sanitation districts surrounding the reservoir. The Authority has encouraged county and local governments to adopt "best management practices," such as stormwater and erosion controls for nonpoint pollution because the majority of phosphorous entering the reservoir comes from nonpoint sources. Once the annual phosphorous loadings from stormwater runoff have been cut in half (from pre-project levels), trading may begin. Trades will be guided by using procedures approved by the State Water Quality Control Division. The Basin Authority could make any further nonpoint reductions available to

sewage treatment plants in the form of pollution credits. Other phosphorous credits might be made available as the result of nonpoint projects initiated by the Authority and financed by proceeds from member assessments, reservoir user fees, and other fees and taxes. As of January, 1992, project officials believed they had achieved the 50% reduction, but were waiting for data to come in. Even so, trading in the near future is unlikely, since development is currently slow, and treatment facilities are operating well within their waste water treatment capacities.

Revisions were made to the Cherry Creek Control Regulation in 1992 to provide for temporary transfers of phosphorus allocations between waste water dischargers if appropriate intergovernmental agreements are developed, the discharger who requests the additional allocation is taking reasonable steps to reduce phosphorous loadings, and the requesting discharger has been in substantial compliance with its discharge permit. A discharger may request a phosphorous allocation from the "reserve pool" of 303 pounds if a need has been established, reasonable steps have been taken to control phosphorous loads, and a long-range plan for phosphorus reduction exists.

Oregon Tradable Credits

Goal: Meet Clean Water Act requirements for Total Maximum Daily Load (TMDL) at the least overall cost.

Timeframe for Results:
This is only a proposal.

Contact:
Neil Mullane, Manager, Standards and Assessments Division of Environmental Quality, Oregon Department of Environmental Quality, (503) 229-5284.

Summary: Oregon is discussing the implementation of tradable permits for maximum daily stream loadings on rivers of limited water quality. The permits would be for point sources and tradable on an annual basis.

Tradable Credits for Recycled Content Being Discussed in California

Goal: Meet California minimum recycled content law requirements at lower overall cost by allowing trading in credits for recycled content.

Timeframe for Results:
Proposal stage only.

Contact:
Edward Boisson, California Integrated Waste Management Board, (916) 255-2160.

Summary: The California Integrated Waste Management Board has been evaluating the applications of tradable credit mechanisms for recycled content in such products as plastic trash bags and newsprint. For example, the state has passed a law that required newspapers to use 25% recycled material beginning in 1991 which will increase to 50% by 2000. The idea would then be to give credits to those who exceed the 50% target, which they could sell to other newspapers unable to efficiently meet the 50% goal on time. In this case, those newspapers that achieve high recycled content levels would be rewarded, while those that do not would pay.

Puget Sound Program

Goal: Protection and enhancement of estuary water and habitat quality in Puget Sound through a comprehensive program involving many partners.

Timeframe for Results:
Ongoing program.

Contact:
Nancy McKay, Executive Director, Puget Sound Water Quality (PSWQ) Authority, (206) 493-9300.

Summary: Initiated in 1987, the Puget Sound Program is a cooperative effort involving the state of Washington, private entities in the Seattle area, local tribes, EPA, and other federal agencies to improve the aquatic resource. The Initiative is focusing on estuary management, fish and wildlife habitat protection, oil spill prevention, and overall water quality (nonpoint source pollution, municipal and industrial discharges, stormwater and combined sewer overflows, air-water cross media issues, and groundwater).

Puget Sound was designated as an "estuary of national significance" under The Clean Water Act (CWA). The Act requires development of a "Comprehensive Conservation and Management Plan." The Puget Sound Water Quality Management Plan, conceived and enacted into law in an ancestral form by the state of Washington before Puget Sound attained national estuary status, guides the program. While the effort is spearheaded by EPA, Washington Department of Ecology, and the PSWQ Authority, many state and federal agencies are involved in implementing the Plan.

The initiative covers the entire ecosystem of Puget Sound, including the open water within it, the beds and ocean floors beneath it, freshwater streams flowing into it, related riparian areas (freshwater and marine), and nearby habitats related to these areas. Transborder impacts from Canada are also included. Funding for the initiative comes from federal, state, and local sources of all types (> 35 different sources). The Plan is being implemented at about 35% of the $100 million/2 yr. called for by the program.

As a result of the program, partnerships have been formed, monitoring is ongoing, research priorities and at-risk watersheds have been identified, pollution standards have been tightened in some areas, and new standards set in other areas.

The Program has used several innovative policy tools. Because of its size and scope, new processes and management approaches are being tested. Funding for some local participation comes from special low-interest loans through the state's revolving fund. Two proposed funding sources for the Estuary Management and Plan Implementation Programs (sub-programs within the Puget Sound Program) are a motor vehicle manufacturers' fee, to be assessed on each new vehicle registered in the state, and a tax on commercial marine fuel which is currently untaxed. The Estuary Management Program is developing a strategy for shellfish protection which will focus on "...long term funding programs that use fees, taxes, or other mechanisms, such as financial incentives and disincentives." The Wildlife Habitat Program is using a GIS database and will work with private entities to grant funding or incentives for projects. The Wetlands Program sets up a wetlands acquisition scheme and proposes restrictions on wetlands use. Under the Municipal and Industrial Discharges Program, variable (based on degree of toxicity) fees for discharge permits will be investigated. A study evaluating alternative methods of carrying out self-monitoring reports submitted by dischargers will be done eventually (1995), and a program for technical outreach to dischargers will be funded (1993).

San Francisco Estuary Project

Goal: Protection and enhancement of estuary water and habitat quality in San Francisco Bay and the Sacramento-San Joaquin Delta through a comprehensive program involving many partners.

Timeframe for Results:
Program now moving out of planning stages; results will begin to be seen in 1993.

Contact:
Gail Louis, San Francisco Estuary Initiative Program Manager, EPA Region IX, (415) 744-1952.

Summary: The San Francisco Bay-Delta Estuary is an "estuary of national significance" under The Clean Water Act (CWA), which means a Comprehensive Conservation and Management Plan (CCMP) is required. EPA and California established the Project in 1988, with the five-year goal of developing a plan. The Project convened a management conference composed of members of the private sector and all levels of government. Participants are presently completing the Plan, and it will be submitted to EPA and the state for approval. The CCMP is the first-ever comprehensive plan to improve resources protection throughout the Bay-Delta.

To date, the Project has published a series of technical reports on relevant issues, funded several demonstration projects, and has been engaged in the process of building consensus among the various parties for goals and specific objectives relating to each of the issue areas. Consensus has been reached by the parties on a majority of the CCMP goals, objectives, and actions.

The CCMP identifies common goals and strategies "to achieve and maintain an ecologically diverse and productive natural estuarine system," as expressed by the CCMP vision statement. It will help guide coordinated state and federal efforts aimed at improved resource management. The heart of the CCMP consists of approximately 150 actions which focus primarily on the water bodies and the 12-county area directly surrounding the Estuary. The actions are contained in the following nine CCMP program areas: Aquatic Resources, Wildlife, Wetlands, Water Use, Pollution Prevention and Reduction, Dredging and Waterway Modification, Land Use, Public Involvement and Education, and Research and Monitoring.

Specific instances of contemplated uses of innovative policy techniques do not appear in the Project's summary of goals and objectives for the issue areas. However, one of the CCMP Mission Statement Goals is to "[d]evelop and expand non-regulatory programs, such as public-private partnerships and market incentives, in conjunction with regulatory programs to achieve the goals of the Project." The summary, in discussing a strategy for implementing the Plan, states that "[m]ajor themes in these early discussions of an implementation strategy have included ... seeking market-based techniques as cost-effective alternatives to centralized, command-and-control mechanisms traditionally associated with governmental regulation..."

Washington's Sustainable Forestry Plan

Goal: Establish forestry practices that allow all uses to be sustainable, by expanding the planning process to include more ecological considerations, and extending planning to larger regions.

Timeframe for Results:
From August 1, 1992 onward.

Contact:
Jack Hulsey, Division Manager, Forest Practices Division,
Washington Department of Natural Resources, (206) 902-1784.

Summary: Washington is on the verge of implementing a far-reaching Sustainable Forestry Plan, the first of its kind in the country. The Plan will shift regulation of forestry practices to a broader landscape-based approach and away from the current narrow jurisdictional model. The Plan will include measures to protect forested wetlands, water quality in streams, and habitat from logging impacts. The Plan will also restrict clearcut size and regulate the timing between adjacent clearcuts.

Nisqually River Council: Progress Through Cooperation

Goal: To implement the Nisqually River Management Plan through a collaborative process involving state and federal resource agencies, local and tribal governments, and business, environmental, and other community groups.

Timeframe for Results:
Ongoing.

Contact:
Steve Craig, Washington Department of Ecology, (206) 459-6780.

Summary: The Council has been extremely effective in pulling together disparate interests to protect and enhance the unique cultural, historical, environmental, and economic resources of the Nisqually River basin. Created in 1987 after the Washington State Legislature approved the Nisqually River Management Plan, the Council is an advocacy and coordination body only. There is no added layer of government. The program emphasizes working within the framework of existing laws and regulations.

The 21-member, broad-based organization represents a cross-section of tribal, agency, municipal, business, and citizen interests. In addition, a 21-member Citizens Advisory Committee, composed mostly of local residents, assists the Council in identifying and implementing needed actions through advocacy and coordination. Working together, they have been able to overcome initial distrust and perceived conflicts of interests.

Their successes are impressive, e.g., creation of the Nisqually River Basin Land Trust to protect critical lands through purchases, donations, and easements; a Nisqually Basin Watch that enlists the public in stewardship of the basin's natural resources; a Nisqually River Interpretive Center Foundation designed to promote public education and involvement through a major regional interpretive facility; major riparian habitat protection and salmon restoration projects; an ambitious Nisqually River Education Project that coordinates environmental education and student water quality monitoring in schools throughout the basin; etc.

Arkansas Pollution Control Act

Goal: Remove any financial incentive to violate state pollution statutes.

Timeframe for Results:
Enacted into law 1991.

Contact:
Steve Weaver, Chief Legal Counsel,
Arkansas Department of Pollution Control and Ecology, (501) 562-7444.

Summary: The 1991 Arkansas Water and Air Pollution Control Act contains provisions which allow the state, as an alternative to leveling the usual criminal and civil penalties for violation of the state's pollution statutes, to recover the full amount of any pecuniary gain realized by the polluter from its actions (or twice the amount in criminal cases). Thus, in no case will it be economically advantageous to violate pollution laws.

Wildlife Conservation Incentives: Defenders of Wildlife Wolf Programs and Salmon Protection in the Northeast

Goals: Reduce local livestock industry's hostility to wolves by reimbursing owners of livestock killed by wolves for their financial loss; provide incentive for local landowners to tolerate wolves by paying

them for instances of documented breeding success.

Benefit Atlantic salmon populations by paying Greenland fishermen not to fish.

Timeframes for Results:
Defenders of Wildlife Program: Ongoing.
Salmon Protection Program: In proposal stage.

Contacts:
Defenders of Wildlife Program: Hank Fisher, Northern Rockies Director, Defenders of Wildlife, (406) 549-0761.

Salmon Protection Program: Whit Fosburgh, Director of Fisheries Programs, National Fish and Wildlife Foundation, (202) 857-0166.

Summaries: Defenders of Wildlife has experimented with two programs which use financial incentives to benefit the wolf population in the northern Rocky Mountains.

In 1986, Defenders launched its compensation program, designed to compensate ranchers for livestock lost to wolves. Wall Street Journal (10/20/87) reported that Defenders' proposed plan was to have the "Agriculture Department" verify that an animal had indeed been killed by wolves, and the U.S. Fish and Wildlife Service would estimate the damages and dispense the money. The use of private money is seen as advantageous because it reduces the need for government funds, limits the potential for fraud or false claims, deters the incentive for government-run programs to use up all of each year's allotted money to keep their program alive, and conservation groups are given a chance to feel the extent of the wolf "problem." In addition to straight reimbursement for livestock kills, the compensation program also helps ranchers avoid kills by providing financial assistance for electric fences and livestock guard dogs. Special purpose donations to Defenders created a $100,000 fund, of which approximately $12,000 has been paid out to date.

In 1992, Defenders announced a second program, which will pay $5,000 to any northern Rocky Mountain landowner on whose land wild wolves reproduce and raise pups to adulthood. While the first program may have, at best, transformed the wolf from a negative factor into a neutral factor, this second program is designed to make the wolf a positive factor.

A similar program is being developed in the Northeast. Despite large expenditures to restock and restore rivers, salmon populations in New England are declining. One reason is over-fishing off the coast of Greenland. An Icelandic businessman has proposed a plan to pay commercial fisherman in Greenland not to fish salmon. The fishermen would receive some fraction of the amount they would have earned from fishing; some of the money paid would also be used to get the fishermen started in other economic activities. Funding for the program would come from private donations and a U.S. grant. The total yearly cost of the program ($1 million) would be much less than that of traditional solutions, and a similar program for Faroe Islands fishermen has already resulted in a twofold increase in returning salmon in some parts of Europe. Economically, the solution is a sound one, because one salmon is worth about $15 to a commercial fisherman in Greenland, but $500-1000 to a recreational fisherman in New England.

Hawaii's Forest Stewardship and Natural Area Partnership Programs

Goal: Preserve biodiversity and native ecosystem integrity by providing financial assistance for adopting approved management practices and long term conservation set asides, and by providing tax incentives for conservation.

Timeframe for Results:
Tax incentives are proposed; financial incentives programs are implemented and ongoing.

Contacts:
Forest Stewardship Program: Nelson L. Ayers,
Hawaii Stewardship Coordinator, (808) 587-0166.

Natural Area Partnership Program: Peter Schuyler,
Natural Area Partnership Program Manager, (808) 587-0166.

Summary: Hawaii has initiated two new programs called the Forest Stewardship and Natural Area Partnership programs to provide financial assistance for private landowners to adopt sound stewardship and conservation practices on their land. The programs go beyond planting trees or restoring wildlife habitat. The state Division of Forestry and Wildlife has established a Forest Stewardship program which allows cost-sharing of up to 50% for implementing approved practices. This Program can provide management and protection benefits to a variety of forest resources on private lands. The principal requirement of the Program is that a landowner must develop a Forest Stewardship Plan for the property which must be approved by the State Forester. The second program is the Natural Area Partnership Program, designed to provide matching funds on a 2:1 basis for the management of private lands of natural area reserve quality that are permanently dedicated to conservation. Lands and waters that might qualify include areas with intact native Hawaiian ecosystems or essential habitat for endangered species. This partnership funding can support a full range of management activities to protect, restore, or enhance significant native resources or geological features. Other Program requirements include: 1) dedication of the private lands in perpetuity through a transfer of fee title or a conservation easement to the state or another cooperating entity, and 2) management of the private lands by a cooperating entity or landowner according to management plans approved by the Board of Land and Natural Resources.

In addition, Hawaii is considering changes to its tax structure to encourage reforestation. Currently, no tax classification for private forest lands exists in Hawaii's real property tax system, which is regulated by individual counties. Because of this, many private landowners cannot afford to keep trees on their property. Although sample economic budgets indicate that forest investments can produce modest returns, they are far below the returns gained from grazing cattle and returns per acre from many of Hawaii's agricultural enterprises. This has resulted in many private landowners opting to clear forest lands in order to have their land classified as pasture, which has a relatively low tax rate.

Toxics Reduction in Oregon & Nevada

Goals:
Oregon: Reduction in the amount of toxic chemical use by mandating that each toxics user adopt a plan to do so.

Nevada: Funnel toxic waste disposal tax money into a grant program to help industry find ways to reduce toxics use.

Timeframe for Results:
Oregon: Ongoing.
Nevada: Ongoing.

Contact:
Oregon: Bob Danko, Oregon Department of Environmental Quality, (503) 229-6266.
Nevada: Colleen Cripps, Supervisor, Program Branch, Waste Management Bureau, (702) 687-5872, ext. 3015.

Summary: Oregon has established a new program to reduce toxic chemical use by industry. The program targets selected, high volume toxic use industries and requires companies to have a plan to

reduce toxics use. The plan is not filed with the state, but the state can ask to see it. The program targeted big generators in 1991, and small generators are now complying.

Instead of fines for not developing a plan, the state uses the threat of public "tar and feathering" (public hearings, company name published in paper, etc.,) to encourage plan development. The state provides technical assistance to businesses upon request to help develop plans.

Nevada has taken a slightly different approach to toxics reduction. Nevada is giving grants to industry to reduce the use of toxics. Money to finance the program comes from a fee levied on hazardous waste disposal at a state-owned facility. The fee was imposed by agency regulation.

Grand Canyon Visibility Transport Commission

Goal: Evaluate Grand Canyon air quality problem, and make recommendations for its solution.

Timeframe for Results:
Recommendations due in 1994.

Contact:
John Leary, Western Governors' Association, (303) 623-9378.

Summary: The Grand Canyon Visibility Transport Commission was created by EPA Administrator Reilly under authority vested in him by the Clean Air Act Amendments of 1990. The Commission is comprised of the governors or their delegates from the eight states which form the airshed affecting visibility in the Grand Canyon. The Commission is charged with assessing scientific and technical data, studies, and other available information regarding adverse impacts on visibility. In addition, the Commission is to make recommendations to the Administrator of the Environmental Protection Agency regarding what measures, if any, should be taken to remedy such impacts. The Commission has four years to develop its recommendations.

The Commission's efforts will include reviewing currently available studies, identifying new data needs, projecting future haze conditions, identifying emission management options, assessing the technical feasibility of selected management options, comparing social and economic costs and benefits, and conducting integrated assessments of preferred management options based on selected case studies.

Arizona's Groundwater Code

Goal: Eliminate groundwater withdrawals in excess of recharge by 2025 in certain areas of the state by limiting the number of new users, imposing pumping fees, and requiring water conservation measures.

Timeframe for Results:
Ongoing. Planning horizon extends to 2025 and beyond.

Contact:
Beverly Beddow, Public Information Officer, Arizona Department of Water Resources, (602) 542-1553.

Summary: In 1980, Arizona enacted a unique groundwater code designed to stem the over-pumping of groundwater in the state. The code identified groundwatersheds known as Active Management Areas (AMA) within which existing and future uses of groundwater are regulated. Existing uses at the time of enactment of the code were grandfathered. New users of groundwater must buy grandfathered rights, obtain a permit after demonstrating unavailability of purchasable water, or seek service directly from a city, town, or private water company.

The goal of the program is to reach a balance between groundwater withdrawals and recharge in the largest Active Management Areas (Phoenix, Tucson, and Prescott) by the year 2025. This goal will be

achieved through mandatory conservation requirements for municipal and agricultural users and by prohibiting new urban development where an assured water supply does not exist. The code requires groundwater withdrawal fees be levied (not to exceed $5/acre-ft.) in each AMA, which serves both to defray the costs of groundwater management and as an incentive to reduce groundwater use.

Nebraska's Groundwatershed Protection Program

Goal: Reduce nonpoint source pollution of groundwater through the establishment and monitoring of special protection areas.

Timeframe for Results:
Ongoing.

Contact:
Dick Ehrman, Unit Supervisor, Nebraska Department of Environmental Quality, Groundwater Section, (402) 471-2589.

Summary: Nebraska has a unique protection program aimed at stemming nonpoint source contamination of groundwater (originating primarily from fertilizers and livestock manure). The program establishes special protection areas, based on natural resource districts where well samples indicate significant nitrate-nitrogen contamination, wherein local water management agencies are allowed to develop action plans to meet state groundwater improvement goals and monitor both the amounts and times agricultural users apply pesticides and fertilizers. The agencies can require users to take soil and water samples.

To date, two special protection areas have been designated and another is in the approval stage. Areas covered include 3,300 square miles with more than 75,000 residents.

Central Valley Agricultural Initiative

Goal: Improvement of surface waters and related natural resources in California's Central Valley by addressing issues of point and nonpoint pollution, water use efficiency, water transfers and water marketing.

Timeframe for Results:
Program is just emerging from planning stages. EPA funding for 1993-1994.

Contact:
Palma Risler, U.S. EPA Region IX, (415) 744-2009.

Summary: The Initiative grew out of EPA's Regional Comparative Risk Assessment and Strategic Planning Process, where the Central Valley was identified as an "at risk" area. Goals of the program are to "improve the biological, chemical, and physical integrity of high priority water bodies in the Central Valley, and to facilitate water use efficiency, water transfers, and water marketing." The focus of the Initiative is on cooperation rather than new regulation. The project is being integrated with existing EPA and state programs and policies. FY92 was for planning and start up; FY93 and FY94 will see $750K/yr. funding from EPA Region IX funds.

Cooperators include the State Water Resources Control Board, Central Valley Regional Water Quality Control Board, Department of Water Resources, Soil Conservation Service, water districts, resource conservation districts, U.S. Fish and Wildlife Service, Bureau of Reclamation, Department of Pesticide Regulation, Pacific Gas & Electric, and others.

Specific risk problems identified include pesticides, nonpoint source surface water pollution, wetland degradation, and drinking water. The Initiative is evaluating the implementation of innovative policy tools like tradable permits to meet its goals.

Headwaters Mining Initiative on Basin Water Quality

Goal: Address mine waste related water quality problems in several western watersheds by bringing together all relevant participants to agree on priorities and the use of innovative cleanup strategies.

Timeframe for Results:
Efforts in several watersheds are ongoing. Other efforts are just being started.

Contact:
Rob Walline, Program Manager, EPA Region VIII, (303) 294-7093.

Summary: EPA Region VIII has initiated a program to address inactive and abandoned mines' impacts on water quality. The effort is using a watershed geographic focus to unite multiple stakeholders to address basin water quality. The key element of the Headwaters Initiative is a process of targeting watersheds where environmental risks from abandoned sites are greatest, assessing the contributing problems, setting priorities within the watersheds for action, and using resources from multiple sources and programs to address the priority sites. To date, EPA Region VIII has begun efforts within the Arkansas River and Clear Creek basins in Colorado and is in the preliminary stages of organizing efforts in the Blackfoot basin (MT).

EPA Region X is considering a similar effort in the Coeur d'Alene basin in Idaho, in cooperation with the Idaho Division of Environmental Quality, the Coeur d'Alene Tribe and other federal, state, and local governments and private parties.

Both these efforts are based on the Watershed Protection Approach advocated (but not mandated) by EPA Headquarters. (Note: North Carolina has begun a similar effort at a state level to assess and address water quality on a watershed-by-watershed basis.)

The Headwaters Initiative will use a variety of tools to achieve goals within the basins including remedial actions, demonstration projects, Superfund actions, and the transfer of technologies and other information among basins.

Idaho Snake River

Goal: Find ways to correct water quality problems related to nonpoint sources in the Snake River and meet demands of Clean Water Act.

Timeframe for Results:
Monitoring and organization of the effort are ongoing; results will follow.

Contact:
Tim Litke, Idaho Department of Health and Welfare, Division of Environmental Quality (DEQ), (208) 736-2190.

Summary: The "middle Snake River" is a 94 mile stretch of the Snake River in south-central Idaho. This section of river is one of the most highly developed river reaches in the state. The stretch is heavily impacted by upstream water withdrawals, return flows from irrigated agriculture, runoff from dairies and feedlots, effluent from fish hatcheries, hydroelectric development, discharges from sewage treatment plants, and degradation of riparian/wetland habitat.

The state of Idaho has determined that a portion of the middle Snake is not currently meeting water quality standards and has listed it as "water quality limited." The Clean Water Act requires a Total Maximum Daily Load (TMDL) to be established in such cases. The Idaho legislature had enacted the Idaho Nutrients Act in 1989, which originally was intended primarily to address phosphorous and eutrophication issues in northern Idaho. However, the language of the Nutrient Management Act is seen to be broad enough to accommodate the development of a water quality management plan

to implement the TMDL requirement. The intent is that the local entities and the state will work together to devise a plan that is acceptable both to them and EPA. The Nutrient Management Act requires Idaho DEQ to determine the problems and issues with respect to nutrient pollution in the Snake, to study and gather data on water quality, nutrient cycles and processes in the River, and then determine the best solutions.

A watershed approach has therefore been initiated to improve the quality of the middle Snake River ecosystem. Representatives from industry, hydropower, nonpoint sources (agriculture and irrigation companies), environmental groups, and local government are participating in the implementation of the Nutrient Management Act. EPA Region X is preparing an ecological risk analysis for the aquatic ecosystem. This work will provide the scientific basis for assessing impacts and making management decisions. EPA is also coordinating its program activities, including pilot projects in economic sustainability and point/nonpoint source trading.

The Nature Conservancy "Last Great Places"

Goal: Protect areas of high ecological worth and biodiversity, while recognizing human presence within the landscape, by focusing on and developing agreements and partnerships around key areas.

Timeframe for Results:
Ongoing.

Contact:
Will Murray, Director of Conservation Programs, Western Regional Office, The Nature Conservancy, (303) 444-1060.

Summary: The Nature Conservancy announced its "Last Great Places" initiative in May 1991. The program is an innovative public-private venture to protect critical habitat. The initiative was born out of the realization that 1) large and continuous natural areas are needed to adequately preserve biological diversity, (2) acquiring such areas in the traditional manner would be impossibly expensive, and (3) conservation programs must recognize human presence and land uses. Seventy Western Hemisphere ecosystems/areas have been designated as program sites; the basic idea is to preserve biological diversity while also accommodating human economic and cultural uses within the area. This is to be accomplished, in many cases, by maintaining a core natural area of long-term protection, surrounded by a buffer zone featuring compatible economic use. The Conservancy hopes to demonstrate that some carefully chosen uses, moreover, can function as protection devices in themselves.

The Conservancy is working on "Last Great Places" sites in every western state except Alaska. Each site is managed locally. Cooperating parties vary widely depending on which country or state the program is in, its proximity to urban areas, ownership of nearby and included lands, etc. In general, the list of actual cooperators is large, taking in all manner of the private sector and public agencies.

California's Natural Community Conservation Planning

Goal: Protect key California habitats by establishing a procedural and organizational structure to engage all relevant parties, including private landowners, in a planning process for specific habitats and areas.

Timeframe for Results:
Enacted into law in 1991.

Contact:
Carol Whiteside, California Resources Agency, (916) 653- 5656.

Summary: Natural Community Conservation Planning (signed into law in October 1991) is a pioneering effort by California to protect habitat of threatened plant and animal species in a proactive manner. The objective of the program is to protect sufficient habitat so that endangered species listings of single species (which tend to result in economic dislocations, regulatory gridlock, and inevitable conflict) will not be necessary.

The program gets policy direction from the California Resources Agency, and oversight from an advisory committee, composed of local government, private organizations, conservation interests, and a scientific review panel composed of five distinguished biologists. Permanent Natural Community Conservation Plans, which will have the force of law, will be developed for specific critical habitats. Each Plan will specify which land must be conserved, and how development can be integrated with conservation using scientifically justifiable guidelines.

The first habitat to which NCCP is being applied is coastal sage scrub, which is native habitat for several threatened and endangered species, including the California Gnatcatcher. The pilot is finishing a voluntary enrollment phase where public and private landowners have formally agreed to be a part of the NCCP process. By enrolling, landowners agree that during the 18 month interim period following the conclusion of the enrollment period, they will not disturb habitat, and will cooperate with scientific studies and the formation of a Plan. Public agencies with regulatory control over habitat land they do not own agree to increase discretionary review of activities affecting the habitat to the maximum extent allowed by their statutory authority. In the two target counties (San Diego and Orange), plans in process will address virtually all of the remaining habitat. During the interim review period, the scientific review panel will determine what amount of habitat is necessary to protect the ecosystem, and the players will agree on subregional plans for the entire habitat range. State and local governments may facilitate the establishment of the Plan by acquisition or transfer of lands, imposition of regulatory restrictions, establishing easements, etc.

Arizona to Classify and Protect Riparian Zones

Goal: Multi-agency effort to identify options for protecting riparian areas in Arizona.

Timeframe for Results:
Reports due 1994.

Contact:
Herb Bishlip, Deputy Director of Water Management, Arizona Department of Water Resources, (602) 542-1554.

Summary: In July, 1992, Arizona enacted legislation designed to document and identify protection measures for riparian areas and instream flows in the state. The Game and Fish, Water Resources, and Environment Departments will each undertake different parts of the analysis. Reports will be submitted to a Riparian Area Advisory Committee. The Committee is to issue a report by December, 1994, recommending the scope and elements of any necessary regulatory program and statutory provisions for a riparian area protection.

Black Hills Land Use Restrictions

Goal: Governor created commission to recommend options for updating mining practices.

Timeframe for Results:
South Dakota legislature has implemented several of the commission's recommendations.

Contact:
Steve Pirner, Director, Division of Environmental Regulation (605) 773-3153.

Summary: In September, 1992, Governor Mickelson created a commission to examine the impacts of gold and silver mining in the Black Hills. While the area has had mining activity for over a century, changes in technology, production processes, and prices have increased mining activity in the Black Hills in the last seven years. Legislation adopted in July, 1992, has incorporated several of the Commission's recommendations into state law. One of the primary recommendations was to limit the amount of permitted acreage for gold mining to no more than 6,000 acres at any one time. In addition, at least 500 acres of land currently being mined must be reclaimed by 1997.

Cascadia Project

Goal: Create a multi-jurisdictional entity to deal with transportation, trade, and environmental issues along the "I-5 Corridor" from Vancouver, BC to Portland, OR.

Timeframe for Results:
Funding expected for two year trial period to try out effectiveness of the approach. Project may continue if results from this trial period are positive.

Contact:
Bruce Agnew, Staff Director, Congressman John Miller's Office, (206) 672-4224 or (206) 771-1239.

Summary: Since the signing of the U.S. - Canada Free Trade Agreement, growth has increased rapidly along the I-5 Corridor from Vancouver, B.C. through Seattle, WA to Portland, OR. The Cascadia Project is proposed to deal with the intertwined issues of trade, transportation, technology, and environmental quality along this corridor.

As of July, 1992, this project is still in the proposal stage. A number of ideas are under consideration for inclusion into the proposal but the core concept is the creation of a "Cascadia Corridor Commission." The CCC would be multi-jurisdictional (federal, state/provincial, local) and made up of congressional members, governors and premiers, state legislators, local officials, and relevant federal and state agencies.

Substantively, transportation issues seem to be the driving force behind much of the project. Improved transportation is seen as crucial to increased trade, tourism, and environmental protection. The Commission could provide a forum for the discussion of what particular mix of air/rail/ground/marine transportation would be best. A push in Congress to restore AMTRAK service along the corridor (already in progress) and a study of high speed rail options might be overseen by the Commission. There is a perceived need to coordinate airport planning with the planning of other transportation modes.

With respect to the local environment, the Commission might cooperate with the proposed Georgia Puget Basin Sustainable Development Demonstration Project which would be part of the United Nations Development Program. Both projects would attempt to foster sustainable development in the area made up of the inland sea of Georgia Strait, Puget Sound and Juan De Fuca Strait, along with surrounding air and watersheds. In October of 1992, the Washington State congressional delegation led by Senator Brock Adams and Congressman John Miller secured congressional support and $400,000 in State Department funding if the Governors of Washington and Oregon, and the Premier of British Columbia reach agreement on matching funds, representation, agenda, and structure. The congressional resolution also calls for the involvement of non-governmental organizations, Native Americans, and the private sector in the development of strategies for sustainable development.

Valuing Power Generation Environmental Externalities — California and Nevada

Goal: Incorporate environmental costs of power generation externalities into decisions about new power plants and power distribution over networks.

Timeframe for Results:
Ongoing (CA and NV).
Proposed (other western states).

Contact:
Douglas Larsen, Executive Director, Western Interstate Energy Board, (303) 573-8910.

Summary: Two western states have adopted, and six states are studying the use of monetary values for emissions from powerplants. Such monetary values are added to the private cost of new generation options to arrive at a total social cost of each generating option which becomes the basis for selecting the most economically viable new generating method. California also requires its investor-owned utilities to use such values when evaluating long-term power purchase contracts. Some states are studying the application of monetary values to other environmental externalities of electricity generation options, such as nuclear waste and damage from hydroelectric dam construction and operation. Both California and Nevada apply such values to generating resources within and outside the states. The use of externality values involves complex issues decisions on appropriate amounts for different pollutants (e.g., the environmental damage created by the pollutant) and policy decisions about how such values should be used (e.g., in considering new resource options, in dispatching power from various plants). The use of such values will affect electricity generation throughout the western electricity grid, which extends from western Canada to western Mexico. Appropriate application of externality values will require innovation in each state and extensive coordination among states and provinces.

Creating Markets for Recyclable Materials and Recycled Products

Goal: Locate and enhance recycled materials markets.

Timeframe for Results:
Ongoing.

Contact:
Lauris Davies, EPA Region IX Solid Waste Program, (206) 553-6522.

Summary: Two projects undertaken by the EPA Region X Solid Waste Program are characteristic of the multi-jurisdictional effort needed to create new markets for recycled products. In the first project, EPA, state, and local governments and recycling associations in Washington and Oregon are working cooperatively to create new markets for glass cullet (waste) within the Region. Through a grant to the Clean Washington Center (an office within the Washington State Department of Trade and Economic Development), an information system on potential end uses for glass cullet was developed. The system includes technical, economic, performance, market, and environmental data. Local and state government throughout the Region are using the information system to work with existing companies and encourage entrepreneurs to substitute glass cullet for other raw material.

The second project is an incentive-based program to create new markets for recycled products. Fourteen western states, through a grant from EPA Regions VIII, IX, and X are working together to contract the purchase of recycled and energy-efficient products. In the process of constructing the first solicitation for recycled copy paper, the states have been joined by local government and some tribes who also want to purchase through the contract. This effort creates an incentive for manufacturers to

make the recycled product (due to the large size of the contract), saves the participating government money from (the economies of scale), and allows many governments to buy recycled products they otherwise could not afford or could not access.

Commencement Bay Cumulative Impacts Study

Goal: Conduct cumulative impact assessment for Commencement Bay, Washington.

Timeframe for Results:
Ongoing.

Contact:
Michael Stoner, Chief, Superfund Site Management Section 1, U.S. EPA Region X, (206) 553-2710.

Summary: The objective of the ongoing Commencement Bay Cumulative Impacts Study (CIS) is to perform a cumulative impact assessment of special aquatic sites that are or have been located within Commencement Bay. This "cumulative" approach will document the changes in habitat (e.g. mudflats, vegetated shallows, and wetlands) that have occurred in the bay over the past 100 years of development, develop a complete inventory of the various different types of habitat that currently exist in the Commencement Bay area, and finally, provide information to decision making agencies that will allow them to manage activities in the bay such that the function of the marine ecosystem will not be impacted adversely, but hopefully be progressively enhanced over time.

The primary parties involved are the U.S. EPA, the U.S. Fish and Wildlife Service (USFWS), National Oceanographic and Atmospheric Administration (NOAA), Washington Department of Natural Resources (WDNR), and the U.S. Army Corps of Engineers (USACE). The CIS project has combined the effort of these various agencies in recognition of the unique but interrelated role that each agency plays in the Commencement Bay area. EPA and the Corps share responsibility for regulating the discharge of fill or dredge material into waters of the United States. Such activities must not adversely affect the aquatic ecosystem. NOAA, USFWS, and WDNR each play a significant role as natural resource trustees, responsible for ensuring that the various wildlife supported by these delicately balanced ecosystems will be preserved in the midst of economic development. The Puyallup and Muckleshoot Tribes are also natural resource trustees. The Washington Department of Ecology and EPA are involved in Superfund remedial decisions and actions throughout the Commencement Bay area.

Alternate Authorities for RCRA Corrective Action

Goal: Eliminate red tape for EPA approval of state corrective action under The Resource Conservation and Recovery Act (RCRA).

Timeframe for Results:
Proposal stage.

Contact:
Pat Springer, U.S. EPA Region X, (206) 553-2858.

Summary: EPA Region X, along with the Washington Department of Ecology and the Oregon Department of Environmental Quality, have been exploring the use of the states' environmental cleanup authorities for RCRA corrective actions. In the past, EPA has required that state programs be equivalent or more stringent than the federal requirements before being delegated responsibility for any part of the RCRA Subtitle C (hazardous waste) program. This would mean that in order for a state to be authorized

to implement RCRA corrective action, the state would need to establish a new corrective action program, including any necessary statutory and regulatory authorities. This initiative would be a pilot program that would allow these states to use their existing established environmental cleanup authorities and programs to implement the corrective action program requirements of RCRA as long as all the substantive requirements of RCRA are met. This approach could have many benefits, including more and better use of resources, more environmental cleanups, and the potential for cost recovery. Currently, a number or issues, including legal and implementation concerns, are being identified and resolved.

Building Public Stewardship: The Streamwalk Program

Goal: Collect useful stream health data while involving and educating citizens.

Timeframe for Results:
Ongoing.

Contact:
Susan Handley, Water Division, EPA Region X, (206) 553-6913

Summary: Streamwalk is a simple, direct and "user friendly" citizens' monitoring tool designed by EPA Region X. It empowers diverse citizen groups, students, and teachers with a standardized means of gathering and sharing information on the health of streams and their associated riparian habitat in the Pacific Northwest.

Streamwalk, developed in consultation with local governments, environmental groups, tribes, and schools, has three purposes: (1) to educate community residents on stream ecology and to enable them to effectively identify problems affecting their own neighborhood streams; (2) to permit the efficient compilation of such localized observations into a broader regional picture; and (3) to make such information readily available to all interested groups. Of course, it also indirectly encourages such groups to assume a greater role in actually protecting their local streams.

While still in its infancy, the Program has already motivated over 13,000 adults and students to take a closer look at miles of streams not usually monitored by other programs. Unique enhancements to the basic assessment tool, such as computerized sharing of data, a stream game for kids, and a teacher's manual have increased the attraction and excitement of the project.

The materials which support Streamwalk activities include a manual with detailed background and instructions for completing data sheets, a teacher's handbook with lesson plans and extension activities, and a specific stream health analysis which is returned to participants submitting data sheets. EPA is currently investigating the feasibility of developing a computerized Streamwalk Program for citizens to use in recording and reporting data.

Improving State/Federal Coordination of Land Management Plan Implementation in Oregon and Washington.

Goal: To provide a process to jointly identify, communicate, and coordinate actions related to the management of the region's public lands and resources.

Timeframe for Results:
Ongoing

Contact:
Bob Warren, Director, Oregon Governor's Forest Planning Team, (503) 378-8127.

Summary: Oregon, the Bureau of Land Management (BLM), and the Forest Service (FS) have signed a Memorandum of Understanding (MOU) which provides a formalized mechanism for con-

tinued involvement in the development, implementation, monitoring, and revision of land management decisions and land use plans. It also provides a framework for supervisors of individual programs and organizational units as they plan, implement, and monitor land use practices.

The initial development of the MOU resulted in closer cooperation between the three signatories, who, together with Washington State, held regular meetings to share information on a broad range of regional natural resource issues. They discussed and provided information and input on BLM planning, FS plan implementation, and plan adjustments.

Since the MOU was signed in August, 1992, communication and information exchange on major regional issues has been facilitated. It has led to coordinated response on 6 BLM resource management plans and strengthened relations with national forests. The relationships that have developed since the MOU was negotiated and signed have created important new institutional linkages.

Northwest Renewable Resources Center's Tribes and Counties: Intergovernmental Cooperative Action Project

Goal: To foster cooperation with respect to land use planning/regulation and environmental protection between the 26 federally recognized tribes in Washington and the 18 counties in which their reservations are located.

Timeframe for Results:
Ongoing.

Contact:
Shirley Solomon, Project Coordinator, Northwest Renewable Resources Center, (206) 623-7361.

Summary: Since the Center initiated the Tribes and Counties project in June, 1990, progress has been made in promoting working relationships and coordination between county and tribal governments in Washington to cooperate on land use planning and environmental protection issues. Through conferences focusing on the technical aspects of intergovernmental coordination, cross cultural communications, and growth management, the Project intends to develop the following: 1) Coordination agreements on a variety of natural resource issues; 2) Institutionalized procedures for communications between tribes and counties; 3) Improved problem solving capabilities; 4) Improved relations between county and tribal leaders; 5) Cooperative solutions to issues of mutual concern.

The Project has also developed a short course on Tribal/County intergovernmental coordination to prepare tribal and non-tribal officials for cooperative activities. The course includes sections on federal Indian law and policy, status of tribal-county coordination, information on Indians in Washington, and on and off-reservation examples of intergovernmental tribal planning.

The Project is being funded by the Ford Foundation and Northwest Area Foundation and is being conducted in cooperation with the Governor's Office, the Washington State Department of Community Development, the Washington State Association of Counties, and State Indian Tribes.

South Dakota's Toxic Cleanup Day Pilot Project

Goals: Gain knowledge and experience in the occurrence of household hazardous waste and the feasibility of establishing household hazardous waste collection programs, and to remove the household hazardous waste from the waste stream going into the Brookings landfill.

Timeframe for Results:
Project preparation began in March, 1991, and the project was completed in December.

Contact:
Steve Pirner, Director, Division of Environmental Regulation, (605) 773-3153

Summary: The Project was strongly supported at the grassroots level and involved the cooperation of a number of local organizations and agencies. The Project was widely publicized and a substantial amount of household hazardous waste was collected.

One of the reasons Bookings was selected for the pilot project is that the Bookings landfill is located over the Big Sioux Aquifer, the major drinking water supply for a large part of eastern South Dakota. Because the landfill is located over the aquifer, disposal of household hazardous waste in the landfill poses a serious risk for groundwater contamination. In fact, monitoring around the landfill has shown the presence of some organic compounds. An even broader concern is that groundwater in the aquifer also discharges into the Big Sioux River.

The project has been highly successful, demonstrating that the public is eager to engage itself in projects designed to protect the environment, and that such public-oriented projects do yield real environmental benefits.

Alaska Environmental Community Agreement Program

Goal: Formalize Alaska Department of Environmental Conservation's (DEC) and a local community's commitment to solving environmental problems by developing a common agenda through ranking the environmental problems in a community.

Timeframe for Results:
Ongoing.

Contact:
Jim Powell, Deputy Director, Division of Environmental Quality, (907) 465-5265.

Summary: Over a year ago, the Alaska DEC established the Environmental Community Agreement Program. The Program establishes formal agreements between communities, organizations, Native organizations, and the department. The agreements establish a common agenda through identifying and ranking the environmental issues in each community. The community's list of environmental issues also will be used in developing the Statewide Comparative Risk Project, a new innovative program that provides a multimedia and pollution prevention approach to environmental problem solving.

Currently, over 25 community agreements have been signed covering 50% of the state. EPA is now considering co-signing the agreements.

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Membership Roster — March 1993

Ann Notthoff, Staff Scientist
Natural Resources Defense Council

John Charles, Executive Director
Oregon Environmental Council

Dennis W. Donald, Western Regional Director
The Nature Conservancy

Thomas Graff, Senior Staff Attorney
Environmental Defense Fund

Tom Jensen, Vice President
Grand Canyon Trust

Don Snow, Executive Director
Northern Lights Education and Research Institute

Neil Goldschmidt, President
Neil Goldschmidt, Inc.

Garrey Carruthers, President and CEO
Cimarron Managed Care Corp.

David Getches, Professor
University of Colorado School of Law

Kenneth D. Hubbard , Attorney-at-Law
Holland & Hart

James W. Spensley, Attorney-at-Law
Holme Roberts & Owen

David Ervin, Professor
Dept. of Ag. & Resource Economics
Oregon State University

Peter Menell , Professor
Stanford Law School

Dr. Gil Omenn, Professor
Public Health/ Comm. Medicine
University of Washington

John Dwyer, Professor
University of California School of Law

Dr. Robert Hahn, Resident Scholar
American Enterprise Institute

Dr. Rodney T. Smith, Professor
Claremont McKenna College

Richard Stewart, Professor
New York University School of Law

Major General Ernest Harrell
U.S. Army Corps of Engineers
North Pacific Division

John Wise, Acting Regional Administrator
U.S. Environmental Protection Agency, Region IX

Jack W. McGraw, Acting Regional Administrator
U.S. Environmental Protection Agency, Region VIII

Bob Moore, Colorado State Coordinator
Bureau Land Management

Dana Rasmussen, Regional Administrator
U.S. Environmental Protection Agency, Region X

Alexandra Smith, Asst Administrator for Environment
Bonneville Power Administration

Dr. Robert Bringer, Vice President
Environ. Engineering & Pollution Control, 3M Company

Dr. James Falco, Manager
Earth & Environmental Sciences Center
Battelle Northwest Laboratories

Frank Friedman, Vice President for Environmental Affairs
Occidental Petroleum Company

Howard Klee, Jr., Director of Regulatory Affairs
AMOCO

Dick Rush
Idaho Association of Commerce & Industry

Lamond Godwin, Senior Vice President
Shearson Lehman Bros, American Express

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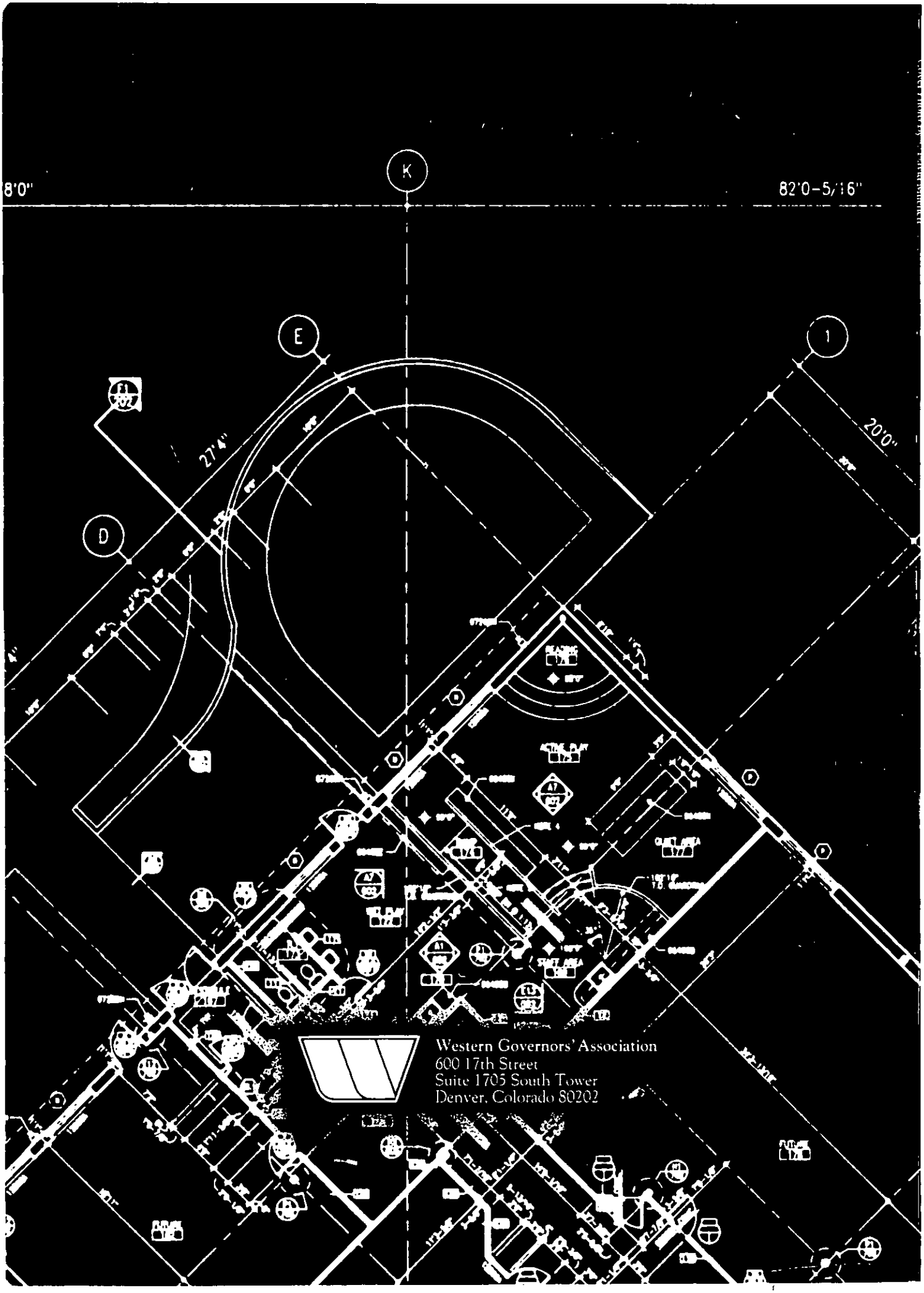
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