OKLAHOMA POLITICS

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Oklahoma Politics, an annual publication of the Oklahoma Political Science Association, publishes political science articles that have a significant Oklahoma component as well as reviews, notes, and data on subjects relating to Oklahoma politics. Submissions should be sent to Jan Hardt, Department of Political Science, University of Central Oklahoma, Edmond, OK 73034.

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ENVIRONMENTAL POLICY IN OKLAHOMA:
ISSUES, INNOVATIONS, INSIGHTS

FOREWORD

At the Fall 1998 OPSA meeting at Oklahoma Baptist University in Shawnee, I presented a proposal to the editor of *Oklahoma Politics* and the leaders of the Oklahoma Political Science Association to publish occasional "theme" issues, either with or in addition to, the regularly scheduled *OP* issues. I further offered to edit the first of these thematic issues and take responsibility of soliciting papers on the theme of environmental policy in Oklahoma. It was obvious to me that environmental policy scholars and practitioners were conducting important research, formulating ground-breaking policy, and finding novel ways to analyze and implement policy that deserved recognition among the Oklahoma policy community. This issue, entitled, *Environmental Policy in Oklahoma: Issues, Innovations, and Insights,* followed from their hospitable response to and approval of my proposal.

To get this project started, I prepared a flyer that was mailed out to all OPSA members shortly after the 1998 meeting that solicited papers for consideration. The solicitation failed to stimulate interest, however. Not easily dissuaded, I began to call colleagues and friends whom I knew were conducting noteworthy work and asked if they would be interested in contributing a paper to this project. Gradually, support began to build.

The real kickoff occurred at the Fall 1999 OPSA meeting held at Redlands Community College in El Reno. I chaired a session of the same name as this issue and five papers were presented – all of which are among the papers in this issue. Inspired by the reception, I redoubled my efforts to recruit additional contributions. By summer 2000, I had gathered 14 suitable papers. I ultimately withdrew one of these papers to publish in another journal, leaving 13 for this issue. Two other persons had submitted abstracts but ultimately did not submit papers.

After some preliminary editing, I sent the papers for peer review in Fall 2000. Comments were sent to the authors and revised papers were returned during Winter and Spring 2001. During Summer 2001, I edited the papers one more time and copy-edited the volume for consistency of formatting and appearance. The final manuscript was submitted to OPSA in Fall 2001.

The papers in this issue communicate the successes, novelties, lessons, and other noteworthy information learned from our recent advances in environmental policy. I hope that you find them useful in your research, practice, and teaching. This volume includes all of the academic work in environmental policy being conducted in Oklahoma of which I am aware. If I have failed to include other important work, I apologize.

Before discussing the individual papers included in this issue, I want to recognize all those who helped make this special issue possible. First, I thank Professor Bob Darcy who first proposed that I consider assembling a special issue four years ago while he was still editor of *Oklahoma Politics* and I had just arrived in the OSU Political Science Department. I also thank Professor Greg Scott who succeeded Dr. Darcy as *OP* editor and who encouraged and assisted me in gaining *Oklahoma Politics* editorial approval and the funds to publish this issue. Without his leadership, this project would not have been realized. Sincere thanks are also due to Professors Tom Webler of the Antioch New England Graduate School in Keene, New Hampshire and Bob Brulle at Drexel University in Philadelphia who reviewed the articles in this issue and provided many valuable suggestions that greatly improved the quality of its contents. To Saundra Mace, without whose patience, dedication, and artistic skills this issue would never have found a publisher nor such an attractive cover, I am deeply indebted to you. Finally, I want to thank the contributors to this volume who were willing to share their work with us in this forum. In particular, I thank my graduate students who deserve the reward of seeing their work in print.

Organization of This Issue

The papers in this issue are grouped under five topics.

In **Part I: Environmental Policy in Oklahoma,** an introduction to environmental policy in Oklahoma is skillfully presented by Stephen L. Jantzen, an assistant attorney general for the State of Oklahoma at the time of his writing, in "Environmental Regulation in Oklahoma: A Patchwork Green." This informative review of environmental agencies, statutes, regulations, rulemaking procedures, permitting processes, and enforcement mechanisms illustrates the bewildering complexity of environmental regulation in Oklahoma. Nevertheless, his accounting can help the reader to navigate the maze of jurisdictions and gain a better appreciation of the complex, diverse, and fragmented "patchwork" of environmental policy in Oklahoma.

In **Part II: Environmental Policy Legitimacy**, two papers by political philosophers consider political legitimacy as it pertains to the formulation of environmental policy. In "Environmental Management and Democratic Legitimacy," Professor Edward Sankowski addresses some of the legitimacy issues that attend stakeholder participation in environmental decision-making. Problems with economic-political equality, intergovernmental relations, cultural relations, role of experts and expertise, and access to legal recourse are discussed as threats to legitimacy. He argues that current environmental policymaking institutions must become more democratic and that new private-public partnerships need to be forged if political legitimacy is to be protected.

In the second paper, Professor Zev Trachtenberg, in his "Scientists and Stakeholders: Evaluating the Legitimacy of the Illinois River Basin Management Protocol" considers the relationship between two legitimacy needs: incorporating the values and attitudes of stakeholders in environmental policymaking and, equally importantly, ensuring that environmental policy is scientifically informed. This tension, based in part on competing notions of legitimacy based on volunteerism (free consent) and fiduciarism (public good), is inherent to most environmental policy contexts and is fundamental to any discussion of policy legitimacy. The means for resolving this tension between legitimation through stakeholder participation and justification through scientifically sound assessments is necessarily contingent on the policy context. A policy formulation protocol used in an ongoing case study is evaluated as a test case of legitimation across these two constructs.

Part III: Stakeholder Perspectives in Siting Controversies includes three papers. All three investigate the nature of stakeholder opposition to siting noxious facilities in community neighborhoods and inquire into the bases of these perspectives. Two over-arching conclusions can be drawn from these studies. First, stakeholders in such controversies are not simply locked in an intractable pro-con struggle that obviates resolution. Indeed, the perspectives are more complex and reveal moderate positions that can forge optimism for reaching consensus. Second, opposition is not simply based on lack of scientific understanding or selfish parochialism. Upon closer inspection, opposition involves issues of trust, local autonomy, and fairness that are often ignored by critics of "NIMBYism."

In the first paper, I consider stakeholder participation in localized hazardous facility decision-making as a psycho-political phenomenon. In "A Synthesis of Stakeholder Perspectives in Siting Controversies," I review 15 prior studies that defined typologies of the roles that people adopt in environmental decision-making and related arenas. Two findings are paramount. First, stakeholder perspectives reported in these studies are reducible to three major "ideal types." Second, these ideal types fail to account for three other perspectives that can be masked by the dominance of ideal types: the parochial communitarian, technocratic progressive, and radical skeptic. The discovery of these additional perspectives calls into question the efficacy of any attempt to resolve locational conflicts that ignores non-technical and community-based concerns, desire for local control, and social trust.

In the second paper in this part, "NIMBY-TIMBY: Analysis of Stakeholder Perspectives on Hazardous Waste Controversies in Oklahoma," Professor Jim Lawler and I examine stakeholder perspectives revealed in our study of noxious facility siting and remediation controversies in Oklahoma. Siting controversies that involve stakeholder opposition (the so-called not-in-my-backyard, or NIMBY, reaction) have been studied extensively over the last two decades. To a lesser extent, facility remediation controversies (referred to by the authors as the threats-in-my-backyard, or TIMBY, reactions) have also been studied. However, NIMBY and TIMBY stakeholder perspectives have not been compared

previously. In this paper, we examine these two perspectives together, based on interviews of stakeholders in three NIMBY and two TIMBY communities in Oklahoma. We find that both NIMBY and TIMBY communities include stakeholders who are fundamentally divided by their beliefs and values. For example, both communities include siting proponents (typically, industrialists and regulators) who favor scientifically rational decision-making and who are technologically optimistic and siting opponents (typically, environmentalists and community activists) who are offended by the technocratic perspective and distrust anyone who insists on its dominance in decision-making. In addition, both also include perspectives that are intermediate between these two extremes and which include mixtures of opponents and proponents as well as occupational types). These intermediate and less polarized perspectives can play an important role in mediating controversy. Only TIMBY communities manifest a perspective that is dominated by local concerns and desire for local control. Moreover, those fighting against the status quo in TIMBY communities seem more willing to work with the polluting facility than those opposing new facility siting in NIMBY communities. This finding has important implications for the use of risk-benefit analysis in justifying proposals for siting or remediation.

NIMBY opposition to the siting of public housing facilities can reach a level usually reserved for toxic waste sites. In his "Public Housing and NIMBY: The Effects of Citizen Participation in the Siting of Public Housing Facilities in Tulsa," Charles Peaden, in his master's thesis research, conducted a survey of 426 homeowners in Tulsa, Oklahoma to explain the bases of their opposition to public housing siting. The respondents were also asked whether provisions for their direct involvement in the siting process might increase their acceptance of public housing. The analysis revealed that the use of participatory tradeoffs had little impact in reducing opposition to the siting of public housing facilities. However, risk perception was a significant predictor for both groups.

Part IV: Environmental Policy Planning and Administration includes four papers that discuss the potential – and the challenges – of environmental policymaking and implementation in Oklahoma. Fragmentation of environmental programs across several statutes and administrative agencies continues to be a significant impediment to efficient and effective accomplishment of environmental goals. However, recent innovations have demonstrated that the barriers to cooperation can be overcome. These innovations involve building private-public sector alliances, increasing involvement of stakeholders in program planning, establishing supra-agency task forces to coordinate agency efforts, and increasing political efficacy of underserved groups.

In the first paper, Professor Mark Meo takes a rare look into the role that policy entrepreneurs play in environmental policy innovation in a case study entitled, "Strategic Policy Innovation and Flash Flood Hazard Mitigation: The Tulsa Story." Environmental policy innovation requires fundamental shifts in political institutional relationships, forging alliances outside of government, and careful systemic analyses. In particular, the need for concerted effort, coalition building, and rational planning in environmental policy innovation argues for the applicability of strategic entrepreneurship model over the "groping-along" model that may be more appropriate in other policy arenas. The story of Tulsa's successful efforts to control flooding along Mingo Creek illustrate how these requirements were satisfied in this case – despite the inevitable fits and starts that usually accompany such ambitious projects.

In "Brownfields Initiative in Oklahoma," Rita Kottke, a manager in the Oklahoma Department of Environmental Quality, reviews the evolution of a policy that guides the remediation and redevelopment of contaminated sites to restore them to productive use. Referred to as brownfield sites, they have presented continuing health threats, eyesores, and economic blights on those communities stigmatized by their presence. However, the controversy among stakeholders on how these sites should be handled complicates the policy process. Dr. Kottke interviewed stakeholders across the state to ascertain their concerns about brownfields, preferences regarding their remediation and reuse, and opinions about the performance of ODEQ in cleaning up these sites. She uses these findings to define the context of brownfields policy context and then recommends a policy formulation strategy appropriate to the context using a prescriptive model. The lessons learned from this exercise are being used to help ODEQ continue its formulation and implementation of its brownfields redevelopment policy.

"Inter-Governmental and Inter-Agency Coordination: The Oklahoma Environmental Crimes Task Force Example" was co-authored by Kelly Hunter-Burch and Stephen Jantzen. Ms. Hunter-Burch was also an assistant attorney general for the State of Oklahoma at the time of the writing of this paper. They

describe the recent effort to overcome intergovernmental and interagency barriers in the implementation of environmental policy by the Oklahoma Environmental Crimes Task Force. Established three years ago, the Task Force is a model of successful coordination among disparate organizations, programs, and personnel to obtain criminal convictions of those who commit environmental crimes. In this case, the aphorism that the total is greater than the sum of its parts is amply demonstrated.

Professor Rajeev Gowda and a doctoral student, Paula Long, review the unique challenges of addressing environmental federalism and environmental justice on Indian lands in their "The Complexities of Environmental Federalism: An Investigation of the Oklahoma Native American Context." In a study of two tribes in Oklahoma – the Sac and Fox and the Tonkawas – they illustrate the difficulties that the federal government faces in attempting to site nuclear waste facilities on tribal lands. The problems in siting such facilities are further complicated in Oklahoma by the patchwork of tribal jurisdictions and land ownership as well as the large number of interests seeking representation in environmental decision-making, both within and outside of the tribes themselves. The authors show that these policy conflicts are due to cultural barriers, socioeconomic disparities, diminished tribal administrative capacities, distrust of government, and procedural inequities. Remedies may require both structural and functional changes in the relationships between tribes and governments, which have been crippled by a long history of abuse.

Three papers are included in **Part V: New Tools in Environmental Policy Analysis**, the last part of this special issue.

In "Application of GIS in Environmental Policy Analysis," Professor Mahesh Rao, Professor John Bantle, and I consider the use of geographical information systems in spatially analyzing ecological risks caused by environmental contamination of surface water. Analysis of risk caused by environmental threats is essential to informed decision-making, as is the evaluation of the efficacy of alternative risk-reduction strategies. Geographical information systems are one tool that can be used to perform and communicate the results of risk analyses and alternatives evaluation. This paper presents preliminary results of a GIS-based toxicity study that is being used to inform policy dialogue and to frame further analysis of the causes of an observed decline in amphibian populations near a landfill located in Norman, Oklahoma, designated as a national toxicology study site by the U.S. Geological Survey (USGS). GIS was used to understand the spatial components of threats to amphibian populations from various environmental stressors as well as to integrate data collected from various sources such as global positioning system (GPS) data, remotely sensed data on habitat, Mesonet weather stations, water quality probes, FETAX assays on surface and ground water samples, and amphibian biomonitoring. Base maps were developed for the study site incorporating locational data from USGS and digital aerial photographs. Tagging the attribute data to the locational data has produced thematic maps pertaining to toxicity and amphibian population used to visualize spatial distribution of concentration, toxicity, hydrologic, and population data. The use of GIS to produce thematic maps of the study area facilitates policymaking regarding spatially dependent activities such as selection of sampling sites and the location of *in situ* toxicity experiments. The organization of data using GIS has important potential applications in modeling risks at other sites. Moreover, the results of the GIS analysis were used to identify where further studies are needed and to identify a pathway of exposure that may have been ignored without these results.

In the second paper, "Informing the Policymaking Process with Concept Mapping," Todd DeShong and I discuss a preliminary application of concept mapping to better understand stakeholder schema regarding impacts to the Illinois River watershed in eastern Oklahoma. We demonstrate how concept mapping can another new tool that can be used in environmental policy analysis to identify the cognitive conceptions that stakeholders have of environmental problems. By revealing the constructs that stakeholders use to conceptualize environmental problem elements – and the relationships between them – the analyst can better understand why they are concerned about some impacts and not concerned about others. Understanding system constructs can also shed light on why stakeholders prefer the policies that they do. Using the case of the Illinois River Basin, we illustrate the use of concept mapping to help inform policy deliberations and point the way toward fashioning a policy that can enjoy widespread public support.

Katera Whitaker and I discuss the utility of using expert-developed influence diagrams to better understand an environmental system and thereby better inform subsequent policy deliberations in "Expert Modeling of Environmental Impacts" – the last paper in this issue. Environmental policy analysis depends, in part, on accurate functional representations of the environmental problem to be addressed.

Given the complexity of most environmental systems, graphical representations of these systems can greatly aid the comprehensibility of the problem. These authors introduce the use of influence diagrams to construct expert models of environmental systems, which can be used to assist analysts in identifying appropriate policy interventions, design educational programs to correct factual misunderstandings, and diagnose conflict. We introduce the use of expert models in policy analysis with a cursory explanation of the model we used to represent the Illinois River watershed in eastern Oklahoma.

I hope that you will find this issue useful in coming to grips with environmental policy in Oklahoma and to perhaps better appreciate the issues, innovations, and insights that have emerged from our investigations of it.

Fall 2001

Will Focht
Stillwater, OK

PART I

ENVIRONMENTAL POLICY IN OKLAHOMA

ENVIRONMENTAL REGULATION IN OKLAHOMA:
A PATCHWORK GREEN

Stephen L. Jantzen

Introduction

Environmental regulation in Oklahoma can be down right confusing. On its own terms, environmental regulation is complicated – often involving intricate technical, scientific, economic, political, and legal issues. These complexities are compounded in Oklahoma by the current system of governmental regulation. At least ten state agencies in Oklahoma have jurisdictional authority over environmental matters (OS 27A, § 2-1-102(14)). While some have broad regulatory jurisdiction, others have a finely focused environmental jurisdiction. Certainly, each has its own slice of the environmental pie.

Adding to the complexity is the web of statutes, regulations, standards, and requirements that governs activities in Oklahoma to protect the environment. For the most part, each state environmental agency has its own governing statute under which it promulgates regulations and procedures. Many employ separate and distinct permitting, licensing, and certification processes. Each has a distinct enforcement authority and philosophy. If the agencies and commissions of the federal government such as the U.S. Environmental Protection Agency, the U.S. Department of Labor, the U.S. Department of Energy, and the U.S. Nuclear Regulatory Commission are thrown in, getting your arms around environmental regulation gets even tougher. Include tribal governments, counties and municipalities, and one's eyes may roll to the back of the head.

Like Oklahoma itself, the current environmental regulatory scheme in Oklahoma is a patchwork. The purpose of this article is to briefly sketch this patchwork for the reader by discussing the various state agencies exercising environmental regulatory authority in the State of Oklahoma, their respective jurisdictions, and the processes of rulemaking, permitting, and enforcement that play such an integral role in the work they each perform.

The Players

Regulation of the environment in the State of Oklahoma is divided by, and shared among, federal agencies, state agencies, tribal governments, county governments, and municipalities. As to the State of Oklahoma, environmental regulatory authority is divided unequally among at least ten state agencies (OS 27A, § 2-1-104(14)). An understanding of the fractured environmental regulatory landscape in the State of Oklahoma must start with the environmental jurisdiction of each state environmental agency. Of course, only the principal jurisdictional reach of each environmental agency is outlined here. A detailed analysis of each agency's jurisdiction is beyond the scope of this discussion.

The Oklahoma Legislature

Any discussion of environmental regulation in Oklahoma must include the Oklahoma Legislature. Under the "police power," the Oklahoma Legislature has the authority to make laws that regulate and protect the environment. Although well-established, the concept of "police power" can be somewhat obscure and is best understood as:

an attribute of sovereignty, inherent in every sovereign state, and not derived from any written Constitution nor vested by grant of any superior power. [It] comprehends the power to make and enforce all wholesome and reasonable laws and regulations necessary to the maintenance, upbuilding, and advancement of the public weal and protection of the public interests. It is plastic in its nature, and will expand to meet the actual requirements of an advancing civilization and adjust itself to the necessities of moral, sanitary, economic, and political conditions. No principle in our system of government will limit the right of government to respond to public needs and protect the public welfare *(Ex parte Tindall*, 229 P. 125 (Okla. 1924)).

Thus, the Oklahoma Legislature enacts laws that regulate and protect the environment as part of its inherent power to protect the public interest. To protect the environment, the Oklahoma Legislature has created, over time, a network of agencies and statutes that govern the environmental arena.

The Department of Environmental Quality

The principal environmental agency in the State of Oklahoma is the Oklahoma Department of Environmental Quality ("ODEQ"). The successor to the Department of Health, ODEQ was formally created in 1992. Of all the state environmental agencies, its environmental jurisdiction is the most extensive.

ODEQ is responsible for certain point source discharges of pollutants and stormwater to waters of the state and for certain nonpoint source discharges (OS 27A, §§ 1-3-101(B)(1) & (2)). Surface water and groundwater quality and protection, including water quality certifications, are under the ODEQ's oversight, as are water and wastewater works and both public and private water supplies (OS 27A, §§ 1-3-101(B)(4), (5) & (6)). ODEQ is responsible for underground injection control under the federal Safe Drinking Water Act, 42 U.S.C. § 300f *et seq.*, except for certain classes and types of injection wells regulated by the Oklahoma Corporation Commission (OS 27A, § 1-3-101(B)(7)). Air quality (except indoor air quality and asbestos), hazardous and solid waste, radioactive waste, environmental lab services and certification, freshwater wellhead protection, hazardous substances (except relating to branding, package, and labeling requirements), and utilization and enforcement of Oklahoma Water Quality Standards and implementation documents, each fall under ODEQ's environmental jurisdiction (OS 27A, §§ 1-3-101(B) (8), (9), (11), (14)-(16) & (18)). For those areas or activities under its environmental jurisdiction, ODEQ is responsible for groundwater protection, and for developing and promulgating a Water Quality Standards Implementation Plan (OS 27A, §§ 1-3-101(B)(17) & (21)).

Many of the State of Oklahoma's Superfund responsibilities under the federal Comprehensive Environmental Response, Compensation and Liability Act of 1980 also fall under ODEQ jurisdiction (OS 27A, § 1-3-101(B)(10)). ODEQ is also broadly charged with regulating entities, activities, and preventing, controlling, and abating pollution, not subject to specific statutory authority of other state environmental agencies (OS 27A, § 1-3-101(B)(19)). Finally, the Oklahoma Legislature has charged ODEQ with developing and maintaining a computerized water quality database (OS 27A, § 1-3-101(B)(20)).

The Oklahoma Water Resources Board

By statute, the Oklahoma Water Resources Board ("OWRB") consists of nine members who are well-versed in recreational, industrial, irrigational, municipal, rural residential, agricultural, or soil conservation uses of water (OS 82, § 1085.1(A)). The OWRB's jurisdictional areas of environmental responsibility fundamentally revolve around surface water and groundwater quality and quantity.

One of the OWRB's most important environmental responsibilities is the promulgation of Oklahoma Water Quality Standards and policies affecting their application, including an anti-degradation policy (OS 27A, § 1-3-101(C)(9); OS 82, § 1085.2(16); and OS 82, § 1085.30(A)). Related to Oklahoma Water Quality Standards is the OWRB's responsibility for a Water Quality Standards Implementation Plan (OS 27A, § 1-3-101(C)(11)). The OWRB serves as technical lead agency for the federal Clean Water Act's clean lakes program (OS 27A, § 1-3-101(C)(8); and OS 82, § 1085.29). It also oversees groundwater protection for activities under its regulatory jurisdiction and develops classifications and identifications of permitted uses of groundwater (OS 27A, §§ 1-3-101(C)(10) & (12)). The OWRB is also responsible for surface water and groundwater rights and for interstate stream compacts (OS 27A, § 1-3-101(C)(1)). Weather modification, dam safety, floodplain management, and administration of loans and grants for water and wastewater projects are also within the domain of the OWRB, as is licensing for water well drillers and pump installers (OS 27A, §§ 1-3-101(C)(2)-(7); and OS 82, § 1085.2(12)).

The Oklahoma Corporation Commission

Interestingly, unlike many of the other state environmental agencies, the Oklahoma Corporation Commission owes its existence to Oklahoma's Constitution (OKLA. CONST. Art. 9, § 15). The Corporation Commission is led by three persons, each elected in a general election for a term of six years.

The Oklahoma Corporation Commission has a broad environmental jurisdiction, exercising authority, among other activities, oil and gas conservation, oil and gas exploration, drilling, development, production, and processing, underground injection control for certain classes of injection wells under the federal Safe Drinking Water Act, 42 U.S.C. § 300f *et seq.* and the Oklahoma Brine Development Act, certain tank farms used for storage of crude oil, pipelines for transporting oil, gas, petroleum, anhydrous ammonia, or mineral brine, subsurface storage of oil, natural gas, and liquified petroleum gas in geologic formations, and groundwater protection for activities under its environmental jurisdiction (OS 27A, §§ 1-3-101(E)(1)(a)-(h), (k) & (l)). Finally, certain above ground and below ground storage tanks are the responsibility of the Oklahoma Corporation Commission (OS 27A, § 1-3-101(E)(5)).

The Oklahoma Department of Agriculture

The Oklahoma Department of Agriculture, created by the Oklahoma Agricultural Code, consists of the State Board of Agriculture, which was created by Article 6, Section 31 of the Oklahoma Constitution (OS 2, § 1-2). Much of the Oklahoma Department of Agriculture's environmental jurisdiction is an outgrowth from its oversight of the agriculture industry.

Point source discharges and nonpoint source runoff from agricultural crop production and services, livestock production, silviculture, feed yards, livestock markets, and animal waste are the responsibility of the Oklahoma Department of Agriculture (OS 27A, § 1-3-101(D)(1)(a)). The Oklahoma Department of Agriculture is also charged with enforcing Oklahoma Water Quality Standards and developing and implementing a Water Quality Standards Implementation Plan for its jurisdictional areas of environmental responsibility (OS 27A, §§ 1-3-101(D)(1)(h) & (i)). Facilities storing grain, feed, seed, fertilizer, and agricultural chemicals must answer, for certain purposes, to the Oklahoma Department of Agriculture (OS 27A, § 1-3-101(D)(1)(e)). Forestry, pesticides, fertilizer, slaughterhouses, aquaculture and fish hatcheries, and waste from milk production facilities are also the responsibility of the Oklahoma Department of Agriculture (OS 27A, §§ 1-3-101(D)(1)(b)-(d), (D)(1)(f), & (D)(2)(a)(2)-(3)). Like many of the state environmental agencies, the Oklahoma Department of Agriculture is responsible for groundwater protection for activities within its environmental jurisdiction (OS 27A, § 1-3-101(D)(1)(g)).

The Oklahoma Conservation Commission

The Oklahoma Conservation Commission was created by the Conservation District Act and is the successor agency to the State Soil Conservation Board (OS 27A, § 3-2-101). Not surprisingly, soil conservation and erosion control are within the jurisdiction of the Oklahoma Conservation Commission (OS 27A, § 1-3-101(F)(1)). Wetlands strategy, abandoned mine reclamation, and the coordination of environmental and natural resource education are also the responsibility of the Oklahoma Conservation Commission (OS 27A, §§ 1-3-101(F)(3), (4), & (8)). Other areas of environmental responsibility include groundwater protection, and developing and promulgating a Water Quality Standards Implementation Plan for those activities subject to its environmental jurisdiction (OS 27A, §§ 1-3-101(F)(10) & (11)).

Nonpoint source pollution is also a principal part of the Oklahoma Conservation Commission's environmental jurisdiction. For example, the Oklahoma Conservation Commission is charged with monitoring, evaluating, and assessing waters to determine nonpoint source pollution impacts (OS 27A, § 1-3-101(F)(2)). It serves as the technical lead agency for nonpoint source pollution categories, except for industrial or municipal stormwater (OS 27A, § 1-3-101(F)(2)). The Oklahoma Conservation Commission also acts as a management agency, with jurisdiction and responsibility for directing nonpoint source pollution prevention programs outside of the jurisdiction of local governments (OS 27A, § 3-2-106(19)). It is also responsible for all identified nonpoint source categories except silviculture, urban storm water runoff, and industrial runoff. *Id.*

The Department of Wildlife Conservation

Like the Oklahoma Corporation Commission, the Department of Wildlife Conservation was established by Oklahoma's Constitution (OKLA. CONST. Art. 26, § 1). The Department of Wildlife Conservation's

jurisdictional areas of environmental responsibility extends to the investigation of fish kills (OS 27A, § 1-3-101(H)(1)). It also has the broad responsibility of wildlife protection (OS 27A, § 1-3-101(H)(2)). Lastly, the Department of Wildlife Conservation is responsible for wildlife damage claims (OS 27A, § 1-3-101(H)(2)). Like other state environmental agencies, the Department of Wildlife Conservation is charged with developing and promulgating a Water Quality Standards Implementation Plan for its jurisdictional areas of environmental responsibility (OS 27A, § 1-3-101(H)(3)).

Department of Mines

The Department of Mines also owes its creation to the Oklahoma Constitution. The Department of Mines is charged "with the execution of laws passed in relation to mining activities and corporations engaged in mining activities in the State" (OKLA. CONST. Art. 6, § 25). Thus, its jurisdictional areas of environmental responsibility extend to mining regulation and the reclamation of active mines (OS 27A, § 1-3-101(G)(1) & (2)). It is also charged with the protection of groundwater and with developing and promulgating a Water Quality Standards Implementation Plan for these activities (OS 27A, § 1-3-101(G)(3) & (4)).

Department of Public Safety

Many of the Department of Public Safety's jurisdictional areas of environmental responsibility derive from the Hazardous Materials Transportation Act. It is responsible for hazardous waste, substances, and material transportation inspections under the Hazardous Materials Transportation Act (OS 27A, § 1-3-101(I)(2)). It is also responsible for inspecting and auditing hazardous waste and materials carriers under the Hazardous Materials Transportation Act (OS 27A, § 1-3-101(I)(3)). Its final responsibility is vehicle inspection for air quality (OS 27A, § 1-3-101(I)(1)).

Department of Labor

The Department of Labor cuts a fairly narrow swath through the field of environmental regulation. One of its principal jurisdictional areas of environmental responsibility is regulating indoor air quality under the Oklahoma Occupational Health and Safety Standards Act (OS 27A, § 1-3-101(J)(3)). The Department of Labor also regulates asbestos in the workplace and has responsibility for asbestos monitoring in public and private buildings (OS 27A, § 1-3-101(J)(1) & (2)).

Oklahoma Department of Civil Emergency Management

Created by the Oklahoma Civil Defense and Emergency Resources Management Act, OS 63, § 683.1 *et seq.*, the Oklahoma Department of Civil Emergency Management was created to prepare for and deal with disasters and emergencies in the State of Oklahoma (OS 63, § 683.2(A)). An important part of the Oklahoma Department of Civil Emergency Management's environmental responsibility is maintaining a computerized emergency information system that allows state and local access to information relating to the location, quantity, and potential threat of hazardous materials (OS 27A, § 1-3-101(K)(5)).

The Oklahoma Department of Civil Emergency Management also administers and conducts hazardous materials training for state and local emergency planners and first responders and is required to administer and enforce planning requirements set forth in the federal Emergency Planning and Community Right-To-Know Act (Title III of the Superfund Amendments and Reauthorization Act of 1986) (OS 27A, § 1-3-101(K)(2) & (4)). It also develops emergency operations plans that mitigate, prepare for, respond to, and recover from environmental disasters and emergencies under the Oklahoma Hazardous Materials Planning and Notification Act, OS 27A, § 4-2-102 *et seq.* (OS 27A, § 1-3-101(K)(2) & (4)).

Secretary of Environment

In addition to the state environmental agencies discussed above, the Secretary of Environment is granted environmental responsibilities. The Secretary is charged by the Oklahoma Legislature as the recipient of federal monies (along with the OWRB for certain federal funds) distributed under the Clean Water Act (OS 27A, § 1-2-101(A)(2)). These funds are then disbursed to state environmental agencies based upon statutory duties and responsibilities (OS 27A, § 1-2-101(A)(2)). The Oklahoma Legislature has designated the Secretary of Environment as public trustee for natural resources under federal laws such as the Clean Water Act, the Comprehensive Environmental Response and Liability Act of 1980, and the Oil Pollution Act of 1990 (OS 27A, § 1-2-101(A)(4)). Importantly, the Secretary of Environment coordinates pollution control

and complaint management to avoid duplicative efforts among state environmental agencies (OS 27A, § 1-2-101(A)(3)).

The Secretary of Environment is also charged with developing and implementing public participation procedures relating to the development and modification of reports and assessments required by the Clean Water Act such as the 303(d) report (list of impaired waters), the 305(b) report (water quality assessment), and the 319 report (nonpoint source assessment) (OS 27A, § 1-2-101(B)(1)(a)-(d)). Lastly, the Secretary of Environment is authorized and directed to coordinate lake monitoring in Oklahoma and to identify lakes that are eutrophic (overloaded with nutrients such as phosphorous and nitrogen that can cause algal blooms and a concomitant loss of dissolved oxygen) under Oklahoma Water Quality Standards (OS 27A, § 1-2-102(A)).

Rulemaking

In addition to the various state statutes governing environmental regulation, state environmental agencies often adopt rules and regulations that implement and administer the Oklahoma Legislature's mandates as prescribed by statute. When creating environmental agencies and defining their jurisdictional boundaries, the Oklahoma Legislature, from time to time, delegates rulemaking authority to environmental agencies to administer the general public policy enacted (OS 75, § 250.2(B)); *City of Sand Springs v. Department of Public Welfare*, 608 P.2d 1139, 1144 (Okla. 1980)). In delegating rulemaking authority, constitutional concerns dictate that the Oklahoma Legislature provide definite standards that guide agencies in the rulemaking process (*Democratic Party of Oklahoma v. Estep*, 652 P.2d 271, 277-78 (Okla. 1982)). Rulemaking authority and the standards governing delegation generally are found in the provisions that created the agency or granted it jurisdiction over a particular environmental issue. The process of rule promulgation is governed by the Administrative Procedures Act (OS 75, § 250 *et seq.*).

The first step for an environmental agency in the rulemaking process is to draft a proposed rule that implements or interprets legislation enacted by the Oklahoma Legislature.

The next step is the process of "adoption." This step is characterized by a number of public participation components. Notice of the intended rulemaking must be published in *The Oklahoma Register* (OS 75, § 303(A)(1)). Upon publication, interested persons are afforded a comment period of at least twenty days, during which interested persons may submit data, views, or arguments (OS 75, § 303(A)(2)). Under certain circumstances, a public hearing must be held, although many environmental agencies voluntarily elect to hold one or more public hearings or public meetings at this juncture (OS 75, §§ 303(A)(3) & (C)). Agencies must also issue rule impact statements, which generally contain a brief description of the purpose of a proposed rule, a description of those persons who will be benefited and burdened by the proposed rule, a description of the probable economic impacts of the proposed rule and the probable costs to the state environmental agency, and a discussion as to whether there exists any less costly or non-regulatory methods to achieve the purpose of the proposed rule (OS 75, § 303(D)). Upon consideration of the submissions relating to the proposed rule, and after public hearings have been held, an environmental agency may then "adopt" a proposed rule (OS 75, § 303(E)).

The next step can be described as the process of "final adoption." Within ten days of adopting a proposed rule, the state environmental agency files the newly adopted rule, among other documentation, with the Governor, the Speaker of the House of Representatives, and the President Pro Tempore of the Senate (OS 75, § 303.1(A)). A statement is published in *The Oklahoma Register* that the newly-adopted rule has been submitted to the Governor and the Legislature (OS 75, § 303.1(C)). The Governor has forty-five days to approve or disapprove the newly-adopted rule (OS 75, § 303.2(A)). If approved, the Governor notifies the environmental agency and a copy of the approval is given to the Legislature (OS 75, § 303.2(A)(1)). Notice of the approval is published in *The Oklahoma Register* (OS 75, § 303.2(A)(1)). In the event of disapproval, the Governor notifies the environmental agency of the reasons for disapproval and provides notice to the Legislature of the disapproval (OS 75, § 303.2(A)(2)). Failure of the Governor to approve the rule constitutes disapproval (OS 75, § 303.2(A)(2)). Notice of the disapproval is published in *The Oklahoma Register*.

Upon the Legislature's receipt of the newly-adopted rule from the state environmental agency, it is assigned to appropriate committees in the House of Representatives and the Senate for review (OS 75, § 308(A)). The Legislature must review the rule within thirty days of receipt (OS 75, § 308(A)). Through adoption of a joint resolution, the Legislature may approve or disapprove the rule, or waive the thirty-day review period

(OS 75, § 308(B)(1)). Transmission of an adopted rule for legislative review on or before April 1 results in the approval of such rule by the Oklahoma Legislature if the Oklahoma Legislature is in regular session and has failed to disapprove such rule within thirty legislative days after such rule was submitted or if the Oklahoma Legislature adjourned before the expiration of the thirty legislative days and has failed to disapprove such rule (OS 75, § 308(E)(1)). After April 1 of each year, transmission of a newly-adopted rule for legislative review results in the approval of such rule by the Legislature only if the Legislature is in regular session and has failed to disapprove the newly-adopted rule within thirty legislative days after the newly-adopted rule has been transmitted (OS 75, § 308(E)(2)). If the Oklahoma Legislature adjourns before the expiration of the thirty legislative days, the newly-adopted rule is carried over for consideration during the next regular legislative session (OS 75, § 308(E)(2)).

If approved by the Legislature and the Governor, the newly adopted rule is considered "finally-adopted" (OS 75, § 308.1(A)). The finally adopted rule is thereafter submitted to the Secretary of State for filing and publication in *The Oklahoma Register.* (OS 75, § 308.1(A)); and OS 75, §§ 304(A) & 308.1(A)). Final rules are effective ten days after publication in *The Oklahoma Register* (OS 75, § 304(B)(1)). The rules are then valid, binding, and have the force of law (OS 75, § 308.2(A)). The Secretary of State codifies, compiles, indexes, and publishes agency rules in a publication known as the Oklahoma Administrative Code and annually updates this compilation (OS 75, §§ 256(A)(1)-(2)).

Permitting

Mindful of the fractured nature of environmental regulation in the State of Oklahoma, it is not surprising that each agency empowered to permit an activity may have its own statutes, rules, and regulations that govern the subject matter of the activity and the permitting process itself. It is entirely possible that one activity or operation will require permits from more than one state environmental agency. For example, in Oklahoma, those desiring to operate concentrated animal feeding operations usually must obtain two permits for the operation. First, it is necessary to obtain a license from the Oklahoma Department of Agriculture to operate a concentrated animal feeding operation. Secondly, many concentrated animal feeding operations rely upon groundwater and must therefore appear before the Oklahoma Water Resources Board to obtain a permit to take and use groundwater.

A brief discussion of the permitting process in Oklahoma must include the Oklahoma Uniform Environmental Permitting Act (OS 27A, § 2-14-101 *et seq.*). This Act specifically applies only to ODEQ and is intended to provide a uniform and consistent scheme for notices and public participation opportunities relating to applications for permits and permit authorizations (OS 27A, § 2-14-102). Under the Act, permits are categorized by "tiers." Tier I is the basic permitting process and includes, fundamentally, an application, notice to landowner, and review by ODEQ (OS 27A, § 2-14-103(9)). Tier II is a more involved permitting process that includes notice of an application filing by publication in a local newspaper, ODEQ's preparation of a draft permit or draft denial of the application, publication of a notice of the draft permit or draft denial in a local newspaper, opportunity for public comment, and a possible public meeting (OS 27A, § 2-14-301(A), 2-14-302(A) & (A)(2)). Tier III is an expanded permitting process that includes all of the Tier II elements plus the opportunity for a meeting on the permitting process and ODEQ's preparation of responses to comments received (OS 27A, §§ 2-14-301(B) & 2-14-304(C)).

The Oklahoma Water Resources Board administers a permitting process for the appropriation of stream water, OAC 785:20-1-1 *et seq.*, and for taking and using groundwater (OAC 785:30-1-1 *et seq.*). Similarly, those seeking licenses to operate concentrated animal feeding operations are required to proceed through the Oklahoma Department of Agriculture's permitting process (OAC 17:35-3-1 *et seq.*).

Understanding that different agencies have distinct permitting procedures and that environmental jurisdictions can overlap is only part of the story. Environmental permitting in Oklahoma is influenced by the Oklahoma Supreme Court's decision in *Dulaney v. Oklahoma State Department of Health*, 868 P.2d 676 (Okla. 1994). In *Dulaney*, the issue was whether adjacent landowners and mineral interest owners are entitled to notice and an opportunity to be heard when a party applies for a permit to operate a solid waste disposal site (868 P.2d 678-79 (Okla. 1994)). The facts of the case reveal that a landfill permit was issued by ODEQ's predecessor agency after turning down adjacent landowners' request for an evidentiary hearing under the Administrative Procedures Act.

The Court first ruled that mineral interest owners are entitled to notice and an opportunity to be heard:

[m]inimum standards of due process require that administrative proceedings, which may directly and adversely affect legally protected interests, be preceded by notice calculated to provide knowledge of the exercise of adjudicative power and an opportunity to be heard. A petroleum engineer testified that use of the surface as a landfill would create numerous problems for oil and gas exploration, development, and recovery....

The permit granted by the Department of Health allows the use of the surface estate in a manner which may impair recognized and well-defined property rights of the mineral interest owner. Due process requires that the mineral interest owner be given notice and an opportunity to contest the permit at the administrative level. The due process clauses of the United States and the Oklahoma Constitutions provide that certain substantive rights – life, liberty and property – cannot be deprived except by constitutionally adequate procedures (868 P.2d 680-81 (Okla. 1994)).

Employing similar reasoning, the Oklahoma Supreme Court also ruled that neighboring landowners have a right to notice and an opportunity to be heard:

The trend is toward an enlargement of the class of people who may protest administrative action. This nation's highest court has recognized that aesthetic and environmental well-being, like economic prosperity, are important ingredients of the quality of life in our society....

[U]nder the facts presented, these landowners are entitled to notice and an opportunity to be heard. Water rights are property, which are an important part of the landowners' "bundle of sticks." The use and control of fresh water is a matter of publici juris, and of immediate local, national, and international concern. No commodity affects and concerns the citizens of Oklahoma more than fresh groundwater. Here, evidence was presented that drilling operations, which the mineral interest owners are entitled to engage in on the landfill site, could potentially contaminate the ground water supply – the same supply underlying the adjacent landowners' property and which they use for drinking purposes. It is a problem that must be explained. These landowners' water-related property interest alone requires that they be given notice and an opportunity to participate in a hearing whose outcome could affect their constitutionally protected rights (868 P.2d 683-85 (Okla. 1994)).

What the reader must take from *Dulaney* is that "minimum standards of due process require administrative proceedings that may directly and adversely affect legally protected interests be preceded by notice calculated to provide knowledge of the exercise of adjudicative power and an opportunity to be heard" (868 P.2d 686-86 (Okla. 1994)). Thus, permitting proceedings before state environmental agencies that may affect property interests must include notice and an opportunity to participate in those proceedings for those whose property interests may be affected.

Enforcement

The enforcement of environmental laws and regulations serves several important purposes. One such purpose is "deterrence." The idea of deterrence relates equally to encouraging compliance and discouraging non-compliance. Deterrence is often subdivided into "specific deterrence" and "general deterrence." Specific deterrence relates to enforcement of environmental laws against a person for violative behavior. In this way, environmental enforcement actions can serve to rehabilitate or reform the violator, and restrain the violator from engaging in present and future noncomplying conduct. General deterrence relates to the effect that an enforcement action, or the threat thereof, against one person has upon the behavior of another person. Just as we decide to maintain the speed limit when we witness another motorist pulled over by a police officer, an environmental enforcement action against one person may deter others from noncompliance.

Related to the idea of deterrence are the active and passive enforcement models. Environmental agencies that operate under the active enforcement model vigorously investigate or "hunt" for environmental noncompliance. Environmental agencies operating under the passive enforcement model take a less aggressive stance with the regulated community. These environmental agencies view themselves less as police and more as a technical consultant that encourages environmental compliance through a "partnership" with the regulated community. Numerous factors influence which model an environmental agency will employ in its approach to enforcement. One factor is budget constraints, *i.e.*, how to achieve the

greatest degree of environmental compliance per dollar. Political pressures also exert influence on this decision. Political forces can come from numerous sources: the public, the regulated community, public interest groups, state and federal legislators, local politicians, the Governor, and even other governmental agencies, federal, state, and local.

Another purpose of enforcement is punishment. Related to the idea of punishment is extracting the benefit, economic or otherwise, achieved from environmental noncompliance from the noncomplying person. Extracting these benefits may be achieved through the assessment of monetary penalties or by requiring certain actions such as remediation, removal, and/or natural resource repair. Environmental enforcement may also educate the public about environmental laws. Publicity surrounding environmental enforcement educates the public about the dire legal, social, and environmental consequences that flow from noncompliance, and fosters a heightened awareness about the environment.

Administrative Enforcement

Using the Environmental Quality Code as an example, ODEQ has the power to enforce noncompliance through administrative procedures. In this regard, administrative enforcement is initiated with the issuance of a Notice of Violation, which ODEQ issues when there are reasonable grounds to believe that a person is in violation of the Environmental Quality Code (OS 27A, § 2-3-502(A)). The Notice of Violation sets forth the alleged violation, the alleged violator's duty to correct the alleged violation, and the time within which such correction must be made (OS 27A, § 2-3-502(A)).

After service of the Notice of Violation upon the alleged violator, ODEQ may issue a proposed compliance order (OS 27A, § 2-3-502(B)). Therein, ODEQ may assess an administrative penalty for past violations and propose the assessment of an administrative penalty for each day of noncompliance with the compliance order (OS 27A, §§ 2-3-502(B)(1)(a) & (b)). The proposed compliance order may also specify compliance requirements, compliance schedules, and mandate corrective action (OS 27A, § 2-3-502(B)(2)). Proposed compliance orders become final orders if the violator does not request an administrative enforcement hearing within fifteen days (OS 27A, § 2-3-502(B)). Failure to comply with a final compliance order results in the issuance of an assessment order, which assesses the administrative penalty set forth in the final compliance order (OS 27A, § 2-3-502(C)).

The Executive Director of ODEQ is also empowered to revoke, modify, or suspend permits (OS 27A, § 2-3-502(D)). To satisfy due process concerns, this action may be taken only after notice and an opportunity for an administrative hearing (OS 27A, § 2-3-502(D)).

Generally, penalties assessed or proposed in an order cannot exceed $10,000.00 per day of noncompliance (OS 27A, § 2-3-502(K)(1)). Determinations as to the amount of the penalty must include consideration of the nature, circumstances, and gravity of the violation, the economic benefit resulting from the violation, the history of violations, the violator's culpability, and the violator's good faith efforts to achieve compliance (OS 27A, § 2-3-502(K)(2)). ODEQ may take or request civil action or criminal prosecution, or both, for violations of the Environmental Quality Code in addition to, or in lieu of, administrative enforcement proceedings (OS 27A, § 2-3-504(I)).

The Oklahoma Department of Agriculture is empowered to assess an administrative penalty of not more than $10,000.00 per day of non-compliance with the Oklahoma Concentrated Animal Feeding Operations Act (OS 2, § 9-212(C)(1)(a)).

Civil Enforcement

The Environmental Quality Code also provides that violations of its provisions are punishable in civil proceedings in district court by the assessment of a civil penalty of not more than $10,000.00 for each violation (OS 27A, §§ 2-3-504(A)(2) & (B)). Each day or part of a day upon which such violation occurs constitutes a separate violation (OS 27A, § 2-3-504(D)). Additionally, injunctive relief may be granted by the district court (OS 27A, §§ 2-3-504(A)(4) & (F)). Injunctions are court orders that prohibit (prohibitive injunctions) or command (mandatory injunctions) certain conduct. Thus, through injunctive relief, a district court can compel compliance with, or prevent violations of, the Environmental Quality Code (OS 27A, §§ 2-3-504(A)(4)). It is worth noting that ODEQ is not the only governmental entity empowered to seek enforcement of the Environmental Quality Code through civil proceedings. The Attorney General and district attorneys are also empowered to bring a civil action in district court to prosecute violations of the

Environmental Quality Code (OS 27A, § 2-3-504(E)). Further, if requested by Executive Director of ODEQ, it is the responsibility of the Attorney General or district attorney to bring actions for injunctive relief or for recovery of an administrative or civil penalty (OS 27A, § 2-3-504(F)(4)).

Under the Oklahoma Department of Agriculture's environmental jurisdiction, owners or operators of animal feeding operations that fail to take reasonable and necessary action to avoid pollution of surface waters can be assessed a civil penalty of up to $10,000.00 for each violation (OS 2, § 9-212(B)). The Oklahoma Department of Agriculture may also bring an action for injunctive relief in district court (OS 2, 9-212(C)(1)(b)).

Criminal Enforcement

The final mode of enforcement involves criminal actions. Persons criminally violating the Environmental Quality Code are guilty of a misdemeanor and may be punished by a fine of between $200.00 and $10,000.00 for each violation or by imprisonment of not more than six months, or both (OS 27A, § 2-3-504(A)(1)).

In addition to the general criminal enforcement provisions of the Environmental Quality Code, specific criminal provisions may be found in the Environmental Crimes Act (OS 21, § 1230.1 *et seq.*). The Environmental Crimes Act criminalizes several acts. First among these is the crime of unlawful hazardous waste transportation, which is knowingly and willfully transporting or causing the transport of hazardous waste without a proper manifest (OS 21, § 1230.3). Unlawful hazardous waste transportation is a felony punishable by not more than five years in prison and/or a fine of not more than $25,000.00 (OS 21, § 1230.8(1)).

Under the Environmental Crimes Act, a person who knowingly and willfully receives, stores, treats, processes, recycles, or disposes of waste without a permit commits unlawful waste management (OS 21, § 1230.4). The criminal sanctions for unlawful waste management vary by waste. For example, for hazardous waste, unlawful waste management is a felony punishable by imprisonment of not more than 5 years and/or a fine of not more than $50,000.00 (OS 21, § 1230.8(2)(b)). For waste other than hazardous waste, the crime of unlawful waste management is a misdemeanor, which is punishable by a fine of not more than $10,000.00 (OS 21, § 1230.8(2)(a)).

An interesting group of six criminal activities is included under the general crime of unlawful misrepresentation of waste. Included among these are making false statements, including false data, and omitting material information in an application for a waste permit or authorization (OS 21, § 1230.5(A)(1)). Similarly, making false statements, including false data, or omitting material information in waste manifests, waste labels, or waste compliance documents, records, or plans, is a crime (OS 21, § 1230.5(A)(2)). Submitting false samples of waste for analysis is a crime, as is tampering with environmental monitoring devices (OS 21, §§ 1230.5(A)(3) & (5)). It is also a crime to make false statements, include false data, or omit material information from a laboratory analysis of waste (OS 21, § 1230.5(A)(4)). Lastly, providing hazardous waste to another person for transportation without proper manifest is a crime (OS 21, § 1230.5(A)(6)). Like the crime of unlawful waste management, penalties for the crime of unlawful misrepresentation of waste are tied to the type of waste involved. For example, if the crime of unlawful misrepresentation of waste involves hazardous waste, it is a felony punishable by imprisonment for not more than five years and/or a fine of not more than $25,000.00 (OS 21, § 1230.8(3)(b)). For wastes other than hazardous waste, the crime of unlawful misrepresentation of waste is a misdemeanor punishable by a fine of not more than $5,000.00 (OS 21, § 1230.8(3)(a)).

Certainly, hazardous waste was very much on the collective mind of the Oklahoma Legislature when deliberating the Environmental Crimes Act as it specifies that it is a felony to unlawfully dispose of hazardous waste. This crime contains two parts: (1) knowingly and willfully failing to secure a permit; and (2) without a permit, knowingly and willfully disposing, directing the disposal, or aiding and abetting in the disposal of hazardous waste at a solid waste landfill, a transfer station, a processing facility, or into a sanitary sewer system without pretreatment (OS 21, § 1230.6). Unlawful disposal of hazardous waste is punishable by imprisonment of not more than five years and/or a fine of not more than $25,000.00 (OS 21, § 1230.8(4)).

Additionally, the Environmental Crimes Act specifies that it is a felony to unlawfully conceal hazardous waste. Consisting of several elements, the unlawful concealment of hazardous waste is: (1) knowingly and

willfully subjecting other persons to the potential for immediate or long term risk to health or safety by exposure to chemical wastes by: (a) knowingly and willfully concealing or causing others to conceal the unlawful abandonment or disposal of hazardous waste; or (b) concealing or causing others to conceal the transportation of hazardous waste; or (c) misrepresenting or causing others to misrepresent the type of hazardous waste being transported (OS 21, §§ 1230.7(1)-(3)). If the severity of punishment is any indication, the Oklahoma Legislature believed that the unlawful concealment of hazardous waste is more serious than other environmental crimes since it is punishable by imprisonment of two to ten years and a fine up to $100,000.00 (OS 21, § 1230.8(5)).

Penalties imposed under the Environmental Crimes Act are in addition to, and not in lieu of, other civil or administrative penalties or sanctions that may be imposed under law (OS 21, § 1230.10). Similarly, administrative, civil, or criminal penalties available under the Environmental Quality Code are in addition to those in the Environmental Crimes Act (OS 27A, § 2-3-506(C)).

Under the Oklahoma Department of Agriculture's environmental jurisdiction, persons violating the Oklahoma Concentrated Animal Feeding Operations Act are guilty of a misdemeanor, as are owners and operators of animal feeding operations that fail to take reasonable and necessary actions to avoid pollution of any stream, lake, river, or creek (OS 2, § 9-212(A) & (B)).

Conclusion

The mass of statutes, rules, regulations, and ordinances governing environmental matters in the State of Oklahoma is not necessarily unique to Oklahoma. One unusual aspect of environmental regulation in Oklahoma, however, is the division of environmental jurisdiction and responsibilities among many state agencies. The jurisdiction and responsibilities of federal agencies, tribal governments, counties, and municipalities makes matters even more complicated.

Splintering environmental regulatory jurisdiction among numerous state agencies complicates matters for the regulated community and the professionals that render technical or legal advice as to environmental matters. For example, there are numerous activities with the potential to cause pollution or that may require permits that fit within more than one state environmental agency's regulatory jurisdiction. Such a state of affairs may result in inconsistent positions, policies, regulations, and enforcement practices. Further, it fosters turf battles among state environmental agencies desiring to increase their jurisdictional empire. It also creates an environment where certain activities go virtually unregulated as state environmental agencies play "hot-potato" with politically sensitive or highly technical issues. Reasonable minds can and do differ as to the wisdom of the current environmental regulatory landscape, but unless and until it is change, it remains Oklahoma's landscape.[1]

References

Oklahoma Administrative Code (OAC). 1996, with annual supplements.

Oklahoma Constitution.

Oklahoma Statutes (OS). 1999, with annual supplements.

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[1] The views expressed herein are not necessarily those of the State of Oklahoma or the Office of the Oklahoma Attorney General.

PART II

ENVIRONMENTAL POLICY LEGITIMACY

ENVIRONMENTAL MANAGEMENT AND DEMOCRATIC LEGITIMACY

Edward Sankowski

Introduction

"Stakeholder processes" (about environmental politics and policy) is a phrase that can be used to describe a wide variety of group problem-solving strategies. Interested parties so interact as to identify and characterize environmental problems, to project possible solutions, and to coordinate collective action to manage these problems. Stakeholder processes discussed here are intended to contribute to making environmental policy. Such policy might be called public, but is usually not purely governmental. In stakeholder processes, input is typically sought from both governmental and non-governmental sources. Non-governmental entities consulted might include both business and non-profit community groups.[1]

This chapter points out selected issues about stakeholder processes. It is a mixture of general philosophical considerations; interpretations of various contemporary events; and particularly a discussion of one project, funded by the Environmental Protection Agency and the National Science Foundation, for research in Oklahoma about water management environmental policy in connection with the Illinois River Basin in eastern Oklahoma.[2]

At worst, stakeholder processes can create a manipulated, false impression of democratic community legitimacy when there are actually major flaws in the democratic quality of decision-making practices. For example, the role of interested or affected citizens in making policy may be much attenuated and yet the policy may be depicted as citizen-generated. Such flaws may also include inadequate representation of some relevant community groups, poor environmental education, or other basic problems about institutional structures. (These are overlapping problems.) At best, stakeholder processes can better educate a community about environmental problems and better prepare it to manage its environment; stimulate the

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[1] There is a distinction between (a) those consulted because they have specialized knowledge relevant to the decisions to be made, such as scientific, or engineering background, or legal-administrative expertise, or risk analysis expertise, and (b) those consulted because they are thought to have political standing to have a role in decisions, as interested and affected persons. Stern and Fineberg (1996:3) note that "Risk characterization is the outcome of an *analytic-deliberative process*....The process must have an appropriately diverse participation or representation of the spectrum of interested and affected parties, of decision makers, and of specialists in risk analysis, at each step." While their aim is not the same as that of this paper, much of what is said in their work about analysis and deliberation can be adapted and fit into the present paper's discussion of stakeholder processes. The literature summarized in their work could usefully enrich and extend this paper's necessarily abbreviated treatment of stakeholder processes. Normative ethical and political aspects of decision processes are referred to and used in justifications, but they note "the possibility that a risk decision will violate" certain "ideas of what is morally right is rarely given explicit attention in risk characterization" (Stern and Fineberg 1996:49). Also, their perspective seems to confine itself to "perceived legitimacy," while this paper is more concerned with "real legitimacy."

[2] "Ecological Risks, Stakeholder Values, and River Basins: Testing Management Alternatives for the Illinois River", a multi-year interdisciplinary research project, funded by the EPA/NSF Partnership for Environmental Research (FY 1997), EPA Grant: GAD # R825791. This particular project is far richer and more promising than can possibly be conveyed in the short span of this paper. I urge anyone who works on such topics to familiarize themselves with the relevant research, present and future, done on this project by the project PI, co-PIs, and others. The PI is Mark Meo, from the Science and Public Policy Program at the University of Oklahoma, and the co-PIs are Lowell Caneday, Will Focht, Robert Lynch, Ed Sankowski, James Sipes, Zev Trachtenberg, Baxter Vieux, and Keith Willett.

growth of new democratic institutions; and improve the prospects for the legitimacy of environmental policy. (These are overlapping gains in a best-case scenario.) Between the worst and the best, there are many possibilities.

Moral and political philosophy has a contribution to make to the evaluation of stakeholder processes as responses to environmental problems, especially through the evaluation of claims that democratic community decision-making practices have generated ethically and politically legitimate environmental policy.

Clearly, "legitimacy" here does not refer solely or even primarily to legality as such. (The word "legitimacy," with its legalistic connotations, invites misunderstanding, but is so deeply entrenched in some scholarly prose that it is difficult to dispense with. The colorless "acceptable" – or some other substitute – might be preferable if the specialized meaning were thoroughly explained; nevertheless, I use the problematic "legitimacy"). An environmental policy may have the force of law, but may be flawed normatively (either due to features of the content of the policy itself or the process by which the policy has come to be). Because of such flaws, the policy, though legal, may sometimes plausibly be called illegitimate. On the other hand, interested parties may make references to stakeholder processes (among other things) in justifying environmental management plans as "legitimate" when the plans do not have the force of law or even when the plans are contrary to existing law.

In the case of environmental policy, an important part of the motivation for stakeholder processes is sometimes an antipathy to government regulation of other institutions, or perhaps in its better forms, a desire to get government and other institutions that constitute a community to cooperate in ways that are more satisfactory. Part of what makes such cooperation more satisfactory should be the creation of institutional innovations in a democratic framework for dealing with environmental problems. While I do not share the reflexive anti-statism of those who celebrate "free markets" as a solution to societal problems, I do recognize a need to go beyond reliance on government for legitimacy. I believe that at their very best, stakeholder processes could help create novel institutional combinations, new institutional forms, and new policies to help solve environmental problems. Such processes at their very best could help reinvent democracy in desirable ways. At their worst, stakeholder processes are ways to assist the dominance of powerful institutions, whether corporate or governmental (or more likely objectionable combinations of these) that manifest no genuine concern about democratic legitimacy.

A central problem on which progress is hoped for is this. When "democracy" tries to deal with environmental problems under contemporary circumstances, to what extent and in what ways does it need institutions that are non-governmental to enter into dialogue and decision-making about public policy? This is admittedly not a problem that can be solved in academic research alone. It needs to be addressed pragmatically in societal interactions that address environmental problems. We might optimistically interpret some of the academic projects to which the EPA has contributed funding as attempts to encourage the development of not only policy content but also institutional forms suitable for generating legitimate public environmental policy. From this point of view, problems about the environment can only be addressed by addressing basic issues in political philosophy, issues not only about government but also about the most nearly ethically legitimate mix of institutions in a given community context. It is a problem about democratic community legitimacy, a community being understood as constituted by the mix of major institutions.

The Illinois River Case

This chapter discusses an example of environmental management of watershed pollution currently being studied (and intervened in) by a multidisciplinary team of researchers (including this author). The researchers include faculty in political science, environmental science, economics, civil engineering, philosophy, education, public health, and other areas. The researchers are drawn from faculties of the University of Oklahoma, Oklahoma State University Norman, and the University of Oklahoma Health Sciences Center. The overall study includes consideration of the social, natural, and economic dimensions of environmental problems about watershed management and it includes attention to stakeholder beliefs and values. That study will compare and evaluate policy alternatives; it also aims to educate and build consensus.

This multidisciplinary, multi-year project ("Ecological Risks, Stakeholder Values, and River Basins: Testing Management Alternatives for the Illinois River") aims to address problems about environmental policymaking concerning the Illinois River Basin in eastern Oklahoma. Project descriptions variously refer to legitimacy or similar concepts.

The Illinois River, one of the most scenic rivers in Oklahoma, has been the center of political controversy about private property rights and environmental protection for more than 25 years. The Illinois River has provided multiple social benefits to the citizens of Oklahoma through its use for recreation, water and power supply, flood control, and nutrient removal. Yet, the inability of different interests to reach agreement on how to protect the Illinois River watershed has placed its hydrologic resources at increased risk of long-term degradation.

This 3-year interdisciplinary research project demonstrates how different environmental and social values held by river basin stakeholders can be identified and compared so that more effective environmental protection strategies can be determined and adopted by local land and water use interests and state agencies.

Visual simulations developed from GIS-based hydrological models will be shown to stakeholders in conjunction with focus group sessions to ascertain management preferences and the overall legitimacy of negotiated agreements.

The entire process will be tested to determine the degree to which the process is viewed by experts and lay stakeholders as efficient, effective, and legitimate, and therefore acceptable (Meo *et al.*, 1988).

In a later statement, again, it is written that "The project objective is to identify and compare different environmental and social values held by stakeholders in the Illinois River watershed, and to test a management protocol that is technically effective, economically efficient, and socially and politically acceptable." This 1999 statement does not use the word "legitimate" but does seem to use other concepts that do similar work; it refers, for example, to what might be "politically acceptable" and to "consensus" (Meo *et al.* 1999). The references to "legitimacy" and to what is socially and politically "acceptable" might be construed as either allusions to the perception or reality senses of "legitimacy" (or "acceptability"). (See distinctions made in the next section entitled, "Conceptions of Legitimacy").

A complicating, and central agency involved in these issues is the Oklahoma Scenic Rivers Commission, a public agency. Persons serving on it, along with persons from Oklahoma State University and the National Park Service, devised "The Illinois River Management Plan" (Bality *et al.* 1998). Ed Fite, Administrator of the Oklahoma Scenic Rivers Commission, writes in the Foreword to this report,

> The Illinois River Management Plan has been anything but a normal exercise to develop and write. It has been a convoluted process that I would be unable to convey in this brief foreword. The most unique and valuable aspect of the management plan lies in its contributors. This plan was not written solely by government, but also by many stakeholders who took their valuable time to become involved. Participation was open to all who wished to take part. This consensus-building process between government and the private sector lead to the 22 major goals and 130 strategies included in the plan and reflect a wide variety of needs and concerns for the preservation and protection of the Illinois River Basin.

The management plan was endorsed by the OSRC by a narrow vote. The Executive Summary of the plan states,

> In 1993, concerned citizens, with direction from the Oklahoma Scenic Rivers Commission (OSRC), National Park Service, and Oklahoma State University, began to develop a plan to manage the river corridor's natural, cultural, and historical values. Plan development and implementation is a citizen-driven initiative that has brought together a large number of people willing to work cooperatively to improve the future of the river. Publication of the management plan will complete the initial stage of this effort; the process of implementing the goals and strategies set forth will be ongoing for years to come.

It remains to be seen what the relation will be between this OSRC-related management plan and the management alternatives that are to be generated and compared by the academic, EPA-NSF funded project.

Phil Lorenz (1999), President of the Scenic Rivers Association of Oklahoma, comments on problems about the Illinois River, claims that, "The Scenic Rivers Commission, which was restructured into a working team after a fractious beginning in the 70s, is now showing signs of coming unglued again." Lorenz continues, "A notable symptom of this was the cliffhanging 6-5 vote in December to approve the Illinois River Management

Plan. The ominous feature of this action is that the five negative votes were cast by the locally elected commissioners. Commissioner Gerald Hilscher (whose slot on the board is filled by appointment by the governor) pleaded with his fellow commissioners to offer amendments if they objected to particular features of the plan, but there were no amendments, and the NO vote was apparently against any plan at all." Lorenz goes on to a mostly favorable discussion of the plan and upholds the authority of the OSRC, denying that the rights of the local community should prevail. He writes, "The Commission's twofold function is to preserve the river and to protect the rights of the local community. If the second function is all the local community will support, we don't need a Commission at all." However, without the Commission, Lorenz writes, among other debits: "There would be no monitoring of water quality, and no one with clout to champion action against polluters. The river would become a ditch for disposal of chicken litter, pesticides, manure from cattle, and (more recently) sewage from the Watts lagoon. Lake Tenkiller would experience more and more of a suffocating bloom of algae in summer. Swimming and fishing opportunities would go downhill in both river and lake."

Lorenz goes on to make some proposals, including increased user fees and an enlarged scope for the OSRC's work. He argues that "we" should "Reexamine the requirements for membership on the Scenic Rivers Commission, so that commissioners will honor their responsibilities to both of the two functions." Finally, he insists, "These measures will require legislative action. We 'outsiders' don't want to ride roughshod over the interests of local people who own the land and pay taxes. However, they are benefiting from our taxes; and we boost their economy by being there, so we also have some right to influence policy." (Regrettably, this is an argument that appeals to money and property as a source of legitimate political authority.)

Conceptions of Legitimacy

One basic distinction necessary for this chapter is as follows. "Legitimacy" may refer to a predominant perception (in the sense of a belief, plus correlative pro-attitudes) among a population that some feature of public policy is morally acceptable, perhaps obligatory. Actually, moral acceptability may not always be precisely what is involved, but it is a close enough fit for present purposes. The "perception" sense of "legitimacy" is to be distinguished from the normative claim that some feature of public policy is rationally binding, that it ought to be thought of and acted on as morally legitimate. We might call this the "reality" sense of "legitimacy," and we write about "real legitimacy."

There is also a possible distinction between procedural legitimacy as such and the normative rightness, obligatoriness, etc. of the content of a policy. If a policy has been arrived at by defensible social processes, including the generating institutional mix, it is unlikely, but logically possible, that it is still not objectively a good, let alone the best policy. We have some terminological options here. We could reserve the word "legitimate" to characterize only those policies with content that we think ethically good, right, etc. Or we could instead use the word to apply to policies that we think have been arrived at by appropriate processes, including the description of institutions in the description of these processes, in pure cases bracketing the question whether the policies are really good, right (etc.) policies. Sometimes it seems that both of these meanings of "legitimacy" are used in a text. We might refer to these senses of "legitimacy" as "substantive" and "procedural," respectively. Substantive and procedural legitimacy may often go together – and there is often interplay of the two concepts in deciding when to apply either – but they do not absolutely have to coincide.

It is to be noted that the distinctions between perceived and real legitimacy, and between substantive and procedural legitimacy, cut across one another. It seems that each of perceived and real legitimacy can be subdivided into references to substantive and procedural legitimacy.

Five Legitimacy Problems

In the sections that follow, five ethical problem areas will be identified about democratic community legitimacy (primarily, "real" and "procedural" legitimacy) of environmental policymaking by stakeholder processes. There is no attempt to provide an exhaustive list, which is an impossible task. There is also no attempt to provide criteria that could distinguish between legitimacy and non-legitimacy, a task which may or may not be possible to carry out, but which is beyond the aims here. The list is calculated more modestly to identify some major (overlapping) problems about democratic community legitimacy of stakeholder processes in environmental policymaking. Arguably, all of these problems are directly or indirectly concerned with democratic citizens'

freedom and equality, though there is not the space to argue for this contention here. All of the problems are arguably about the distribution of effective power in a community that is necessary for democratic legitimacy.

Problem area 1 is about relations among different cultural groups in a multicultural democratic society. This will be illustrated by the example of Native Americans in the context of the Illinois River Basin (though it has more general applicability). From my point of view, the main issues here are about "real" and "procedural" legitimacy.

Problem area 2 is about local governmental entities as contrasted with more centralized entities (e.g., states in the U.S. as contrasted with the federal government, or cities and other localities as contrasted with the state or federal government). Stakeholder processes are often about problems that extend across local boundaries, sometimes governmentally drawn boundaries, and require the participation of both local stakeholders and others. Again, this is primarily about real and procedural legitimacy.

Problem area 3 relates to the observation that the role of scientific and related technical expertise in stakeholder processes raises major issues. While there are issues about substantive legitimacy that could be raised in this context, the primary challenge is to real and procedural legitimacy and the appropriate incorporation (consistent with democratic citizens' freedom and equality) of scientific and technical expertise into stakeholder processes.

Problem area 4 concerns the differential effectiveness of various groups in stakeholder processes based, at least in part, on access to legal resources, such as the power to sue or use other legal tools. This is, again, a matter of real and procedural legitimacy.

Problem area 5 recognizes that economic, as well as concomitant political, inequality poses a major problem for stakeholder processes. This is acknowledged in the rationales for some programs within the EPA. This is perhaps the most basic worry expressed here about real and procedural legitimacy and stakeholder processes.

Cultural Relationships

There are many reasons why a gap may exist between perception and reality about legitimacy. One example connected with relations among different cultural groups in a multicultural "democracy" is the following. Suppose that there are conflicting claims about the ownership of land, perhaps because there are disputes about the acquisition of property in land that was formerly inhabited and used by indigenous cultures currently dispossessed. It could not follow morally that a consensus among stakeholders that does not include the relevant indigenous peoples suitably involved (whatever that means exactly) could generate legitimate environmental policy. It would remain an open moral question whether policy generated by such stakeholder processes is really and procedurally legitimate, even if all agreed that it was. Moreover, inclusion of some members of the indigenous cultures as individuals along with many other stakeholders of other cultural backgrounds would not seem to be enough for legitimacy, at least in some cases. Issues about group rights and group self-determination in some cases would generate problems about real and procedural legitimacy.

To some extent, the Environmental Protection Agency recognizes the importance of such issues in its programs. To take one example, EPA materials note, "The American Indian Environmental Office (AIEO) coordinates the Agency-wide effort to strengthen public health and environmental protection in Indian Country, with a special emphasis on building Tribal capacity to administer their own environmental programs."[3] More generally, EPA also has environmental justice programs: current internet materials refer to President Clinton's Executive Order 12898 on February 11, 1994, "to establish environmental justice as a national priority." Such materials also state, "The *Order* focuses federal attention on the environmental and human health conditions of minority populations and low income populations with the goal of achieving environmental protection for all communities."[4] This section of the paper concentrates more on the problems of minority cultural groups, especially Native Americans as one example.

Tahlequah, Oklahoma is the site of the OSRC headquarters. It is located in the Illinois River Basin. Tahlequah is also the county seat of Cherokee County, Oklahoma and is the capital of the Cherokee Nation.

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[3] See on the Internet (http://www.epa.gov/indian/miss.htm), July 6, 1999.

[4] See on the Internet (http://www.epa.gov/oeca/oej/), July 6, 1999.

A good deal of local tourism literature refers to the land of the Cherokees. A free handout map "Produced for the Tourism Council of the Tahlequah Area Chamber of Commerce," for example, was available in the Headquarters of the Oklahoma Scenic Rivers Commission on 9/11/98, when many of the Illinois River project research team met with Ed Fite. The map plus informational items printed on the same item invites the reader to "Discover Historic Tahlequah Capital of the Cherokee Nation." A number of the advertisements printed in the map material are from such sources as resorts, Elephant Rock Nature Park, Tenkiller State Park, motels, beds and breakfasts, etc. The map also refers to the "Tahlequah Terminus of the Trail of Tears and Capital of the Cherokee Nation Since 1941" and mentions related area attractions including the "Cherokee Heritage Center" and the "Cherokee National Museum." It should be added that the official state map of Oklahoma refers to the state as "Native America" and alludes to and depicts "American Indians" as part of its promotion of the state for tourism, both tourism by Oklahomans and non-Oklahomans.

The methodology of the EPA-NSF study, however, whatever its other merits may be, does not especially emphasize any particular culture such as the Cherokee tribe as a stakeholder group, though it does aim at representativeness. (Attempts have been made, however, to involve the Cherokee Nation of Oklahoma in policy maker deliberations, though that group had no representative at the first policymaker workshop, held on October 3 and 4, 2000, in Tulsa). For example, Focht (1998:1) describes how research team members

> "interviewed policy elites (policymakers, policy implementers, policy and technical experts), local residents and landowners, business owners and operators, tourists and recreationists, environmentalists, civic group and opinion leaders, and others who perceived that they have a stake in the outcome of river basin management planning. To maximize the representativeness of our sample, we divided the basin into nine regions – eight geographical and one functional (policy elites). Representativeness was also assured by our inclusion of participants from all stakeholder classes within each region (e.g., agriculture, forestry, plant nursery, animal feeding operation, outfitter, all levels of government, retail business, tourist and recreationist, resident, etc.). Finally, we used 'snowballing' to locate and include others who held opinions and positions different from those already interviewed."[5]

"Representativeness" here is not solely a statistical notion. It is clear that it is intended to have some sort of normative and probably specifically ethical force. Otherwise, it would be hard to understand why this report notes not only that "Participants were identified initially from lists of attendees at OSRC public hearings and from references to those known to the researchers from previous contacts," but then goes on to talk about snowballing and increasing representativeness "by interviewing representatives of all participant classes that were present in each of the nine regions, especially of those who were opinion leaders," and adds that "Finally, we attempted to ensure all races and both genders were fairly represented" (p. 4). It is to be noted that the stakeholder classes include those in agriculture (farmers) and other businesses of various sorts, as well of residents of different types, and environmentalists.

The analysis does not seem to attempt to elucidate legitimacy considerations that might not be captured in interviews with individuals, e.g., actual political relations among different cultural groups. It is possible that in the consensus-building phase of the project such relations may come more to the fore; but perhaps not. If not, the project will still be informative in its study of stakeholder values. It would, however, be desirable to supplement the project approach with an additional inquiry into the politics of multicultural interactions.

In the case of the Illinois River Basin, issues about environmental justice seem potentially applicable to questions about democratic community legitimacy of any environmental public policy, especially given considerations about tribal sovereignty. It is, however, asking a great deal from such a project as conceived to expect that it should fully address overall legitimacy problems generated by relations among cultures, perhaps even the more circumscribed area of relations of the dominant culture considered as an aggregate and such tribes as the Cherokee nation. Perhaps it would be best to say here that, besides environmental justice initiatives, the Environmental Protection Agency's efforts to deal with environmental problems in "Indian Country" do need to be taken into account in some supplementary inquiry, both for this particular project and for others. In such supplementary inquiry, issues about multiculturalism in a democracy, and Native American sovereignty, would have to be considered in greater depth than is possible here.

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[5] For an interesting approach to legitimation, see Focht *et al.* 1999.

Intergovernmental Relations

Another set of issues that need further exploration concerns the implications for legitimate policy of differences between local and non-local stakeholders, alluded to in previous sections. Tribal sovereignty issues are a subset of these issues, but we shall proceed to consider others. One important illustration of this concerns questions about state jurisdiction in the U.S. In the case of the Illinois River Basin, the relations between Oklahoma and Arkansas are particularly significant. Keith Willett, an agricultural economist and project co-PI, has for his own good reasons, not centered on issues about legitimacy, industriously explored some of the connections between issues about Arkansas as well as Oklahoma for Illinois River Basin water management.

It should be noted that there is, of course, both a local and national background to some of these problems. In describing a small part of the local background, I shall not discuss Willett's interesting work, some of which will be available independently in any event. It is worth mentioning that the Sierra Club has taken an interest in hog and chicken factory farms, especially in eastern Oklahoma. In a letter to the Norman, Oklahoma newspaper, Karl M. Rysted, writes, "I just wanted to thank you for your editorial of May 18th about the need for increased regulation by the Environmental Protection Agency ... of hog and chicken factory farms, also known as CAFOs (Confined Animal Feeding Operations). I thought the article went to the crux of the matter in stating that 'the EPA is bound to prevail, however, as people in states that have not been involved in CAFO disputes become better informed.'" (It should be emphasized that chicken waste seems to be a particular problem in the parts of the Illinois River Basin involved in the project study. It is a problem, and is locally perceived as such, according to IRB project work). Rysted adds,

> We at the Sierra Club have taken on the task of doing just that (i.e., informing the public), joining with rural residents, family farmers and public health officials on this issue. We're working together to find a national solution to this problem....Furthermore, although we were successful in getting a poultry bill passed in the state Legislature, much of the water pollution in eastern Oklahoma will continue to flow in from Arkansas and Missouri, until we have tough national standards which are enforced. According to a study of Lake Eucha, Tulsa's source of drinking water, released in February 1997 by the Oklahoma Conservation Commission, poultry growers in Arkansas and two municipal water treatment systems in Arkansas were among the phosphorous sources feeding algae in the lake. Because of Arkansas pollution, the cost of treating water for Tulsa and other northeastern Oklahoma communities increased. These Arkansas sources produce about 77 percent of the total phosphorous in the watershed, according to the study.

Rysted also notes that "the Sierra Club calls for a nationwide moratorium on construction of new livestock factories."

In *The Norman Transcript* of 8/14/98, an article concerning an Environmental Protection Agency meeting held in Oklahoma City reported "on the impact of large hog and chicken farms on the environment." Before that meeting, the Sierra Club had held its own public meeting. "Two EPA officers were present to listen to the concerns of Oklahoma residents on the possible conditions of water in the state if the general permit for hog and chicken farmers, which does not allow for public participation prior to permitting of a specific facility, is accepted." Objections were voiced by an environmental program director for the Quapaw Tribe, who spoke favorably about the family farm and against corporations. "He told EPA officers that his group had just heard about the hearing earlier in the day. Due to the fact that the tribe was not consulted about general permits within their communities, it is asking for a 45-day extension on public comments so that all concerned tribe members could have a voice." A Sierra Club regional vice president "told the officers that the EPA already had identified a total of 70 different water bodies from all across Oklahoma already impaired by the animal factories," including "some of our state's most important resources," including the Illinois River.

As the interest of the EPA and Sierra Club suggest, the issue is of more than purely state-level significance. In an article in *The New York Times* of 8/26/98, "Poultry Growers Unite to Address Waste Issue," it is reported that "Chicken and turkey producers across the country are trying to develop a uniform, voluntary plan to handle the waste runoff from their operations in hopes of avoiding either new Federal rules they fear could be costly or state-by-state rules that could create a competitive imbalance. The situation has come about in part because the Clinton Administration has declared agricultural runoff to be one of the biggest threats to water quality."

The IRB project report of 10/31/98 (p. 12) claims that:

Farmers tend to downplay the impacts of cattle and poultry, instead insisting that Fayetteville (Arkansas) is the problem. They want more research on Fayetteville to prove that it is the problem and to exonerate farmers. They are worried that the OSRC is plotting to take their farms away. Institutional distrust is highest in this group, possibly because of their high stakes. They perceive their lifestyle as fulfilling because it is rural; this keeps them isolated from others. Thus, they view others who wish to recreate, reside, or develop in the area as a threat to their isolated lifestyle.

This localism is both a source of some types of community at the local level and a difficulty for attempts to create institutions with enough legitimate authority, scope, and clout to cope with environmental problems.

For some sorts of localism, even the authority of Oklahoma state government seems questionable. The issue raises complex issues about who controls state government and who supports various measures that are supposedly pro-environmental or anti-environmental. At the same time, the Clinton Administration is said to support more of a role for state and local governments (though this leaves unresolved what balance to strike between state and local governments).

There is a constant tension between centralizing and decentralizing tendencies in social and political arrangements. There are skirmishes of many types. No simple moral vision will do justice to the varied ethical issues involved. Sometimes more centralized measures are justifiable, at other time more decentralized measures are more appropriate. Interestingly, we may encounter alliances between centralizing tendencies and some decentralist environmental measures. Some interests favorable to economic concentration of power within a market framework (a type of centralization) may also support more localism about environmental regulation. There are many Republicans like this. It is somewhat tempting to think that consistent decentralization would be best for citizen autonomy and legitimacy, but this is far from obvious. The issue has to be dealt with in ways that cope with the larger picture and the details of a local socio-political context, and does not admit of a very general solution.

Role of Scientific and Technical Expertise

The next problem area for stakeholder processes commented on here is the role of scientific and related technical expertise in stakeholder decision-making processes. Zev Trachtenberg, a researcher on the Illinois River project, takes this issue up in his recent work, but I shall not discuss his approach here. In a way, this is an issue about those two concepts basic to democratic ideals: freedom and equality. If we think of freedom as, in part, the capability to choose in effective ways, those who think about environmental problems without knowing the relevant science (reasonably well) lack freedom. They are also unequal in deliberations as versus those who have the knowledge.

The problems here are interestingly complex. Terry Yosie and Timothy Herbst (1998), in an essay on stakeholder processes and environmental decision-making, raise the issue of how scientists are involved in stakeholder processes. In a section entitled "Clarifying the Roles and Capabilities of Scientists and Other Stakeholders," they acknowledge that stakeholders have varying roles and capabilities in a decision-making process. They quote a World Bank publication, "Experts of all types – engineers, social scientists, economists, sector specialists, institutional specialists, and more – need to contribute what they know." Yosie and Herbst endorse a picture derived from a study in which a division of function is allotted among citizens, government officials, and scientists. One feature of this picture is that citizens are seen as providing necessary input on values and "providing social and political risk information" among other inputs. "Governmental officials' primary role was seen as recommending and choosing policy options." Finally, Yosie and Herbst (1998:22) write that "scientists were viewed as providers of technical information, but many also strongly believed that scientists should not have a role in choosing policy options or offering input on values."

One doubts that this picture will work. One worry is the supposed dichotomy of "values" and "technical information." Science as an institutional activity (such as conducted in science-based institutions in engineering, medicine, and so on) tends to incorporate positions on various value issues. Sometimes this is pertinent to environmental issues. If the value-ladenness of technical theory and information is not highlighted, danger exists that these values will be input into stakeholder processes in a way that is shielded from critical examination. Due to the social prestige that science enjoys in some quarters, such values may exert undue influence on stakeholder processes. Also, science in some forms can reasonably assist in the critique of values held by individuals and communities. In a way, the picture that Yosie and Herbst endorse both overestimates the idea of value-free science and underestimates the potential critical importance of science in relation to values.

Another worry is that science is conceived with little emphasis on the fact that scientists are enabled to do what they do, for the most part, by a network of institutions, including government and business. Yet, another concern is that Yosie and Herbst write about "scientists and other stakeholders." This could just be an acknowledgment that scientists can have vested interests in environmental issues, or that they sometimes, for various other reasons, are stakeholders in senses in which anyone else might be. However, it could be that Yosie and Herbst are prejudging the question whether scientists are typically stakeholders. Finally, the study which Yosie and Herbst apparently endorse is about perceptions of legitimacy. The perceptions that people have are shifting and manipulable, and do not warrant drawing conclusive inferences about the place of science in arriving at real legitimacy (nor, in particular, real procedural legitimacy).

Access to Legal Recourse

An issue about stakeholders and stakeholder groups who are taken seriously in an environmental decision-making process is their access to legal recourse. According to some accounts, this is becoming more difficult in some respects. Glaberson (1999), referring to an article by Echeverria, director of the Environmental Policy Project at Georgetown University Law Center, and Jon T. Zeidler, reports that they claim there has been an undermining of the capacity of citizens to bring lawsuits to court about environmental issues. This issue is relevant to democratic legitimacy of stakeholder processes since it is pertinent to the functioning of stakeholder groups with effective power in stakeholder decision-making processes. A group is more likely to be consulted and its opinions weighed if it has influence – and one important type of influence is the capacity to sue. The capacity to sue, within limits, is an incentive to others to engage in stakeholder processes that include those who have the capacity, as well as mattering for other reasons. This perspective is controversial. Some, for example, warn that if using the courts looks more attractive in terms of results than do stakeholder processes, then there are poor prospects for stakeholder processes. Thus, Yosie and Herbst (1998:18) write that "if stakeholders believe they have a chance at a better outcome using the courts or the regulatory process, stakeholder processes are unlikely to generate a successful outcome."

Echeverria and Zeidler (1999:1) write, "Congress believed that granting citizens a direct right to sue would temper the risk that changing political winds and special interest influence could undermine diligent enforcement of environmental laws…"Currently, however, the effectiveness of citizen suit provisions is weakening under the cumulative weight of recent U.S. Supreme Court decisions limiting citizen 'standing' to sue." They give many examples, including many involving water pollution, of court decisions at the federal level which limit the standing to sue, e.g., of citizens living along a river in New Jersey, a San Francisco Bay environmental group, and so on. They argue that the gravest impact has been on standing to sue under the Clean Water Act. In 1972, amendments to this act enabled "any citizen" to sue, "to seek injunctive relief, civil penalties payable to the United States treasury, and reimbursement of legal costs and attorneys fees" (p. 14). "But, following the lead of the Supreme Court, the lower federal courts have recently raised the bar for citizen standing in CWA cases, undermining the regulatory scheme established by Congress" (p. 15).

Economic and Political Inequality

Perhaps the major issue about legitimacy is the role of combined political and economic inequality in structuring and determining the outcome of stakeholder processes about environmental policy. This is a huge and obvious problem. The valuable discussion prepared by Yosie and Herbst (1998) about stakeholder processes in environmental decision-making, for example, was the outcome of a project "supported by a grant from the American Industrial Health Council, the American Petroleum Institute, and the Chemical Manufacturers Association." Their discussion is full of useful ideas, but one inevitably wonders what spin is being put on issues concerning stakeholder processes, given the sources of support for the project.

A cynical but unavoidable thought about the degree of cooperation now common between government and industry is that sometimes, even often, it results in government abandoning any plausible role as a democratic and legitimate regulator of activities with an adverse impact on the environment. However, it would be much too quick to say that this is the full truth. A much more hopeful attitude is expressed by Carmen Sirianni and Lewis Friedland, who are interested in what they call "Civic Environmentalism" as an expression of the democratic impulse. They talk about "the limits of top-down regulation" and discuss the emergence of civic environmentalism, including as one element in a complex account "collaboration among various communities, interest groups, and government agencies, often initiated by a period of adversarial conflict." However, they emphasize that they "do not offer these as a full blown alternative to national regulatory tools and top-down controls. As Dewitt John (1993) has argued in his important book on this topic, civic environmentalism makes

sense as a complement, not a substitute, to regulation, and a strong federal role is often required to trigger civic approaches."[6]

Conclusion

The role of democratic government remains and will remain important in environmental protection, but invention of participatory institutions that are non-governmental and cooperation between government and non-governmental institutions are important, too. The Illinois River project, and the challenges to legitimacy I examine here, imply quite general problems about stakeholder processes, environmental policy, and democratic community legitimacy. Such problems are applicable in all USA contexts, and indeed, globally. Thus, while local, the Illinois project directly implicates more national, and probably even global, issues. Typically, environmental policy planning in a would-be democracy aspires to be part of a process that has real ethical and democratic legitimacy, especially in a procedural sense. Only that would give basic reasons to citizens to accept and act on the policy recommendations. (One more global example: environmental policymaking in South Africa, which since 1994 has more democratic institutions than under the apartheid regime, also refers to stakeholders, calls for broad participation, responds to the claims of indigenous peoples and to a multi-cultural society, deals with national and provincial government, and in general faces environmental problems broadly analogous to those in the United States that are discussed here.[7]) If there is movement toward a better future, there will eventually be changes in those non-governmental institutions so that the mix of institutions and the way they interact will be altered. This is not to take on the mantle of a prophet and say it will happen, but if there is improved democratic community legitimacy about environmental policy, it will require democratizing changes in our basic institutions. No guarantee exists that such progress will occur. Both government and non-governmental institutions must face the basic problem of severe inequality of citizen influence. This remains and will remain (in the absence of fundamental changes) an obstacle to democratic community legitimacy. Any simpler attitude than this will not do justice to the situation.

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[6] See also Sirianni and Friedland at http://www.journalism.wisc.edu/cpn/sections topics/environment/civic_perspectives /civic_environmentalismA.html. I am grateful to Mark Meo for calling my attention to their work.

[7] See, for example, a 1997 White Paper on Environmental Management Policy issued by the South African Department of Environmental Affairs and Tourism, (currently on the web at http://www.environment.gov.za/white_paper/ envmanagement.htm), especially the section entitled, "The Consultative National Environmental Policy Process."

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SCIENTISTS AND STAKEHOLDERS: EVALUATING THE LEGITIMACY OF THE ILLINOIS RIVER BASIN MANAGEMENT PROTOCOL

Zev Trachtenberg

Introduction

In this paper, I discuss a persistent problem in the legitimation of environmental policy: the proper interaction between scientific expertise and stakeholder autonomy. I refer my discussion to an ongoing project by a team of researchers, of which I am a member, from the University of Oklahoma (OU) and Oklahoma State University (OSU), to develop a management protocol for the Illinois River in northeastern Oklahoma. I first review briefly the circumstances of the Illinois River watershed and summarize the OU/OSU protocol. I then discuss the increasing use in recent years of stakeholder processes in the environmental policy arena. Next, I present a scheme that represents the ways that both scientific assessment and stakeholder processes factor into policy legitimation. Finally, I use this scheme to illuminate the roles assigned to scientific experts and stakeholders in the OU/OSU protocol and to explore the broader question of the complex relation between those roles in general.

The Illinois River and the OU/OSU Project

The Illinois is Oklahoma's most prized scenic and pristine river. It and its two major tributaries (Flint Creek and Barren (or Baron) Fork Creek) flow freely from their headwaters in northwestern Arkansas to a dam that forms Tenkiller Ferry Reservoir, south of the town of Tahlequah. Together the three streams comprise a corridor of 119 miles and drain a watershed of 900 square miles. The Illinois River provides multiple social benefits to the citizens of the state and region. It provides habitat to an abundance of wildlife, including several threatened and endangered species of plants and animals. The river is a center for rafting and canoeing, fishing, and other recreational activities, drawing users from Oklahoma, Arkansas, Missouri, Kansas, and Texas. Tourism is the major industry in the area; it is estimated that in 1997 there were more than 58,000 boat trips down the river, accounting for over $11 million in spending (Bality *et al.* 1998). However, the area has seen increasing agricultural development. In addition to limited cattle ranching and several plant nurseries, large-scale poultry operations have increased in the area.

Recent studies have indicated that the water quality in the Illinois has deteriorated. Although both point and non-point sources contribute to the total nutrient increase, non-point agricultural sources are responsible for most of the phosphorous loading. Recreational users have thus blamed agricultural users for the decline in water quality. In response, riverfront property owners have blamed boaters for trespassing on their land, for leaving litter along the banks, and for rowdy behavior. In addition, residents of Oklahoma have attributed water quality declines to a water treatment plant near the Arkansas city of Fayetteville for the problem – leading to lengthy litigation finally resolved by the U.S. Supreme Court.

This pattern of stakeholder groups trading blame for the river's problems has meant that management of the Illinois has been the center of political controversy for over twenty-five years. Since 1970, management has been in the hands of the Oklahoma Scenic River Commission (OSRC), which has attempted to balance stakeholder claims. However, the OSRC has been frustrated in its efforts to

implement a comprehensive management plan. The need for a plan was recognized in 1979, when a study showed that the Illinois was not ready for designation under the federal Wild and Scenic Rivers Act. In late 1998, after five years of difficult work, the OSRC released a draft plan that consists of goals and suggested implementation strategies.

The problem the Illinois has faced, therefore, is the inability of different stakeholders to reach agreement about how to protect their shared resource. In 1997, in an attempt to address this problem, a team of researchers from OU and OSU proposed a protocol for developing a management plan that is technically effective, economically efficient, administratively feasible, and sociopolitically acceptable. The OU/OSU project, supported by three years of funding from NSF and EPA, involves a rigorous scientific assessment of the physical and ecological characteristics of the region, as well as of the economic interests and social and political attitudes and values of resident and non-resident stakeholders. These data will be used to produce a model that predicts alternative impacts on the region under different management scenarios. The model, in turn, will drive interactive GIS-based visualizations, to be used first by policymakers and later by stakeholders as a decision-support tool for a policy dialogue about alternative land and water uses. The results of these stakeholder discussions will be presented again to policy makers to help refine their policy proposals, and then be evaluated by stakeholders. The acceptability of the final proposal that emerges will tested through a telephone survey of basin stakeholders.

The feature of the OU/OSU project I wish to examine here is the way it brings together two groups who represent distinct sources for the legitimacy of environmental policy: scientific experts and stakeholders. The project presumes that policies must be based on sound scientific assessment of the relevant environmental problems and their proposed solutions. At the same time, it is based on a firm commitment to the ideal that policies must be responsive to the values and attitudes of the persons who will live by them. Thus, the project raises the question, what is the relation between these two sources of policy legitimacy? This question is obviously present in virtually all policy contexts, and indeed is as old as political theory itself: Plato's dismissal of democracy in favor of government by the wise is one clear, if clearly controversial, answer. In my view, the relative weight of popular support and scientific validity for legitimating a given policy is a matter of ongoing inquiry, subject to the particularities of the specific case. I will therefore use the OU/OSU project as an arena for rehearsing this kind of examination, rather than as a basis for a definitive finding.

The Increasing Use of Stakeholder Processes

The OU/OSU project's use of stakeholder deliberation is, of course, hardly unique; the current movement to include affected parties in both private- and public- sector decision-making is indeed international in scope. In a recent survey of stakeholder processes in the environmental policy arena, Terry F. Yosie and Timothy D. Herbst (1998:10) argue that such processes "represent an evolution from previous methods of soliciting public input." They cite several sources of the present presumption that stakeholders ought to play some role in environmental decision-making (p. 11).

- In the 1960s, the War on Poverty sought to organize low-income people at the community level, in order to foster "maximum feasible participation" in the programs that served them.[1]

- Within the private sector, dating from the 1970's, there has been an increasing recognition that companies are responsible to other parties than shareholders, e.g., customers, suppliers, and communities in which they operate.

- In the 1970s and 1980s, stakeholder groups became involved in environmental dispute resolution, which grew out of more general efforts to head off litigation by negotiated settlements, mediation, and also by public involvement in city planning.

- The "good government" movement has called for greater public participation in administrative rule making. For example, as Mark Sagoff (1999) notes, in 1972 the U.S. Forest Service instituted a program for engaging stakeholders in policy debate that became a model for other federal agencies.

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[1] These efforts, in turn, hearken back to the "Social Unit" experiments of Wilbur and Elsie Phillips in the 1910s (see Wayne A. R. Leys (1952), pp. 224 ff).

- A further impetus, according to Sagoff (1997), has been grassroots frustration with the inability of the formal policy-making apparatus to respond to local concerns and to resolve conflicts over resource uses due to "unclear and conflicting goals, and a maze of competing agencies and programs." This has led to a movement dubbed "civic environmentalism," in which local stakeholder groups have stepped forward to propose solutions themselves. Thus, John (1994) notes, "hundreds of citizen associations now exercise responsibility in managing forests, wetlands, rivers, lakes, wildlife, and other natural assets."

The past three decades, therefore, have established stakeholder participation as a norm in environmental policymaking as a way of providing democratic legitimacy to policy decisions. However, Yosie and Herbst (1998) observe that this mode of legitimation stands as a rival to another mode that grew in importance over the same period: the reliance by policymakers on scientific assessments of environmental issues. The invocation of scientific authority is an expected and powerful way to justify environmental policy.[2] Thus, Yosie and Herbst (1998:40) note, "At present, science-based and stakeholder-based processes represent competing approaches for influencing policymakers' choices." Indeed, Yosie and Herbst pose as one of the most significant challenges to stakeholder participation the need to integrate these two processes' contributions more successfully.

Yosie and Herbst propose an integration that is based on two distinctive roles that scientists and (lay) stakeholders are best suited to play. Their survey of over three dozen participants in stakeholder processes, from a range of backgrounds, yielded the intuitively plausible conclusion that while scientists should be the "finders of fact" about environmental problems, lay stakeholders should be the interpreters of social values. Insofar as environmental conflicts stem from competing values, scientific assessments are insufficient guides to the right public policy. However, at the same time, the application of values to the formation of policy must be informed by the best available understanding of the physical processes at work. Thus, on this view, the best prospect for stakeholder processes is that scientists have some structured role by which they may contribute their assessments so that stakeholders may then shape policies in light of the best scientific information and their own authoritative conception of societal values.

Policy Legitimation

Yosie and Herbst are right to highlight the relation between scientists and lay stakeholders as a crucial issue for stakeholder processes. However, I believe that while their scheme (whereby scientists confer legitimacy to policy at the level of facts and stakeholders confer legitimacy at the level of values) is intuitive, it is also too simple. In particular, it does not make clear how the information to be provided by scientists and stakeholders functions to make policy legitimate, and, importantly, it ignores the different contributions that can be made by natural and social scientists. I thus propose an alternative scheme that better captures the complexity of policy legitimation. I will begin with an overview of the main concepts to which I will appeal.

Theoretical Background

The western tradition of political theory offers two broad accounts of legitimacy – one distinctively modern, one a legacy from antiquity.[3] The modern account, which lies at the root of the social contract metaphor that remains the dominant explanation of democratic legitimacy, is voluntarism. Human beings are seen as inherently free, hence any political obligations to which they are subject must be voluntarily self-imposed to be legitimate. The social contract, from its classic to its contemporary versions, involves independent agents consenting to be ruled in this or that manner. We can isolate two distinct strands within voluntarism. One strand emphasizes the activity of choice itself; it is in this activity that human beings exercise their distinctively human capacity for autonomy.[4] A policy that is freely chosen by the

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[2] Though, as Sagoff observes, opposing parties frequently cite their own scientific experts to support their views, leading to policy deadlock and the danger that the public will become skeptical regarding appeals to scientific authority.

[3] The discussion here follows Riley (1982).

[4] This notion was articulated Rousseau, and then rigorously developed by Kant.

people it covers is *prima facie* legitimate; its rightness is established directly by being the object of autonomous choice. The other strand in voluntarism emphasizes the fact that consent reveals what people want; this strand is associated with utilitarianism, for which (in its standard contemporary version) the good is the fulfillment of preferences. On this view a freely chosen policy is *prima facie* legitimate because choice is authoritative evidence that the policy is good, and it is right to implement good policies.

The ancient account of legitimacy, which survives in contemporary talk of government acting (or not acting) in the public interest, can be called fiduciarism: the view that a state is legitimated by the fact that it serves the interests of the public that it governs (Wolin 1960:56).[5] Two further distinctions are important here. First, the term "interest" is typically used in distinction from "want"; thus, someone may want something that is not in his or her interest or not want something that is. However, this stark distinction between want and interest is too strong. There are certainly cases where a person might want something for a good reason in spite of the harm it will bring. Thus, it is not obviously outside of one's interest to risk injury to save a child in danger. Further, it is paternalistic to deny that there is a certain benefit to having one's wants satisfied, even if those wants lead to some degree of harm. Finally, it may not be clear which of several outcomes is in fact more beneficial, in which case the one that is desired has a stronger claim to the status of interest. Therefore, it is reasonable to speak of locating interests within a spectrum between subjective wants and objective benefits. The case is strictly analogous when we speak of the public rather than individual interest. Thus, we must recognize that, in particular cases, the debate over what is in the public interest will include arguments that appeal both to what the public wants as well as to what is good for the public, objectively.

Second, speaking of the public interest raises the question of precisely how it aggregates the interests of the individuals who constitute the public. We can distinguish between two conceptions of aggregation. On one hand, the public interest is that which is in the interest of everyone. To the extent that different individuals have different sets of interests, the public interest is the intersection of those sets. On this view, clean air is in the public interest because everyone benefits from it. However, on the other hand, the interests of different groups frequently conflict, so that there are few interests shared in common. Such cases call for some sort of equilibrium or balancing of interests, whereby competing groups trade off some of their claims in order to satisfy others. On this view, the public interest is the best reconciliation possible given the particular constellation of interests at hand.

These two accounts of legitimacy, voluntarism and fiduciarism, identify conditions that make a policy legitimate. On the first account, a policy is legitimate to the extent that it is willed by the public; on the second, a policy is legitimate to the extent that it furthers the public interest. How are we to know if these conditions are fulfilled? It is, I take it, obvious that democratic decision-making procedures such as deliberation and voting establish *prima facie* that a policy has been chosen by the public. Thus, stakeholder processes base their claim to be sources of legitimacy largely on voluntarist considerations. It is equally obvious that establishing that a policy serves the public interest is a *prima facie* goal of scientific assessment. Fiduciarist considerations are thus the basis for scientists' claims to legitimate policy (Hays 1959).[6] However, as we shall see, stakeholder processes and scientific assessment in fact contribute in complicated ways to *both* sorts of considerations. The respective "turf" of experts and lay people is not clearly demarcated, but is shared – and contested – simultaneously.

Likewise, I must stress that no robust political theory ignores one or the other account of legitimacy, but weaves together elements of both. Voluntarism has been the central theme of modern political thought,

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[5] Sheldon Wolin argues that Plato defends rule by the philosopher kings on the grounds that philosophers' pursuit of wisdom makes them discount the ordinary personal benefits of political power, e.g. wealth and prestige, freeing them to direct their energies toward pursuing the common interest.

[6] This is Plato's ideal of rule by experts, which was shared by the conservationist movement's promise of "scientific management." As Hays explains, "Each resource problem involved conflicts. Should they be resolved through partisan politics, through compromise among competing groups, or through judicial decision? To conservationists, such methods would defeat the inner spirit of the gospel of efficiency. Instead, experts, using technical and scientific methods, should decide all matters of development and utilization of resources, all problems of allocations of funds" (p. 271).

but appeals to the public interest are a recurring theme in many social contract theories. As Patrick Riley (1982) argues, Rousseau in particular is notable for his attempt to blend an ancient commitment to a common good morality into a theory built on voluntarist foundations. But, as Riley shows within the context of Rousseau's theory, these two elements are in significant tension: there is no guarantee that a people will freely choose what is actually good for itself – and *making* it choose the good violates its freedom.[7] Rousseau's theory thus vividly illustrates a persistent problem for democratic legitimation: voluntarism and fiduciarism both identify essential elements of legitimacy, but they pull in opposite directions. This problem is particularly acute in the environmental arena, where achieving goals that seem straightforwardly good (e.g., cleaner air) can involve actions that much of the public does not want (e.g. regulations on automobiles). The lesson to be drawn from this conceptual tension is that, in any given instance, legitimation involves a complex negotiation between competing normative concepts. The scheme I shall now offer is meant to identify the main sites of that competition, in order to clarify the kinds of issues that must be negotiated to frame legitimate policy.

A Scheme for Representing Policy Legitimation

The scheme I propose has three layers: the abstract structure of public policy, the conditions that legitimate policy, and how it is determined whether those conditions obtain.

Layer 1: Public Policy

The foundation of the scheme is a simple representation of policy in terms of ends and means (Figure 1a). A policy has a goal and implements measures to attain it. In line with the fiduciarist account of legitimacy, let us stipulate that the goal is in line with the public interest, as will be elaborated later.

Layer 2: Legitimation

Overlaying this foundation is a representation of the voluntarist and fiduciarist conditions that legitimate policy (Figure 1b). Note that these operate at the levels of both ends and means: a policy with acceptable ends might be pursued in an unacceptable way (the converse case seems less likely). Let us see how the two accounts of legitimacy operate at each level. At the level of means, each account supplies a distinct consideration. Policy instruments that were not efficacious, e.g., due to an inadequate understanding of the natural systems involved, would clearly fail the fiduciarist criterion of legitimacy since they would fail to act in the public interest. On the other hand, policies that lacked public support would fail the voluntarist criterion since they would be rejected rather than chosen by the people they regulate.

At the level of ends, the voluntarist and fiduciarist considerations are not so distinct. I list two legitimating factors for policy ends, which together shape our understanding of the public interest: "what the public wants" and "what is good for the public." The former has an obvious *prima facie* association with voluntarism: it seems right for the public to choose the ends its government should pursue based on its own conception of its good, i.e., what it wants. Note that this association points to the utilitarian strand in voluntarism – the idea that what is important about choice is that it reveals preferences, and what legitimates government is that it acts in accordance with people's preferences.

Nonetheless, at least for the version of fiduciarism that stresses the objectivity of benefits, the legitimacy of a goal whose main claim is that the public wanted it would still be very much in question. This version has an obvious *prima facie* association with the second factor of legitimacy, "what is good for the public:" it seems right that the government should pursue ends based on what will actually do the public good. However, what exactly makes something count as a public good?[8] Can a policy be determined to be good for people, whether they themselves acknowledge it or not? Or, as the strand of voluntarism that stresses autonomy would insist, is it the case that the good for human beings is not given externally, but has to be chosen to count as a good for the public involved? These questions demonstrate the complexity of the notion of the public good, which must keep in balance voluntarist and fiduciarist considerations that are in conceptual tension.

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[7] *The Social Contract*, Book II, chapters vi-vii.

[8] I am *not* using the term public good in its technical economic sense, i.e., to refer to a good that if it is available to anyone it is available to everyone, but rather in a more informal sense of something that is good for the public.
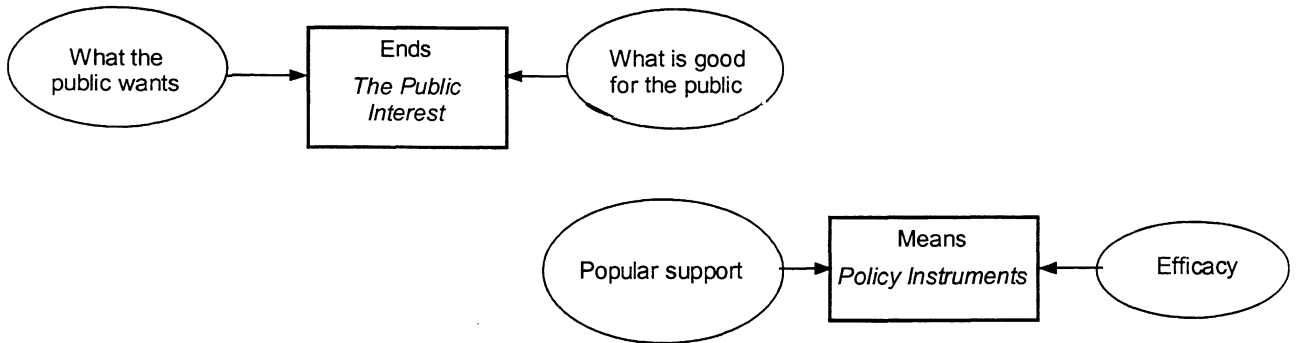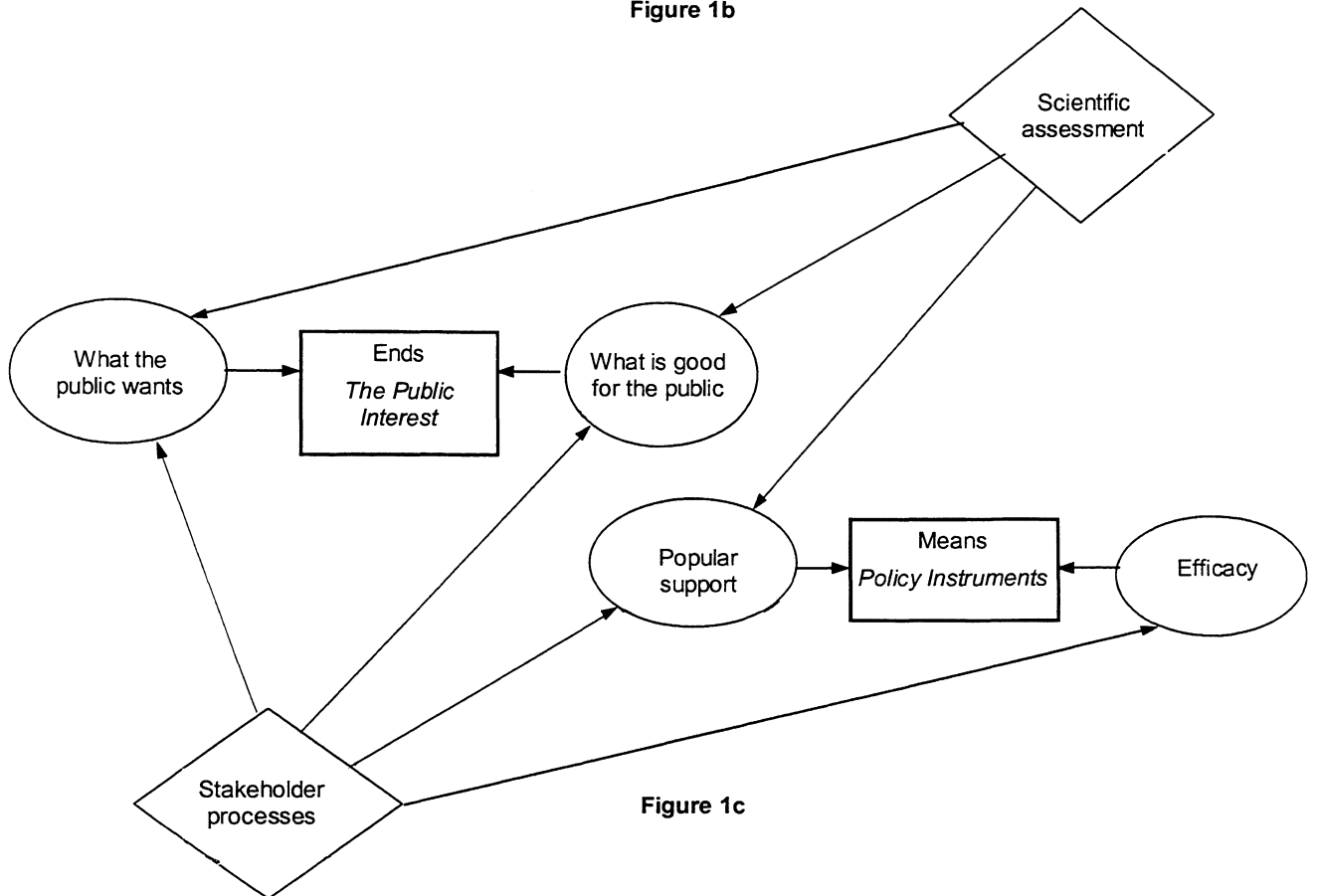
Figure 1a

Figure 1b

Figure 1c

Layer 3: Determination

The top layer of the scheme represents the methods used to determine whether the conditions of legitimacy in fact obtain (Figure 1c). The methods are, of course, scientific assessment and stakeholder processes; the scheme illustrates the different ways stakeholders and scientists contribute to the process of policy legitimation. I will present this layer by taking up the contributions scientists and stakeholders make with respect to the four legitimating factors represented in layer 2 (the ovals in the figure). At first glance, it might seem most natural to associate stakeholder processes with the voluntarist conditions of legitimacy and scientific assessment with the fiduciarist conditions. However, as the figure indicates, in fact the situation is more complex: both sorts of methods provide evidence pertinent to both sorts of conditions.

Efficacy. Determining the efficacy of policy instruments may seem like the simplest case, since it seems that scientists have a privileged role to play in determining whether a policy will meet the fiduciarist criterion of actually serving the public interest. Indeed, the expertise of physical scientists is clearly crucial in predicting the impacts of policy on the natural world, and social scientists, such as economists, can predict the impacts of policy on society. However, stakeholder groups can also have a role in assessing the efficacy of policy. Thus, for example, citizen juries have been used to evaluate the sometimes conflicting contributions of scientific experts in a range of policy domains (Smith and Wales 1999).

Popular support. Insofar as popular support is a voluntarist criterion, it would be natural to suggest that it be determined democratically, say by a vote. However, the approval of a representative stakeholder group is in most cases more practical, and, given the opportunities for increased understanding by participants in small groups, perhaps is even more authoritative. However, the utilitarian strand in voluntarism suggests that social scientific methods can be used to determine if this condition is met. These methods are meant to determine the public's preferences directly, without any formal choice procedure. Thus, polls, focus groups, or other methods of opinion research can gauge whether a policy enjoys popular support.

What the public wants. As we noted above, this factor is linked to the voluntarist account of legitimacy – specifically, the utilitarian idea that identifies the good with preference satisfaction. How, then, do we determine the public's preferences? Clearly, both scientific methods and stakeholder processes can be used in this inquiry. Sophisticated social science techniques can identify subtle structures of knowledge and opinion within a population by using random polling or detailed interviews with targeted individuals. On the other hand, discussions among representative stakeholders can also reveal the preferences of members of the public. How are we to compare the evidence provided in each way?

As advocates of deliberative democracy argue, the "discourse conditions" of stakeholder discussions can lend them greater weight than scientific methods in the process of legitimation.[9] For, as noted above, in small groups individuals are able to gain greater knowledge of a situation, hence to inform their preferences with facts. Ideally, in such situations, individuals must respond to the stated preferences of others and hence must provide reasons that might appeal to others' points of view as well as acknowledge and respond to others' like explanations. Thus, the results of deliberation can claim to represent not merely a static "snapshot" of the public's preferences at a given moment, but the expression of a considered preference that is revised in light of existing disagreements.

On the other hand, however, the legitimacy of a stakeholder process is highly dependent on the range of factors that determine whether the broader public accepts a particular set of individuals as their spokespersons, in a formal or informal sense. The results of a stakeholder discussion might be deliberatively robust but democratically unrepresentative. Thus, scientific techniques might claim to produce results that, while perhaps less robust in the deliberative sense, are more truly representative of the range and distribution of preferences in the given population.

What is good for the public. As we saw above, the concept of the public good is complex; it embodies some conceptual tension between voluntarist and fiduciarist considerations. Correspondingly, the

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[9] See James Fishkin's (1995) work on deliberative polling.

methods used for determining what is, in fact, good for the public are addressed to different and competing legitimating conditions.

From the fiduciarist perspective, the public good is an objective matter, discoverable (in different ways) by natural and social scientists. Natural scientists might claim to speak with authority on what state of the ecosystem is objectively good for the public, and, in light of observed or predicted changes in the environment, what policy ends are required to maintain that optimum state. This claim would be made in light of the conception that defines the public good as what is good for everyone in society, i.e., the interests that all share in common.

However, from the perspective of the autonomy strand in voluntarism, the public good is good in virtue of its having been chosen as a good by the public. How is such a choice identified? Here, social scientific techniques for measuring opinion seem to miss the mark. What is called for is an actual process of public deliberation emanating in a decision that, in a performative sense, makes the chosen policy end good. With the important caveat that they be appropriately representative, stakeholder processes seem to be necessary to fulfill this role. Note that the notion that the public must choose a good for it to count as the public good addresses the idea that stakeholders speak on behalf of public values. It is here, therefore, that we can locate the partition of roles for scientists and stakeholders articulated by Yosie and Herbst, i.e., that scientists discover facts but these facts must be evaluated by stakeholders.

What is the role of social scientists in discovering the public good? Recall the conception of the public interest as the best tradeoff between competing interests. As Sagoff (1997) argues, economists have claimed to be able to determine the equilibrium of interests that defines the public interest: the economic technique of benefit-cost analysis aims to identify the optimal blend of resource uses, offering the prospect that competing interests can be reconciled. Moreover, apart from economics, there is an arsenal of research techniques to identify the range of values in a population and their relative salience. Policy makers can make use of this evidence in combination with the evidence regarding the ecosystem itself to frame policy ends that blend objective assessments of benefits with the values that would make such benefits count as public goods.

Legitimation and the OU/OSU Project

The scheme just presented lays out the kinds of appeals that might be expected in arguments about the legitimacy of a given public policy and the kinds of evidence that might be used to support these appeals. As noted, the scheme is complex, allowing for overlapping and conflicting appeals based on different sorts of evidence. The value of the scheme is, I believe, that it aids the analysis of the claim of a given policy-making process to produce legitimate outcomes. The scheme provides categories for identifying the legitimating features of such a process as well as for pointing out sites of conflict over the legitimacy of a given policy. To test the scheme, I analyze the policy-making protocol proposed by the OU/OSU team for the Illinois River.

First, I must stress that this analysis is preliminary. The OU/OSU project is ongoing, and as of this writing has not yet reached the stage of initiating the policy dialogue involving first policymakers and then stakeholders. The visualization tools intended to support these discussions are still being created. Thus, my comments are informed less by concrete results than by speculations based on the procedures the project plans to implement. The situation is complicated further by the fact that the OU/OSU project is being conducted at a time when the OSRC has released its own plan for the river and is enmeshed in substantial controversy regarding its implementation. With these caveats in mind, what is of particular interest in the OU/OSU project is the degree to which it integrates scientific assessment and stakeholder processes. I will comment in particular on how both natural and social scientific techniques will be used to help frame and conduct stakeholder discussions.

Natural Science Techniques

A wealth of data on physical and ecological impacts on the Illinois River will be used to develop a database and hydrologic model of the river basin. These, in turn, will be the basis of visual simulations that represent predicted changes in the basin due to alternative management scenarios. The simulations, which will include photo-realistic animations designed to make scientific data understood by non-specialists, will be presented to groups of policy makers and stakeholders to aid them in ranking and revising alternative plans for managing the Illinois.

How will the scientific techniques embodied in the visualizations contribute to the legitimacy of the policy that (hopefully) will emerge from the OU/OSU protocol? Most obviously, the models supporting the visualizations can produce assessments of the efficacy of various policies. This is a fiduciarist criterion, which speaks to the ability of the given policy means to attain its end. Nonetheless, it seems likely that, if seen by a large number of residents, the visualizations can also aid with the voluntarist criterion of generating popular support.

More interestingly, however, the visualizations will help their viewers decide on the precise ends management policy should aim to achieve. They will be first presented to a group of policymakers who will use them to frame initial versions of policy alternatives. At this level, the information about the hydrology and ecology of the Illinois that the visualizations incorporate can be used to inform fiduciarist claims by policymakers about what is in the public interest. However, the visualizations will also be used, at another level, in discussions among representative stakeholders aimed at evaluating and revising the initial proposals drafted by policymakers. Here they provide a more robust voluntarist service. For example, by showing one stakeholder group how policies that are aimed to satisfy their specific preferences might adversely affect other groups, the visualizations might lead the members of the first group to reconsider and revise their preferences, leading to a deliberative expression of what the public wants. Thus, by showing vividly how a management plan affects a variety of stakeholder interests, the visualizations will support stakeholder deliberations about how to balance competing interests, allowing them to reach a considered judgment of what, in their view, is good for the public. The results of these stakeholder discussions will in turn be fed back to policy makers as data about the public's views, thereby initiating another round of policymaking and evaluation. In sum, then, the visualizations contribute to policy legitimation by aiding policymakers in fulfilling their fiduciarist responsibilities in a way that fully respects the voluntarist requirement that stakeholders have a say in framing the policies under which they will live.

However, we should take note of a concern that the scientific methodology embodied in the visualizations can work to undermine the legitimating force of their use by stakeholder groups. The models that drive the visualizations incorporate assumptions about highly complex and uncertain ecological processes. Thus, on the one hand, technical decisions on the construction of the models might lead them to under- or over- emphasize impacts on the river basin. This kind of distortion in the representation of reality might unduly dispose stakeholders to choose associated policy goals. The science, that is, might "wire" the outcome of democratic deliberations. On the other hand, there is a conflict between the uncertainties associated with the models' predictions, and the fact that vivid visual images can give an impression of predictive certainty. The visualizations are useful as decision support tools precisely because they have a high degree of credibility. However, to the extent that they represent the future in unambiguous terms, they misstate the ambiguities implicit in the exercise of modeling complex natural systems. This is, of course, not to suggest that models or visualizations based on them have no place in stakeholder processes. Rather it is to observe that they acutely raise well-recognized difficulties in communicating scientific information to the lay public. With respect to the question of policy legitimacy, scientific information *must* be communicated to meet the voluntarist condition of public engagement in policymaking. However, if it is presented in a way that conceals uncertainties and indeed keeps invisible the techniques by which it has been produced, then it actually compromises the very stakeholder autonomy it is intended to serve. Under these circumstances, the mode of presenting the scientific information gives stakeholders the misleading impression that the information on which they base their decisions is more certain and unequivocal than is in fact the case.

Social Science Techniques

Two sets of social science techniques are used in the OU/OSU project. First, economists are assessing the regional economy to develop a model that can generate benefit-cost analyses of alternative management plans for the basin. The model will focus on tourism and recreational activity, and agricultural activity, with a particular focus on poultry production. The economic model will be linked with the model of physical and ecological aspects of the basin discussed above so that visualizations can also represent the economic impacts of different basin policies. Second, political scientists have used a battery of techniques to ascertain knowledge and opinions about the basin among a range of stakeholders including policy makers, local residents, and tourists, among others. This sociopolitical assessment includes a comprehensive description of various participants' perspectives, beliefs, views, and values concerning the river, perceived threats to its uses, and options for policymaking. The assessment will in turn be used to help policymakers first to frame alternative management plans and then to select participants for stakeholder discussion groups. It will also be used by the groups' facilitators to guide their discussions.

The economic techniques contribute to policy legitimation in ways that parallel the contributions of natural science, as discussed above. To the extent that the visualizations mesh economic analysis with hydrological and ecological predictions, they will allow their viewers to consider a fuller range of impacts of proposed management plans. In particular, the visualization of economic aspects might aid both policymakers and stakeholders in identifying acceptable balance-points between competing stakeholder interests. However, paired with this opportunity for legitimation that is enhanced by the economic information are the possibilities, just discussed, of compromising the full requirements of voluntarism by understating the degree of uncertainty associated with the economic model.

The sociopolitical assessment enters into the legitimation process in three especially interesting ways. At the level of the drafting the initial alternatives, the data will be used by policymakers to frame proposals that have greater prospects for success. That is, the opinion research techniques give strong evidence of what the public wants and values. Thus, their results can guide policymakers in their efforts both to determine what environmental conditions count as benefits and harms for the public, as well as to reconcile groups when their interests are inconsistent.

At the level of stakeholder evaluation of proposed policies, the data will help determine which individuals will be invited to participate in the stakeholder discussions. Here, the assessment will incorporate the technique of Q-factor analysis (Brown 1994), which identifies typical structures of opinion present among members of a population (though not how widespread each structure might be). This analysis enables researchers to select previously interviewed stakeholders for discussion groups in a way that ensures that all commonly held perspectives are represented. This will improve the likelihood that the full range of viewpoints that exist in the region will be articulated and defended in-group discussions. To help reach this goal the discussions will be run by trained facilitators who will use the assessment data to estimate the likelihood of the development of a consensus policy outcome based on the existence, nature, and intensity of conflicts among stakeholder viewpoints.

Finally, the sociopolitical assessment will consider the validity of different groups of stakeholders' beliefs about the various physical and social processes that produce impacts on the Illinois by having individuals produce "mental models" that represent their understanding of the relevant causal relationships between impacts and their sources. These will be compared to an authoritative model, produced by interviewing a set of experts on various aspects of river basin management, with particular preference for those familiar with the Illinois River and the studies conducted on it. The comparison will reveal deficiencies in stakeholders' understanding of how the watershed "works." Identifying these gaps in understanding can serve the goal of fostering popular support for the final management plan since policymakers will see in advance, and be able to address, ways in which stakeholders' opposition is due to their misconceptions.

The contribution of opinion research techniques to policy legitimation addresses the strand of fiduciarism that stresses the subjective quality of the public interest: in general, it helps policymakers identify policy ends that are in the public interest by showing what the public wants and values. However, from the perspective of the autonomy strand of voluntarism, these techniques raise certain concerns. Consider the difference between giving one's opinions in a private interview and participating in a public discussion. The latter forum, unlike the former, carries with it the connotation of collective decision-making. It is thus

distinctively political and invokes the voluntarist notion of legitimation through public choosing. However, in fact, the stakeholder discussions that evaluate the policymakers' proposals are not designed for stakeholders to make a politically effective choice but rather to serve the fiduciarist purpose of providing policymakers with very accurate information about what stakeholders think. It is thus entirely possible for stakeholder participants to misconstrue their own role in the legitimation process by thinking of themselves as decision-makers rather than as informants.

The present concern is highlighted by the way participants for the stakeholder discussions are chosen. From the fiduciarist perspective, it is crucial that all points of view be recognized and incorporated in the policy dialogue. In that sense, the stakeholder groups can be thought of as genuinely representative. However, this notion of representativeness is in tension with the more manifestly voluntarist notion in which representatives are chosen by those they represent. Thus, even if the participants in the discussions are made completely aware of their role, there is the prospect of misunderstanding among the wider public. It is plausible that, in the absence of a personal connection with the process even as attenuated as voting, members of the public might not regard the policy outcome as legitimate precisely because they take it to be unrepresentative. Public suspicion of the process might well be exacerbated by the fact that it consists of complex scientific techniques, administered by outside academic experts, instead of conventional and familiar democratic forms of participation.

The use of opinion research techniques thus raises the prospect of the paradox that the OU/OSU protocol could produce a policy that, in fiduciarist terms, serves the public interest perfectly, but which, for voluntarist reasons, the public does not accept. This is, of course, the essential problem regarding the role of expert knowledge in democratic politics recognized since Plato. Science might identify the right policy – right even in the sense of being the policy in accord with what the public wants. However, if it is not legitimated by a procedure that makes room for the public's active and effective choice, it may not be accepted even by those whom it would benefit. Legitimacy is most enhanced by policy-making processes in which there is an explicit and active partnership between scientists and stakeholders. As suggested by an influential National Research Council report, within such a partnership scientific analysis would work to inform stakeholder deliberations, which in turn would frame scientists' research efforts.[10] In this recursive interaction, scientists' and stakeholders' distinct but mutually dependent contributions to legitimacy can be most productively combined.[11]

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[10] The research design for the OU/OSU project was strongly influenced by this report. However, the policymaking protocol it proposes is importantly different, in that it places greater emphasis on policy-making officials, and uses survey data rather than direct stakeholder deliberations to frame the questions the project scientists studied.

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PART III

STAKEHOLDER PERSPECTIVES IN SITING CONTROVERSIES

A SYNTHESIS OF STAKEHOLDER PERSPECTIVES
IN SITING CONTROVERSIES

Will Focht

Introduction

Stakeholder resistance to the siting of noxious facilities – referred to as LULUs ("locally undesirable land uses") by Popper (1981) – has received frequent attention by researchers since at least 1977 when Michael O'Hare published an article entitled "Not On My Block, You Don't." Since then, this seemingly intractable local pattern of resistance to LULU siting has been referred to, often derisively, as the NIMBY (Not In My Back Yard) syndrome. This paper concerns only locational conflicts involving hazardous chemical wastes.

Not all hazardous waste facility locational controversies involve siting proposals, however. For example, Focht (1989) reported a study of stakeholder LULU conflict about the need for and proper means of remediating contamination from an existing facility. He found dynamics similar to those found in siting conflicts. As an analogue to NIMBY, Focht proposed the acronym, TIMBY, for "Threats In My Back Yard," to distinguish remediation from siting controversies.

This paper presents a synthesis of stakeholder perspectives identified in 15 previous studies. This synthesis produces three "ideal types" that seem to dominate these studies. These ideal types are hypothesized to represent the expected views of stakeholders in all locational controversies.

Review of Prior Research on Stakeholder Perspectives

In this section, 15 studies published in the academic literature that characterize stakeholder perspectives are reviewed. Those studies that concern complex and controversial (especially environmental) policy issues, particularly those that involved locational conflict, were preferred. However, two studies that focused on neither environmental issues nor locational conflict were included because they were instructive and applicable to the project (i.e., they concerned perspectives held by government employees who, collectively, represent one of the stakeholder classes [e.g., local citizens, experts, industry representatives, environmental activists, government officials, and perhaps others] and who also comprise one of the four "communities"]).

Six of the 15 studies assess only the perspectives of elites such as industrial, academic, governmental, and/or health care professionals. One study examines only lay citizens as information consumers. Another study characterizes three distinct languages inherent to discourse concerning hazardous waste regulation. The remaining seven studies examine the perspectives multiple stakeholder classes, both lay and elite.

Q Methodological Studies of Multiple Stakeholders

Two empirical studies of multiple stakeholder perspectives of hazardous waste facility controversies using Q methodology were found in the literature. Both concerned nuclear waste facilities. The first is a NIMBY dispute about the proposed siting of a low level radioactive waste repository in Nebraska (Thomas 1990). The other is a Brownfield controversy about the Diablo Canyon nuclear power plant in California (Hill

1992). The Thomas study involved a NIMBY controversy surrounding a proposed siting whereas the Hill study is a Brownfield controversy about risk management at an existing facility.

Thomas' (1990) Star Trek Perspectives

Thomas interviewed 27 undergraduate agricultural students at the University of Nebraska concerning their views of media reporting of a proposed siting of a low level radioactive waste repository in Boyd County. Thomas identified three common perspectives, which he named after the original Star Trek television series' leading characters: rational "Spocks," doubting "McCoys," and pragmatic "Kirks."

- "Spocks" are hyper-rationalists with a technocentric orientation and basic trust of government and private institutions. People having this perspective believe that the news media are not objective - they instead engage in sensationalistic and biased reporting which, Spocks believe, stirs controversy and inflates fear.

- "McCoys" are moralists who exhibit high environmental and justice concerns, have low institutional trust, and perceive unacceptably high risks from technologies such as nuclear power generation and radioactive waste management. To them, the media simply confirm their suspicions that these technologies are too risky and should be opposed.

- "Kirks" are pragmatists who view technological progress as inevitable and who are willing to accept risks in exchange for benefits. They have faith that risks will be satisfactorily managed. They prefer that emotions be excluded from policy dialogue. Finally, they view the media as neither biased nor confirming, but simply another source of information that should be considered in deliberation.

Hill's (1992) Past-Structured vs. Present-Structured Perspectives

In a study of citizen stakeholder views toward the Diablo Canyon Nuclear Power Plant, Hill found evidence of support for his social-process theory of citizen assessment that seeks to explain how citizens evaluate risky technologies. He shows that previous experience and other tacit knowledge are incorporated into schema that in turn structure how citizens assess risky proposals. He presents evidence that supports the argument that citizens' evaluations are more present-structured, more project-specific, and more procedure-oriented than are agency evaluations. He suggests that the past-structured, ideology-based, outcome-oriented biases of agencies produce decisions that are much less socially desirable and far more politically illegitimate than they would be had they included, from the beginning, attentive citizens representing the various social perspectives in policy dialogue.

Hill believes that identifying stakeholder perspectives can best be accomplished by using Q methodology. Interestingly (and for reasons that are not made clear), he uses cluster analysis, rather than the more commonly used factor analysis, to identify well-formed and separated "clusters of opinion" (Converse 1964). He then uses path analysis to construct causal models of citizens' project evaluations using personal control, common orientation, procedural judgment, and substantive effects clusters as independent variables and project support-opposition clusters as the dependent variable.

Hill concludes (p. 151) that his findings conform well to his social process theory. He finds that most citizens' common orientation has little to do with predicting project support or opposition. The sole exceptions are those zealous supporters who manifest high trust and faith in science and technology and zealous opponents who have low trust and low faith. Lay citizens who are more moderate tend to adopt a "wait-and-see" attitude toward siting proposals. In fact, zealots on both sides tend to be distrusted by lay citizens because they act in a manner that seems to be insensitive to community values, biased and manipulative. This is consistent with citizens' preferred reliance on procedural schema.

Empirically, personal control and procedural judgment do well in Hill's model. Supporters are much more willing to defer to expert opinion. Opponents fear a loss of autonomy: they do not believe that problems can or will be detected by the proponents and experts, and, even if they are detected, the problems will not be appropriately addressed. Opponents also react negatively against risks that are imposed without community consent. Judgments about substantive effects weakly mediate these perceptions about personal control insofar as project opposition is concerned.

The substantive effects variable also performs well in Hill's model, but not quite as well as personal control and procedural judgment. When impacts are uncertain, lay citizens tend to trust those individuals who

argue in terms of collectivities. Individual citizens then judge the credibility of the principals and judge whether the collective impacts have personal consequences. Opponents also seem to consider collective adverse impacts (such as health risks to future generations) in their evaluations, demonstrating that their opposition is not motivated by parochial interests.

Hill's model was qualitatively supported by Focht (1995), at least in part, by narrative case studies. For example, citizens in Cushing did not trust an out-of-state national environmental grassroots organization that came into town seeking to offer assistance nor did they trust federal and state agencies. In each of the NIMBY communities – but especially in Haystack – citizens were slow to form positions on the proposals, and those positions that formed were based primarily on how trustworthy the principals were perceived by stakeholders.

Q Methodological Study of Elite Stakeholders

Only one study of elite stakeholders was found that used Q methodology to identify their perspectives.

<u>Durning and Osuna's (1994) Typology of Policy Analysts</u>

Durning and Osuna (1994), using Q methodology in interviews of 38 policy analysts, identify five perspectives. Three of these were found to be quite similar to Jenkins-Smith's (1982) and Weimer and Vining's (1992) ideal types ("objective technicians" [both studies], issue advocates ["issue activists" in this study], and client advocates ["client helpers" in this study]. Two other perspectives seemed to be amalgamations of the original three ("ambivalent issue advocates" and "client counselors"). This finding confirms the truism that actual perspectives on an issue rarely correspond to over-simplified generalizations; perspectives encountered among actual stakeholders are combinations of and interpolations between ideal types. This fact is not lost in our analysis of Oklahoma stakeholder perspectives, as will be made clear later.

- "Objective technicians" prefer objective analyses of policies and favor analytic integrity over policy outcomes and responsibilities to clients.

- "Issue activists" believe that it is their proper role to steer policy toward their desired outcomes, though they are still sensitive to analytic integrity.

- "Client" helpers are those who combine a willingness to assist clients (like the client counselors) but with the fervor of a strategist (like the issue activists).

- "Client" counselors share much in common with the objective technicians but are more willing to consider the wishes of their clients to guide their analyses. However, they are not willing to abandon objective analyses altogether. Rather, they view analytic integrity and political accountability as equally legitimate parts of their job (thus representing a perspective between the objective technician and client helper).

- "Ambivalent issue activists" are an intriguing combination of objective technicians'/client counselors' preferences for objective analyses and issue activists' preference for desired outcomes. Those policy analysts holding this perspective seem to prefer using the best objective arguments that they can to support their desired policy outcome.

Non-Q Methodological Studies of Multiple Stakeholders Groups

The next six studies of multiple stakeholder perspectives were conducted using methodologies other than Q.

<u>Elliott's (1984, 1991) and Hodges-Coppel (1987) Risk Acceptance Patterns</u>

In a hypothetical simulation involving stakeholders in two communities, three hazardous waste siting proposals were offered. One proposed a risk management strategy based on advanced design technology (risk prevention). The second relied on advanced monitoring (detection) and quick and effective emergency response (mitigation). The third proposed emergency trust funds, dispute resolution procedures, and operations oversight by community representatives. Participants were asked to indicate which options they most and least preferred and then to provide responses to questions about the reasons for their choices. From this study, three patterns of preference emerged.

- "Sponsors" perceive low risks, are pro-economic development and pro-technology, approve compensation to risk bearers but do not approve of inducements that may be viewed as bribes. Sponsors also favor private-sector decision making without government intervention. They prefer risk prevention that relies on advanced design technology.

- "Guardians" perceive high risks but believe them to be controllable, recognize that economic development is important to maintenance of a high quality of life, judge technical expertise as necessary but not sufficient, favor direct input into siting decisions, reject compensation and inducements (safety can't be compromised), and are public-interest oriented. They favor community oversight of hazardous waste operations.

- "Preservationists" perceive very high and uncertain risks, are anti-development and pro-status quo, are skeptical about the benefits of technology, fear loss of control over their lives, and view compensation and inducements as extortion. They favor advanced detection and mitigation measures that empower citizens to take personal actions to protect themselves.

A few important differences among these perspectives are worth emphasizing. Opponent groups (guardians and preservationists) are not convinced that more control technology will adequately assure safety; they prefer monitoring and/or management controls. Proponents (sponsors), however, do favor technological controls. This may be due to proponents' desire to retain control over their operations whereas opponents want to share control. The opponent groups also reject compensation and inducements. Finally, sponsors and guardians believe that risks are ultimately controllable; only preservationists are skeptical of risk control technologies.

These results suggest that the implicit distinction separating opponent and proponent groups may be social trust. Hodges-Coppel (1987), in a test of Elliott's typology, addresses the trust issue. Sponsors tend to trust risk managers and technology, preservationists do not, and guardians reserve trust judgment until they evaluate the fairness of the decision process (e.g., openness and balance) and its outcome (e.g., equity).

Each group adopts a different ethic vis-à-vis their views toward technological/locational decisions. Sponsors appear to endorse a utilitarian ethic, based upon their acceptance of the propriety of compensation, pro-technology orientation, progressivist ideology, and high social trust. Guardians appear to have a pragmatist ethic based on a cautious, moderate stance on technology and reluctance to rush to judgment based on ideology. Preservationists, on the other hand, seem to embrace the "new environmental paradigm" ethic of Lester Milbrath (1981). They reject utilitarian decisions that unquestionably accept technological progress as a good and ignore non-technical and non-economic impacts. They also reject the anti-democratic character of elitist, technocratic models of decision-making.

Susskind's (1987) Political Actors

In another extension of Elliott's (1984) typology, Susskind identifies four types of political actors in technological/locational conflicts.

- "Boosters" favor economic growth and represent 10-15% of the U.S. population.

- "Preservationists" oppose any project that threatens the environment or a sense of community (15-20% of the population).

- "Guardians," comprising about 50% of the population, are fence sitters who decide on a siting proposal based on their judgments of the openness and fairness of the decision making process.

- "Non-participants," who comprise the remaining 10-15% of the population, take no stand and remain inactive.

Wedge's (1985) Tower of Babel

Wedge claims that stakeholders' responses to LULU siting suggest the Tower of Babel: everyone communicates in different languages and pursues different purposes. The incoherence produces policy stasis.

- "Technocrats" speak in scientific and legal jargon.

- "Industrialists" speak primarily in economic terms (civic concerns are of secondary importance) and tends to withhold information.

- "Politicians" talk only of compromise and of balancing economic and environmental concerns.

- "Victims" speak in emotional terms based on threats to his or her lifescape, unfairness, and the unresponsiveness and irresponsibility of government and industry. "People who feel under direct threat don't respond passively to being asked to consider the statistics of risk" (p. 26).

- "Advocates" of victims is more dispassionate and communicates better than the others.

The solution to gridlock, in Wedge's view, is to foster a common language and common understanding borne of empathy and respect.

Williams and Matheny's (1995) Competing Languages of Regulatory Legitimacy

Williams and Matheny (p. 10) cite Fiske (1987:14) in defining discourse (and language) as a "system of representation that has developed socially in order to make and circulate a coherent set of meanings about an important topic area. These meaning serve the interests of that section of society within which the discourse originates and which works ideologically to naturalize those meaning into common sense." They argue that one of the major factors hindering the successful conclusion of regulatory policy debates is that disputants fail to communicate effectively due to their different understandings of public interest based on their different languages of social regulation.

- The "managerial" language, an outgrowth of the progressive era in public policy and administration (ideal governmental structure should reflect a clear separation of value-laden politics — the province of political bodies such as elected legislators and executives — from Weberian bureaucracy which embraces efficiency and value-free scientific rationality) is founded on its disciples' "faith in science and technology as remedies for the inadequacies of participatory democracy" (p. 11). This language of expertise, still pervasive in bureaucratic culture (as reflected in recent trends toward risk-based policy making and risk/benefit/cost analyses to justify rulemaking and other decision making endeavors), threatens to undermine public trust of bureaucratic institutions and, in the end, erodes lay citizens' confidence in and their perceived political legitimacy of bureaucratic authority.

- The "pluralist" language "assumes that conflicting interests are the essence of politics and, in a democracy, cannot be resolved by appeal to an overriding public interest discoverable by experts. Instead, the public interest is served by creating an open political process that allows contending organized interests equal opportunity to influence public policy" (p. 20). The main shortcoming of pluralist language in environmental and technological policy debates is that lay citizens often lack sufficient technical expertise and have difficulty gaining access to (and understanding) technical information, both of which are prerequisites to effective democratic participation.

- The "communitarian" language, an alternative to the managerial and pluralist languages in social regulation, "holds that it is possible to sustain an enlightened citizenry capable of ruling directly through communal forms of democracy. The creation of citizens capable of overcoming narrow self-interest would allow doing away with illegitimate political institutions that are removed from popular control and would return government to its true sources of legitimacy: the people" (p. 26). The main problems with this language is that no one has yet developed an effective and relatively efficient way to (1) transform the polity into a political community capable of self-governance and (2) ensure that the inevitable patchwork of local policy making can be made coherent in a regional and national contexts.

Because all three languages fail in finding a way to incorporate all interests in policy making by existing institutions and each language tends to be incomprehensible those who embrace one of the other two languages, Williams and Matheny propose a fourth meta-language based on postmodern ideals of multi-perspective, inclusive discourses "juxtaposed rather than [an] integrated cluster of changing elements that resist reduction to a common denominator, essential core or generative first principle...We have to learn to think and act in the 'in between' interstices of forced reconciliations and radical dispersion" (Bernstein (1991:8-9; cited on p. 37). Borrowing from the work of Dewey, Habermas, Mansbridge, Barber, Forester and others, they propose a "dialogic" model of social regulation which is, at its core, a model based on a dialectical synthesis of languages – a polyglotic approach to discourse most appropriate to "strong"

democratic visions of policy making. Determining which languages should be used in which setting at what time should be left to stakeholders, not captured by elites.

Bord's (1987) Stakeholders' Views of Community Acceptance of Risk

Bord limited his research to those views that state and federal government policy makers and the public have toward low-level radioactive waste. He found two major differences between the stakeholder groups: the public favors power sharing whereas policy makers favor compensation; and the public distrusts local officials to represent their interests in siting decisions whereas policy makers not only trust local officials but prefer to negotiate directly with them on behalf of the community.[1]

Davis (1985) confirms that government officials and industry representatives do not wish to share power with residents of local communities. Both government and industry favor preemption of local authority over delegation to them as well as a multi-member siting board over local government policymaking and interstate agreements.

Rosenbaum (1983) believes that agencies resist public participation because they view themselves as acting as stewards to protect the public interest and they believe that public involvement interferes in the efficient and effective accomplishment of this mission. The irony of course is that this attitude often results in litigation and confrontation that produces the very immobilization that the agencies wish to avoid.

Otway and Fishbein's (1977) Risk-Attitude Factors

Fishbein and Ajzen (1975) defines attitude as a "feeling of favorableness/ unfavorableness towards an object such as an evaluative judgment" (p. 112). Attitudes can be measured as the product of an affective element (evaluation of an attribute, independent of the attitude object) and cognitive element (the strength of belief that the attribute is related to the attitude object). A slight modification of the example given by Greer-Wooten (1988) is illustrative. The affective element (risk attribute without the risk object) can be measured with a Likert scale (-3 = bad to +3 = good) response to the statement, "How do I feel about being exposed to risk without my consent." The cognitive element (risk attribute's relationship with the risk object) can be measured with a Likert scale (-3 = unlikely to +3 = likely) response to the statement, "The siting of a hazardous waste facility in my neighborhood will mean exposing myself to risk without my consent." The product of these two scores represents the attitude score for this attribute (consent to exposure to hazardous waste facility). The sum of such scores across all attributes represents the overall attitude toward the object (hazardous waste facility).

In a study of nuclear power acceptability using the risk attribute scoring method across 39 attributes, Otway and Fishbein (1977) found that factor analysis produces a four-factor solution (orthogonal, varimax rotated). The factors were interpreted as (1) beliefs about psychological risks, (2) beliefs about sociopolitical risks, (3) beliefs about economic and technical risks, and (4) beliefs about environmental and physical risks. This shows that, in this study at least, the risk construct is four dimensional, not one dimensional as technical risk assessors often insist (e.g., risk = probability x consequence). Upon examining the factor loadings in proponent versus opponent groups, two findings emerge. First, cognitive elements are the best predictors of group membership: proponent groups have greater faith in technology and technocratic orientation. While the two groups share common beliefs about risk attributes, they disagree on how the attributes relate to the risk object. Second, the two factors that concerned objective impacts (beliefs about economic and technical risks and beliefs about environmental and physical risks) make a greater contribution to proponents' attitudes whereas the factors that concerned subjective impacts (beliefs about psychological risks and beliefs about sociopolitical risks) make a greater contribution toward the opponents' attitudes.

These two findings suggest that risk constructions are multi-dimensional and that different stakeholders adopt quite different constructions. Proponents base their risk judgments on cognitive elements and

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[1] Given these results, the legitimacy and wisdom of the policy of negotiating with local government officials for compensation in order to gain community acceptance of a low level radioactive repository is questionable. In fact, despite years of trying, this policy has not succeeded. Compensation fails to overcome opposition because citizens are not concerned about equity nearly as much as they are concerned about fear and distrust (a discussion of compensation as a solution to NIMBY gridlock is presented in Focht (1995).

objective risk dimensions whereas opponents base their risk judgments move on affective elements and subjective risk dimensions.

Non-Q Methodological Studies of Elite Stakeholders

The following five studies examine the perspectives only of elite stakeholders. Q methodology was not used in these studies.

Richards' (1993) Summary: Who Is the Victim Here?

Both industry and environmental groups, Richards claims, see themselves as victims of unfair and unjust treatment. Industry complains that their expertise is not accorded proper respect, their motives are frequently questioned and their contributions are ignored, the news media is biased against them, regulations are manipulated by those with ulterior motives, environmental interest groups are not held to the same standard of public critique as they are, current decision making processes are grossly inefficient, cost is not given sufficient weight, and change is too fast and impractical.

Environmental interest groups (EIGs) complain that industry is greedy and ignores the public interest (only EIGs speak for the public and for future generations). EIGs believe that industry performs economic accounting that undervalues natural resources and encourages waste, media and government experts are captured by industry, scientific knowledge deserves no greater weight in decision-making than cultural knowledge, and change is too slow. EIGs' perceived duty is to hold government accountable to the public.

Lynn's (1986) Attitudes toward Chemical Risks

Lynn finds a link between political ideology, place of employment, and scientific beliefs about chemical risks among occupational health professionals. In fact, group affiliation (industry, government or academia) predicts risk attitudes better than any combination of demographic characteristics can (Kraus, Malmfors and Slovic 1992).

Those employed in industry are politically more conservative, favor pro-chemical assumptions in risk assessments, think that the public is over-concerned and risk phobic, oppose further government regulation of industry, strongly support the use of cost-benefit analysis in policy making, disagree that extrapolations from animals to humans in toxicity assessments are valid, and believe that there exists a safe-exposure threshold for carcinogens. In a separate study, Davis (1985) also finds that industry officials believe that economic considerations are just as important as health and environment considerations in policy making. Kraus, Malmfors and Slovic (1992) confirmed another of Lynn's findings: industrial toxicologists judge chemical risks far lower than do either academic or government toxicologists.

Lynn finds that toxicologists and health professionals employed in government are more liberal, favor conservative risk assessment assumptions, believe that there are many more risk yet to be discovered, favor additional regulation, are moderately against the use of cost-benefit analysis in policy making, agree that inter-specific extrapolations are valid, and do not believe that there is a safe dose for carcinogens. Davis (1985) also finds that government officials believe that health and environment considerations are more important than economic considerations in policy making.

Health researchers in academia are moderate in their political beliefs, favor moderate risk assessment assumptions, agree with government occupational health professionals that all chemical risks have not yet been identified, favor more regulation, are only weakly supportive of cost-benefit reforms to policy making, are split or are unsure about the validity of inter-specific extrapolations, and are weakly suspicious of the non-threshold claim for carcinogenicity.

Jenkins-Smith's (1982) and Weimer and Vining's (1992) Typology of Policy Analysts

These authors identify three ideal types of policy analysts.

- "Objective technicians" embrace analytic integrity.
- "Issue advocates" champion their own preferences.
- "Client's advocates promote the client's policy preferences.

According to Jennings (1987) and Torgerson (1986:39), the objective technician is a technocratic positivist who strives for value neutrality in a triumph of knowledge over politics, whereas issue and client's

advocates view objective analysis as a "mask for the surreptitious exercise of power" in a triumph of politics over knowledge. The authors prefer the client's advocate model: a post-positivist approach of "analysis as counsel" in which the analyst is a participant-observer in policy formulation and evaluation.

<u>Downs' (1967) Typology of Bureaucrats</u>

Downs describes five ideal types of employees who work in hierarchical government organizations.

- "Zealots" are attracted by the agency's mission and dominate in the early days of the establishment of an agency. Once the agency matures and its mission becomes more diffuse and accommodative, zealots tend to become frustrated and leave.

- "Advocates" are loyal to the organization and its policies and will remain loyal regardless of changes in leadership or mission.

- "Climbers" are self-motivated and ambitious and are most interested in advancing their personal careers. They become unhappy if they hit a glass (or any other type of) ceiling and cease moving up the hierarchy.

- "Conservers" are just the opposite: they are interested primarily in security. They tend to be conservative in their behavior and avoid controversy, preferring instead lower profile and predictable jobs.

- "Statesmen" function well as agency heads – they are interested in the big picture and are good compromisers.

<u>Alexander's (1986) Typology of Bureaucrats</u>

Alexander describes similar types in his identification of the different roles that planners play in their profession.

- "Mobilizers" act as lobbyists to build support for and enhance the legitimacy of policy proposals (similar to Downs' advocates).

- "Mediators" (similar to Downs' statesmen) function as a mediator of conflict during policy implementation.

- "Advocates" (akin to Downs' zealots) work to advance a particular cause or interest, often creating conflict as a result.

- "Technical administrators" is an expert in systematic analysis of objective data (no Downsian equivalent).

Non-Q Methodological Study of Lay Stakeholders

One study that examined the perspectives only of lay citizen stakeholders was found. This study also did not utilize Q methodology.

<u>O'Hare, Bacow, and Sanderson's (1983) Information Consumers</u>

These authors identify five types of information consumers, based on the value (to them) of analysis of risk information. The order implies decreasing reliance on analytical reasoning.

- "Fact respectors" search for facts and do their own analyses.

- "Expertise takers" accept experts' or trusted others' (by virtue of credentials or office) analyses.

- "Attitude takers" adopt positions on the basis of ideology, either their own or that of leaders with whom there is identification.

- "Majority viewers" adopt positions consistent with the predominant view.

- "Personality takers" adopt the position of a charismatic opinion leader, not based on ideology, but rather on the leader's personality.

Synthesis of Stakeholder Perspectives into "Ideal Types"

Though modest differences among different researchers' typologies and descriptions of stakeholder perspectives are apparent, they are overwhelmed by the similarities – making it quite plausible to attempt an integration of their perspectives into a synthetic composite of "ideal types."[2]   The studies reviewed above identified between two and five perspectives. In combining similar perspectives, three synthesized, categorical perspectives emerge. Many of the stakeholder perspectives previously identified are quite strongly related to the categories to which they are assigned (e.g., those identified by Thomas; Elliott; Susskind; Hill; and Jenkins-Smith/Weimer and Vining), while others are more weakly so (e.g., those identified by Lynn; Downs; Wedge; Bord; and O'Hare, Bacow and Sanderson).

Of course, not all types identified by the researchers correspond to one of the three categories (e.g., Downs; Alexander; and O'Hare, Bacow and Sanderson) since more than three types are described. Moreover, some researchers identified less than three perspectives (e.g., Hill; Bord; Otway and Fishbein; and Richards). As a result, a perfect fit is not possible for all stakeholder perspectives identified in the latter two groups of studies.

Despite these qualifications, the synthesis proposed in this section is compelling. Each ideal type is explained separately below. The explanations are followed with a tabular summary of the relationships between the perspectives identified in the 15 studies and the proposed ideal types.

Ideal Type A: The Technocratic Rationalist Perspective

Stakeholders adopting this perspective embrace a scientific-technical approach to policymaking and rely on Cartesian (technical) rationality to assess policy acceptability. Technocratic rationalists are inclined to judge that technology and chemicals pose relatively low risks (especially when compared to common risks routinely ignored or minimized by the public) and that these risks are controllable through technology. They tend to embrace an abiding faith in technological solutions to problems, view technological progress as good, and support pro-economic development policies. They value economic efficiency and technical sufficiency in formulating and implementing policy. Preferring objective analyses, they favor benefit-cost analysis, risk analysis, and similar decision-theoretic approaches and resist non-technical "interferences" in policy making. They also accept the validity of compensation as a commensurable tradeoff against risk imposition.

Technocratic rationalists are generally trusting of political and economic institutions. They view the news media and the public as ignorant and biased, favoring policymaking processes that reserve power to elites.   They are not predisposed to involving citizens directly in decision-making unless they are technically informed. They would naturally feel comfortable with the managerial view of social regulation.

It is likely that this perspective is typical of those who work in the private sector – particularly those in industry – as well as many of those employed in government and in technical research/science-based academic arenas. Technocratic rationalists can be expected to support, even boost, proposals for hazardous facility siting and remediation if they are based on acceptable (to them and their peers) scientific and economic analyses. However, the technocratic rationalist perspective is not expected to be common among citizens not employed in these sectors and should be rare among environmental activists, whether they are affiliated with local ad hoc grassroots groups or formally constituted national and international non-government organizations (NGOs).

Ideal Type B: The Pragmatic Guardian Perspective

Pragmatic guardians are generally not ideologically committed to acceptance or rejection of technological/locational proposals. They prefer to reserve judgment on the merits of a proposal until they have sufficient opportunity to learn about potential impacts – social as well as technical – on them and their communities. Their chief concern is that the policy outcome is fair and equitable and considers community values.   Until they get the facts, they rely on procedural schema concerning balanced arguments, free access to information, and open debate from all sides – similar to the tenets of the

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[2] The relevance of this synthesis will be made clearer in the discussion of second order and composited first order Q factor interpretations of stakeholder perspectives exhibited in those Oklahoma communities that had experienced hazardous facility siting or remediation controversies.

pluralist (and if non-adversarial and consensus-seeking, the dialogic) languages of legitimacy. They have a reservoir of trust in sociopolitical institutions but will quickly distrust those that violate principles of fairness.

Pragmatic guardians have a conditional faith in technology. While they recognize the value of technological progress and economic growth as important to maintenance of a high quality of life, pragmatic guardians also value government regulation to protect them from hazards. They recognize that more needs to be done to understand the risks posed by hazardous technologies. In addition, they do not accept the idea of trading off health and environmental risks for economic compensation. In sum, pragmatic guardians are cautiously optimistic, preferring to share power and fulfill oversight responsibilities to ensure that technological progress brings benefits at reasonable cost.

If Susskind (1987) and Hill (1992) are correct, most of the population is composed of pragmatic guardians. These stakeholders represent the swing vote in community acceptance or rejection of LULU proposals.

Ideal Type C: The Disaffected-Ideological Opponent Perspective

The disaffected/ideological opponent perspective is either community-based (client advocacy) or ideology-based (issue advocacy). It is characterized by a distrust of political and economic institutions, a moderate to low faith in technology, and an aversion to technological progress – especially if it threatens the status quo social or physical environment. Those with this perspective adopt a social (sometimes even parochial) construction of risk and risk acceptance. They tend to perceive high levels of risk and high uncertainties associated with technologies and their supposed benefits.

Disaffected-ideological opponents generally tend to favor active government intervention, especially by local government agencies, to protect them from abuses by industry and supra-local governments. Because of their high level of social distrust, they favor community control over power sharing – insisting on a communitarian view of policy legitimacy. Those with this perspective are unlikely to be persuaded to support a technological project based on technical and economic arguments. Guided by cultural rationality and a desire to prevent technological intrusion into their lives, they value preservation of existing lifestyle patterns over change. It may be appropriate to predict that those with this perspective, at least in some cases, are potential hard-core locational opponents.

The table on the next page summarizes the posited relationships among the stakeholder perspectives reviewed above. The three ideal type perspectives synoptically developed from this review are arrayed across the top of the table, while the 15 studies are arranged in rows on the left. The various perspectives identified by the researchers are presented in the body of the table.

Acknowledgements

Ideal Types Derived from a Synthesis of Research on Stakeholders' Perspectives

RESEARCHER	IDEALIZED STAKEHOLDER PERSPECTIVES		
	Technocratic Rationalists	Pragmatic Guardians	Disaffected-Ideological Opponents
Thomas	Rational Spocks	Pragmatic Kirks	Doubting McCoys
Elliott & Hodges-Coppel	Sponsors	Guardians	Preservationists
Susskind	Boosters	Guardians	Preservationists
Wedge	Technocrats and Industrialists	Politicians	Victims and Victims' Advocates
Williams & Matheny	Managerial	Pluralist and Dialogic	Communitarian
Jenkins-Smith and Weimer & Vining	Objective Technicians	N/A	Issue Advocates and Client Advocates
Durning & Osuna	Objective Technicians	Client Counselors and Ambivalent Issue Activists	Client Helpers and Issue Activists
O'Hare, Bacow & Sanderson	Expertise Takers and Some Fact Respectors	Some Fact Respectors, Some Attitude Takers, and Majority Viewers	Some Attitude Takers
Alexander	Technical Administrators	Mediators	Advocates & Mobilizers
Downs	Advocates	Statesmen	Zealots
Richards	Industry Groups	N/A	Environmental Interest Groups
Lynn	Industrial and Some Academic Health Professionals	Some Academic and Some Government Health Professionals	Some Government Health Professionals
Hill	Past-Structured	Present-Structured	Past-Structured
Otway & Fishbein	Cognitive-Objective Risk Construction	N/A	Affective-Subjective Risk Construction
Bord	Risk Acceptors	N/A	Risk Aversives

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NIMBY–TIMBY:
ANALYSIS OF STAKEHOLDER PERSPECTIVES
ON HAZARDOUS WASTE CONTROVERSIES IN OKLAHOMA

Will Focht and James J. Lawler

Introduction

Local opposition to unwanted hazardous waste facilities has spawned an extensive social science literature on the so-called "NIMBY (Not In My Backyard) Syndrome" (Brion 1991; Bullard 1994; Greve 1989; Morris 1994; O'Looney 1995; Rabe 1994; Rosenbaum 1998). "NIMBY," a pattern of intense citizen opposition to local sitting of risky activities or technologies (Mazmanian and Morrell 1990:126), has been a major obstacle to hazardous waste facility sitings throughout the United States (Brion 1991; Bullard 1994; Greve 1989; Morris 1994; O'Looney 1995; Rabe 1994; Rosenbaum 1998). NIMBYism has been variously attributed to differences in perception of risk (Armour 1991; Kunrether, Fizgerald, and Aarts 1993: Mazmanian and Morrell 1990; Visocki and Brennan 1993), to citizen distrust of government and industry (Hunter and Leyden 1995;Kraft and Carly 1991; Leroy and Nadler 1993, Rabe 1994), to feelings of loss of citizen control (Edelstein 1988), and to inequities in distribution of costs and benefits (Armour 1991; Portney 1991). A comparative study of six hazardous waste controversies in Oklahoma found that a lack of responsiveness by state officials to local citizen activism contributed to the NIMBY phenomenon (Lawler, Focht and Hatley 1990).

Multiple regression analysis of data from a statewide survey of 801 Oklahoma respondents found three variables to be most important in accounting for citizen participation in NIMBY controversies: perceived risk, perceived personal political efficacy, and history of past political participation (Focht, Hirlinger and Lawler 1998).

A related, but distinguishable phenomenon, which has been called "TIMBY" ("Threats In My Backyard") (Focht 1989), concerns the discovery of pre-existing hazards in a community (P. Brown 1992; Couto 1985; Edelstein 1988; Kraus 1989). TIMBY situations present many of the same issues as NIMBY conflicts: the imposition of environmental risk, desire for local control or influence over the decision process, concerns over equity and fairness, community disruption, problems of institutional trust, etc. Though TIMBY differs from NIMBY in important ways, there is disagreement in the literature as to what the relevant differences are.

Smith and Desvousges (1986) found that citizens are willing to pay ten times the amount to reduce risk at a TIMBY site than they would pay to avoid risk from a proposed NIMBY site. The authors attribute this difference to citizens' expectations of a right to protection from the involuntary imposition of NIMBY risk, whereas in TIMBY situations, the contamination is already in their backyards and they want to get it out. On the other hand, TIMBY movements for site cleanup are more likely to encounter opposition from some local citizens concerning possible negative publicity and generation of panic that might accompany action to eliminate the threat, and to trigger various manifestations of psychological denial (Janis 1967:3). A major expected difference from NIMBY is that, in TIMBY controversies, the status quo is likely to be preferred by industry and opposed by many citizens. However, Wolf (1980:477) found that "(r)esidents in industrial zones often become inured after many years to the noxious industrial activities around them," suggesting that citizens may be more inclined to accept risks from existing TIMBY hazards than from the

newly proposed, unfamiliar, NIMBY hazards. Gerrard adds that "communities which already have risky facilities tend to have local cultures that have accepted such risks and often will accept still more risks (Gerrard 1994:111).

This study compares three NIMBY disputes and two TIMBY disputes in Oklahoma. The purposes of the study are twofold: to gain a valid understanding of the subjective viewpoints of stakeholders in actual NIMBY and TIMBY controversies and to compare the perspectives of stakeholders in the two controversies to identify patterns of similarity and difference in attitudes toward proposed hazardous waste sites and existing ones.

Q Methodology

Q methodology is designed to illuminate the subject's own definition of the conflict situation. Most attitudinal studies of NIMBY employ the familiar "R" methodology in which a survey instrument reflecting the investigator's hypotheses are administered to a random sample of respondents, statistically analyzed, and generalized to a larger population (Brown 1980; Stephenson 1935; 1953; 1978). The tradeoffs in this statistical capacity to generalize are loss of considerable richness in responses, as the subject's own definition of the situation is subordinated to that of the investigator; and the danger of misinterpreting responses according to the investigator's preconceptions, rather than the subject's own views.

Q methodology was developed to overcome these limitations. The Q technique is designed specifically for the direct measurement of an individual's subjective point of view (Brown 1980). The investigator begins by asking a participant to place a sample of statement in a significant order according to his/her reactions or feelings toward them. The cards are sorted along a continuum, from "most unlike" the respondents' beliefs to "most like" the respondents' beliefs. The Q sort configurations are then factor analyzed. Through factor rotation, a single array of factor scores is derived for each factor. Each of the resulting factor arrays represents a group of individuals who sorted statements in a similar fashion. Although the investigator may attempt a tentative interpretation of each factor, the ultimate meaning attributed to the factors must be validated by the persons who load most purely and highly on them. These factors refer to aspects of a given individual manifested over a sequence of different conditions, rather than to underlying properties, which various items have in common.

As outlined by Stephenson (1978), Q methodology consists of the following steps:

1. Identification of a <u>condition of instruction</u>: a definition of a concrete functional situation that will serve to "focus" the subject's attention; e.g., asking the subject to give his/her views about a set of statements concerning a given topic;

2. Development of a <u>concourse</u>: a population of statements about the situation which reflect the spectrum of issues or viewpoints related to the topic;

3. Selection of the <u>P sample</u>: a set of persons to be interviewed;

4. Selection of the <u>Q sample</u>: a subset of statements reflecting the diversity of meanings of the statements in the concourse;

5. Administration of the <u>Q sort</u>: communicating the condition of instruction to the P sample, and asking respondents to sort the statements according to their reactions to them;

6. <u>Factor analysis</u> of the Q sort correlation matrix: using statistical procedures designed to identify common factors representing distinctive perspectives shared by persons loading highly on them;

7. <u>Interpretation</u> of the meaning of each revealed factor: by deduction from placement of items in the common factor score arrays; and

8. <u>Validation</u> of the inferred meanings: by discussing the results with respondents who loaded most highly or purely on these factors.

Unlike R methodology, Q methodology does not purport to extrapolate its findings to an entire population or to report the proportions of persons who hold any particular view. While lack of a statistical basis for generalizing to a larger population of respondents is a major limitation of the Q technique, the method does provide a fuller account of the various perspectives and viewpoints of stakeholders.

Q methodology has found a wide range of applications in the social sciences (Brown 1982; 1996; During and Osuna 1994; Jacobson and Yan 1998; Sexton *et al.* 1998; Thomas *et al.* 1993; Waddington and Braddock 1991; Yan 1998). Yet, only two studies used Q to investigate issues related to hazardous waste controversies. Thomas (1990) examined the views of college students about media reporting of a low-level radioactive waste repository in Boyd County, Nebraska and Hill (1992) investigated views of citizens toward the Diablo Canyon Nuclear Power Plant in California.[1]

No studies used Q to investigate stakeholder perspectives in TIMBY cases. Our paper seeks to fill this gap by uncovering the viewpoints that govern the positions of the various TIMBY stakeholders, as well as to provide additional empirical evidence concerning NIMBY conflicts.

The Cases

Stakeholders from five rural Oklahoma communities involved in hazardous waste siting controversies were included in this study. Three of these – the Ramona injection well, the Haystack waste disposal complex, and the Olandis incinerator – involve local NIMBY opposition to proposed new facilities. Two of the cases – the Cushing refinery and the toxic contamination incident in Ponca City – concern TIMBY reactions to existing facilities.

Ramona Injection Well

Ramona, a small town (1990 population = 508) in northeastern Oklahoma about 30 miles north of Tulsa, became embroiled in a bitter battle over the proposed siting of a hazardous waste injection well. In 1982, Environmental Solutions, Inc. (ESI) contracted with a local rancher to lease 2.5 acres for the site in the center of a 10,000 acre ranch, thereby circumventing the State's legal requirements of personal notification to "affected property owners" within one mile of the site boundary. Upon leaning about the proposal, several Ramona citizens formed the Toxic Waste Impact Group (TWIG) on March 5 1985, to oppose the facility. Unable to prevail before the Oklahoma State Department of Health, TWIG turned to the courts, where the group won two favorable district court rulings and obtained a stay pending review by the Oklahoma Supreme Court. To date, the district court's stay remains in effect.

Haystack Waste Disposal Complex

Haystack Mountain, a semi-arid area in northern Greer County in southwestern Oklahoma, was selected by Materials Management and Recovery Systems, Inc. (MMRS) in 1984 for a 71-acre commercial hazardous waste disposal facility, to include a landfill, a drum disposal pit, two surface impoundments, and other units. Anticipating public concern, MMRS hosted public meetings on January 25 and February 1 1984, in the towns of Mangum (1990 population = 3344) and Sayre (1990 population = 2881) near the proposed site. The meetings generated negative public reaction, leading to formation of a citizens group known as the Haystack Environmental Group, Inc. (HEGI). HEGI mounted effective opposition in the Oklahoma Legislature, the County Commissions of Beckham and Greer Counties, and the Oklahoma State Department of Health. In response to HEGI's efforts, the Chamber of Commerce of Elk City (1990 population = 10,428) passed a resolution opposing the facility. These efforts delayed the project until the summer of 1989, when MMRS went to district court to challenge OSDH's ruling that the company's application had to be revised and resubmitted. The district court decided against MMRS. Although the application has not been withdrawn at this writing, MMRS has not yet resubmitted it.

Olandis Incinerator

In early 1988, Olandis, Inc. announced its intention to build a multimillion-dollar hazardous waste incinerator 17 miles northwest of Boise City (1990 population = 1509). Boise City is an economically depressed community of declining population that depends heavily upon tourism from its location near Black Mesa State Park, the Dakota Sands, and the Santa Fe Trail. The facility, once operational, was expected to employ 95 workers. In an effort to avert opposition, Olandis offered the community a $1.1 million financial incentive package, including $180,000 a year for the Boise City Memorial Hospital, $700,000 a year for purchase and maintenance of an Air Evac helicopter, and $20,000 a year for the county ambulance service. Ironically, these medical expenditures aroused citizen concerns about health

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[1] One of us (Focht) reviews several studies of stakeholder views, including these two, in another paper in this volume.

risks form the facility. Many leading citizens were attracted by the offer and wrote to the Oklahoma Governor in support of it. Opponents, however, voiced concerns about air pollution, and contamination of the Cimarron River and the Ogallala ground water aquifer, as well as fears that the facility would adversely affect tourism. Citizen opponents in the area remain defiant, and continue to be on guard should Olandis submit a permit application.

Cushing Refinery

Cushing is a small town (1990 population = 7218) located in southern Payne County, 25 miles southeast of Stillwater the county seat), and 71 miles northeast of Oklahoma City. Once the beneficiary of a booming oil economy, the city has since fallen on leaner times. The surrounding area is used primarily for wheat and alfalfa farming and cattle ranching. In 1915, Deep Rock Refinery was constructed on a 330-acre site two miles north of Cushing and used for crude oil refining and storage. In 1956, the Kerr-McGee facility purchased the site. From 1963 until 1966, the Kerr-McGee facility was used to enrich nuclear fuels under license to the Atomic Energy Commission. In 1966, the facility was decommissioned and returned to petroleum product handling. Kerr-McGee currently employs about 130 people at the Cushing facility. Approximately 17 million cubic feet of hazardous waste, including spent acids and caustics, spent industrial solvents and heavy metals, had been disposed of at the site.

Citizen concern arose in 1988, when a Cushing police officer learned that the Fire Department would not respond to a call at the site because of its belief that the ground was "hot." In the spring of 1989, he organized a group of townspeople as Citizens for Environmental Safety (CES) to demand further information about the threat. The U.S. Environmental Protection Agency (EPA), which had already been investigating the problem, determined that hazardous substances had migrated from the site to surface and ground waters and surface soil near the site. In October 1989, EPA published notice of a proposal to list the site on the National Priorities List for Superfund Cleanup, and announced a 60-day period for public comment.

On December 4 1989, the Cushing City Commission held a public hearing to discuss possible endorsement of NPL listing. Kerr-McGee representatives opposed the listing, denying that the site posed a substantial hazard and claiming that the listing would interfere with their intended cleanup. A representative from the Oklahoma Department of Health maintained that the site characterization had been completed and that remediation plans were being finalized. The City Manager proposed, and Kerr-McGee agreed to, establish and oversight committee composed of selected CES members and other citizens to monitor the cleanup. At a subsequent meeting, the Commission agreed to endorse listing the site on NPL. In February 1991, however, EPA removed the site from Superfund consideration, because under EPA's new methodology for risk analysis, the Hazard Ranking System (HRS) score for the site fell below the minimum threshold for listing.

The facility is presently under remediation under a consent order between OSDH and Kerr-McGee. CES remains active, but small and somewhat dispirited. Members complain that Kerr-McGee and OSDH are not sharing enough information for them to understand or meaningfully evaluate the process. They feel abandoned by EPA and cannot get answers to questions raised by EPA's own field investigators.

Ponca City Refinery

Ponca City (1990 population = 26,359), located in north central Oklahoma 102 miles north of Oklahoma City, became the center of a chemical contamination controversy in November 1986, when the city fire marshal ordered the evacuation of two homes in the Circle Drive neighborhood on the south side of the city. Following a period of heavy rain, the water table had risen to ground surface in many parts of south Ponca City. The water was found to contain high levels of hydrocarbons that generated an explosive mixture of volatile vapors. The neighborhood lay immediately south and east of a refinery operated by Conoco, the oil company that is the city's largest employer (more than 4000 employees). Many in the neighborhood became alarmed at the news of the evacuation and expressed doubts about the safety of their homes. Conoco denied responsibility. The company claimed that the contamination was due to operations of their predecessors rather than their own activities and questioned whether the contamination posed a significant health risk.

The residents held a fundraiser that drew more than 700 citizens. The funds were used to hire a contractor to study the water quality. Though he found benzene in the ground water in excess of 25,000

parts per billion, the Oklahoma State Department of Health (OSDH) refuse to accept the data because government investigators did not obtain it. In December 1986, Circle Drive residents organized an interest group, Ponca City Toxic Concerned Citizens (PCTCC), and began to share complaints of numerous health problems that they attributed to Conoco. Beginning in May 1988, a group of some thirty PCTCC members camped on the State capitol lawn in Oklahoma City for nearly three months until ordered to vacate the premises by the State Office of Public Affairs.

A majority of Poncans, however, continued to support Conoco. Conoco supporters formed their own group, Poncans for Progress, which was able to get 9100 signatures during the summer of 1988 on a petition supporting Conoco. PCTCC found an ally in a national environmental organization, the National Toxics Campaign, which sampled the water in the area and provided organizational assistance. In September 1989, PCTCC members filed a class action lawsuit against Conoco in federal district court for compensation for damages to the residents' health and welfare.

Conoco put forward a multistage ground water remediation plan to recover petroleum product and to restore ground water quality. In December 1989, EPA issued a permit for the discharge. In July 1990, Conoco and PCTCC entered into an out-of-court settlement that provided for the buyout of 200 homes and restitution damages for an additional 200 homes, all in the Circle Drive are. As a condition of this buyout agreement, PCTCC dissolved and the former members agreed not to further challenge Conoco's operations.

Methods

P Sample

The P sample of stakeholder participants consisted of actual participants in the five controversies, including local citizens, industry representatives, and state officials. We used archival research and word of mouth to develop an initial list of stakeholders. Persons on the list were then contacted, asked to participate, and asked to provide the name of another stakeholder. Seventy-two persons, consisting of equal numbers of NIMBY and TIMBY stakeholders, were willing to participate. A demographic profile of these respondents is shown in Table 1. Some of the industry representatives who had been involved in the NIMBY controversies declined to participate in the study or were otherwise unavailable (e.g., they had relocated to other states), which accounts for their low representation in the P sample.

Table 1

Stakeholder Sample Profile

COMMUNITY	CITIZEN	GOVERNMENT	INDUSTRY	OPPONENT	PROPONENT	NEUTRAL	TOTAL
Boise City	4	1	0	2	3	0	5
Haystack	12	1	1	12	2	0	14
Ramona	11	5	1	10	4	3	17
Cushing	9	2	2	6	4	3	13
Ponca City	15	5	3	12	6	5	23
Totals	**51**	**14**	**7**	**52**	**19**	**11**	**72**

Condition of Instruction

The condition of instruction given to all participants was: "What are your beliefs about the following statements concerning the siting of hazardous waste disposal facilities in your community?" Since all respondents had previously experienced a siting or remediation controversy, they were encouraged to rely on their prior experience.

Q Concourse

An initial concourse of statements was prepared by the investigators from a questionnaire containing open-ended questions administered to twenty members of a statewide environmental group. We later expanded this concourse to include statements obtained in preliminary interviews with the respondents. While no claim is made that this concourse is exhaustive, the investigators submit that it captures the range and diversity of statements that would be made by stakeholders regarding hazardous waste siting proposals.

Q Samples

The Q sample consists of 47 statements, which were selected to reflect the breadth and diversity of the Q concourse. Statements were selected to achieve "stimulus representation," that is, to provide a set of 40 to 50 statements that mirrors "the range of commentary being voiced" (Brown 1980:260). A review of the statements suggested a division into four broad groups of topics: ***institutional trust***, encompassing those statements concerning whether or not governmental or industrial institutions should be trusted in making siting decisions; ***political participation***, including those statements that refer to stakeholder access to information and involvement in the decision making process; ***technical concerns***, consisting of those statements that deal with technical issues such as risk, economics, procedures, and technology; and ***community-based concerns***, comprising those statements that involve matters relating to social impacts, such as environmental justice, disruption of group ties, etc. In selecting the Q sample, an attempt was made to include a balance of statements in each of these four groups.

The initial Q sample was pre-tested twice: first with a group of graduate students and university faculty and second with several citizens from the communities involved who were not included in the P sample.

Q Sorts

Subjects were given a shuffled deck of paper slips on which were typed the statements to be sorted. A written statement of the condition of instruction was handed to the subjects and read to them. All subjects were asked to read the entire collection of statements and to sort them into three groups reflecting how the subjects initially judged the statements. Subjects were then asked to mark with a "+" those statements with which they most agreed, to mark with a "–" those statements which they most disagreed with or which were most inconsistent with their viewpoint, and to mark with a "0" those statements about which they felt neutral, ambivalent, or uncertain.

Next, respondents were given a 47-item form board styled as a quasi-normal distribution. Respondents were instructed to enter the numbers of the two statements "+" that were most like their viewpoint into the rightmost two spaces on the form board. They were then asked to move to the other end of the form board and to repeat the process for the two statements marked "–" that were most unlike their viewpoint. They then moved back and forth until they had exhausted their "+" and "–" statements. They continued to fill in the form board until all of the statements marked "0" were placed according to their perceived nuances of preference.

Q Factor Analysis

The data obtained from the Q sorts was entered into a software program for Q factor analysis known as PC Quanal (van Tubergen 1980). Orthogonal factors were extracted by the principal components method and rotated to a simple structure by varimax rotation. Five criteria were used to determine retention of factors of interpretation:

1. an eigenvalue greater than one;

2. a factor loading equal or greater than 0.4;

3. a bipolar splitting criterion of 30%; and

4. the theoretical importance of the factor.

Findings

Factor analysis of the Q sort data produced a five-factor solution for the NIMBY stakeholders and a four-factor solution for the TIMBY stakeholders.   To validate and elucidate interpretation of the Q sorts, respondents were telephoned in open-ended interviews in which they were encouraged to elaborate on the proposed interpretations and to clarify possible researcher misinterpretations. The factors were given titles that characterize the perspectives represented by the factors.

NIMBY Stakeholder Perspectives

Five factors, explaining 61 percent of the total variance and accounting for all 36 respondents, satisfied the retention criteria and were analyzed. Table 2 lists the factor scores for each of the 47 items on each of the five factors.

Table 2

Factor Array Z Scores (Population = NIMBY, N=36)

#	STATEMENT	A	B	C	D	E
1	Waste facility siting means economic growth and prosperity for the community	-1.7	1.2	-.9	-.1	-1.0
2	Offering cash payments to a community is the same as a bribe	.7	-.3	.5	.4	-.2
3	When jobs are scarce, an increase in employment is good even if there is resulting pollution	-1.8	-1.3	-.9	-1.2	-1.8
4	If environmental restrictions limit the ability of a company to make a profit, the restrictions should be lifted	-1.7	-2.1	-1.3	.1	-1.5
5	Industry works with communities to maintain a good public image	-.6	.0	.1	-.4	.3
6	Scientific risk assessment should be the major consideration in siting decisions	-.2	1.4	.8	.5	.8
7	Citizens need to control which risks they have to put up with	.9	-.2	.0	.0	1.4
8	We should not take any chances with the environment	1.5	-1.0	.7	1.4	1.9
9	I tolerate risk as a fact of life, but I don't like it	-.4	.2	1.2	.3	-.1
10	It doesn't matter how much we pollute today because tomorrow's technology will solve the problem	-2.2	-2.3	-1.7	-2.3	-1.5
11	The world would be a better place to live if we could go back to old days	-.6	-.5	.1	-1.0	1.0
12	It is better to put facilities in communities with high unemployment; the people there need the jobs	-1.3	-1.1	-.4	-.6	-.2
13	The people who benefit the most from a waste facility are not the ones who bear the risks	1.8	-1.0	1.7	-.5	1.2
14	Government and industry know what they are doing; they are the experts	-2.0	-.2	-.6	-1.2	-1.4
15	Cost effectiveness is more important to industry and government than environmental issues	.2	-.2	-1.6	.7	-.7
16	The government adequately enforces environmental laws to protect human health and safety	-1.4	.0	1.0	-1.3	-1.0
17	Industry usually complies with environmental laws even when it costs them money	-1.5	-.2	.7	-.6	-1.0
18	Environmental laws are full of loopholes for industry advantage	1.3	-.3	-1.3	.2	-1.6
19	The character of a community changes after a waste facility is located there	.1	.3	-.5	.1	-.4

20	Allowing a waste facility to locate in a community divides a community	.5	.5	.5	-1.1	.2
21	Waste facilities give a community a bad reputation	.6	-.6	.5	.3	.0
22	Citizens should be involved in every step of a siting decision	1.2	.2	.9	.5	1.3
23	Citizens have ample opportunity to be involved in siting decisions in their community	-.6	1.3	.7	-.8	.4
24	Industry, government and the public should decide together what level of pollution should be allowed	.2	-.9	1.2	1.5	.9
25	All information should be shared in easily understood language a as soon as it is available	.4	1.3	.5	1.7	1.4
26	Who provides information makes a difference to me; the person must be honest	1.0	1.2	2.0	1.9	.8
27	It is really hard to know if decision makers have the same values as I do	.6	-.1	2.0	1.0	.6
28	It is impossible to know whether or not a process is really safe without adequate technical education	.3	1.8	1.1	1.0	.6
29	If the public were more familiar with the operation of a waste facility, they would be more willing to consider it	-.9	.5	-.4	.3	-.2
30	Citizens should have their own experts	.9	.3	.3	.3	.9
31	We would all be better off if the legal procedures were easier to follow	.5	1.0	1.0	.9	.5
32	Government shouldn't be trusted in making siting decisions	.4	-.1	.0	.4	-1.2
33	Government uses citizen opinion against them	-.3	-.7	-.8	-.6	-.8
34	Economic special interests have too much influence in siting decisions	.7	-.4	-1.2	.8	-.9
35	The people living in a community know best what is good for them	.7	-.8	.2	-.3	1.4
36	Citizens should initially oppose all proposals for siting by industry	-.6	-1.9	-.7	-1.7	.0
37	It is better to be active today than to be radioactive tomorrow	.7	1.4	.6	.3	1.6
38	If you have enough money, you can get away with polluting	.9	.1	-2.2	-1.1	-.7
39	Conflict in decision making is necessary and healthy	.1	.9	-.3	-.7	.2
40	Consensus is impossible when activists become involved in environmental decisions	-.6	.3	-.2	-.3	-1.0
41	The chief function of government is to support the economy	-1.0	-.4	-.5	-.8	-1.6
42	Just being physically present in situations where environmental decisions are made is not enough	.4	.4	.5	-.3	.0
43	The siting process is unfair because the results provide greater risks to the people who are ethnically different or poor	.3	-1.4	-1.0	-.3	-.2
44	Environmental radicals are necessary to bring balance to the issues	-.4	-.4	-1.9	-1.5	-.2
45	There are clean technologies available that must be used now to reduce pollution	.9	1.7	.5	1.8	1.8
46	Government and industry skew their risk estimates to suit their own purposes	.2	.2	-1.1	.4	-.6
47	Industry must be required to recycle, reduce wastes, and use safer techniques and raw materials	1.4	1.9	.4	2.3	.0

Disaffected Skeptics. This factor (factor A) accounts for 26.2% of the total variance and 43% of the explained variance. All those who loaded significantly on this factor are citizens (18 of the 27 citizens in the P sample – three of whom also loaded on the fourth factor: Pragmatic Guardians). All but one (a self-reported neutral) were active NIMBY opponents. They are risk averse and distrust government and industry to ensure their safety, which motivates them to insist on substantive participation in all stages of

the decision process to ensure that their concerns are addressed. They also believe that economics rather than environmental concern underlies support for siting proposals and that environmental risks and economic benefits are not equitably distributed. They are skeptical that participation will produce an outcome that they will perceive as fair and equitable.

Technocratic Rationalists. Accounting for 10.1% of the total variance and 16.5% of the explained variance, this factor (factor B) represents the perspectives of three citizens, two government officials, and one industry representative (one official and one representative also significantly loaded on the third factor: moderate supporters). Five of the six respondents were supporters of the facility; the sixth was a weak opponent who was a bus operator concerned about loss of tourism. They believe that environmental decisions should be based primarily on rational criteria such as risk-cost-benefit analysis, which requires that tradeoffs and risks are necessary if economic progress is to be realized. Though they acknowledge environmental concern and the importance of equity, they are not necessarily sympathetic to citizen involvement. In fact, they believe that current decision processes are fair and just and that opportunities for public participation are adequate. They believe that lay citizens should become technically informed before they engage in automatic opposition.

Technocratic Rationalists are quite comfortable with the rational balancing of economic development against environmental protection and believe that opponents are acting irrationally or out of ignorance. Given the choice, they may prefer preemption of lay citizens if efforts at technical education and co-optation fail to convince them of the overall desirability of the siting proposal.

It appears that the perspectives revealed by Disaffected Skeptics and Technocratic Rationalists lie at the extremes of viewpoints in the NIMBY population. Disaffected Skeptics seem to have little in common with technocratic rationalists (factor correlation coefficient = .317). In fact, 19 of the 47 items' z scores lie more than one standard deviation apart (are distinguishing items). They disagree strongly on the roles that technical and economic criteria play in siting decision-making and prefer egalitarian criteria based on justice and community wide concerns. They are more likely to see economic considerations such as compensation, economic-environmental tradeoffs, and economic influence in decision making as illegitimate. Technocratic Rationalists, on the other hand, are much more sympathetic to the importance of technical criteria in siting decision than are skeptical citizens and much less sympathetic to citizen involvement in siting decision making and local control of risks.

Moderate Supporters. This factor (factor C) explains 9.5% of the total variance and 15.6% of the explained variance. Six respondents loaded significantly on this factor: four of the seven government officials, one industry representative (one official and the representative also loaded on the Technocratic Rationalist factor), and one citizen. All were supporters of the siting proposal. Their perspective is similar to but more moderate than that of the Technocratic Rationalists. For example, Moderate Supporters are more willing than Technocratic Rationalists to acknowledge the legitimacy of non-technical decision criteria such as cultural values, equity, and predisposition to risk acceptability. They differ from the Disaffected Skeptics in that they are far more willing to trust government and industry. Moderate Supporters share an abiding faith in current decision processes and institutions and therefore are not predisposed to oppose proposals emanating from them. On the contrary, they do not see the need to include groups that are predisposed to opposition. Moderate Supporters recognize that citizens should be involved in decision-making but do not necessarily agree that there should be increased opportunities for this.

Pragmatic Guardians. This factor (factor D) accounts for 9.4% of the total variance and 15.5% of the variance explained by the five factors. Pragmatic Guardians exhibit mixed demographic characteristics: seven are citizen opponents (three of whom also loaded on the Disaffected Skeptics factor), one is a neutral government official, and one is an industrial proponent. This curious group of significant loaders is moderately skeptical of the ability of technology to solve pollution problems and of government and industry to provide adequate protection from these risks. Interestingly, this group is more willing to trust industry. They also realize the importance of education about the complex issues involved. Finally, they realize the importance of consensus in siting decision-making and believe that people should not be too quick to jump to conclusions about siting proposals. This interpretation suggests that Pragmatic Guardians prefer a serious, thoughtful, objective exploration of the impacts of a decision and give the benefit of the doubt to industry. Most of all, they are interested in collaborative decision making based on a careful review of all available facts.

<u>Local Controllers</u>. This factor (factor E) accounts for 5.8% of the total variance and 9.5% of the explained variance. Only two respondents, both opponents to the proposed hazardous waste facility siting, significantly loaded on this factor: a citizen and a local government official (and neither was confounded). They are primarily interested in local control over environmental decisions.

This insistence on local control may be due to risk aversion. They do trust local government to act in their interest, but do not trust their technical competency. Interestingly, this perspective differs from all others in that it includes a sentiment for a return to bygone days. These opponents wish to maintain a sense of control over quality of life issues and resent imposition of costs and risks by non-local entities. With the provision of expertise, Local Controllers would prefer the local government make these decisions in close collaboration with residents.

A relatively high factor correlation between the perspectives of Local Controllers and Disaffected Skeptics (r = .613) and between Local Controllers and Moderate Supporters (r = .609) were noted. A quick comparison suggests that each group supports inclusion of non-technical criteria and citizen involvement in decision-making.

<u>Consensus</u>. Only eight items were held in consensus among all five factors and only two of these are salient. None of the five perspectives seems to endorse a jobs-for-environment tradeoff or a willingness to allow pollution today in the belief that tomorrow's technology will deal with it. Though all parties agree on the importance of environmental protection, they disagree on how and by whom these decisions should be made.

TIMBY Stakeholder Perspectives

Four factors for the TIMBY stakeholders account for 61% of the total variance across the 36 sorts. Table 3 presents the factor scores of each statement on the four factors.

Table 3

Factor Array Z Scores (Population = TIMBY, N=36)

#	ITEM	A	B	C	D
1	Waste facility siting means economic growth and prosperity for the community	-.7	-.2	-1.3	-.8
2	Offering cash payments to a community is the same as a bribe	-.2	-1.2	.0	-1.9
3	When jobs are scarce, an increase in employment is good even if there is resulting pollution	-1.6	-.6	-1.5	-1.5
4	If environmental restrictions limit the ability of a company to make a profit, the restrictions should be lifted	-1.3	.1	-1.8	-1.1
5	Industry works with communities to maintain a good public image	.3	.5	-.4	-.8
6	Scientific risk assessment should be the major consideration in siting decisions	1.3	2.3	-.3	.0
7	Citizens need to control which risks they have to put up with	.7	.2	.2	1.5
8	We should not take any chances with the environment	.0	-.3	1.7	.4
9	I tolerate risk as a fact of life, but I don't like it	.7	1.5	.2	1.5
10	It doesn't matter how much we pollute today because tomorrow's technology will solve the problem	-2.1	-2.0	-1.9	-1.1
11	The world would be a better place to live if we could go back to old days	-1.2	-.8	-.7	1.5
12	It is better to put facilities in communities with high unemployment; the people there need the jobs	-.8	.0	-.8	-1.9
13	The people who benefit the most from a waste facility are not the ones who bear the risks	.4	.7	1.0	.0
14	Government and industry know what they are doing; they are the experts	-.5	-.1	-1.9	-1.1
15	Cost effectiveness is more important to industry and government than environmental issues	-.6	-.5	.9	-.4

16	The government adequately enforces environmental laws to protect human health and safety	.6	-.2	-1.9	-.8
17	Industry usually complies with environmental laws even when it costs them money	.1	1.4	-1.8	-.8
18	Environmental laws are full of loopholes for industry advantage	-1.1	-.6	1.2	-1.5
19	The character of a community changes after a waste facility is located there	-.4	-.3	-.2	.0
20	Allowing a waste facility to locate in a community divides a community	-.1	.4	.1	.4
21	Waste facilities give a community a bad reputation	-.7	-.5	-.4	1.9
22	Citizens should be involved in every step of a siting decision	.9	.3	1.0	.8
23	Citizens have ample opportunity to be involved in siting decisions in their community	.2	.5	-1.0	-.4
24	Industry, government and the public should decide together what level of pollution should be allowed	1.9	.8	.5	.8
25	All information should be shared in easily understood language a as soon as it is available	1.6	1.3	1.0	-.8
26	Who provides information makes a difference to me; the person must be honest	1.1	1.4	1.0	.8
27	It is really hard to know if decision makers have the same values as I do	.4	.6	.9	.4
28	It is impossible to know whether or not a process is really safe without adequate technical education	.0	1.9	.2	1.1
29	If the public were more familiar with the operation of a waste facility, they would be more willing to consider it	.8	1.5	-.6	-1.1
30	Citizens should have their own experts	1.0	-.7	.3	.4
31	We would all be better off if the legal procedures were easier to follow	1.4	1.2	.7	1.1
32	Government shouldn't be trusted in making siting decisions	-1.0	-.6	.7	.4
33	Government uses citizen opinion against them	-.8	-.7	-.2	-.4
34	Economic special interests have too much influence in siting decisions	-.4	-.5	1.1	.0
35	The people living in a community know best what is good for them	.5	-.5	.1	.8
36	Citizens should initially oppose all proposals for siting by industry	-1.2	-2.1	-.8	1.9
37	It is better to be active today than to be radioactive tomorrow	.7	.7	1.0	.8
38	If you have enough money, you can get away with polluting	-1.4	-1.1	1.0	-.4
39	Conflict in decision making is necessary and healthy	.8	.2	.1	.0
40	Consensus is impossible when activists become involved in environmental decisions	-.9	-.4	-1.0	-.4
41	The chief function of government is to support the economy	-1.7	-1.6	-.7	.0
42	Just being physically present in situations where environmental decisions are made is not enough	.7	1.0	.5	1.1
43	The siting process is unfair because the results provide greater risks to the people who are ethnically different or poor	-.2	-1.0	.4	1.1
44	Environmental radicals are necessary to bring balance to the issues	.8	-1.6	-.5	-.4
45	There are clean technologies available that must be used now to reduce pollution	1.4	.4	1.5	.0
46	Government and industry skew their risk estimates to suit their own purposes	-1.3	-1.0	.9	-1.5
47	Industry must be required to recycle, reduce wastes, and use safer techniques and raw materials	1.7	.1	1.6	.4

Technical Consultants. Proponents and neutrals, including five of the seven government officials, two of the five industry representatives, the community opinion leader and two citizen supporters, share this perspective. This factor (factor A) accounts for 19.6% of the total variance and 32.1% of the explained variance. It reveals optimism in technological progress. Those who load on this factor also trust government and industry institutions. This perspective seems compatible with increased citizen participation – with one caveat: citizens should reserve judgment until they have had a chance to educate themselves on technical matters.

Apparently, someone with this perspective adopts an accommodative, power sharing view of decision-making. In fact, and unique among the four factors, Technical Consultants agree that environmental radicals are necessary to bring balance to the issues.

Seen in context with the other items salient to abducting this perspective, radical involvement in siting decision-making is conditioned upon their being technically informed, open minded, and willing to work toward consensus. In fact, Technical Consultants' emphasis on shared power in decision-making is strongest among the four factors. They agree with Disaffected Controllers that risk reduction is important and that sacrificing the environment for jobs is unsatisfactory.

Technical Consultants seems an apt label for this perspective because of their willingness to include all stakeholders in decision-making but limit their input to technical, economic, and legal issues. Non-technical issues are either mildly rejected or judged to have no salience at all.

Technical Paternalists. This factor (factor B) accounts for 11% of the total variance and 18% of the explained variance. Only six respondents load on this factor: two government officials and two citizens (one of each is confounded on the Technical Consultant factor) and two industry officials. All six are either proponents or neutral toward the TIMBY proposals. This perspective has much in common with Technical Consultants, as apparent in the factor correlation coefficient, r = .665). Technical Paternalists believe that the dominance of technical criteria requires that environmental decision-making should be left to elites (consistent with the paternalist approach identified by Ducsik (1978) as the decide-announce-defend (DAD) approach to decision-making). In their opinion, citizens should remain neutral on siting proposals until they have educated themselves on the technical merits of the proposal.

Technical Paternalists do not believe that citizens should have their own experts. While they can accommodate open and free access to information, they are not as willing to share power and are generally not supportive of citizen involvement in decision-making. They are especially opposed to participation by ideological opponents.

Technical Paternalists trust industry's motives and are convinced of the value of technological progress. They further believe that current decision processes produce just and fair results, though the process is inefficient by being too legalistic and complicated. Finally, they do not support government intervention in the economy.

In sum, Technical Paternalists prefer scientific and economic criteria in making environmental decisions in a rational manner. They also believe that they alone are competent to make these decisions; lay citizen involvement that is uninformed is not welcome.

Disaffected Controllers. This factor (factor C) is the dominant factor, accounting for 26.1% of the total variance and 42.7% of the explained variance. Eighteen respondents, all citizens, loaded significantly on this factor (one was confounded on the Technical Paternalist factor!). Sixteen of the 18 are opponents; the other two are neutrals. Disaffected Controllers are risk averse concerning protection of environmental quality. They believe that environmentally appropriate technology should be used to protect the environment from insult. The problem, in their opinion, is that neither government nor industry can be trusted to protect environmental quality. They believe that the influence that money provides supersedes environmental protection, and that institutions' claims of safety based on scientific risk estimates are ruses to disguise their true motives. They do not believe that there are adequate compensating net benefits to the community from waste facility siting. In fact, whatever benefits, costs, and risks that do accrue are inequitably distributed. The solution, in their opinion, is to increase citizen involvement in decision-making and facilitate access to information.

The distinguishing feature of this perspective is the pervasive distrust of government and industry to protect the environment. The remedy in their opinion is aggressive citizen oversight to ensure that the

environmental quality interests of the community are protected.   However, as mentioned previously, access to information is not paramount – their concerns are not technical but rather trust-related.

Communitarians.   Only one citizen opponent loads significantly on this factor (factor D), accounting for 4.4% of the total variance and 7.2% of the explained variance. The major concern from this perspective is the importance of preserving community identity, traditions, and welfare.

This perspective is sustained by an aversion to risk and pervasive distrust of government and industry. In contrast to Disaffected Controllers, however, Communitarians recognize the importance of technical knowledge to understanding safety and environmental risk; however, having this knowledge has nothing to do with siting opposition.   The best explanation for this finding may be that non-technical criteria concerning protection of quality of life are simply more important and this requires local control of decision-making by the public.

Comparison of NIMBY and TIMBY Perspectives

Conflicts over hazardous waste are often portrayed as struggles between opposing worldviews, with little basis for accommodation between antagonists (Douglas and Wildavsky 1982; Thomson, Ellis and Wildavsky 1990; Dake 1992). Our Q study reveals a more complex reality in which diverse coalitions of stakeholders on both sides are often drawn into conflicts that obscure important differences among allies and exaggerate the incompatibility of positions between opposing sides. This is most evident in NIMBY conflicts, but also appears among the TIMBY participants. Table 4 presents a summary of each of the five NIMBY and four TIMBY perspectives.

Both NIMBY and TIMBY controversies include participants who are divided by fundamentally incompatible beliefs and values. At one end are Technocratic Rationalists (NIMBY) and Technical Paternalists (TIMBY) who generally trust government and industrial institutions; have faith in technological progress; favor decision making based on scientific, technical, and economic criteria; wish to limit citizen participation to those who are technically informed; believe that the decision process should be streamlined so as to be more efficient but not changed so as to encourage more citizen participation and the inclusion of non-technical concerns; are not particularly risk averse; are willing to make risk-benefit tradeoffs; and prefer that citizens adopt a neutral stance and learn the "facts" before deciding on whether to oppose a facility. This perspective is held by those who are employed in industry and government (though a few citizens also share this view) and represents a technically rational epistemology.

At the other end are Disaffected Skeptics (NIMBY) and Disaffected Controllers (TIMBY), primarily citizens in our P sample, who are offended by the technocratic perspective and who reject its arguments. In fact, it is the technocratic arguments themselves that erode their trust in decision-making. The more that defenders of the technocratic approach insist that decisions be made in accordance with technical criteria and processes, the more opponents become dissatisfied and distrust the proponents.   It is a synergistically antagonistic relationship – a social amplification phenomenon that rapidly devolves into gridlock. These opponents reject the legitimacy of technocratic decision-making and cannot be appeased by technically rational arguments and information. Their distrust feeds their unwillingness to defer to the expertise or discretion of government or industry. Moreover, they resist power sharing for fear of elite manipulation. The only recourse that may gain their cooperation is to delegate decision-making power, including issue framing and selection of decision rules.

Our study also shows, however, that there are NIMBY and TIMBY stakeholders who may be more open to accommodation.   Among NIMBY stakeholders, four such orientations emerge: Moderate Supporters (NIMBY), Pragmatic Guardians (NIMBY), Local Controllers (NIMBY), and Technical Consultants (TIMBY). Perhaps the diversity of the demographic makeup of these perspectives contributes to their moderate views: Pragmatic Guardians and Technical Consultants included government officials, industry representatives, and citizens and the other two perspectives included government officials and citizens. In addition, while NIMBY Moderate Supporters and TIMBY Technical Consultants share a faith in science/technology and economics, they remain receptive to cooperative solutions involving the public in decisions concerning pollution.

Table 4

Comparison of NIMBY and TIMBY Perspectives

NIMBY	TIMBY
Disaffected Skeptics They are risk averse; believe that money governs siting decisions; distrust industry, government, scientific risk analysis, and technical decision criteria; believe siting processes are unfair; and believe citizen participation and access to information are desirable, but are skeptical of their efficacy.	**Disaffected Controllers** They are risk averse; believe that money governs siting decisions; distrust industry, government, scientific risk analysis, and technical decision criteria; believe siting processes are unfair; favor aggressive citizen oversight, although not concerned about information sharing; and believe that aggressive citizen oversight can make a difference.
Technocratic Rationalists They trust science, technology, scientific risk analysis, and economic criteria for siting decisions; view siting as fair; accepts risk-benefit tradeoffs; and are unsympathetic to citizen involvement unless it is informed.	**Technical Paternalists** They trust government and industry; favor scientific risk analysis, risk-benefit tradeoffs, and technical criteria in environmental decision making; view siting processes as fair; oppose citizen control; but favor information-sharing and citizen education and see no need to include radical opponents in citizen participation.
Moderate Supporters They acknowledge legitimacy of both technical and non-technical decision criteria; trust government, industry and the established decision system; see no need to include radical opponents; and favor citizen involvement, but not necessarily increased opportunities for participation.	**Technical Consultants** They trust government, industry, and technology; favor citizen participation, but think citizens should inform themselves about technical matters; and favor including environmental radicals for balanced perspective.
Local Controllers They are risk averse; trust local government's protection of interests, but not its technical competence; long for return to bygone days; resent imposition of costs by outsiders; and favor local control of environmental decisions.	**Communitarians** They are risk averse; distrust government and industry; recognize importance of technical knowledge; and seek to preserve community identity, traditions, and welfare.
Pragmatic Guardians They distrust technology and government, but trust industry; favor information and education and believes that people should suspend judgment about siting until they have all the facts; favor collaborative, deliberative siting decisions.	

Pragmatic Guardians (NIMBY), Local Controllers (NIMBY), and Communitarians (TIMBY) all share a distrust of government and industry expertise that is characteristic of the more skeptical perspectives, they differ from skeptics in other respects. Pragmatic Guardians and Communitarians are more amenable to working with industry and government and Local Controllers and Communitarians are less interested in environmental/technological issues *per se* than in impacts on the local community. These findings suggest that by meeting concerns about equity, citizen participation, and/or local control, it might be possible to reach accommodation between facility supporters and various components of the opposition.

Although the term "NIMBY" may connote selfishly parochial motivations, we find that only Local Controllers (NIMBY) Communitarians (TIMBY) manifest predominantly local concerns. This finding supports the conclusion of Kraft and Clary (1991) that citizen participation in hazardous waste disputes cannot simply be attributed to parochialism.

Another difference evident between NIMBY and TIMBY stakeholders is that TIMBY opponents (those most strongly believing that cleanup is required) were more supportive of the industry position than were NIMBY opponents (those most opposing facility siting) who were generally unwilling to cooperate with the facility – even when the community would likely benefit from the siting in other respects. Similarly, the lines of division are less clear in TIMBY communities. Many of those who oppose the status quo and want cleanup are willing to work with the polluting facility, presumably due to the recognition that compensating benefits are present. Thus, risk-benefit tradeoffs are less desirable when the benefits are hypothetical than when they are real.

Q analysis does not permit generalization about the incidence of the various attitudes in the general population of stakeholders – information that could be important in assessing the feasibility of incentive packages or compromise solutions to NIMBY and TIMBY conflicts. Nevertheless, the attitudinal patterns uncovered by Q analysis may provide a basis for construction of more meaningful survey instruments for testing in larger populations. We expect Q- and R-based approaches will complement each other in providing a more adequate profiles of NIMBY and TIMBY stakeholders in future studies.

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PUBLIC HOUSING AND NIMBY:
THE EFFECTS OF CITIZEN PARTICIPATION IN SITING
PUBLIC HOUSING FACILITIES IN TULSA

Charles C. Peaden

Introduction

Public housing has become akin to toxic waste facilities in the amount of citizen opposition generated to oppose the placement of these facilities in particular communities. While problems associated with low-income public housing have increased, the need to provide low-income housing has remained persistent. Collisions between these two forces have become more frequent. Therefore, the need to find solutions to this conflict has grown in importance. This research examines what forms of non-traditional citizen participation, if any may alleviate "not in my back yard" (NIMBY) attitudes toward the siting of public housing facilities. We argue that increased participation and dialogue involving the community might lead to less conflict and more acceptance of the facility in their neighborhoods. We will attempt to identify factors that may be useful in formulating public policy to deal with NIMBY activities.

A goal of some policymakers is to concentrate their efforts on the problems associated with high-density public housing located in undesirable areas. While the issue of NIMBY and the siting of public housing does not appear to fit within usual environmental policy concerns, we feel it is important to realize that public housing does involve the living environment of citizens and presents a threat to the "...health and safety" (Walsh *et al.* 1993:25) of citizens. To this end, policymakers have attempted to disperse public housing throughout the community with the hope of reducing the concentration of low-income public housing and the problems associated with high density housing. Organized responses by citizens, however, have thwarted this strategy. Successful movements opposing the siting of these facilities has resulted in the poorest people in the community continuing to reside close together in the worst areas of the community. This situation breeds crime and a sense of hopelessness and the surrounding neighborhoods experience these negative effects also (Fuerst and Petty 1991). Low-income individuals and families, along with the surrounding community, find themselves in a seemingly intractable situation.

Opposition to the presence of public housing in one's neighborhood is commonly referred to as the NIMBY syndrome. NIMBY has been around since the beginning of community living (Marshall 1989), arising from "protectionist attitudes of and oppositional tactics adopted by community groups facing an unwelcome development in their neighborhood" (Dear 1992:288). NIMBY is viewed primarily as a middle and upper middle-class phenomenon. Educated citizens with money, influence, and time attempt to keep "undesirable" facilities out of their neighborhoods (Marshall 1989). According to the 1990 Robert Wood Johnson Foundation Study, individuals most likely to oppose development are white, high-income executives as well as older citizens. Strong opponents also tend to be "homeowners, married, highly educated and male" (p. 242). Residents are concerned that these facilities may lower their property value, disturb the equilibrium of their neighborhood, or bring in the "wrong-sort" of people to their communities (Bussel 1993). Due to recent changes in the political and legal environment, involvement from middle and lower class citizens associated with NIMBY has increased (Marshall 1989). NIMBY is no longer confined to wealthier citizens and the potential for a NIMBY response has increased. These changes have given citizens greater power to stop undesirable projects – even projects that are important for the good of the community as a whole (Marshall 1989).

Most citizens agree that low-income public housing is "desperately needed" (Fuerst and Petty 1991:91). Citizen "objections are not based upon if they should be built" (Inhaber 1992:16); rather, it seems that problems arise during the "siting process" (LeRoy and Nadler 1993:108). Since there is a demonstrated need for these facilities, it is necessary to assess what strategies may be implemented by policymakers to address this dilemma. An answer may be found in citizen participation and involvement. It is possible to change opposition to acceptance (Arens 1993) – if citizens are involved in the decision making process (Folk 1991).

Citizen participation is widely accepted as being "acts that aim at influencing government, either by affecting the choice of government personnel or by effecting the choice made by government personnel" (Verba and Nie 1972:2; Tarlock 1984). The components of participation include calling and writing decision-makers, voting, signing a petition, and participating in a public demonstration (Verba and Nie 1972). These are known as traditional or classic political participatory methods.

Citizen participation is thus a set of principles and procedures that are designed to check decisions made by policymakers that affect citizens. These checks are generally employed to ensure responsiveness (Mayo 1960; Pitkin 1972; Prewitt and Eulau 1969; Verba and Nie 1972). "Contacting" is a form of participation in which citizens contact governmental officials to complain about, or request, services (Coulter 1991).

Though traditional methods of political participation provide important means by which citizens are able to express political concerns (Crosby 1986; Rosener 1975; Thomas 1982; Peel and Ellis 1987; Inhaber 1992; Tarlock 1985), we wish to examine non-traditional methods such as neighborhood-level participation. These forms of participation give citizens the opportunity to become involved in a more direct manner. The goal of neighborhood level participation is to engage citizens earlier in the siting process (Crosby et al. 1986; Rosener 1975; Thomas 1982; Peele and Ellis 1987; Inhaber 1992; Tarlock 1985).

Literature Review

NIMBY

"The story of NIMBY is not a new one. Anyone rich enough to have lawyers and to influence city hall has always been able to see to it that a facility is not located next to his home" (Marshall 1989:307). The NIMBY syndrome has long been associated with hazardous waste sitings and environmental issues. NIMBY has evolved to encompass the siting of other specific public services, such as prisons, halfway houses, drug rehabilitation centers, nursing homes, and public housing (Davis 1993:103-8; Lester and Bowman 1983). The "acronym NIMBY and all its attached political causes and consequences, cannot be confined to hazardous wastes facility siting, or even to environmental policy in general" (Rabe 1994:167). NIMBY has grown to include any facility that the general public or the immediate community deems undesirable.

As NIMBY has increased in frequency, it has also spread to other areas of public service sitings. One such area is public housing. The NIMBY phenomenon has expanded to "housing designed primarily for low income citizens" (Rabe 1994:168). The case that will be presented here certainly points to low-income public housing as fertile ground for NIMBY. Consequently, the political and social importance of this situation can no longer be overlooked.

Since a leading solution to the problems associated with public housing facilities appears to be the dispersal of new facilities throughout the community, it is likely that a larger portion of the general public will be effected. Government planners must contend with opposition from the communities that have been listed as possible sites for public housing. Such an aroused interest will likely lead to NIMBY activity. It is important for policymakers to be aware of citizen groups that are likely to become involved in NIMBY oppositions, in order to formulate policies that are responsive to citizens' needs and the public good as a whole.

In the past, politicians and public administrators have "dismissed the NIMBY syndrome as community selfishness and ignorance" (Inhaber 1992:18). Due to the spread of NIMBY and the persistent need to site new public housing facilities, politicians and public administrators now realize they can no longer dismiss these concerns (Marshall 1989).

Public Housing

Low-income public housing facilities were authorized by the 1937 National Housing Act. This program is the oldest of its kind and has produced 1.3 million public housing units that are owned by public housing authorities in over 3200 locations (Landers 1987). The tenants of these housing projects were required to pay rent based on the tenant's income, which was sufficient to cover operating costs.

The 1949 National Housing Act set a goal of "a decent home and a suitable living environment for every American family" (Landers 1987:214). In only three years, the Act produced 155,000 units. From the early 1950s and into the late 1960s, there were 15,000 to 35,000 public housing units built annually. Federal subsidies were extended to cover operating costs, which allowed the lowest of low-income families to live in public housing. According to the National Association of homebuilders, these public housing units were "high density, stripped of amenities, and located in undesirable areas" (Landers 1987:214).

According to Fuerst and Petty (1991:118), public housing has become extremely undesirable due to crime, vandalism, and social dysfunction. Most of these problems are found in many public housing facilities. The cause of this is "location, control, enormous concentration, socially troubled families, design flaws, few supporting social services, and inept management."

Public housing has become undesirable to both tenants and the surrounding neighborhood. Typically, these facilities are dense, overcrowded, and infiltrated with crime. Public housing affect neighborhoods by increasing crime rates, reducing property values, and contributing to a general deterioration. These negative effects provide the motivation for many residential communities to oppose public housing construction in their neighborhoods.

One might think that citizen groups, armed with motivation and organizational skills, would be able to easily turn back an undesirable project. The United States Supreme Court has not been sympathetic to citizen concerns on the subject of public housing siting. It seems that the stage has been set for intractable conflict.[1] The Court's rulings demonstrate that the federal government has substantial latitude on this question. While the government must act in the best interests of public good, they are not required to reimburse the owner with the highest possible value of properties, and in the case of public housing, governments may site the facility wherever they wish it to be.

Tulsa Public Housing - The Setting

The Tulsa Housing Authority (THA) operates 12 low-income multifamily public housing facilities. Additionally, there are more than 30 privately owned government subsidized low-income housing facilities within Tulsa. These privately owned facilities are commonly referred to as Section 8 housing.[2]

The THA oversees 2,254 multifamily living units. The majority of these units are located in North Tulsa. North Tulsa is the second most populated area and has the largest proportion of minority residents. It also has the city's highest unemployment rate and the largest proportion of residents who live in poverty (Paskin et al. 1992). This is typical of areas in which public housing is located (Inhaber 1992; Bussel 1993; Dear 1992).

THA has an official location policy for public housing. Its stated purpose includes the promotion of housing opportunities for lower-income and minority households, dispersal of housing throughout the community, and the avoidance of the creation of new lower income and minority concentrations as a result of local, state, and federal housing programs (Tulsa Housing Authority 1995). Of the 12 multifamily public housing facilities seven are located in North Tulsa, four are located in West Tulsa, and one is located in East Tulsa. South Tulsa, which is generally regarded as the most affluent area in Tulsa, has no public

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[1] The Supreme Court in *Hadacheck v. Sebastian* 239 U.S. 394, 1915, and *Penn Central Transportation* 438 U.S., 1978 have generally held that if the government can show that a public project advances the public good, the government can site the project over citizen objections.

[2] Section 8 housing involves the renter leasing to lower income residents with any difference in the amount paid by the low-income lessee to be reimbursed by the government. These dwellings are usually single family homes. This type of housing unit is not relevant to our study. We are only concerned with multiple family dwellings.

housing facilities. It is clear that Tulsa's public housing is exemplary of the problems associated with public housing in general.

Community Participation and Involvement

Citizen contacting, though a popular mode of public response to an undesirable government activity, does not have a significant impact on government policies (Crosby *et al.* 1986). This is not to imply that citizen participation in any form is without merit. It is possible that traditional methods of citizen participation are not adequate in addressing the needs of both the government and the citizens. Neighborhood level participation is a more intense form of citizen participation and has grown in its importance (Thomas 1982). Research has indicated that traditional modes of participation have had limited impact and have served primarily as a check on government actions after the fact (Rosener 1975; Crosby *et al.* 1986).

In an effort to improve the effectiveness of citizen participation, a group at the Center for New Democratic Process searched for solutions to the weakness of citizen participation. This group developed a method that they term "citizen juries." The group identified five criteria that could be used to increase the effectiveness and success of citizen participation: (1) participants should be representative of the broader public and selected in a fair manner; (2) the proceedings should promote effective decision-making; (3) the proceedings should be fair; (4) the process should be flexible; and (5) the likelihood that the recommendations of the group will be followed should be high (Crosby *et al.* 1988:175-177).

Crosby et al. (1986) analyzed the citizen panel method suggested by the Center for New Democratic Process in 1984. They tested the effectiveness of the five criteria as applied to a dispute concerning adverse environmental impacts from the agricultural industry on the water supply in the state of Minnesota. They found that the panel method was successful in addressing participant selection, broad based decision-making, and producing fair procedures. Where the water supply program needed improvement, recommendations were suggested by the panel, which were forwarded to state officials. The author concluded that all five criteria are important if citizen participation is to succeed.

Peelle and Ellis (1987) examined an analysis of 105 selected water and highway engineering projects for potential solutions for NIMBY. Their analysis of the successes and failures of these projects demonstrated a significant relationship between the degree of public participation and the public's willingness to accept a siting proposal. When an agency or developer attempted to site a project without previously consulting the public, ignored public sentiment, or did not attempt to educate the public in the early stages of the project, the project was met with opposition. If a developer or agency pursued the opinions of the citizens through channels such as public opinion, survey of public needs, assistance of small group meetings, and provision of the means to exchange information with concerned citizens, chances of project success increased (Peelle and Ellis 1987).

Rosener (1975) notes that citizen participation is usually viewed as a review function that acts as a type of check on policy decisions. Through voting, public hearings, and advisory committees elected officials have deemed this type of citizen participation as a sufficient means for input. Improvements have occurred in citizen participation regarding who participates, how they participate, why they participate, and when they participate.

Rosener (1975) presents a matrix that identifies 14 functions in which participation techniques perform best for elected officials and public administrators. The focus here, however, will be on only one of these functions: "develop support / minimize opposition." Rosener provides 18 techniques that could be utilized to serve this function. Of those 18, we will examine seven.[3]

The first technique is the use of *citizen advisory committees,* which is a "generic term used to denote any of several techniques in which citizens are called together to represent the ideas and attitudes of various groups and/or communities." The second technique is *citizen representation on public policymaking bodies,* which is defined as the composition of public policy-making boards comprised of either partially or wholly of appointed or elected citizen representatives. The third technique is the *citizen review board* in which decision-making authority is given to citizen representatives who are either elected or appointed to review alternative plans and decide which plan should be implemented. The fourth technique is *design-in,*

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[3] We believe that these seven techniques best reflected neighborhood level participation (see Rosener 1975). Also, these seven techniques were chosen for reasons of parsimony.

which is a variety of planning techniques in which citizens work with maps, scale representations, and photographs to provide a better idea of the effects that proposed plans and projects may have on their community. The fifth technique, *fishbowl planning,* involves a process by which all parties can express their support or opposition to an alternative before it is adopted, thereby bring about a restructuring of the plan to the point where it is acceptable to most, if not all, involved parties. This involves the use of several participatory techniques – public meetings, public brochures, workshops, and a citizen's committee. The sixth technique is *meetings (community-sponsored)*, which are gatherings organized by a citizen groups or organizations; these meetings focus upon a particular plan or project with the objective to provide a forum for discussion of various interest group perspectives. The final technique is *meetings (neighborhood level)*, which are meetings held for the residents of a neighborhood that has been, or will be, affected by a project, and which are usually held early in the planning process or when the plan has been developed.[4]

The research design of our study will be patterned after these techniques. The survey used in this study has been constructed to sample respondents based on these seven techniques. We intend to determine if these techniques are effective in reducing opposition in siting public housing facilities in Tulsa. We hypothesize that the level of non-traditional citizen participation is adversely correlated with opposition to siting public housing facilities. In other words, as opportunities for neighborhood level participation increase, opposition will decrease.

Data and Methods

The sample was restricted to permanent adult residents of the City of Tulsa who were homeowners.[5]

Professionally trained interviewers solicited citizens' responses to public housing facilities being placed in their neighborhood via a telephone survey. The survey, conducted in 1995, contained 22 questions focused on measuring opposition to the siting of public housing facilities. Respondents were asked whether they had actually experienced a proposed public housing siting. The survey also measured the level of opposition and the types of participation in which they would engage.

The independent variables were geographical area, familiarity with public housing, the perceived risk of public housing, trust in government, gender, racial group, age, social economic status, perceptions of efficacy, and the importance of neighborhood[6] (see Table 1). We also took into consideration and measured past political participation. The following variables were combined to measure past participation: voted in last city councilor election, voted in last mayoral election, recently written a city councilor, recently attended a council meeting, and participated in a public protest. The variables were binary coded, ranging from 0 to 3 (see Table 1).

To measure the types of participatory activities that can influence opposition, seven variables referred to as tradeoffs, were selected. The tradeoffs, patterned after Rosener, were: location approval, construction plan approval, advisory committee, oversight board, rules establishment, limited management participation, and participation in all phases of management.

The dependent variable was the determination of whether the participatory tradeoffs affected the acceptance of the housing facility.

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[4] These techniques can be found in Rosener (1975).

[5] We restricted our sample to homeowners because we felt that the focus of our study should be on those that had a stake in their neighborhood's quality, i.e., property values, crime risks, and the usual inability of homeowners to simply move away from the threat that public housing might present. Business owners would not be as representative since many do not live in the area in which their businesses are located. We gathered our telephone data by using random digit dialing to assure the representativeness.

[6] Based on previous research (Peelle and Ellis 1987; Fuerst and Petty 1991; Crosby *et al.* 1986) we believed that these variables would be best suited to determine whether or not they would affect the acceptance of a public housing facility.

Table 1

Means and Standard Deviations for All Variables Included in the Analysis*

INDEPENDENT VARIABLES	VARIABLE DESCRIPTION	MEAN	STD DEVIATION
Residential Status	0=Other; 1=SE	0.728	0.446
Familiarity	0=No; 1=Yes	0.319	0.467
Perceived Risk	ordinal variable ranging from 0=Strongly Disagree to 3= Strongly Agree	1.793	0.988
Trust in Government	ordinal variable ranging from 0=None to 3=Great deal	1.675	0.76
Gender	0=Male; 1=Female	0.501	1.197
Race	0=Nonwhite; 1=White	0.842	0.365
Age		41.259	17.736
Socioeconomic Status	summed Z-scores for Income & Education	0.65	2.194
Perceived Efficacy	ordinal variable ranging from 0=None to 3=Great deal	1.444	0.987
Neighborhood Quality	ordinal variable ranging from 0=Not Important to 2=Very Important	1.842	0.39
Past Participation	summed variable ranging from 0 to 5	1.976	1.144
Actual Participation		1.080	1.540
Hypothetical Participation		2.788	1.776

* N=426

Findings

Involvement and Perception of Government

When asked about trust of government, the survey revealed that 11% of the respondents had a great deal of trust, 52% had a fair amount of trust, 29.7% had little trust, and only 6.8% had no trust at all. Of the respondents, 88.1% were registered voters, 58.3% voted in the last city council election, and 72.8% voted in the last mayoral election.[7]

When asked about political involvement other than voting, the numbers dropped dramatically. Only 17.3% of the respondents have called or written a city councilor to voice their opinion about an issue in the last five years. Only 11% attended a city council meeting to voice their opinion about an issue in the last five years. In the last five years, only 18% participated in a political protest.

Response to Siting Public Housing Facilities

The survey showed that 81.5% of the respondents believed that the quality of their neighborhood was excellent or good. Eighteen percent believed that the quality of their neighborhood was fair or poor. When asked if neighborhood quality was important, 84.8% of the respondents stated that it was very important, 13.8% responded that it was somewhat important, and only 9% responded that it was not important. When asked if a public housing facility located in their neighborhood would be a danger, 59.7% responded that it would be and 36.8% responded that it would not be.

Nineteen percent have actually had a public housing facility proposed in their neighborhood.[8] When asked how they reacted to this facility, 5.4% wrote or called their city councilor, 5.4% signed a petition,

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[7] We cannot explain why these percentages are so high. This is an accurate depiction of the data. Perhaps our question was unable to filter responses that tended to inflate these percentages.

[8] N = 81.

2.3% spoke at a public hearing, 4.9% joined a community organization, and 1.6% had been involved in a public demonstration. Only 5.6% approved or gave support for the facility.

When asked what would change their opinion and make them more receptive to the facility, 2.8% of the respondents stated that if government and the facility promised to maintain open lines of communication with the community, their opinion would change. If the neighborhood received compensation for losses that could occur, 3% would change their opinion. If the facility location decision required community approval, 5.9% would change their opinion. Community participation in construction plans would result in 4.7% altering their opinion. Of the respondents, 4.4% stated that an opportunity to participate on a citizen advisory committee would change their opinion. In addition, 4.4% stated that if they were allowed to participate on an oversight board, their opinions would change. Three percent stated that if they were allowed to participate in the management decisions of the facility, their opinion would change. Finally, 4.4% stated that if they were allowed to participate in all phases of the facility, their opinion would change.

For the respondents who have not experienced a proposal for a public housing facility in their neighborhood, the question was posed in hypothetical terms.[9] When asked if they would write or call their city councilor, 56.4% responded that they would, and 58.8% would sign a petition against the proposed siting. Moreover, 34.4% would attend a public hearing, 48.2% would join a community organization, and 24.4% would participate in a public demonstration against the siting proposal. Only 27.2% would support a public housing facility in their neighborhood.

When asked what would change their opinion and make them more receptive to the facility, 8.9% of the respondents stated that if the government and the facility promised to maintain open lines of communication with the community, their opinion would change. Eleven percent responded that if the neighborhood were compensated for possible losses, their opinion would change. If the facility location decision required the community's approval, this would result in 16.9% altering their opinions about the public housing facility. Fifteen percent would change their opinion if the community were allowed to participate in construction plans. If the community were allowed to participate in citizen advisory committees, 16.6% would change their opinion, and 19.2% stated that if they were allowed to participate in an oversight board their opinion would change. If they were allowed to participate in establishing the rules that tenants must follow, 15.9% stated that their opinion would change. Finally, 14.1% of the respondents stated that if they were allowed to participate in the management decisions of the facility, their opinion would change, whereas 15.2% stated that if they were allowed to participate in all phases of the facility, their opinion would change.

Statistical Analysis

This analysis examines both the levels of expected opposition to the siting of public housing and the possibility that participatory tradeoffs would lessen such opposition. The first part of analysis looked at citizen participation to oppose the siting of a public housing facility. The analysis examines the both the actual group and the hypothetical group. The two groups were compared for the effects of the independent variables on lessening NIMBY opposition. Because of the dichotomous nature of our dependent variable, we determined that logistic regression to be the appropriate method to be used in our statistical analysis (Aldrich and Nelson 1968; Walsh 1987).

For the actual group, two variables were statistically significant. The *perceived risk* variable was significant at the .05 level. This demonstrates that perceived risk of the danger that the facility presents to the neighborhood is important to those who actually experienced public housing in their neighborhoods. In addition, the variable *lived near a facility* was significant at the .01 level. This finding suggests that the notion of living near a low income housing facility is disturbing to citizens, which may be caused by ramifications of crime, loss of property values, and a general threat of risk the facility presents to the community (Fuerst and Petty 1991; Marshall 1989; Rabe 1994; Landers 1987).

In the hypothetical group several variables were statistically significant (see Table 2). First, the *neighborhood quality* variable was significant at the .05 confidence level. This should be expected because those that value the quality of their neighborhood would not welcome the siting of a public housing facility (Bussell 1993; Dear 1992; Landers 1987). As with the actual group, the variable labeled

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[9] N = 340.

lived near a facility was significant at the .01 level. The *perceived risk* variable was also significant at the .01 level. Perceived risk may help explain why the other three variables were significant. It is likely that the concerns of living near a housing facility along with neighborhood quality and socioeconomic status are ancillary to the general fear of the facility. In other words, perceived risk of the facility may influence the significance of the other variables.[10]

Table 2

Logistic Regression Equation Predicting Citizen Participation

INDEPENDENT VARIABLE	ACTUAL GROUP (N=80)	HYPOTHETICAL GROUP (N=340)
Neighborhood Quality	.2318 (.6185)	.6827* (.2915)
Trust in Government	-.3589 (.2794)	.2150 (.1547)
Past Participation	.3351 (.2000)	.1006 (.1011)
Lived near a Facility	1.4754** (.4811)	-.8302** (.2507)
Efficacy	-.0845 (.234)	.0832 (.1229)
Perceived Risk of the Facility	.6205* (.2546)	.4689** (.1166)
Age	.0163 (.0148)	-.0011 (.0067)
Gender	.1819 (.3844)	-.1459 (.1118)
Racial Group	-.0867 (.6175)	.0617 (.3116)
Residential Location	-.4624 (.2683)	.6236 (.6127)

Standard errors are in parentheses
* p<.05   **p<.01

$x = 30.43^{**}$
Pseudo R =.43

$x = 49.33$
Pseudo R = .49

The second part of the analysis looked at tradeoffs that citizens would accept in order to allow the siting of public housing facilities. A difference of proportions test was applied to all tradeoffs between the actual and hypothetical groups.[11] Only one of the seven tradeoffs was statistically significant, the tradeoff of *participating in management decisions* (see Table 3). This result indicates that if citizens are allowed to participate in management decisions, they are more likely to accept the siting of public housing facilities. However, this variable is admittedly vague, and reveals little in terms of insight as to what specifically causes that concern.

Table 3

Willingness of Citizens to Accept Tradeoffs to Site Public Housing Facilities

TRADEOFFS	ACTUAL % YES (N=67)	HYPOTHETICAL % YES (N=362)	Z-SCORE*
Location decision requires community approval	37.9	27.6	1.036
Allowed to participate in construction plans	30.3	24.5	0.682
Allowed to participate on citizen advisory committee	28.4	27.1	0.138
Allowed to participate on oversight board for input to tenant criteria	28.8	31.5	-0.2783
Allowed to establish rules that tenants must follow	26.7	26.1	0.087
Participate in management decisions	20.0	22.9	2.632**
Participate in all phases of the public housing facility	28.87	24.6	0.452

*Difference of proportion test between respondents who have actually experienced the siting of public housing and respondents that had not.

** p<.01

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[10] A Pearson's test for colinearity proved that the independent variables are not significantly correlated.

[11] We used a difference of proportions test to determine which tradeoff, through combining the real experiences of citizens and those that might experience a siting, would be effective in reducing siting opposition.

Conclusion

The hypothetical group is likely to be of higher socio-economic status, care a great deal about their neighborhood, and be fearful of the risk that the housing facility may present to their community. The hypothetical group indicated that it would become more involved in protest activities than the actual group.

The actual group shares with the hypothetical group their fear of the housing facility. The actual group participated in protest activities on a much lower level than the hypothetical group.

It appears that the most significant issue in siting public housing facilities is the perceived risk that the facility brings to the community. Policymakers attempting to site a public housing facility in an area that has not previously experienced public housing, should also consider the socioeconomic status of the area, the concern of residents about the quality of their neighborhood, and the resident's previous political involvement. The offer of ways for the effected community to involve themselves in the process had little effect on the willingness of the community to accept the facility. It seems that concerns involving the risk the facility presents to the community outweigh the opportunity to become involved in the process.

The results of this study indicate that the policymaker should emphasize overcoming the perceived risk of the facility more than offering participatory tradeoffs. In the actual group, the perceived risk variable was the only significant variable influencing opposition. In the hypothetical group, the perceived risk variable was the dominant factor influencing opposition and could be the motivating factor for the other variables.

This findings of this study are limited by the relatively small sample size for the actual group (81) and by the fact that only five of the eleven variables (R^2 = .20) were significant (a better-specified model can improve the findings).

Additional research in this area should pursue the perceived risk finding. This variable has the most significant impact in the opposition to the siting of public housing facilities. The focus of additional research could explore methods that could overcome the perception of risk associated with public housing facilities.

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PART IV

ENVIRONMENTAL POLICY PLANNING AND ADMINISTRATION

STRATEGIC POLICY INNOVATION AND FLASH FLOOD HAZARD MITIGATION:

THE TULSA STORY

Mark Meo

Introduction

The story of Tulsa, Oklahoma's triumph over the recurring threat of flash flooding is a dramatic tale that has been discussed at several natural hazards conferences and workshops in recent years (e.g., Flanagan and Associates 1994; Hinkle 1994). Tulsa, which once was vulnerable to repeated devastation of homes, buildings, and loss of life, undertook a major effort to diminish the destructive power of episodic flood events in its Mingo Creek watershed. In the wake of the 1984 Mother's Day flood, which incurred losses of $184 million in damages and 14 lives, Tulsa adopted an innovative program that enabled the city, in partnership with the U.S. Army Corps of Engineers (ACE), to design and construct an award-winning flood control system comprised of a network of landscaped detention basins along Mingo Creek, organizational changes in city government, and land use reforms that has signaled an end to the city's constant flood worries while serving as a model program for the nation (Hardt 1994; Patton 1993; Patton 1994).

A less well-known aspect of the Tulsa story, however, is the role of the individual people who made the city's comprehensive stormwater management program possible. While the changes that arose in the wake of the record-setting 1984 flood command attention, less well known are the sequence of events and the leadership roles that key individuals played in them, which collectively contributed to the comprehensive policy foundation upon which future activities and accomplishments would stand. When, in retrospect, the disparate strands of individual actions are woven together, the evolution of Tulsa's flood control policy takes on the appearance of a complex strategy that ultimately found the right *policy window* to be put in motion. In light of the lengthy incubation period in which the flood control program matured, and the number of individuals whose actions contributed to the program now in place, it is instructive to examine cases such as Tulsa's to improve our understanding of the policy innovation process and the factors that contribute to its success.

In this paper, an argument is made that Tulsa's response to its flash-flooding hazard represents a strategic type of policy innovation. While a clear paradigmatic shift from reliance on structural flood control solutions to nonstructural ones is evident from the history, a careful reading of that history also reveals the concerted efforts of several key individuals to facilitate such a shift within the institutional, legal, and sociopolitical constraints surrounding them. The respective roles of these policy entrepreneurs will be examined to clarify the different steps and stages involved in the policy innovation process, and to make clear what differences exist between strategic approaches to policy innovation and other forms prevalent in the literature. In order to frame the argument, that literature is discussed in the next section. Following this, the historical evolution of the Mingo Creek flood control project is described in which the salient activities of the policy entrepreneurs are identified. Finally, the implications of the Tulsa case for policy innovation for wider application are discussed.

Strategic Policy Innovation

How innovation in public policy, or policy innovation, occurs has been the subject of a growing amount of scholarly interest in recent years for several reasons. First, the federal government has been actively promoting the devolution of many of its programmatic responsibilities to the states and municipalities without

concomitant resources. Moreover, municipal governments have been increasingly subjected to a variety of unfunded federal mandates, many of them environmental quality requirements, which obligate them to do more with less. In addition, federal funding for public programs has been precarious in recent years while urban problems have continued to mount. The growing trend toward the privatization of public sector functions, which has ushered in the need to foster workable public-private partnerships, has also placed a premium on an improved understanding of the policy innovation process. Finally, understanding policy innovation is central to the national commitment to develop a more sustainable society. Whether or not a truly sustainable society is even attainable in our industrialized world, an improved understanding of policy innovation and the factors that can guide it toward success will become more valuable to the local and municipal governments that are the locus of most sustainable development activities.

Kingdon (1984) and Polsby (1984) were among the first researchers to examine the general patterns of policy innovation in government. Kingdon's well-known argument that the conditions for innovation are optimal when the politics, problem, and policy streams converge at a *window of opportunity* has been applied by several researchers in a variety of policy contexts (e.g., Birkland 1997; Rabe 1986). While the notion of a window of opportunity has penetrated both the policy analytic community as well as the general public's vocabulary, Kingdon's characterization of the policy entrepreneur as a participant who motivates policy change had not received very much attention by analysts until recently. Polsby's characterization of policy innovations as either *acute* or *incubated* shed light on the distinctive difference between innovations that evolve relatively rapidly over time with limited information and few decision makers, such as the US reaction to the launch of the first Soviet satellite, Sputnik, compared to those that require a good deal more time to accommodate multiple decision makers, conduct technical studies, and become more widely accepted, such as the movement toward economic rationality (i.e., deregulation) that has become a growing trend in federal government programs.

More recently, Behn (1988) characterized his view of policy innovation as *groping along* since it best describes the trial-and-error approach that many agency managers experience in the uncharted and chaotic course of finding workable solutions to their problems. Behn suggests that managers have a clear sense of their agency's mission, but lack the time, resources, and stable environment necessary to develop comprehensive workable solutions. Rather, they grope along toward a solution, building experience, information, and momentum to attain their ultimate success one small step at a time. In contrast, Golden (1990) found that a *policy planning* approach better addressed the experiences she examined in several human service organizations. The policy planning model differs from groping along due to the former's need for existing legislation that structures the innovation process, the existence of a clear idea and a method of implementation, a greater emphasis on time allocated to planning, and the limited amount of change expected from the innovation. Another valuable contribution is Sabatier and Jenkin-Smith's (1993) development of an *advocacy coalition framework* that defines the conditions under which policy change and learning are most likely to advance. The ACF model captures the value orientation of advocacy coalitions and describes the role that scientific and technical analysis play in policy deliberation and debate, but it tends to slight the role of individual policy entrepreneurs in the policy innovation process.

The role of the policy entrepreneur has been addressed by several researchers, who suggest that the ultimate success of an innovation can be traced to the strategic actions that one or more entrepreneurs motivate in the course of an innovation. Deyle *et al.* (1994) studied the evolution of state coastal erosion policy and found that entrepreneurs were essential to the success of policy innovations in coastal management for several reasons. In the coastal setting, effective entrepreneurs understood the context of environmental issues and their policy relevance very well. They also understood the importance of technical expertise and studies that provided a sound scientific basis for assessing promising alternatives. While they acted in response to Kingdon's window of opportunity, they were also quite skillful in helping to open a window when needed. In their study of school vouchers, Roberts and King (1996) found that policy entrepreneurs were frequently drawn from a variety of occupations, interests, and backgrounds.

To advance understanding of the innovation process, Roberts and King (1996) developed a typology of entrepreneurs and applied it to their voucher study. They found that a policy entrepreneur could participate in an innovation at one or more levels of involvement, but that the degree of participation and the professional career status of the entrepreneur could be used to further define the role being performed. For example, policy intellectuals typically help to foster new ideas or alternatives. Policy advocates can help to advance new ideas but also develop them, sometimes through a prototype demonstration. Policy entrepreneurs (as Roberts

and King define the term) motivate new ideas, demonstrate them, and implement them. Policy champions do the latter two steps. Policy administrators simply implement the innovation. Further specification can be assigned if the entrepreneur is employed in government (policy entrepreneur), holds a leadership position (executive or bureaucratic entrepreneur), or is publicly elected to office (political entrepreneur).

A recent review of leading policy innovations in the U.S. was reported on by Altshuler and Behn (1997) who used the Ford Foundation's annual competition in *Innovation in American Government* at Harvard's Kennedy School of Government as a database. Among other findings, the authors identified a dozen impediments to innovation that impede or prevent entrepreneurs from attaining successful implementation. These impediments are categorized as accountability dilemmas (who is responsible for innovating?), paradigm dilemmas (how can we be innovative thinkers?), analytical dilemmas (how much analysis should be done?), structural dilemmas (how do organizations stimulate innovation?), replication dilemmas (how do we transfer an innovation?), and motivation dilemmas (who will innovate?).

Using the same database, Borins (1998) analyzed the key success factors for all of the finalists in the Kennedy School database. Concerning environmental innovations in specific, he drew the following conclusions. First, environmental programs are holistic; they increasingly involve systemic thinking about the management of entire ecosystems. Second, environmental activists can be a valuable resource and support to policy entrepreneurs. Third, policy entrepreneurs should rely on market mechanisms and user fees to support and enforce environmental programs. Fourth, environmental innovations tend to involve politicians and public servants in different ways, with substantial movement across bureaucratic and political arenas. Fifth, planning and policy analysis play an important role in the success of environmental innovations. This list is instructive for the Tulsa case, since it suggests that environmental innovations necessitate more scientific and technical analysis than other kinds of policy innovations. It also implies that success flows from the ability of entrepreneurs to cross organizational boundaries and be able to facilitate the interaction of political and nonpolitical actors.

In sum, the literature provides several insights into the conditions for successful policy innovations. Clearly, a variety of policy entrepreneur types must find ways to overcome impediments that are contextual and dynamic. In the case of environmental policy innovations, research indicates that a systems view blended with a variety of perspectives can foster useful alliances with advocates as well as strategies for program design, demonstration, and implementation. Knowledgeable policy entrepreneurs thus often behave in a strategic manner in the way they address these challenges. It is this blend of strategic actions that are observable in the innovation process that is referred to as strategic policy innovation.

Mitigating Flash-Flooding Hazards in Mingo Creek

Tulsa's history of flash-flood hazard mitigation closely tracks and intersects with the national flood control experience at many different points in time. Accordingly, it has been convenient for authors to frame the city's trials and successes with its flooding problem within the specific eras of flood-hazard management that characterize the national effort in general. Flanagan (Flanagan and Associates 1994) and Patton (1993) refer to these eras as: the Structural Era of Flood Control (1928-1966); the Regulatory Era of Floodplain Management (1968 - 1978); and the Nonstructural Era of Floodplain Management (1979-present). As it is for many federal, state, and local government policy innovations, the national context for flood control planning and management is important to understand the opportunities and constraints that confronted local policy entrepreneurs.

Expansion into the Mingo Creek drainage area began during the post-World War II suburban expansion in Tulsa. A second population boom occurred in Tulsa in the 1960s, leading to increased urbanization of floodplains. Despite repeated flooding of these floodplain areas in the late 1950s, development continued nonetheless. Arkansas River flood control was addressed upstream of Tulsa with the completion of the Keystone Dam by the Army Corps of Engineers in 1964. The Mingo Creek drainage area was annexed into the city limits in 1966. During the 1960s, the Mingo Creek watershed experienced one flood event every two to four years. Increasing urbanization of the watershed causes each flood to be worse than its predecessor due to greater volumes of runoff. At the national level, concern about the limitations of structural flood control techniques led to legislation (1960 Flood Control Act) and an Executive Order on Floodplain Management (EO 11296) that encouraged floodplain planning, technical assistance, and mapping.

In 1968, the passage of the National Flood Insurance Act ushered in a new era of floodplain management. That year in Tulsa, the landscape architect Ian McHarg pointed out to the city's leadership that it was locating its parks on high ground and its homes in the floodplains. McHarg suggested that the city adopt an approach that echoed its own 1924 plan by creating a network of linear parks that would serve the dual function of abating flood hazards and providing for a community trail system. This advice was not heeded.

The City of Tulsa experienced a series of severe floods along Mingo Creek in the 1970s. The first of these floods occurred on Mother's Day, 1970. Flooding along Mingo and Joe Creeks caused $163,000 in damages. Tulsa joined the emergency program of the National Flood Insurance Program (NFIP) later this same year. The following year, Tulsa joined the regular NFIP program. Tulsa promised, as a condition of joining these programs, to adopt a new standard based on a 100-year flood and new land-use regulations. The next major flood occurred four years later. Flooding in April and May 1974 resulted in damages totaling $744,000. A storm on June 8 that year resulted in flooding along Mingo, Joe, Fry, and Haikey Creeks and $18 million in damages. Mingo flooded for a third time in 1974 on September 19.

The devastation wrought by this series of events catalyzed citizen action. Carol Williams, a Mingo Creek flood victim, formed a lobbying group with other flooded residents named Tulsans for a Better Community. Despite their growing numbers, the lobby met stubborn resistance on the part of the city's leadership. The city had no flood management plan and little interest in developing one. After the September flood, Bob Miller traveled to Rapid City to study that city's floodplain acquisition program. Upon his return, he presented a slide show to the mayor that illustrated the feasibility of relocating homes (Patton 1993). By 1975, the city had designed and begun the Mingo Creek Improvement Project, a limited channel project that included a right-of-way clearance of 33 houses that would protect 700 homes from floods comparable to those experienced the previous year.

The Memorial Day flood of 1976 was the most severe flood to that date. Ten inches of rain fell in three hours causing floods along Mingo, Joe, and Haikey Creeks. This flood led to three deaths and $40 million in damages. More than 3,000 buildings were damaged. Once again, Carol Williams pressed the city to take action, including a floodplain acquisition program. With the help of U.S. Congressman Jim Jones, funds for acquisition were secured through Section 1362 monies in the flood insurance law. This approach later became national policy. Tulsans for a Better Community merged with the citywide Homeowners Coalition that was a more powerful advocate for change. After this flood, the ACE began working with the City of Tulsa to find a solution to the flooding problem that included 10 miles of channels and 23 upstream detention basins. In sum, the City of Tulsa implemented several innovations.

- A moratorium on building in the floodplain was enacted

- The first full-time hydrologist, Charles Hardt, was hired. Stan Williams was directed to draft city policies with regard to floodplains and development.

- The city was allowed credit or reimbursement by the federal government for Mingo Creek construction work undertaken since 1974.

The following year saw the implementation of a series of flood control innovations.

- Comprehensive floodplain management policies, regulations, and drainage criteria were developed.

- Stormwater detention regulations were enacted for new development.

- An early alert and warning system were initiated.

- Master drainage planning for all major creeks was begun.

- An earth change ordinance was enacted in 1978, giving the city control over alterations made to Tulsa's landscape.

The next major flood did not occur until eight years later. The Memorial Day flood in 1984 was the most devastating flood in Tulsa history. Fifteen inches of rain fell during the nighttime. The flood accounted for 14 deaths, 288 injured, 7,000 buildings damaged or destroyed, and $184 million in damages. Damages along Mingo Creek accounted for 69 percent of the total. In the hours following the flood, newly elected Mayor Terry Young organized a team comprised of himself, City Commissioner J. D. Metcalfe, Ron Flanagan, Charles Hardt, Ann Patton, and Stan Williams to assume the leadership of the city's largest and most innovative floodplain clearance and mitigation program. A paradigm shift in the city's understanding of how best to

reduce flood hazards was now clearly underway. The work of this initial Flood Hazard Mitigation Team effort led to the following results.

- Three hundred flooded homes and a 228 pad mobile-home park were relocated.

- A joint City of Tulsa and ACE detainment basin project was begun.

- The Department of Stormwater Management was created in 1985 that centralized responsibility for stormwater programs.

- A maintenance program that cleared silt and debris from major creeks and tributaries was started in 1985.

- A stormwater utility fee was established in 1985.

The City of Tulsa and the ACE realized that a comprehensive, regional, long-term strategy was required. The goal of the strategy was to prevent flood events through a combination of structural and non-structural measures. Partnerships with local, state, and federal agencies were part of the regional flood control strategy of the City of Tulsa. The Mingo Creek Local Flood Control Project was completed in 1999. These policy innovations transformed Tulsa from one of the most frequently flooded cities in the nation into one of the least.

Policy Entrepreneurs

The story of Tulsa's struggle with flooding documents the presence of a large number of policy entrepreneurs, each of whom made an important contribution to the ultimate success of the Mingo Creek project. The nascent strategy that the entrepreneurs developed was designed to draw several policy themes together in order to produce a more coherent and compelling flood control program. In the course of time, the entrepreneurs learned much from the city's painful experiences with flooding and began to deploy more ambitious strategies that necessitated the development of an effective partnership with the ACE, access to more federal resources, increased flexibility in existing city ordinances and enactment of new ones that would address the system-wide aspects of the problem, and greater organizational capabilities and technical expertise to deal with the flood hazard in an effective and responsible manner. To illustrate more clearly how the different elements of this strategic approach worked together, Roberts and King's (1996) typology of policy entrepreneurs can be used to identify the types of policy entrepreneurs who were engaged in finding innovative policies to resolve Tulsa's flood hazard dilemma.

Two individuals who played a pivotal role as policy intellectuals for the Tulsa entrepreneurs were Ian McHarg and Gilbert White. McHarg, whose nontraditional views on the relationship between the natural environment and the design of built systems are known worldwide, was invited to Tulsa to educate the city's leadership about alternative ways to reduce flashflood hazards. Gilbert White, who has been the leading intellect in the national movement toward non-structural solutions to flooding hazards for several decades, provided the necessary encouragement and information that helped to guide the policy entrepreneurs' overall strategy.

Since the context in which the policy entrepreneurs operated was fairly fluid, it is not unreasonable that many policy entrepreneurs would change their jobs and even their careers in the period under discussion. Therefore, the classification of the entrepreneurs is divided two ways to bracket the periods associated with the most significant flood events: the 1976 and 1984 floods.

Post-1976 Flood Policy Innovations

Several people qualify as political entrepreneurs due to their actions in this period. The first of these is U.S. Congressman James Jones. Jones was one of the key people involved in getting the Water Resources Development Act passed. This had the far-reaching impact of allowing actions that Tulsa undertook in flood prevention to count towards its share of federal flood control projects. This act would become very important in 1984 when the ACE received authorization to work on Mingo Creek. Other political entrepreneurs included Norma Eagleton, Patty Eaton, and Robert Franden, who built upon the work of former Commissioners Bill Morris and Sid Patterson. Eaton and Franden, who were elected as commissioners in 1976, influenced several of the innovations that occurred. They were responsible for declaring a moratorium on building in the floodplain, establishing stormwater detention regulations for new development, establishing new floodplain

policies and drainage criteria, and hiring Stan Williams and the first city hydrologist, Charles Hardt (Patton 1994). They also encouraged the implementation of a rudimentary alert and warning system.

No individuals qualified as executive entrepreneurs during this period, but three people did qualify as bureaucratic entrepreneurs because they held formal, but not leadership, positions with the state or the federal government. Dell Greer became involved in the 1970s as a representative of the Federal Insurance Administration (which later became part of FEMA). He worked with people in Tulsa who were interested in solving the flooding problem. Greer worked with interested Tulsans, including Ann Patton, to address the cause of the floods, which in some cases meant removing houses from the floodplain (Greer 1999). He became involved in 1974 and remained involved until the mid 1980s. Stan Williams and Charles Hardt were hired shortly after the flood. For the next few years, they were heavily involved in working on flood issues. Stan Williams worked on ordinances regarding the floodplains and development with Hardt (Hardt 1998).

Several people can be classified as policy entrepreneurs due to their involvement with the flooding issues and the fact that none held a position in government at the time. Ron Flanagan, a former city employee and planning consultant, offered his services to the flooded residents. Before 1974, Flanagan worked on city zoning and planning issues for developers (Flanagan 1998). Beginning in 1974, Flanagan became intimately involved in the flooding problem along Mingo Creek. Flanagan, who helped educate the flooded residents about floodplains, was one of the people calling for a new method of flood control in the Mingo Creek watershed. Ann Patton was an activist. Working as a newspaper reporter, she covered flood stories and addressed the causes of the floods and the possible alternative solutions that could be employed to mitigate them. The articles she wrote encouraged new ways of approaching the flooding problem. Carol Williams was also involved with the citizens' movement demanding that something be done. Williams' house had been flooded three times in the mid-1970s, which motivated her to become very active in citizen groups, including Tulsans for a Better Community. She played an important role in organizing these groups and in educating them about flood issues. Finally, J. D. Metcalfe, president of Standard Industries, was responsible for helping organize the Floodplain Symposium in 1976 and inviting Ian McHarg to lecture at this presentation. Metcalfe took an active role in the flooding issues.

Post-1984 Flood Policy Innovations

Several of the people identified as entrepreneurs in the post-1976 flood innovations also qualified as entrepreneurs in the post-1984 flood innovations. Their classifications have been changed due to the different roles they played in 1984 and afterward.

Terry Young and J. D. Metcalfe were both political entrepreneurs. Both Young and Metcalfe were newly elected as Mayor and Street Commissioner, respectively. They assumed office only 19 days before the 1984 Memorial Day flood. They were responsible for several of the more significant innovations that were implemented during that time. Mayor Young called Metcalfe the night of the flood and assembled the first Flood Hazard Mitigation Team, which was responsible for developing the mitigation measures put in place following the flood. Mayor Young decided to move those houses that had flooded repeatedly out of the floodplain. He also played a critical role in getting approval to use federal flood insurance money, combined with City of Tulsa monies, in the home buyouts.

In the aftermath of the flood, Young and Metcalfe continued their flood-prevention activities. Together, they were able to sell the public on the joint City of Tulsa-ACE plan for detainment basins. Young and Metcalfe were responsible for the creation of the Department of Stormwater Management (Pepple 1999). In 1985, they started a maintenance program that would clear debris out of major creeks. They also created the Stormwater Drainage Advisory Board (SDAB), a citizens' advisory board.

Four people qualify as executive entrepreneurs: Stan Williams, Neal McNeill, Charles Hardt and Michael Buchert because they occupied leadership positions. Stan Williams was hired as an assistant city attorney as part of the Flood Hazard Mitigation Team in 1984. He worked with City Attorney Neal McNeill, another entrepreneur, on figuring out ways for Tulsa to legally accomplish the goals that Mayor Young had set forward. Williams worked closely with Hardt and Flanagan on the detention projects as well as securing funds for homeowner buyouts. McNeill's biggest contribution was the legal support for a $2 per month stormwater utility fee, which was implemented in 1986 and assessed on every house and business in Tulsa. McNeill arranged the billing method so that the fee was taken out first; people were forced to pay the stormwater fee or else their water supply would be curtailed (McNeill 1999). Charles Hardt, who had been working for the Wright-

McLaughlin Water Engineering firm in Denver, was hired by the City of Tulsa as a consultant after the 1984 flood as part of the Flood Hazard Mitigation Team (Hardt 1998). He brought the engineering experience he gained in Denver to bear on the Mingo Creek problem to provide a measure of legitimacy to the various projects. Michael Buchert started working for the Tulsa District ACE office in 1977 on possible flood control measures for Mingo Creek, specifically detention basins (Buchert 1998). This work played a large role in the ACE's offer to conduct a joint project with the City of Tulsa.

Two people qualified as bureaucratic entrepreneurs, having formal, but not leadership, positions with the government: Ann Patton and Carol Williams. Patton played a number of roles in the Mingo Creek saga. In 1984, she became an assistant to Street Commissioner Metcalfe and served as a motivating force for other entrepreneurs. Flanagan (1998) stated that Patton "had the energy of ten people." Patton's most important role was with the media. It was because of Ann's writings and contacts with the media that much of the public became educated about proposed changes (Flanagan 1998). Patton subsequently took a formal administrative position with the Department of Public Works. Carol Williams also became employed by the City of Tulsa, where she worked on natural hazard mitigation and neighborhood development activities for the remainder of her career.

Ron Flanagan, a policy entrepreneur, began working with flood victims in the early 1970s. He left Tulsa in 1978 to work in Denver for a water engineering firm. Returning to Tulsa in 1984, he worked on the Mingo Creek project and was a member of the Flood Hazard Mitigation Team. His plans and designs played critical roles in the Mingo Creek project. Stan Williams remarked that Flanagan was one of those who stressed the multiple-use aspect of the detainment basins (Williams 1999).

Many people were involved with the project who did not qualify as entrepreneurs. This should not suggest that their actions and accomplishments are not important; it is just that they were not involved with as many aspects of the project.

Discussion

As one can see from the preceding discussion, the mix of policy entrepreneurs changed significantly from 1976 to the late 1980s. Interestingly, there is evidence that four of Roberts and Kings' (1996) categories of policy entrepreneurship remained active during both periods with one category, executive entrepreneurs, growing rapidly in number as the solutions to the Mingo Creek flooding problem took final shape. The classification of policy entrepreneurs also illustrates the network of skills and interests that were brought together from federal, state, and local sources to address the flood problem, as well as the strategy by which that network was used to motivate ideas and mobilize resources. This is a key lesson that the City of Tulsa has learned from its struggle with flooding and it has acted to incorporate this knowledge into its organizational structure through the creation of new city departments and targeted programs. Significantly, Tulsa has demonstrated its continuity in political entrepreneurship with the leadership and involvement of its current mayor, Susan Savage, in FEMA's initiative in natural hazards mitigation, *Project Impact*.

This case study well illustrates the fundamental difference between environmental policy innovations and other kinds of innovations. The Tulsa case affirms Borin's (1998) general conclusions about environmental policy innovations and reinforces Deyle's (1994) suggestions that environmental innovations necessitate a good deal more planning and policy analysis to reduce the relatively high degree of uncertainty that is systemic to environmental issues. The key to successful flash-flood hazard mitigation lies in its holistic, or drainage basin, approach that incorporates the essential administrative and managerial components needed to sustain the system. In view of this finding, it is not surprising that the city opted to develop a new organizational structure to address its perennial flooding and related environmental issues. In addition, the entrepreneurs worked quite well with environmental activists, several of whom were actively recruited by the city to implement the innovations. In addition, the stormwater utility fee was adopted by the city as a key user fee to support the effective management of the flood control program. Fourth, the case illustrates the significant degree to which politicians and public servants were involved, and the frequent, if not continuous, transboundary movements that they undertook within the city's administrative bureaucracy to get their innovations adopted and implemented. While political leadership was uneven and inconsistent, several political entrepreneurs recognized the important role that executive entrepreneurs played in the adoption and implementation of effective solutions, and elected to work closely with them, both in the short and longer term planning horizons. Finally, the level of planning and policy analysis undertaken by the city, the ACE, and numerous consulting

firms underscores the need for effective scientific and technical information to guide the design, development, and adoption of environmental policy innovations.

As a result of these attributes, a strategic approach, even one that is network-oriented, would appear to make a good deal more sense to policy entrepreneurs than to *grope along* in an attempt to motivate marginal changes that might ultimately prove to be ineffective. A strategic orientation also enables policy entrepreneurs to develop effective ways to address many of the impediments that would be expected to thwart an innovation. A review of the Tulsa story shows how most, if not all, of Altshuler and Behn's (1997) dozen impediments to innovation were successfully overcome. Lastly, the Tulsa story reinforces more general frameworks for understanding policy innovation while it illustrates the important contribution that strategic entrepreneurship makes to our comprehension of the overall process, particularly in regard to environmental policy and our future prospects for attaining a more sustainable society.

Acknowledgements

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BROWNFIELDS INITIATIVE IN OKLAHOMA

Rita R. Kottke

Introduction

In 1996, the Oklahoma State Legislature passed legislation instructing the Oklahoma Department of Environmental Quality (ODEQ) to create a new program to encourage the cleanup and redevelopment of idled or abandoned industrial properties, often referred to as "brownfields." Oklahoma law defines a brownfield as "an abandoned, idled, or underused industrial or commercial facility or other real property at which expansion or redevelopment of the real property is complicated by environmental contamination caused by regulated substances" (OS 27A §2-15-101 – 110). In general, brownfields can be thought of as properties that have lost commercial value due to the perception that they might be contaminated with hazardous chemicals. Examples of brownfields include former heavy industrial properties such as smelters and refineries, as well as smaller facilities like gasoline stations and dry cleaners.

It is important to understand why brownfields exist. Brownfields are byproducts of the environmental legislation passed in the 1970s and 1980s, especially the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA, also known as Superfund, 42 USC 9601 et seq.). Superfund and its amendments attach strongly binding liability to historical environmental contamination of soil, sediment, air, surface water, and ground water from hazardous substances. This liability for remediation is strict, retroactive, extended, joint and several. In accordance with the "polluter pays" principle, anyone who is in any way responsible for pollution, including those who held title to, leased, or deposited hazardous substances at a property, is potentially responsible for the entire cost of cleanup.

Many states also created state Superfund programs to deal with sites that did not qualify for federal CERCLA intervention. Though Oklahoma does not have a state Superfund law, it does rely on the state's nuisance law (OS Supp. 1991, 50 § 2–1) to force landowners to clean up hazardous wastes on their property. The Oklahoma Environmental Quality Act defines hazardous waste that is not being managed properly as a nuisance (OS Supp. 1996, 27A § 1-3-101 et seq.).

These Superfund remediation programs have had unpleasant side effects, however. In the rush to find sites that most threatened public health and the environment, thousands were investigated throughout the United States; few qualified for inclusion on the National Priorities List (NPL). Though 836 sites have been investigated under Superfund in Oklahoma, only 13 have been added to the NPL (40 CFR 300 Appendix B).

The apprehension caused by the assumption of environmental liability associated with the acquisition of contaminated property created a brownfields policy dilemma. Financial lending institutions and title companies, worried about liability should they foreclose on contaminated property, began to require that "due diligence" be performed on all property transactions. Environmental site assessments became common as buyers and lenders investigated whether industrial or commercial activities may have produced contamination. These assessment data were added to the US EPA's CERCLIS (CERCLA Information System) database, which lists all sites that have been investigated under Superfund. A property's inclusion on CERCLIS, however, raises a red flag to lenders, buyers, developers, and insurers that could halt economic transactions and redevelopment. In response, many companies mothballed their

industrial facilities, preferring not to expose them to assessment and therefore not cause their listing in CERCLIS and subject them to stigmatization that could block economic investment. A dilemma is created by such stigmatization however because unremediated properties cause both a public health hazard to and an economic hardship on host communities.

Abandoned, vandalized industrial properties in urban cores attract vagrants and criminals and are attractive nuisances to local children. They present safety hazards as well as chemical hazards to trespassers. Over time, the facilities come to represent a visible symbol of hopelessness. Other social costs associated with brownfields may include loss of employment opportunities; erosion of the community's tax base; under-utilization of community infrastructure (e.g., roads and sewers) built by the community to serve the industry; costs associated with the construction of new infrastructure to the suburban locations of new industry; and costs associated with urban sprawl.

In addition to the economic problems presented by brownfields, environmental problems may lay undiscovered. Contaminants may slowly leach into the soil and water, or volatilize into the air, and containers and tanks may fail allowing their contents to escape. Though brownfields that currently are lightly to moderately contaminated sites and do not warrant NPL listing, long-term inattention and deterioration could cause risks to increase and threaten surrounding communities – eventually causing them to qualify for NPL status.

The inability of communities to redevelop former industrial properties presents a special problem for large metropolitan areas located in the "rust belt" that already face chronic economic problems from the migration of business to "Sunbelt" states. In many cases, the only impediment to redevelopment of industrial sites was CERCLA liability for site remediation.

With encouragement of Northeastern states, EPA began to examine what could be done within the confines of CERCLA to ease the problem of brownfields. EPA responded with a clarification of its policies concerning environmental liability and the provision of assistance to states, tribes, and cities to empower these governments to establish brownfields programs that would meet the needs of the local community. One of these grants was made to the Oklahoma Department of Environmental Quality to fund its efforts to establish a brownfields program for the State.

Oklahoma Brownfields Program

Oklahoma is not a typical brownfield state. Unlike many heavily industrialized states, Oklahoma is geographically large with an excess of undeveloped land that is attractive to developers. Although much of Oklahoma's historical industrial development occurred in the two large metropolitan areas (Oklahoma City and Tulsa), many other industries were located in small towns across the state. Their growth was fueled and sustained by these industries; thus, they suffered serious economic damage when the industries closed. Therefore, the need to find a way to redevelop brownfields properties while at the same time protect the health and safety of her citizens, is particularly acute in Oklahoma.

In June 1996, the Oklahoma Brownfields Voluntary Redevelopment Act (OS Supp. 1997, 27A § 2-15-101 – 110) was enacted, directing ODEQ to develop a brownfields program for the state. In its brownfields grant and cooperative agreement with Oklahoma, EPA stressed the need to incorporate meaningful public input into the brownfields decision-making process. This position was echoed in the requirements for an EPA-State Brownfields Memorandum of Agreement (MOA).

To ensure that the public was provided meaningful opportunities for input into program development, the ODEQ Site Remediation Section conducted a study that incorporated participatory policy analytical methods. The major objectives of the study were to incorporate a broader method of public participation into the evolution of the program; gain information that would help concentrate ODEQ's program activities in an efficient manner; ensure that ODEQ addressed the actual issues faced by stakeholders; and ensure that tax dollars, as well as future private investments, were spent wisely.

Brownfields redevelopment presents a challenge for ODEQ, whose historical task was to protect human health and the environment. Because environmental decision-making is characterized by scientific and technical complexity, agency decision-makers' training and education had focused on the natural and

applied sciences. However, the issues associated with brownfields redevelopment involve much more than health and environmental protection. At their core, brownfields involve primarily real estate transactions that have environmental and community acceptance issues attached to them. Although the environmental problems represent only a portion of the problems interfering with the reuse of a property, the decisions made during the assessment and cleanup of the property determine the future use of the site. It is important that the environmental decision-maker understand all of the ramifications of cleanup and reuse of the site to ensure that all contingencies are addressed. This expanded agenda, was a primary trigger for stakeholder involvement in the development of Oklahoma's program for the cleanup and redevelopment of brownfields.

Methodology

ODEQ recognized that it needed to understand stakeholders' views on a plethora of issues surrounding the reuse of contaminated sites. A formal research project was launched that incorporated naturalistic inquiry, Q methodology, and the "synoptic normative theoretic framework for legitimated environmental decision-making" (Focht 1995a) to inquire into stakeholder concerns and preferences regarding brownfields redevelopment.

ODEQ drew from previous stakeholder research to design and implement a process that would encourage communication and understanding among the stakeholders and that would help ensure that agency decisions involving brownfields would be viewed as legitimate and trustworthy by the public. Public trust is integral to the redevelopment of brownfield sites because the public is relying on the ODEQ to ensure that hazards are removed and that the redeveloped site is safe, and because the redevelopment will fail without the support of the community.

Focht's (1995) dissertation, *A Heuristic Political Inquiry into NIMBY Conflict: Exploring Solutions To Gridlock,* provides an outline for incorporating stakeholder input into environmental decision making, it also introduces his framework for legitimated environmental decision-making that provides a guide to interpreting stakeholder input as it relates to future agency actions. It prescribes solutions and strategies to improve decision acceptance that fits the context of the policy problem. The framework posits three elements of the decision problem that must be identified before defining a decision-making strategy: the substantive criteria that should be considered in decision-making, the role of government in policy formulation, and the implementation processes that should be used to carry out a program.

To help frame the context of brownfields redevelopment in Oklahoma, stakeholders were interviewed using naturalistic inquiry methods and Q Methodology. Using these methods, ODEQ endeavored to develop a holistic view of the brownfield issue in Oklahoma. ODEQ reviewed various position papers issued by interested organizations and conducted extensive interviews with interested stakeholders across the state. To identify stakeholders, ODEQ issued an announcement of the opportunity to participate in the study and allowed interested parties to identify themselves; this was done to avoid ODEQ-selection bias in the identification of participants. Participants represented environmental groups, industries, city governments, county governments, state regulators, the public, economic development organizations, the legal profession, small business, educators, neighborhood associations, environmental consultants, financial institutions, church groups, and Native American tribes. The interviews were conducted using an open-ended format designed to facilitate an unbiased, conversational elicitation of stakeholders' knowledge, views, concerns, experiences, and preferences surrounding brownfields issues. Although stakeholder interviews indicated substantial agreement on many issues associate with redevelopment of contaminated property, their relative importance varied (Kottke 1998).

Stakeholder perspectives on brownfields were revealed using Q methodology. Q methodology supplies a "quantitative means for examining human subjectivity" (McKeown and Thomas 1988:7). The open-ended interviews were audiotaped and later transcribed. A concourse ("the flow of communicability surrounding any topic" (Brown 1993:94)) of statements reflecting the full range of brownfield issues and positions were extracted from the interview transcripts and prior position papers.

A subset of statements (the Q sample) was drawn from the concourse to "provide a miniature which, in major respects, contains the comprehensiveness of the larger process being modeled" (Brown 1993:99).

The Q sample was selected using a 5 x 6 factorial design (policy issues x stakeholder interest). Issue categories were (1) environmental/health issues; (2) economic development; (3) oversight/control; (4) trust; and (5) justice. Interest categories were (1) economic development; (2) community/ public welfare; (3) regulatory; (4) technical; (5) environment protection and justice; and (6) financial. Two statements per cell in the factorial design were selected using the principle of heterogeneity, i.e., statements that were most different from one another within the same cell were selected to ensure comprehensiveness among the sample statements. Two additional statements were added later to the Q sample to maximize its comprehensiveness (Kottke 1998). The 62 statements and their associated factor scores are presented in the results section of this paper (see Table 3).

The Q sort allows a person to model his or her view of an issue (McKeown and Thomas 1988; Stephenson 1953) by rank ordering the Q sample statements relative to their preferences and based on a specific condition of instruction (McKeown and Thomas 1988). A P sample (set of respondent participants) was selected from the original interviewees and additional stakeholders that were identified during the study. Participants were purposively selected to reflect the full range of representative perspectives (Focht 1995a) – a "set of persons who are theoretically relevant to the problem under construction" (Brown 1980:192). Table 1 outlines the demographic characteristics of the P sample.

Table 1

Demographic Characteristics of the P Sample

ID#	COUNTY RESIDENCE	AGE	RACE	SEX	OCCUPATION	STAKEHOLDER GROUP (SELF ID)
01	Tulsa	27	Cauc.	M	Community Developer	Business Association
06	Cleveland	28	Cauc.	F	Civil Engineer	Prospective Purchaser
07	Garfield	45	Cauc.	M	Economic Developer	Property Owner, Municipal
10	Canadian	46	Cauc.	M	Environmental Manager	Environmental Consultant
13	Lincoln	59	Cauc.	M	Economic Developer	Municipal
18	Oklahoma	42	Cauc.	F	Toxicologist	Property Owner
19	Kay	48	Nat.Am.	F	Community Developer	Municipal
21	Cleveland	43	Cauc.	M	Waste Management	Property Owner
22	Tulsa	66	Cauc.	M	Dry Cleaner	Property Owner, Environmental Group
23	Stephens	54	Afr.Am.	M	Sales, City Council	Municipal, General Public
26	Kay	39	Cauc.	F	Video Producer/Farmer	Environmental Justice, Property Owner
31	Oklahoma	53	Cauc.	F	Epidemiologist	State, Property Owner
32	Cleveland	57	Nat.Am.	F	Public Health	State, Property Owner
33	Canadian	28	Cauc.	M	Environmental Specialist	State, Property Owner
34	Canadian	60	Cauc.	M	Hydrologist	State, Property Owner
35	Oklahoma	40	Cauc.	M	Environmental Specialist	State
36	Cleveland	42	Cauc.	M	Environmental Manager	State
37	Oklahoma	46	Cauc.	F	Hydrologist	State
38	Oklahoma	53	Cauc.	F	Environmental Attorney	State
39	Oklahoma	45	Cauc.	M	Public Information Officer	General Public
40	Jackson	56	Cauc.	M	City Official (retired)	Property Owner, Municipal
41	Oklahoma	42	Cauc.	F	Psychologist	General Public, Potential Purchaser
42	Kay	62.	Cauc.	F	Registered Nurse	Environmental Group, Property Owner
43	Oklahoma	39	Cauc.	M	Geologist	Municipal
44	Kay	46	Cauc.	F	Homemaker	Environmental Group, Property Owner
45	Pittsburg	61	Cauc.	M	School Superintendent	Developing a Brownfield Site
46	Oklahoma	43	Nat.Am.	M	Transportation Planner	State

47	Oklahoma	33	Cauc.	F	Environmental Specialist	State
48	Logan	48	Cauc.	M	Environmental Engineer	Property Adjacent to Brownfield
49	Tulsa	56	Cauc.	F	Land Investor	Environmental Group, Property Owner
50	Tulsa	47	Cauc.	F	Financial Advisor	Environmental Group, Property Owner
51	Logan	40	Cauc.	F	Environmental Specialist	State
52	Tulsa	62	Cauc.	M	Real Estate	Broker, Property Owner
53	Oklahoma	45	Cauc.	M	Banker	Lending Institution
54	Oklahoma	43	Cauc.	F	Environmental Consultant	Utility Industry
55	Jackson	48	Nat.Am.	F	Housewife	Property Adjacent to Brownfield
56	Jackson	65	Cauc.	F	Retired	Property Adjacent to Brownfield
57	Oklahoma	59	Cauc.	M	Real Estate	Property Owner

Participants were asked to sort the 62 statements in the Q sample with this condition of instruction "Considering the issues involved in the redevelopment of contaminated properties, also referred to as brownfields, what are your views on the following statements?" ranking the statements as to "most representative of my view" to "least representative of my view" (Kottke 1998). The sorting was performed on a form board containing 62 cells in the shape of a quasi-normal distribution. Each statement was printed on a card and the cards were placed onto the cells on the form board. The use of the quasi-normal distribution is designed to force participants to identify which of the statements are most salient to them (either positively or negatively) and which are least important, assuming that most statements generate less meaning or ambivalence to the participant.

Results

The Q sorts were recorded, coded, and factor analyzed. "Factor analysis is fundamental to Q methodology since it comprises the statistical means by which subjects are grouped – or, more accurately, group themselves – through the process of a Q sorting" (McKeown and Thomas 1988:49). What is accomplished by factor analysis is that it readily discloses patterns in the data; this is especially important when the correlation coefficient matrix is large and the patterns are not readily apparent. The data were factor analyzed (principal components method) and varimax rotated to maximize the explained variance on each factor, ensuring that each factor is most easily distinguishable from the others (Focht 1995a). A five-factor solution was initially selected with a minimum eigenvalue of 0.9 and bipolar splitting criterion of 30%. One factor proved to be bipolar; therefore, six factors were retained for interpretation. These six factors represent separate and divergent views of the varying issues associated with brownfields redevelopment. Table 2 presents the re-ordered factor score matrix for the five-factor solution, which resulted in six factors after splitting and varimax rotation, as well as the communalities and purities of the loadings. The interpretation of the data was accomplished through a comparison of the individual Q item factor scores (z-scores) and factor structure. Table 3 presents the factor z-score array for the statements, which is used to interpret the perspectives represented by each of the factors.

Factor Interpretation

In examining stakeholders' views, it is important to identify their judgments of the degree of controversy and the relative importance of issues associated with brownfields cleanup and redevelopment. The absolute magnitude of the z-scores indicates the saliency of the item to those individuals whose sorts loaded highly on that factor. In contrast, the items with a score near zero have little saliency for the respondent (Focht 1995a). "By examining the structure of each common factor alone and in comparison with other common factors, and relying on other information obtained during the research...the investigator can propose explanations of the Q sorts" (Focht 1995:139). Brief interpretations and descriptive labels of these perspectives are provided below. The author validated these interpretations by re-interviewing the highest and purest loaders on each factor to confirm the validity of the interpretations and their agreement with perspective labels.

Table 2

Re-Ordered Factor Matrix

STAKE-HOLDER ID #	FACTORS					COMMUNALITY	PURITY
	A	B	C	D	E		
Factor A							
31	.649	.007	.085	.061	.056	.436	.968
38	.678	.090	-.014	-.001	.197	.507	.907
21	.675	-.166	-.058	-.055	-.133	.508	.898
36	.581	.071	.221	-.040	.026	.393	.858
01	.657	-.149	.200	.210	.150	.561	.770
18	.728	-.337	-.021	.141	-.193	.701	.756
39	.456	.004	.277	-.015	.198	.324	.642
54	.539	-.340	.245	-.039	-.070	.473	.614
07	.629	.132	.412	.110	-.295	.682	.580
37	.318	.235	.055	.074	-.128	.182	.558
06	.495	-.353	.134	.000	.292	.473	.518
52	.331	-.307	.249	-.073	.039	.273	.402
33	.431	-.076	.403	.067	.342	.475	.390
Factor B							
26	-.070	.682	-.080	.040	.055	.482	.967
44	-.164	.766	.033	-.007	.036	.616	.952
50	.057	.777	-.070	.080	.168	.647	.934
42	-.196	.739	-.112	.131	-.171	.644	.849
49	-.120	.681	-.202	.091	.257	.594	.782
41	-.042	.549	.100	.324	-.301	.508	.593
Factor C							
19	-.120	-.063	.645	.159	.018	.460	.905
47	.165	-.064	.454	.057	-.100	.250	.822
53	.104	-.121	.522	.085	.216	.352	.774
10	-.013	-.176	.405	.139	.106	.226	.727
57	.176	-.296	.559	-.044	-.083	.440	.710
43	.383	-.018	.617	.058	-.153	.555	.686
22	.219	-.195	.406	.115	.032	.265	.622
35	.234	.018	.534	.352	-.237	.520	.548
13	.142	.393	.503	.085	-.191	.471	.537
32	.235	.428	.442	.021	.051	.437	.448
48	.071	.301	.328	-.221	.038	.254	.423
Factor D							
55	.001	.070	.105	.947	.083	.919	.975
56	-.007	.112	.140	.924	.047	.888	.961
23	.126	.095	.029	.318	-.137	.145	.694
40	.154	.050	.187	.347	-.239	.239	.504
Factor E							
51	.083	.046	-.095	-.036	.609	.390	.951
45	.201	-.128	.006	.171	-.437	.277	.690
34	.229	.128	.110	.354	.519	.475	.567
46	-.092	.388	-.067	.272	-.431	.424	.439

Table 3

Brownfields Q Sample and Associated Factor Scores

#	STATEMENT	A	B	C	D	E	F
1	I think there is a distrust of policy. There's the sense that policy can change from one administration to another.	.0	.4	.6	1.6	1.8	.4
2	My concern is that many chemicals have not been fully tested for their effect on human health – so how can you set standards that are protective of human health?	-.7	.8	.1	1.6	1.2	.9
3	Offering incentives for cleaning up brownfields isn't fair to companies who have already come forward and cleaned up their mess.	-.9	-.4	-1.3	-1.0	-1.4	-1.8
4	My fear is that the property will not be properly taken care of for the foreseeable future.	-1.3	.3	.4	-.3	-.5	1.1
5	In looking at brownfields redevelopment you need to consider whether the new venture will be accepted by the community.	.7	-.5	1.3	-.6	1.0	.0
6	You can have a public meeting, but most people won't pay any attention until the dirt is being moved.	.5	.2	-.2	.6	.2	.7
7	It is better to clean up part of it than none of it.	1.5	.1	.6	-2.0	-.1	-.7
8	My gut instinct is that once a site has been contaminated, it will never be totally clean.	-.8	1.1	-.7	-1.7	-1.6	.7
9	I don't think you can go in and clean up a part of a site and use it—all the contamination problems at the site should be fixed.	-1.9	.0	.1	.9	-1.7	.7
10	Certificates of Completions should be legally binding agreements. I would not enter into an agreement if the government reserves the right to "change" its mind and reopen the site.	-1.3	-1.2	2.3	-1.0	.7	-.9
11	If you start creating too much oversight of these cleanups, you are going to provide disincentives for redevelopment.	-.3	-.8	.1	1.0	.3	-1.8
12	In a state like Oklahoma where people think there is more land to use up, anytime you want to reclaim an area that has already been used, you are not on a level playing field.	.3	.1	-1.2	-.4	.6	-2.5
13	At some point in time, there may be a need to consider economic issues or redevelopment of these sites, but I don't think that is DEQ's function.	-1.4	-.7	-.8	.0	1.1	-.9
14	We tend to overdo things in the environmental area. We might have a site that is presenting relatively minimal danger to people and the environment and yet spend millions of dollars cleaning it up.	.7	-1.1	-.7	.9	1.5	-1.1
15	Contamination is only a minor part of the problem — there are a whole host of reasons for the reluctance to invest in older urban areas.	1.9	-.3	.8	.6	1.2	-.2
16	I don't thing that the public's opinion about what we do with our site is relevant unless they want to pay some of the costs.	-1.0	-1.8	-2.5	-1.7	.0	.4
17	Real estate transactions, irrespective of the Brownfield issues, must make sense from a business perspective. Developers won't participate just to be good citizens.	.9	.2	1.7	-.1	1.0	-.9
18	I think that public comments are often just recorded and added to a document rather than evaluated an responded to.	-1.2	.9	-.7	-1.0	.8	-1.1
19	I don't trust business anymore than I trust government, to be real honest with you.	-1.5	1.5	-1.7	.1	.5	-.2
20	I feel that ODEQ will look out for the interests of the community and the people whose lives, on a daily basis, are affected by a site and its cleanup.	1.6	-1.7	.5	1.7	-1.6	1.8
21	I don't have a problem with public participation — as long as the public is not from someplace else.	.2	-1.4	.2	.0	-.2	.0
22	These sites need to be handled with some degree of finality, so that so that the next generation does not have to worry about them.	1.2	1.1	1.6	.4	.3	1.8
23	Providing economic incentives for the cleanup of these sites gets political— there's not enough money to do it for everybody, so then how do you justify doing it for some?	-.5	-.4	.3	-.1	-.2	-.5
24	Most risk-based assessments are very conservative, and so if you get an answer that's safe, then it is probably safe.	1.2	-2.2	.4	-.4	-1.4	1.1
25	Usually, the State is so tickled to attract new industry that it pays for all the new infrastructure needed to develop greenfields.	.3	.2	-.3	-1.3	.0	.0

26	Business interests should be able to clean up sites voluntarily with guidance rather than under consent orders.	.8	-.4	-.4	-1.6	-2.3	-.7
27	I think it needs to be real clear to companies that the state regulatory agency has the ultimate authority to say what is going to happen at the site.	.6	.9	.1	1.4	1.1	.9
28	They (the government) are going to have to give a company some kind of incentive to come in and set up a business on contaminated land over non-contaminated land.	1.0	-1.0	1.5	.3	-.6	-.9
29	I'd say that the program doesn't work if you have to add financial incentives.	-1.4	.0	-1.0	-.7	-.8	.9
30	I think some people see brownfields as a way to skirt or get around some of the cleanup requirements that are currently in existence.	-.5	.4	-1.8	-.7	1.2	.9
31	For the purpose of environmental cleanups, DEQ should establish criteria to define whether an aquifer is usable or not.	.9	-.4	1.1	-.3	-.3	1.3
32	During traditional public participation, I worry about the vocal few getting their way over the rational group.	.6	-1.0	.8	.7	.3	.9
33	I would say that the state needs to cross check the information businesses submit. Self-monitoring reports can be fiction.	.3	1.7	.4	1.0	.1	-.2
34	The state of the art solutions that we put in place today, we will find inadequate in 10 to 20 years.	-.4	1.4	-.5	-.7	1.0	.7
35	It would seem like a fine thing if, after a site was remediated to some standard, we forget that it was a bad place. Isn't that the idea — to do something so that we don't have to worry about it anymore?	.2	-1.4	-.3	1.3	.1	-.4
36	Often, regulatory agencies are not sensitive to the various costs of their decisions.	1.1	-1.3	.9	-1.6	.7	-.9
37	The big picture is that the reason we need a Brownfields program is that the previous approach didn't work. The brownfields program is just another governmental program put in place to deal with issues caused by another governmental program.	-.8	.3	-1.4	1.1	-.3	-.2
38	Risk Assessments are at best biased and imprecise estimates of actual risk.	-1.6	1.6	-1.0	.3	-.5	-.2
39	I think there's two reasons people attend public meetings: one, some people are legitimately concerned; and the other one is greed—people looking for opportunities for third party lawsuits.	-1.1	-1.2	-1.2	-1.0	.9	.9
40	It's my feeling that we don't always do a good job protecting property rights in this country.	-.8	.3	-.5	-.7	-.1	-.2
41	If we now say that some degradation is acceptable for certain sites, the incentive to prevent pollution could be drastically undermined.	-1.3	-.3	.0	-1.4	-2.2	1.6
42	DEQ's job is to protect human health and the environment, not to protect property values.	.3	1.8	.4	1.8	1.4	1.1
43	In a brownfields program, I think that the best benefit would be reaped from using industrial properties for industrial purposes, and nothing else.	.8	1.6	-.7	-1.3	-.5	.2
44	I don't like the idea of leaving on site wastes that still have the ability to contaminate. If a company is going to be allowed to leave something on site, then I think they should not be relieved of any liability.	-1.9	1.1	1.5	2.0	-.9	.9
45	My feeling is that if you clean up the surface and ignore the ground water, the public perception is that the site is clean, when in reality, there is still contamination.	.5	1.5	1.0	1.0	-1.1	2.0
46	DEQ has a problem with never seeming to be able to fine anybody or punish anybody. It makes me wonder, if a business violates its Certificate of Completion, is anything going to happen to them? Will DEQ enforce?	-.9	.8	-1.0	.0	1.7	-1.3
47	Superficial cleanups transfer risks and costs to future generations in order to suite the convenience of today's political constituencies.	-1.1	1.8	-1.1	.6	-.3	.7
48	There is a perception that environmental groups are supposed to watch out for the public interest—I thought that was the State's function.	-.7	-.4	.5	-.4	.1	-2.0
49	Native people cannot just sell out and move away from contamination. Their homeplace, their lands are not something you can give away, get rid of, or exchange. Ancestral lands are forever.	.0	1.3	.8	.3	.2	-1.4
50	Brownfields transactions are not environmental actions. They are real estate deals, which have environmental concerns. If the brownfield is in a good location from a realty viewpoint, it will be redeveloped – with or without a State environmental agency's program.	.0	-.3	-.2	-1.4	.7	-.5

51	The general public needs to start understanding that they are going to have to accept some risks if they want to live in a society that's the industrial level that we are at – people are going to have to start accepting risks.	1.3	-1.7	-.5	.2	.8	.9
52	My view on property rights is that there is a social responsibility tied to it.	.7	1.2	.4	.7	-.7	1.1
53	I think the city needs to be involved with the entire process of a brownfields redevelopment since they have to live with the outcome.	1.9	.1	1.8	.4	-.1	.2
54	A small town's ability to set zoning, enforce zoning, is extremely limited. I would have to faith in their ability to do it properly.	-.7	-.1	-2.3	-.6	-1.6	.4
55	Brownfields certificates should have some contingency so that DEQ could have a way, if need be, to do something about any problem that might occur later on. I think you've got to have the right to go back in and look at the situation.	-.2	.6	.9	-.6	-.8	.2
56	There should be legislation where the State holds the adjacent property owners liable for any contamination on their property if they refuse access to a company that is trying to clean up a problem.	.5	-.8	1.0	1.6	-1.1	-.2
57	Financial institutions have often been blamed for not providing capital for brownfields transactions; however, people need to understand banks must adhere to the dictates of federal and state banking regulations regarding their lending practices and credit risk appetite.	1.1	-.3	.5	.0	.9	-1.1
58	The big pressure to continue through on a project will come from the lending institutions...you're going to find that they're the ones that have far more effect on the situation than the state agency does.	.1	-.7	.5	-1.0	-1.5	-1.6
59	Always requiring closure to go back to a background level is unrealistic, and there simply is not enough money to do that. We need to start getting realistic about this.	1.4	-.8	-.7	-.4	.6	-.9
60	A participant ought to be able to change his mind because he may find that after investigating the site that his redevelopment plan is unfeasible.	.8	-.2	.1	1.0	1.4	.2
61	I would not like to be in the position of having to defend some of the risk assessments to the public because I think there is a real potential for misunderstanding and misuse of some of the information.	-.7	-.3	-.5	.3	-1.2	.0
62	No lender is obligated to or should be pressured to make a brownfields loan that does not meet normal credit quality standards for similar non-brownfields loans.	1.3	-.3	.3	.1	.2	-.5

Technical Optimists. These stakeholders feel strongly that the contamination issue is not the only reason brownfield sites are not being redeveloped and that communities, to a great extent, control which areas in their jurisdiction are developed. Therefore, they believe that communities should be involved throughout the brownfield redevelopment process, both as a consultant and as an equal partner with local government. Technical Optimists do not question the motives of people/groups with whom they interact; they trust the actions and motives of ODEQ, business interests, and the public. They believe that brownfield sites can be cleaned for reuse without having to remediate the site to background levels and they believe that the participating company should receive a release from liability as long as the remedy functions properly and is maintained. They believe that ODEQ must reserve the right to reexamine brownfield sites in the future; however, sites should be fully addressed so that closure has a degree of finality. They further believe that risk assessments are effective tools for estimating actual risk and that risk assessors use professional judgment appropriately throughout the risk assessment process. They believe that economic issues are central to the brownfield problem and ODEQ should be sensitive to how its actions affect both cleanup and redevelopment. Technical Optimists can be characterized by their optimism that science and technology can solve the problems attending brownfield sites.

Wary Environmental Stewards. These stakeholders do not believe that they or future generations should have to accept health and environmental risks from industrial contamination; current generations, as responsible caretakers, should minimize risk exposure to future generations. They see themselves as speaking for those who do not have a voice, i.e., future generations, non-human species affected by the actions of man, and people with extenuating circumstances who cannot speak for themselves. Wary Environmental Stewards believe that ODEQ's function is to protect human health and the environment rather than the costs of meeting that objective. They are skeptical of ODEQ's motives and question its willingness to act in the public's interest. They object to government's and businesses' denigration of public apprehensions as irrational and emotional. They have little faith in risk assessments as effective

tools for estimating actual risk and believe that there is great potential for abuse of risk assessment by decision-makers. They oppose allowing unlimited use of brownfield sites and believe that these sites should remain industrial. Moreover, they believe that these sites should be tracked to ensure that they are not rezoned for any use other than industrial.

Economic Realists. These stakeholders believe that business and economic issues should constitute the main focus of brownfield redevelopment since, in their opinion, brownfields are actually local real estate issues and not environmental issues. Once a site has been remediated with State oversight, it should be released from any future environmental liability for historical contamination. They do not believe that the State should reserve a right to reexamine the site in the future because this is a major disincentive to any business willing to redevelop the property. They strongly believe that communities should be involved in decision-making for brownfield projects because the community "has to live with it" and will be ultimately responsible for the success or failure of the economic redevelopment. A community's private sector has a great interest in ensuring that local properties are remediated, reused, and maintained, and that this interest should be recognized by the State and Federal government as well as the public. Economic Realists can be characterized by what they feel is a realistic approach to the brownfield problem. They believe that if the environmental liability problems associated with a brownfield site are removed through a State supervised cleanup, economic forces will be allowed to function properly and the property will again be productive – though they voice concern about third party lawsuits and a legal system that is "out of control." They also predict that only sites of economic importance will be "voluntarily" cleaned.

Concerned Neighbors. These stakeholders believe that the major brownfields issues are human health and how these sites affect their families. They have faith that the State government will safeguard their welfare, although they are wary of EPA and sometimes of their own local governments because of the latter's predominant interest in economic development. They believe that the State is responsive to their concerns and fairly addresses them. However, business and industry does not disclose information about the heath effects of their operations and these might adversely affect the health of employees and the public. This distrust extends to businesses' motivation to properly remediate brownfield sites. They have faith in technology but are concerned that science does not have all the answers; therefore, they do not support partial cleanups or State's signing away its right to reopen a site for further cleanup in the future. They prefer that sites be fully remediated so that unrestricted use of the property is permissible and the community can then "move on."

Realistic Reformers. These stakeholders believe that ODEQ has an obligation to protect human health and the environment and that it often fails to fulfill this obligation. They believe that the legislative politics involved in keeping an agency afloat are behind many of ODEQ's decisions and that its desire to keep that fact hidden is responsible for much of the public's distrust. They are concerned about risk assessment and its ability to estimate actual risk and are equally concerned about the ignorance by many regulators of the inherent problems associated with risk assessment. This does not mean that risk assessments have no role in decision-making; rather decision-makers should not place too much faith in them and instead use them as simply another analytic tool. They also believe that too much money is spent on environmental cleanups; it is unlikely that brownfields could ever be restored to pristine condition. Instead, such sites should be reused without full remediation. Realistic Reformers believe that communities should be involved in the decision-making concerning brownfield cleanup and redevelopment since it is the community, and not the State, that will be most directly affected by the success or failure of the redeveloped property. Finally, Realistic Reformers believe that there is a need for fundamental reform in ODEQ's policies, but bureaucratic constraints will limit the reforms that are possible.

Environmentally Concerned Citizens. These stakeholders are not concerned with the economic issues involved in cleaning up brownfield sites and they do not feel that ODEQ should consider the costs of cleaning up brownfield sites; they should be cleaned at any cost. They believe that "we can't help what our ancestors did; if it needs to be cleaned up, we should do it"; there should be no argument about who is responsible and who should pay. They believe that since technology is available to remediate contaminated sites, it the duty of the current generation to do so. They also believe that some risks are inevitable and that risk assessments are valuable tools for determining acceptable cleanup levels; in a modern world, the public has to accept some environmental risks.

Discussion

Implications for the Brownfield Program

The factor interpretations presented above reveal specific issues concerning the Brownfields Program that ODEQ should address to ensure that its program develops in a manner that responds to the needs of all stakeholders and is acceptable to them.

Environmental Risk. The Oklahoma Brownfields Voluntary Redevelopment Act requires a risk-based system for all brownfield cleanups, in which site-specific cleanup levels are determined by risk assessment and are based on proposed future land uses. However, stakeholders' perspectives reveal a great disparity in their judgments of the value of risk assessments. Participants who oppose the use of risk assessments believe that too much uncertainty relating to human-ecosystem-pollutant interactions exist to justify reliance on risk assessment models. They also believe that too much room exists for manipulation of assessment results by risk managers. Those favoring the use of risk assessments believe that they provide a tool that accurately estimates risks associated with contaminated sites and that if models are conservatively designed, the probability unreasonable risk is present is low.

Partial Cleanups. The controversy over partial cleanups at brownfield sites is related to the controversy over risk assessments. Partial cleanups can make a site more economically feasible to redevelop, especially if the redeveloped portion is a small part of a larger site and the remediation addresses only surface soil and water, leaving contamination in the subsurface soil and ground water. Otherwise, sites with cleanup costs exceeding the value of the property will not be voluntarily remediated. However, stakeholders opposed to partial cleanups question the validity of risk assessments as guides to justify partial cleanups and believe that partial cleanups are not justified on either pragmatic or moral grounds.

Who should be involved? There is also disagreement on who should be involved in cleanup and redevelopment decisions. Local stakeholders (the local government and community stakeholders) believe that they should be involved in the decision process because they "have to live with the results." Business interests perceive the existence of additional "players" in their business decisions as unwelcome and public participation requirements as an unnecessary hurdle.

Trust. Perhaps the largest obstacle to redeveloping brownfields is distrust: should the public trust government? should government trust business? should business trust the public? Distrust is fueled by others' "hidden agendas." For the Brownfields Program to function efficiently, ODEQ must not only build trust in the agency, but also foster an atmosphere of trust among stakeholders. If stakeholders come to trust government decision-making processes, policy legitimacy is enhanced.

Application of the Synoptic Normative Theoretic Framework for Legitimated Environmental Decision Making

The knowledge derived from the stakeholders during the initial interviews and Q study allows an assessment of the existing legitimacy context surrounding the brownfields issue and ODEQ's current method of environmental decision-making.

The following discussion applies the synoptic normative theoretic framework for legitimated environmental decision making (Focht 1995a) to the current legitimacy context for brownfields redevelopment in Oklahoma. The framework was designed to build the legitimacy of environmental decision-making.

Focht (1996) suggests that there are three components of decision-making context that define decision-making strategies that will enhance policy legitimacy: the relative dominance of facts and values that are germane to the decision (which dictates the appropriate role of experts and expertise), the level of social consensus on a preferred policy outcome (which dictates whether coercive or persuasive policies are more appropriate), and the level of trust that stakeholders have in the policymaking institutions (which dictates the role of government in decision-making). In his model, these components are represented in three-dimensional space. Each spatial dimension corresponds to a legitimacy component and is represented as a continuum from high to low. Orthogonal intersection of the substantive legitimacy and process legitimacy dimensions produces four quadrants that correspond to four ideal types of decision legitimacy contexts.

The Reformative Context is characterized by facts dominating values and high social consensus in which the realms of facts and coercion overlap. If the existing state of affairs is inconsistent with the consensually desired state, action designed to reform the status quo is appropriate. The Informative Context is characterized by facts dominating values but social dissensus on a preferred outcome. "If the existing state of affairs is inconsistent with the consensus scientifically-defensible and justifiable criteria, action designed to inform society in the effort to induce a particular action is appropriate. The Transformative Context is characterized by values dominating facts with low social consensus on a desired outcome. The decision-making strategies in this quadrant should be process-oriented, encourage dialogue, and be designed to transform disparate interests and preferences into more encompassing stakeholder interests compatible with all points of view. The Conformative Context is characterized by values dominating facts and social concordance on a desired outcome. Decision making in this context should maintain unity of purpose, political cohesion, and social order...to ensure that behaviors and decisions conform to social norms and widely held preferences (Focht 1995b:9).

When the dimension of stakeholder trust of government is added to the model, the resulting eight octants correspond to high and low trust versions each of the four ideal types of legitimacy contexts. The issue of trust in institutional decision-making can also be separated into two dimensions. In fact-dominated contexts, trust refers to judgments of the technical competence of the agency, whereas in value-dominated contexts, trust refers to judgments of the agency's willingness to honor its fiduciary responsibility (referring to the motives of the government to act in the public's interests). If trust is high, then government can legitimately assume the lead in the policy formulation process (it is seen as competent and responsive) and therefore both its expertise and discretion are trusted. However, if distrusted, the government cannot easily assume the lead role in policy formulation, but rather should participate as another stakeholder party – especially in value-dominated contexts (since its values are presumably not shared by stakeholders). In this case, a trusted third party must assume the lead role. Figure 1 depicts Focht's proportionally adjusted diagram of idealized legitimacy contexts.
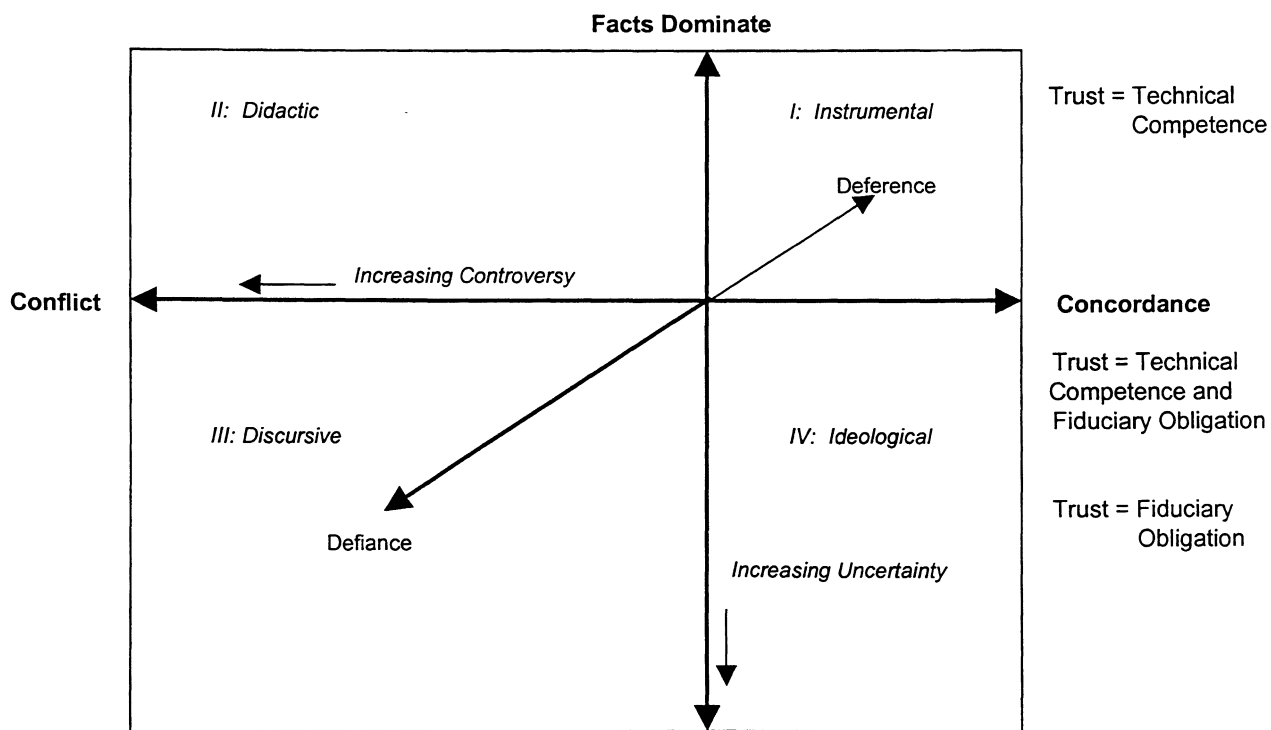

Figure 1. Proportionally Adjusted Diagram of Idealized Legitimacy Contexts

The information gained during the Q study indicates disagreement among the various stakeholders concerning the value of the science of risk assessments and their use in environmental cleanups. Disagreement also exists among experts as to the accuracy of estimated risks' representation of actual risks. According to Focht's legitimacy model, a disagreement on facts (concerning the use of risk assessments to determine cleanup levels) and the obvious salience of values (concerning welfare, equity, justice, democratic norms, sense of community, etc.) suggests that values should dominate facts along the substantive legitimacy dimension.

Though there exists widespread support for the continued development of a brownfields program in Oklahoma, there is substantial disagreement on the reuses of brownfield sites that should be allowed. Focht's model suggests that persuasion should be used to build consensus on residual risk levels and land use restrictions since dissensus on a preferred policy outcome does not yet exist.

The trust that stakeholders have of decision-making institutions (Focht's two dimensions of trust) demonstrates that stakeholders generally trust the technical competence of ODEQ but do not trust its motives. Therefore, an erosion of confidence that ODEQ will act in the public's interest is manifest and ODEQ should not expect widespread public support of its efforts to lead the policy formulation process. A neutral third party is recommended to facilitate policy formulation.

By combining the decision context findings, we conclude that values dominate because of factual uncertainty and high value salience; social consensus on a preferred course of action is mixed (consensus on the need for brownfields policy but no consensus on the form the policy should take); and trust of government is mixed (fiduciary responsibility judgments are low but technical competence judgments are high). Table 4 lists Focht's recommendations for legitimacy building under various contexts. Referring to Focht's model, the current context falls in the low-trust transformative octant, III-B (values dominate, social consensus is low to moderate, and distrust – as fiduciary responsibility – is low).

The recommended strategy for policy formulation for the brownfields program is therefore a policy dialogue facilitated by a neutral, non-ODEQ, party to encourage consensus-building on a course of action, reduce factual uncertainty, and build trust in ODEQ and among stakeholders (Focht 1995b). Only after trust is earned can ODEQ to move beyond providing technical assistance and resources to the policy dialogue to the role of decision authority to which stakeholders willingly defer.

Conclusion

The challenges in creating a brownfield program are multifaceted. Policy is not developed in a vacuum; many variables are beyond the control of the agency charged with its implementation. ODEQ implements programs assigned to it by the legislature and its actions are overseen by five advisory councils and the ODEQ Board. Great strides have been made since the passage of the original Brownfields Act. Implementing rules have been passed, legislation has been passed to create incentives to reuse brownfield sites, and a Brownfield Memorandum of Agreement (MOA) has been signed with EPA. The MOA contains EPA's assurance that sites in Oklahoma's program will not be pursued by EPA under Superfund authority.

At the program level, the information gained during this study has informed the still-evolving program. During the research process, contacts were made and rapport was established with stakeholders unknown to ODEQ before the implementation of the study. The study highlighted the difficulties in redeveloping contaminated property in Oklahoma as well as the concerns that residents have about the reuse of these properties. Information gained during the study has also aided ODEQ in the production of various program guidance documents. Most importantly, the study highlighted the need to form stakeholder partnerships in the redevelopment of brownfield sites. The economic reuse of contaminated property depends on local acceptance to ensure success. It is more effective to form partnerships with the local stakeholders at the beginning of the process than it is to try to "sell" decisions to the local community after they are made. Successful redevelopment of brownfield properties is not just a desirable goal of the program – it is a necessity. If redevelopment fails, sites may once again become a deteriorating blight on communities and everyone loses. If it succeeds, then everyone wins.

Table 4

Stakeholder Legitimacy Claims and Legitimated Decision Making and Communication Strategies

Octant No.	Context Name	Primary Actor	Legitimate Stakeholder Participation	Legitimate Decision Making Strategy	Legitimate Communication Strategy	Tactics
I-A	reformative	decision making Institution	institutional experts only	instrumental	one-way(to notify)	technocratic; gov't notice to public
I-B	reformative	independent technical organization	independent experts	instrumental	one-way (to explain)	technocratic; private and institution notices to public
II-A	informative	decision making Institution	experts; (others passively)	didactic; educational	two-way(to inform, feedback	communications media, schools
II-B	informative	independent educational organization	independent experts; (others passively)	didactic; educational	two-way (to inform, feedback)	communications media, symposia
III-A	transformative	decision making institution as mediator/facilitator	all	discursive (to build consensus)	multi-way with alternative conflict mgt. Techs & gov't support	SH advisory groups
III-B	transformative	neutral fourth party mediator/facilitator	all, including decision making institution as a stakeholder party	discursive (to build consensus)	multi-way argumentation techniques & ideal speech; perhaps with independent tech. Support	SH d-m; with
IV-A	conformative	government agency, as a trustee	government policy leaders and decision makers	ideologic	one-way (to explain rationale; propaganda)	public announcements, documents
IV-B	conformative	government agency, as a delegate	government decision elites; consultants in oversight	ideologic	two-way (to explain processes and seek feedback)	public hearing & community relations

Acknowledgement

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INTER-GOVERNMENTAL AND INTER-AGENCY COORDINATION: THE OKLAHOMA ENVIRONMENTAL CRIMES TASK FORCE EXAMPLE

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Introduction

Enforcement of environmental statutes and rules in Oklahoma can be exceedingly complex. This complexity is not the result of any one factor, but rather stems from the confluence of many conditions. One such condition is the fractured nature of environmental jurisdiction in the State of Oklahoma. Environmental regulatory jurisdiction is currently divided among at least ten state environmental agencies. Although each agency's jurisdiction is set forth in the Oklahoma Statutes, there are numerous activities with the potential to cause pollution or require permits that fit within more than one state environmental agency's jurisdiction. Thus, although the statutes make it clear that it is illegal to cause water pollution without regard to the source, it is often difficult to determine which agency is responsible for regulating and taking enforcement action against any particular activity.

Making matters even more disjointed is the fact that the federal government, local governments, various tribal governments, counties, and municipalities also exercise authority over certain spheres of environmental regulation. These governmental entities are responsible for enforcing myriad environmental statutes, rules, regulations, and ordinances. For example, there are over 70 federal enactments and over 30 state enactments that exact some effect on environmental matters. When federal regulations, state regulations, municipal ordinances, and tribal enactments are considered together, it becomes readily apparent that these regulatory entities can be more effective if they coordinate actions and share limited resources.

All regulatory agencies have limited funding sources and, without fail, the issues that they face are characterized by complex scientific, technical, economic, political, and legal issues. To combat the effects of these issues in criminal environmental cases, an inter-governmental and inter-agency group was recently formed in the State of Oklahoma. Known as the Oklahoma Environmental Crimes Task Force (hereinafter the "Task Force"), it has successfully worked to facilitate a more aggressive criminal enforcement of environmental laws in Oklahoma.

Hindrances to Investigation and Prosecution of Environmental Crimes in Oklahoma

Before the formation of the Task Force, there was no mechanism or criteria at the state level for identifying those violations of environmental laws that warranted criminal prosecution. Many state environmental agencies were aware of environmental matters that seemed to warrant criminal prosecution, but lacked the manpower, knowledge, training, or equipment to properly investigate these cases. Although criminal sanctions for violations of environmental laws have been in place for many years, every violation of an environmental law was being handled through either administrative notices of violation or administrative penalties or civil enforcement actions.

Traditional law enforcement investigative agencies were not equipped to investigate environmental crimes, in part, because environmental investigations require the use of specialized sampling methodologies and equipment. Recognizing what actions constitute criminal violations of environmental laws is also difficult for law enforcement officers who are not familiar with the regulatory schemes for air pollution, water pollution, and

hazardous waste. These determinations typically involve collecting and interpreting complex scientific information in a manner that requires specialized training.

Investigation of environmental matters generally requires that soil, air, water, or other samples be obtained. Those collecting the samples need protective gear to guard against exposure to hazards that may be associated with the media being sampled. Very often, investigators must obtain samples of an unknown constituent, the identity of which can be revealed only through laboratory analysis. To properly obtain samples, special equipment must be employed by investigators. Certain containers must be used to hold the samples obtained. Similarly, investigators must be knowledgeable as to sampling techniques – not only to protect their health and safety, but also to properly preserve and document potential evidence. Recording and documenting each step of a sampling event – from obtaining the sample through delivery to the laboratory for analysis – is essential. Any irregularities in obtaining, preserving, and documenting samples can quickly undermine both an investigation and a prosecution.

In addition, state environmental agencies are sometimes unable to convince local district attorneys to prosecute environmental crimes. Like state environmental agencies, district attorneys are often understaffed with limited resources. Limited prosecutorial resources necessarily translate into focusing on matters of public and political urgency. Often, the prosecution of environmental crimes has been given low priority because the cases were considered less important than crimes that are more traditional. Many district attorneys also lack specialized knowledge of the complex technical, scientific, and legal issues that characterize the prosecution of environmental crimes.

Reports of environmental crimes were infrequent, if not completely lacking. The wide-open spaces of Oklahoma can foster environmental crime by reducing the availability, or even the likelihood, of witnesses to a particular environmental crime. Sometimes, the public lacks information or understanding as to those activities that constitute an environmental violation. Thus, even though there may be witnesses, an environmental violation may go unreported. Very often, witnesses find it more palatable to ignore a potential violation so that they can avoid getting involved in the process of prosecuting an environmental violation.

It was believed that these problems could be solved, to a large degree, if the jurisdictional agencies developed a mechanism for sharing information, resources, and technical expertise. Each of the agencies possessed specialized knowledge and resources which, when combined, could be used to create a well-defined process for recognizing, investigating, and criminally prosecuting the most egregious violators of environmental laws. Together, the agencies could also educate the public and the traditional law enforcement community about environmental crime and the serious impacts that it has on human health and the environment.

Formation of the Task Force

Recognizing these barriers to effective criminal enforcement of environmental laws and the need for a heightened level of enforcement of environmental criminal provisions, several state environmental agencies, in conjunction with the Oklahoma Attorney General's office, and federal and local agencies involved in the protection of natural resources and the environment, initiated the process of forming the Task Force. The first Task Force meeting was held on February 25, 1997.

The purpose of the first meeting was to determine whether the agencies were committed to developing a coordinated statewide effort in the investigation and prosecution of environmental crimes within the State of Oklahoma. Interest in the Task Force, even at the initial meeting, was considerable.

Numerous state agencies sent representatives to this meeting including the Oklahoma Attorney General, Oklahoma Department of Environmental Quality, the Oklahoma Department of Wildlife Conservation, the Oklahoma Water Resources Board, the Oklahoma Corporation Commission, the Oklahoma Department of Mines, the Oklahoma Scenic River Commission, the Oklahoma State Bureau of Investigation, the Office of Public Safety, and the Oklahoma Highway Patrol. Agencies of the federal government also showed interest in the Task Force by sending representatives from the Criminal Investigation Division of the U.S. Environmental Protection Agency (EPA), the Federal Bureau of Investigation, the Division of Law Enforcement of the U.S. Fish and Wildlife Service, the Bureau of Land Management, and the Office of the Inspector General from the U.S. Department of the Interior, the Defense Criminal Investigation Service, the U.S. Air Force Office of Special Investigation, and the U.S. Attorney's Office. Local agencies were also present, including the Oklahoma City Fire Marshall's Office and the City of Oklahoma City. In general, the representatives of these

governmental units expressed both their desire and recognition of a need for more aggressive enforcement of environmental criminal provisions and a mechanism to coordinate state and federal investigatory and prosecutorial efforts.

The initial meetings of the Task Force focused on organization and developing a case screening process. The Oklahoma Attorney General's Office was chosen to chair the meetings and it was decided that meetings would be held every month. Any state, federal or local agency could bring a potential criminal case to the Task Force for assistance with investigation or advice on the viability of a case. All member agencies agreed to share resources such as investigators, sampling and surveillance equipment, and laboratories. Prosecutors also began to attend the meetings to become familiar with the ongoing investigations and the investigators that would be bringing cases to them. Almost immediately after the first meeting, several agencies initiated the first multi-agency investigation of an environmental crime in the history of the State of Oklahoma.

Operation of the Task Force

On the most fundamental level, the Task Force was established to serve as a forum for coordinating state and federal environmental criminal enforcement efforts. Work groups such as the Task Force have been established in numerous states and have proven to be an extremely successful mechanism to coordinate state and federal investigations and prosecutions of environmental crime. The Task Force was specifically organized and patterned after the Texas Task Force, which had been operating for a few years at the time the Task Force was formed. The EPA was instrumental in the formation of the Oklahoma Environmental Crimes Task Force, as well as the Texas Task Force. In Oklahoma, the EPA has actively participated in the daily operation of the Task Force and has provided grant money to the Oklahoma Attorney General to fund training and joint investigations.

The self-avowed purpose of the Task Force is "[t]o protect human health and the environment through coordinated investigations by federal, state, and local agencies and to ensure that no environmental crime goes unprosecuted because of a single agency's limited legal or logistical resources." To accomplish this mission, the Task Force meets regularly to coordinate ongoing investigations and prosecutions of environmental crimes. Between meetings, the Task Force chairperson takes reports of new investigations and assists the lead agency in contacting other agencies with jurisdiction over the violation. This coordination ensures the effective use of limited federal, state, and local resources in investigating environmental crimes.

The Task Force utilizes a case-screening committee. Each agency participating in the Task Force is represented on the case-screening committee by an individual with the authority to commit investigatory and technical resources. It is the job of the case-screening committee to receive case referrals submitted by various federal, state, and local agencies, but only after such referrals have been through the screening process internal to the referring agency. The case-screening committee reviews the facts of the referred case to determine its merits, to determine whether the referred case warrants criminal investigation, and to determine the likelihood of a successful prosecution. If the case is deemed appropriate for criminal investigation, the case-screening committee determines which agency will take the lead investigatory role. As part of this determination, the committee also determines which agencies have resources and personnel available to assist the lead investigating agency. Lastly, the case-screening committee determines whether the prosecution should be referred to a state or federal prosecutor. Several agencies have provided the Task Force with the expertise of in-house staff attorneys that have specialized knowledge of environmental laws. These attorneys are available to assist both state and federal prosecutors both before and during trial with complex issues that are specific to environmental prosecutions.

The Task Force is also actively involved in seeking and providing training opportunities for investigators, technical staff, and prosecutors. In August and September of 1999, the Task Force conducted two training seminars for local law enforcement officers across the state. The focus of the training was to inform these officers about how to recognize environmental crimes, react safely when they encounter them, and report the crimes to the proper agencies. The Task Force plans to conduct seminars for local regulatory personnel and municipal inspectors which will be designed to provide them with guidance on how to recognize when a violation is criminal and deal with parallel criminal and administrative proceedings.

Criminal Environmental Enforcement Efforts

Reports of potential environmental crimes are now surfacing at both the state and the federal level more frequently than before the formation of the Task Force. This result is partially because Task Force investigations have led to a number of high profile prosecutions of environmental crimes. Reports are also increasing because the Task Force has created a procedure for handling reports from citizens, law enforcement, local governments, and administrative agencies. Each complaint received by the Task Force is tracked, investigated, and referred either for prosecution or administrative action. Member agencies are now sharing information with other agencies that may have jurisdiction over the alleged criminal activity and the Task Force is providing them with a forum in which to openly discuss potential cases. Investigators also have better access to prosecutors that are willing to bring these cases despite the fact that the cases typically involve complex scientific and legal issues. The discussion that follows includes two examples of successful cases that utilized the resources and expertise of Task Force member agencies to investigate and prosecute environmental crimes.

Allied Environmental Services, Inc.

The Oklahoma Corporation Commission referred this case to the Oklahoma Department of Environmental Quality for investigation. The Oklahoma Department of Environmental Quality initiated a joint investigation with the EPA - Criminal Investigation Division and the Defense Criminal Investigation Service.

The facts of this case reveal that a Kansas corporation, Allied Environmental Services, Inc. (hereinafter, "Allied"), agreed to remove petroleum-impacted wastewater from storage tanks at military facilities in Kansas and Missouri. By agreement, Allied was to properly treat and dispose of petroleum-impacted wastewater and be paid by the government for proper treatment and disposal. Allied retained Overholt Trucking Co. to haul untreated petroleum-impacted wastewater to Oklahoma, where it was dumped into saltwater disposal wells. Allied collected payment from the government for proper treatment and disposal. EPA remediated a tank farm near Drumright, Oklahoma that Overholt Trucking Co. used for the illegal disposal of waste and which was contaminated with chlorinated solvents, costing taxpayers $1.5 million.

On November 5, 1998, three individual defendants and a corporation were indicted for conspiracy to violate the Safe Drinking Water Act through the illegal disposal of wastewater, transportation of hazardous waste without a manifest, wire fraud, and obstruction during the period of August 1994 through March 1996. Other charges included violations of the Clean Water Act, the Resource Conservation and Recovery Act, federal mail fraud provisions, and making false statements to investigators. The indictment alleged that over 300,000 gallons of wastewater from facilities in Kansas and Missouri had been transported into Oklahoma and disposed in various salt-water disposal wells. The indictment also alleged that about 6,200 gallons of wastewater were dumped into a tributary feeding Lake Keystone near Tulsa.

On October 20, 1999, two of the three individuals and the corporation were convicted in the U.S. District Court for the Northern District of Oklahoma. One defendant was subsequently sentenced to seven years and three months in prison for conspiracy and violations of the Safe Drinking Water Act, the Clean Water Act, the Resource Conservation and Recovery Act, mail fraud, and making false statements. The remaining defendant was sentenced to four years and seven months in prison for conspiracy and mail fraud. Both individuals and the corporation were ordered to share in paying more than $1.2 million to cover the costs of remediation.

H & J Auto

In January 1997, a confidential caller to the Oklahoma Department of Environmental Quality claimed that an auto salvage business in Madill, Oklahoma was improperly storing 34 drums of paint waste. Shortly thereafter, an inspector for the Oklahoma Department of Environmental Quality visited the site and informed the owner, Carl Eugene Hines, that the paint waste was stored illegally and that it was his responsibility to properly dispose of the hazardous waste. Approximately one week later, an Oklahoma Department of Environmental Quality investigator returned to H & J Auto to discover that all of the drums of paint waste had been moved. Mr. Hines had no explanation for the disappearance.

In April of 1997, a municipal police officer called the Oklahoma Department of Environmental Quality and reported that an H & J Auto employee, Daniel Martin, was storing the drums at his home. When investigators from the Federal Bureau of Investigation and Oklahoma Department of Environmental Quality arrived at

Martin's house, they found only one drum in a carport but a neighbor they questioned admitted that Martin had hired him to get rid of the other drums. The neighbor was suspicious and believed that there could have been a body in one of the drums. On his information, the investigators located 27 additional drums abandoned in an open field just two blocks away.

During the course of their investigation of these hazardous waste violations, however, investigators from the Federal Bureau of Investigation, EPA, and Oklahoma Department of Environmental Quality uncovered a major drug conspiracy case. Marshall County Sheriff Deco DeWayne Baxter initially promised to assist with the investigation but later the investigators discovered that he was involved with Carl Hines in a multi-county southern Oklahoma drug manufacturing and distribution enterprise known as "Live for the Family." Rather than assisting with the investigation, Baxter admitted in court that he provided security for drug manufacturing labs and had warned Hines about the presence of the investigators. Because of these agencies' efforts, Baxter pled guilty on December 17, 1997, to conspiracy to manufacture and distribute methamphetamine, witness intimidation, aiding and abetting the possession of a firearm by a felon, possession of methamphetamine, and conspiracy to illegally transport hazardous waste. He was sentenced to eight and a half years in federal prison. Baxter also testified in the trials of Martin and Hines in which they were convicted of conspiring to manufacture, possessing with intent to distribute, and distributing methamphetamine. They were also convicted of illegally storing and transporting hazardous waste. Hines was sentenced to 35 years in federal prison and Martin was sentenced to 20 years.

Conclusion

Mitigating institutional and resource barriers to investigating and prosecuting environmental crime in the State of Oklahoma, one of the principal goals of the Task Force, is one that is likely to require time to fully-achieve. The initial experience of the Task Force, however, has been one of success; agency representatives have participated enthusiastically. The initial success has also served to elevate public awareness of environmental crime. To date, the Task Force has been effective in initiating several investigations that have led to the prosecution and conviction of environmental violators that disregard the damage that their actions have caused to Oklahoma's public health, safety, welfare, and environment. In the short time since its formation in 1997, the Task Force has coordinated 41 investigations. Of these investigations, 13 cases have been referred for prosecution. Individual felony indictments number 52 and there have been 12 felony indictments of corporations. Two individuals have been indicted for misdemeanors. Some 32 individuals and two corporations have been convicted of felonies and two individuals have been convicted of misdemeanors. Eleven of the cases referred for prosecution have been referred to the administrative agencies for resolution. While the initial experience of the Task Force has been a successful one, environmental criminal activity in the State of Oklahoma remains an issue that requires, and indeed deserves, more attention.[1]

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[1] The views expressed herein are not necessarily those of the State of Oklahoma or the Office of the Oklahoma Attorney General.

ENVIRONMENTAL FEDERALISM AND ENVIRONMENTAL JUSTICE: COMPLEXITIES IN THE OKLAHOMA CONTEXT

M. V. Rajeev Gowda and Paula Owsley Long

Introduction

At the dawn of the millennium, it is fashionable to indulge in reflective exercises aimed at discerning broad trends that have brought us to our present position in time and space. If we were to perform such an exercise in the context of environmental policy in the United States, our focus would be on just the last few decades of the 20th century. These decades can be characterized succinctly in the following way. The 1960s represent the emergence of environmental awareness and activism. The 1970s represent the translation of environmental concern into policy, particularly through tough, top-down, ambitious legislation and judicial intervention. The 1980s represent conflicts over efforts to attain efficiency in environmental policy and the emergence of environmental federalism. The 1990s represent the emergence of innovative policy instruments – market and information based solutions – and the recognition of the importance of people in the process, particularly through the concept of environmental justice.

Of these broad trends, our focus in this chapter is on environmental federalism and environmental justice because they present interesting challenges in the Oklahoma context. Environmental federalism involves utilizing the federal structure of the American political system to ensure that policy solutions are designed and implemented at the most appropriate level of government. Environmental justice involves paying attention to the socioeconomic aspects of environmental policy and is aimed at ensuring that the burdens of policy do not fall disproportionately on poor or minority communities. These policy thrusts represent moves towards improving environmental policy by making it more efficient and equitable. We discuss some of the complexities presented by the Oklahoma context through a case study of the involvement of Native American tribes – the Sac and Fox Nation and the Tonkawa Tribe – in the federal effort to locate a temporary nuclear waste storage facility.

Environmental Federalism

During the golden age of environmental policy development, principally the 1970s, the consensus in political, academic, and activist circles was that the federal government should be the key driving force for environmental protection efforts. Several dramatic events, including the fire on the Cuyahoga River in Ohio, demonstrated that the existing patchwork of state and local regulations were not sufficient to protect the nation's resources and that state governments were unable and/or unwilling to do the job (Ringquist 1993).

By the late 1980s, however, there was concern that national level policies could not be as responsive to specific environmental problems because of the diversity of ecosystems and environmental threats. Politically, Ronald Reagan's election as president also brought to center stage his ideological inclination towards moving power away from the federal government to the states. By this time, state governments had shown dramatic increases in institutional capacity (Rabe 1997). These features led the U.S. Environmental Protection Agency to begin shifting power to the states and Native American tribes (Kraft and Scheberle 1998).

This shift has led to a debate over whether states will be able to manage this increased responsibility (Rabe 1997; Ringquist 1993). Some argue that states may actually be more innovative in handling environmental policy (John 1994; Adler 1998). Little research has been done, however, to determine how tribal governments will handle this increased environmental authority. One certainty is that there will be more entities involved in setting environmental standards as the federal government relinquishes power. The more entities involved, the greater the potential variation in the levels of environmental protection. Different cultural values and relationships with the land may affect the level of interest in environmental protection as well as understandings of the degree to which the environment should be protected.

Another concern raised by the new trend in environmental federalism is that states and tribes must work more directly with one another in the environmental context. This can lead to new conflicts. States and Native American tribes do not have a good history of working together. The burden of history and the realities of political and economic power imbalances have led to a situation where there is significant distrust and ill will between some state and tribal governments. This lack of trust and goodwill is perpetuated today through questions over taxation and gambling as well as over the management of natural resources and the environment (Egan 1998b).

State and tribal governments often come into conflict because of the fact that the environment does not recognize political boundaries and jurisdictions. Thus, when states and tribal governments are neighbors, each is affected by the manner in which the neighboring entity handles environmental issues. In Wisconsin, for example, the governor has complained that tribes are trying to "stretch their reach off the reservation" by setting strict clean water standards with which the neighboring regions of the state may have to comply (Egan 1998b). In New Mexico, the Isleta Pueblo have used their new powers from EPA to set higher clean water standards as well, which have required the city of Albuquerque to spend $300 million to clean up the Rio Grande before it flows onto Indian lands (Egan 1998a). In Montana, the Assiniboine and the Gros Ventre tribes held up expansion of a major gold mine by enforcing more stringent standards for land and water protection than those set by the state (Egan 1998a).

While conflicting standards can lead to political conflict, it should also be pointed out that some states are interested in all the help they can get in protecting the environment and welcome the efforts of the tribes. In Minnesota, the same tribal standards that are viewed as intolerable by Wisconsin are actually praised. Minnesota has welcomed the tribal governments efforts to protect the environment (Egan 1998b). The Minnesota response is in line with one of the key points in favor of federalism – that it allows for greater experimentation and policy diversity in tune with local level realities.

Furthermore, states are occasionally on the side of seeking higher levels of protection for the environment. In Washington, the Muckleshoots have sought to build an amphitheater on land that some view as a sensitive wetlands area. The tribe seeks economic growth and views the criticism of its efforts as attacks against its sovereignty. Similarly, the Goshutes in Utah have tried to locate a temporary storage facility for civilian nuclear waste on part of their reservation. Representatives of the state government have expressed concern over the possible environmental impacts of such a facility and have sought to block it through aggressive efforts including the establishment of an Office of High Level Nuclear Waste Opposition (Egan 1998a).

Another concern over the devolution of power out to state and tribal governments arises out of the question of whether these governments are capable of discharging these new responsibilities. Part of this concern has to do with the notion of unfunded mandates whereby more responsibilities are passed on to state and tribal governments without a corresponding increase in funding. In the specific case of tribes, critics are concerned that because of higher rates of unemployment and poverty than other segments of the population, tribal governments will forego environmental protection in favor of economic opportunity. This is the criticism that has been leveled against the Goshutes' nuclear waste storage facility and the Muckleshoots' amphitheater and is among the fundamental challenges that the success of environmental federalism faces in the tribal context.

Environmental Justice

A second of concern regarding Native American tribes and the environment comes from the realm of environmental justice. Environmental justice concerns were first raised by research looking at how black communities suffered from significant environmental degradation. Extensive research has now shown

that communities of color suffer disproportionately from environmental hazards.   Blacks have more hazardous waste disposal facilities and landfills in their communities (Bullard 1990; Collin & Harris 1993; White 1992), are exposed to higher levels of lead contamination (Phoenix 1993), breathe more polluted air in the inner cities (Wright 1995), and are more often subject to environmental exploitation (Bryant 1995; Bullard 1993; Hamilton 1993).   While there is a lively debate over whether the disproportionate impact on minority communities has to do with racism on the part of decision makers or whether is the inadvertent result of market forces (Been 1994), that there is disproportionate environmental impact on poor and minority communities is now broadly accepted in policy circles.

Other minority groups have been affected in similar ways. Mexican-Americans suffer from environmental inequities ranging from lack of control of pesticide exposure for predominantly Hispanic farm workers (Moses 1993; Pena and Gallegos 1993; Perfecto 1992). Native Americans are faced with high levels of toxins in the fish that they heavily rely upon (West 1992) and acute pollution in their living environment (Tomsho 1990). In response to these and similar concerns, President Clinton established a new Office for Environmental Equity within the Environmental Protection Agency. Further, through an executive order, President Clinton made it mandatory for all government projects to consider socioeconomic impacts along with their cost-benefit and environmental impact assessments.

While the modest steps that have been taken may be helpful, there are concerns on a more fundamental level. Some environmental justice activists argue that part of the problem arises from exclusive reliance on science by government agencies in setting environmental priorities. Some groups simply do not have the money to hire scientists to produce the "evidence" of environmental hazards and thus are not able to participate in the process (Bailey, Alley, Faupel, and Solheim 1995). Native American communities are more likely to be poor than other communities (Egan 1998a) and are therefore not as likely to have the money to support extensive research on an issue they think is a problem and may not be able to get the attention of environmental priority setters (Wright 1995). Thus, it becomes critical for agencies such as the Environmental Protection Agency to provide grants and technical assistance to affected poor or minority groups to ensure a level playing field in terms of access to scientific expertise and meaningful participation in the priority setting process.

Critics raise another concern related to the exclusive reliance on science in environmental protection. To participate in the process of setting environmental priorities, one must be able to use scientifically verifiable estimates to quantify health and ecological concerns, the critics argue.   Because Native American communities have different understandings of nature and environmental problems, however, they may not be able to voice their concerns in terms that fit in the rationalistic, quantitative process of defining problems. Hajer (1995) writes that in the scientific, rationalistic approach to defining problems "understanding has ceased to be a matter of direct experience, but is a matter of complex scientific extrapolations" and "consequently, it is a limited group of experts who define the key problems, who assess the urgency of one problem vis-à-vis other possible problems, and who implicitly conceptualize the solutions to the problems they put forward" (Hajer 1995:10). The result is that non-scientists are not allowed into the process and the concerns of groups such as Native American communities may not be given as much weight in a scientifically based assessment of the risk

These are but some of the many challenges that arise for federalism and environmental justice specifically. Now we shall turn to looking at the challenges that exist in the Oklahoma context.

Environmental Federalism, Native Americans, and Oklahoma

The fundamental reason why the issue of environmental federalism assumes importance in Native American contexts is that American Indian tribes retain inherent sovereignty that can be diminished only by specific acts of Congress (Cohen 1942). Indians had treaty relations with the U.S. government until 1871 and unless abrogated, these treaties remain in force and provide the basis for much of the federal government's legal and political relationship with Indian tribes.

The relationship with tribal governments is further clouded by the Constitutional provision granting Congress the power to "regulate trade with the Indian tribes" (Article I Section 8 - the Indian Commerce Clause). This has resulted in Congressional "plenary power" over Indians (Newton 1984) and the federal government acting as trustee for tribal assets such as land and natural resources, as well as for some assets of individual Indians living in Indian Country.

Since the Johnson Administration, federal policy toward Native American tribes has stressed "self-help, self-development, self-determination" (Johnson 1970:336). This policy has been consistently followed under later administrations. Most recently, President Clinton directed the heads of all Executive Branch departments and agencies to ensure that they operate "within a government-to-government relationship with federally recognized tribal governments," including prior consultation before taking action affecting tribes (Clinton 1994).

The Environmental Protection Agency conforms to this policy and many federal environmental statutes recognize a role for tribal governments consistent with self-determination. Several federal laws have been amended to allow tribes under certain circumstances to be treated as states: the Safe Drinking Water Act (1986), the Clean Water Act (1987), and the Clean Air Act (1990). The Superfund Act and the Oil Pollution Act also treat tribes as states.

Because Oklahoma is home to 37 of the 554 federally recognized tribes (CFR 1993), the sovereignty issue takes on special importance. It is further complicated, however, by the fact that most of these tribes are not indigenous to Oklahoma; they were resettled there when it was Indian Territory (Strickland 1980; Wright 1986). Indian Territory was repeatedly reduced by federal acts and by the opening of the Oklahoma and Indian Territories to white settlement in the late 1800s and early 1900s (Debo 1970). A later allotment policy favored by the federal government transferred tribal land to individual Indians (Cohen 1982) and much of this was later lost due to quirks in the law and the acts of unscrupulous land speculators (Debo 1989). The result is a checkerboard pattern of Indian land ownership in Oklahoma and widely dispersed tribal populations intermingled with non-tribal members.

These issues form the background for a number structural and management challenges to environmental federalism in Oklahoma.

Population Jurisdiction Challenges

The first challenge for environmental federalism is determining what laws apply to non-Indians living on tribal land and vice versa. Due to "checkerboard" land ownership patterns, much of Indian country is occupied by non-Indians. For example, while the entire Osage County in Oklahoma is Indian Country under federal law, only 6,088 of the county's 41,229 residents, i.e., 14.7%, are Indian (Census 1992:12). Such situations lead to conflicts over the extent of tribal and state jurisdiction over non-Indians on Indian land and can pose thorny problems for enforcement of environmental protection efforts.

The Supreme Court has addressed these issues on a case-by-case basis, and in a recent ruling has restricted the ability of tribes to apply tribal zoning ordinances to non-Indian owned businesses on fee land within Indian country (*Berndale v. Confederated Tribes and Bands of the Yakima Nation*, 492 U.S. 408 1989). While some have argued that *Berndale* invalidates tribal regulation, EPA regulators rejected that contention in 1991, stating that the Agency "will...continue to recognize inherent tribal civil regulatory authority to the full extent permitted under Federal Indian law..." (CFR 1991, 64880).

Geographic Jurisdiction Challenges

A second challenge comes from the difficulty of knowing what is Indian land and what is not. It is very difficult to design and enforce environmental regulatory policy when the affected "environment" is unclear. This issue is particularly complicated in Oklahoma where tribes may not have a substantial or contiguous geographic land base over which they have authority. States have attempted to enforce state law in Indian country and conflict and confusion over functional jurisdiction has resulted. Diane E. Austin attributes the considerable tension between Indian tribes and the state of Oklahoma to the state's history and land base question and notes that "tribes in Oklahoma have historically had difficulty asserting complete authority because their lands are dispersed" Austin (1993:138). This issue can complicate and hinder efforts at managing ecosystems that cross political boundaries.

Tribal Capacity Challenges

Tribal capacity to regulate and manage the environment is the third challenge for federalism in Oklahoma. Various federal environmental statutes provide mechanisms for treating tribes as states and define a kind of tribal capacity that requires tribes to have the governing and administrative capabilities necessary for program implementation. Any given tribe may or may not be deemed to have the capacity to be treated as a state.

The result of this unequal capacity among Indian tribes is at least twofold. First, environmental protection among Indian tribes may vary widely, which raises questions of equal protection of the law and environmental justice. Second, the efficacy and consistency of environmental policy itself is brought into question. For example, the EPA is required under the Superfund law to deny cleanup monies to states that have not been able to set up licensed hazardous waste management facilities in their jurisdictions (Lazarus 1993). Such a requirement may run counter to EPA's initiatives to treat tribes as states and delay cleanup on tribal lands.

Functional Jurisdiction Challenges

A final challenge for environmental federalism in Oklahoma is that the mix of responsible governments and agencies can make it difficult to determine who bears responsibility for environmental protection efforts in Indian Country. In a recent case (*Blue Legs v. EPA*, 668 F. Supp. 1329 (D.C.S.D. 1987) members of the Oglala Sioux tribe sued the EPA, the Bureau of Indian Affairs, the Indian Health Service, and the Oglala Sioux tribe alleging non-compliance with the Resource Conservation and Recovery Act and the Indian Health Care Facilities Act (Cole 1992). The conflation of responsible parties suggests fractured responsibility and accountability – a potential barrier to adequate environmental protection. In Oklahoma, this is particularly salient given the number of tribes and the fractured nature of Indian Country.

Environmental Justice, Native Americans, and the Oklahoma Context

As noted above, justice is a major challenge to environmental protection in the United States. As agencies such as the Environmental Protection Agency attempt to work with Native American groups in a manner that ensures environmental justice, they need to consider and address the following specific issues that affect the perception and reality of justice.

Trust in Risk Managing Institutions and the Historical Record

With respect to the federal government, the Native American experience has been complex and often bitter. The government's attitudes and policies toward Native Americans have fluctuated over the years, marked by idealism in the post-revolutionary periods, the forcible relocation of numerous tribes under the Presidency of Andrew Jackson, positive efforts in the 1930s aimed at tribal government revival, and the dissolution of the federal-tribal relationships and land annexations in the 1950s. Thus, Native American attitudes toward potentially legitimated processes may be hostile as long as the federal government is a party to them and may affect their expectations about risk mitigation efforts. This is particularly true in Oklahoma because most of the tribes that are here were relocated here largely against their wills. Furthermore, the land they were given upon arrival in Oklahoma was reduced over the years by a number of federal actions. The result of this long history of federal government mistreatment and betrayal of Native American tribes has been significant distrust.

Cultural Perspectives on the Environment

Another factor that must be considered in a discussion on environmental justice in the Native American context has to do with cultural attitudes toward the land and the environment. Jorgensen (1984) differentiates between the cultural concept of land with deep symbolic associations that prevails among Native Americans and the mainstream western concept of land as a commodity – something alienable that can be bought and sold. These cultural perspectives on land result in attitudes opposed to land degradation and more attuned toward land stewardship.

Native American attachments to land for cultural reasons could be strong enough to motivate refusal of substantial compensation in exchange for their expropriation. Jorgensen (1984) points to the Sioux of South Dakota who have rejected offers of $145 million to relinquish their claims to the Black Hills area which they hold sacred, in spite of the tribe's depressed economic condition. Similarly, interviews conducted by Fowler *et al.* (1991) in the context of the Yucca Mountain nuclear waste repository showed that human-environment relations were of deep concern for local Native Americans.

This unique human-environment relationship implicit in Native American attitudes about environmental management indeed vary among the many tribes and typically reach far beyond the overly simplistic idea of "being one with nature" (Allen 1979). However, Momaday's (1976) umbrella concept of "reciprocal

appropriation" is useful in understanding the Native American relationship with nature. Native Americans typically "invest" themselves in the environment while simultaneously "incorporating" the environment into personal fundamental experience. Such attitudes toward the environment normally are not incorporated into federal regulations.

Attitudes toward Economics-driven Decisions and Tradeoffs

Native Americans often reject the economic notion of prioritization of resources and are often absolute in their denial of projects, making arguments of the form: "this land is ours, it should be left alone." Stoffle and Evans (1990) refer to this way of thinking as "holistic conservation." Cultural triage is the term they use to describe a forced choice situation wherein negative impacts of a proposed project are prioritized in importance and decisions are made to protect some cultural or environmental resources more than others. The use of the word triage indicates the extent to which the choice situation conflicts with traditional values and ways of decision-making. Stoffle and Evans (1990) present evidence that Native Americans are usually forced to shift from holistic to triage arguments when confronted with a project imposed from the outside.

Mainstream Americans are significantly individualistic in their worldview (Fitchen 1987) and this can have an impact on how they characterize societal problems and regard potential solutions (Wildavsky and Dake 1990). Native Americans may not share these worldviews. For example, Austin (1993) points out that cultural attitudes of Native Americans orient them toward communal rather than individual land development. Such attitudes present significant challenges to the standard economic notions used in policymaking settings.

Further, Native Americans may bring a different set of attitudes to bear on economic questions such as discounting. Native Americans may factor in future generations differently than the white American population. For example, Onondaga Chief Lyons (1980) and Cherokee Principal Chief Mankiller (1992) have both stressed the importance of thinking in terms of the well being of descendants as far into the future as seven generations. In the Native American view, this frame of mind is a responsibility they have no choice but to inherit.

On the issue of economic compensation, Native Americans may view this in a hostile manner as evidenced in the work of LaDuke and Churchill (1985). There may be resentment that tribes have been put in a situation where they need compensation and that programs exploit their poverty. Susan Shown Harjo, president of the Morning Star Foundation, a Native American advocacy group in Washington, says: "Five hundred years of colonization has done a real job on us. It makes us targets of cash and poverty politics" (Schneider 1992).

Attitudes toward Decision Making Processes or Procedural Equity

LaDuke and Churchill (1985) point to the imposition of alien forms of government supplanting indigenous governing structures, i.e., the formation of tribal council governments under the Indian Reorganization Act of 1934, and the mandate of the newly constituted governments to pursue economic development as a step toward creating dependency. They contend that aspects of reorganization such as the recognition of nuclear family ownership rather than the traditional community ownership destroyed traditional organizational structures and traditional resource management patterns.

Austin (1993) also notes that some forms of development require a willingness on the part of Native American tribes to participate in an adversarial or conflictual process of decision-making rather than the unitary or consensual methods that have traditionally been in place. She contrasts the vesting of authority in American government in *political office* with Native America where authority typically is vested in *persons.*

These differences between Native American perspectives and mainstream perspectives on environmental decision-making call for serious examination of the operationalization of environmental justice in the Native American context. Each of these issues is particularly important in the Oklahoma context because of the large number of tribes, the diversity of cultural values among the different tribes, and the different ways the tribes arrived in Oklahoma. The following case study shows how these concerns of environmental justice and the complexities of federalism play out in the federal government's effort to locate a temporary nuclear waste storage facility and the role that two Oklahoma tribes played.

The Federal Effort to Site a Monitored Retrievable Storage Facility for Nuclear Waste

The United States government's efforts to site a temporary Monitored Retrievable Storage (MRS) facility on lands belonging to Native American tribes was one of the more interesting twists and turns in its quest to establish a storage site for high-level nuclear wastes. In this section, we will explore the Oklahoma angle to this intriguing set of developments by drawing on the experiences of two tribes: the Sac and Fox and the Tonkawa, which demonstrated contrasting reactions to the U.S. government invitation to the tribes to consider serving as host of the temporary MRS facility for nuclear wastes. Our analysis draws on a set of structured interviews with sixteen opponents of the siting proposal among the Sac and Fox Nation (and one telephone interview) and on media reports and U.S. government sources in the case of the Tonkawa tribe. We also draw substantially on a fuller treatment of many of these issues in Gowda and Easterling (1998).

Policy Background

As part of its efforts to support the growth of the nuclear energy industry, the U.S. government took on the responsibility of establishing a storage site for high-level nuclear wastes by January 1998. The government has been trying for many years to site both a permanent geologic repository and an above-ground Monitored Retrievable Storage facility (MRS) for the interim storage. During the 1970s, the Atomic Energy Commission and the Department of Energy employed traditional "decide- announce-defend" siting procedures to locate a permanent repository. This strategy was revised in 1982 when Congress passed the Nuclear Waste Policy Act (NWPA) that provided a comprehensive policy for dealing with the nuclear waste problem, including "science-based" approaches to siting both a repository and an MRS.

However, strong public and political opposition limited the practical viability of NWPA (Carter 1987; Easterling and Kunreuther 1995; Sigmon 1987; McCabe and Fitzgerald 1992). In response, Congress amended the NWPA in 1987 to create a bifurcated approach out of the siting impasse: The permanent repository was to be sited by Congressional fiat (i.e., Yucca Mountain, Nevada, was designated as the only site to be considered), while a voluntary process was stipulated for the MRS.

In theory, a voluntary siting approach holds much promise. Ideally, a developer would not unilaterally select a site but rather invite all communities with technically suitable locations to enter into negotiations. When a community decided it was interested (e.g., through a referendum), its designated representatives would work with the developer to craft a mutually acceptable facility proposal. This proposal would stipulate a site for the facility, the conditions under which the facility would operate, and the nature of the benefits to be awarded to the host community. If more than one community were interested, the developer would select the site that was most attractive on some grounds (e.g., lowest cost, minimal risk). The voluntary approach was thus expected to satisfy the criterion of economic efficiency. More importantly in the siting context, it was also expected to address the main non-economic obstacles to the siting of noxious facilities – adverse perceptions of the risks involved (heightened due to a perceived lack of control), lack of community participation, lack of trust in the managers of the facilities, and concerns over the fairness of both the procedures utilized to choose sites and the eventual outcomes (Rabe 1994; Munton 1996). The voluntary approach was also expected to address concerns about environmental justice because siting was not imposed on poor or minority groups. To obtain informed consent, funds were provided to enable communities to obtain scientific expertise to study the issues involved in the siting.

The voluntary siting process for the MRS was to be implemented by the Office of the Nuclear Waste Negotiator that was specially created by the 1987 amendments to NWPA. The Negotiator was authorized to seek states, counties, or Indian tribes that might be interested in hosting such a facility in return for monetary and other compensation. As a baseline, Congress authorized the host state or tribe to receive $5 million per year before the shipment of waste and $10 million per year during the operational phase of the MRS facility [Section 171 of NWPA, as amended]. The Negotiator was free to negotiate a benefits package well in excess of these figures. Grants could be obtained for such purposes as infrastructure improvement, cleanup of environmental problems, educational assistance programs, economic development, and recreational facilities. The first Negotiator, David Leroy worked hard to ensure that "affected stakeholders [satisfied] themselves on all conceivable issues of safety, control, technology, and

acceptability" (Leroy 1991a:10); that communities could freely withdraw from the process at any time; and that community participation would occur only after a referendum within the community agreeing to decisions taken by elected community officials. The siting process and study grants involved different stages designed to gradually step up the involvement of interested communities and to move toward eventual siting.

Leroy's efforts were met with resounding silence on the part of the nation's governors. The political, environmental, and ideological connotations associated with hosting a nuclear waste storage facility overshadowed whatever economic benefits might be possible under the Negotiator's program. The lack of receptivity on the part of the nation's governors severely compromised whatever hopes for success might have been associated with the Negotiator's voluntary siting process. Not only were the governors unwilling to enter into any communication with the Negotiator, they also thwarted any meaningful participation on the part of those counties that expressed even a preliminary interest in hosting an MRS. Faced with this situation, the only entities left for the Negotiator to approach were Native American tribes. Although governors had the statutory authority to veto counties' participation in the Negotiator's program, Native American tribes enjoyed a level of sovereignty that precluded interference from state-level officials. While avoiding any obvious overtures to "target" Native Americans for an MRS, the Negotiator's Office spent much of its time responding to the interest that various tribal councils showed in acquiring economic benefits in return for hosting the facility.

A total of 24 tribes applied for study grants, with 20 coming into the process during Stage I (including the Sac and Fox) and four others during Stage II-A of the siting process. However, only a fraction of these represented serious interest on the part of the applicant tribes. For example, among the 20 applications for Stage I grants, three were rejected by the Negotiator, four others were withdrawn by the tribe before funds were disbursed, and eight others dropped out of the process shortly after receiving their Phase I funds. This left only five of the initial 20 applicants to move onto Stage II-A (although four others entered into the process at that point). In the end, only four tribes – the Mescalero Apache of New Mexico, the Skull Valley Goshute of Utah, the Tonkawa of Oklahoma, and the Fort McDermitt Tribe of Oregon and Nevada – remained committed to the MRS as they explored the opportunity in greater depth. In August 1993, the Mescalero Apache Tribe submitted an application for a Phase II-B grant stating that it was ready to begin "credible, formal discussions" regarding hosting the MRS. A second application for a Phase II-B grant was submitted by the Skull Valley Goshutes who wanted to volunteer a site near the Dugway Proving Grounds in Utah, a much-contaminated and test-bombed piece of land with little development potential.

The interest being expressed by Native American tribes, particularly the Mescalero Apache, raised significant concern on the part of New Mexico officials. The prospect of an MRS facility in central New Mexico was extremely unpopular among the non-Native American population of the state, especially since New Mexico was already the host of another nuclear waste repository – the Waste Isolation Pilot Project for transuranic waste near Carlsbad (for military waste). Because state officials had no authority to intervene in the negotiations, they sought another approach to block the Mescaleros from pursuing an MRS facility – namely, U.S. Senator Jeff Bingaman (D-NM). Senator Bingaman sponsored legislation that would have required interested tribes to gain the cooperation of state and local officials before receiving study grant funds. Congress went further and voted to cancel the entire study-grant program in October 1993 (*Western Energy Update* 1993), and, ultimately, the Office of the Nuclear Waste Negotiator in January 1995 (Fedarko 2000).

The Sac and Fox Reaction

The Sac and Fox Nation's application for a study grant from the Office of the Nuclear Waste Negotiator had been submitted by the elected officials of the tribe who are recognized as the legitimate decision-makers under the Indian Reorganization Act. These actions were in accordance with the procedures prescribed by the tribal constitution. In spite of this, there was concern among tribal members that the tribe's participation in the MRS siting process had not been discussed openly in order to obtain the consent of the entire tribe. This concern crystallized in the form of a petition for a special tribal meeting initiated by Grace Thorpe, a tribal member (and daughter of the renowned Olympian Jim Thorpe). This meeting was held in January 1992 after the petition received the number of signatures required by the tribal constitution. At this meeting, the tribal chairman announced that the business council had only

decided to accept an MRS Phase I study grant and that the tribe would withdraw from the MRS facility siting process thereafter. After some discussion on the issue, Grace Thorpe moved a resolution to the effect that the tribe withdraw from the MRS facility siting process altogether. With support from other opponents of the proposal, this resolution carried by a substantial margin, thus ending the Sac and Fox's involvement with the MRS (personal interviews).

There were several factors cited by Sac and Fox opponents of the MRS facility to justify their opposition. One central feature was their lack of trust in the federal government and in the study grants. Sac and Fox opponents argued that it was unthinkable that the federal government would "give away" $100,000 for a study grant with no strings attached. They referred to the federal government having recently upgraded the highway that ran through their tribal headquarters as a sign that they were potentially going to be faced with a fait accompli. Opponents were also concerned that the MRS would not be a temporary facility, the process would not be truly voluntary, and the federal government would ultimately abdicate responsibility for the nuclear waste to the tribe (personal interviews).

In terms of risks and their management, opponents questioned the federal government even considering nuclear waste siting on tribal lands, especially when tribes typically did not have strong internal regulations, expertise, or enforcement mechanisms. Further, while opponents acknowledged that tribal members faced serious economic hardships and that the MRS represented one of the few economic-development opportunities available to the tribe, they also attributed a number of substantial risks and other costs to the MRS facility, including risks to the health of tribal members, future generations, and even the very existence of the tribe. Opponents therefore asserted that proceeding with the MRS would not be in the interests of the tribe. These opponents suggested that, in general, a "noxious" facility would be much more acceptable if the facility had a purpose that directly served the needs of the tribe. Since the nuclear waste was not generated by the tribe, these opponents believed there were no *intrinsic* benefits or responsibility for hosting the MRS.

Some tribal opponents of the MRS facility explicitly pointed to the fragmented nature of the tribal land holdings and how these were interspersed with non-tribal lands. They were concerned about being stigmatized by their mostly non-white neighbors and about putting these people at risk when they gained no benefit from the facility. Opponents were also concerned that while the tribal management did use appropriate procedures in applying for the study grant – given the importance of the siting issue – the entire tribe should have been included in decision-making process from the beginning. Opponents then led a move to reform the tribe's decision-making procedures to avoid similar situations in the future.

The Tonkawa Reaction

The Tonkawa involvement in the nuclear waste-siting saga may have arisen more from the entrepreneurial efforts of non-tribal consultants than from an inherent interest on the part of the tribal leadership. The *Daily Oklahoman* reported that differences with the Ponca tribe caused a consultant to withdraw from his association with the Poncas and to instead work with the Tonkawas to prepare and submit a new application on their behalf (McNutt 1993a). This may have been an instance of a tribe taking advantage of the nonbinding nature of the study grant and treating it potentially as a source of revenue. Regardless of motive, the Tonkawa tribe applied for and was awarded a Stage II study grant of $200,000 to investigate the feasibility of hosting the MRS on land owned by the tribe near the former Chilocco Indian School in northern Oklahoma. The application was argued by the tribal chairman as being justified because of its potential economic benefits for a tribe with a significant unemployment rate. Initially, the tribal chairman was also reported to have stated that the nuclear waste may not be located on tribal lands in Oklahoma but instead on already contaminated land bought for the tribe by the federal government in Nevada or Colorado (McNutt 1993b).

These initiatives of the Tonkawa tribal leadership ran into significant opposition over time, within the tribe, from other Native American tribes, from environmental groups in Oklahoma, from state representatives, and from the Governor of the state (McNutt 1994c). Opponents within the tribe were concerned that the leadership had not discussed the proposal within the tribe before pursuing the MRS (McNutt 1994d; 1994e). Earl Hatley of the Oklahoma Toxics Campaign cited technical reasons – the site's unsuitability to even support a solid waste dump by state standards – as among the leading reasons for his organization's opposition (McNutt 1994f). The site was opposed by all communities in Kay County and

also by residents across the Kansas border. The local state legislators, the governor of Oklahoma, and a member of Congress also openly expressed their opposition to the site (McNutt 1994b). Finally, other Native American tribes, including the Ponca, Kaw, and Cherokee who possessed land in the region or shared the land around the Chilocco Indian school expressed opposition to the siting proposal and declared their lands "nuclear-free zones" (*Daily Oklahoman* 1994; McNutt 1994a).

Virginia Combrink, the chairman of the Tonkawa tribe, combatively responded to the opposition by stating: "We will pursue this anyway, independently, even if the Department of Energy does not give us the (facility). Chilocco is our land, and we will do what we want with it" (*Daily Oklahoman* 1994). Ultimately, in August 1994, the tribal government put the issue of participation in the MRS program to a vote of the entire tribe. By a vote of 44-58 (more than half of the tribe's 181 members participating), the motion to continue with nuclear waste siting was defeated. The tribal chairman reacted to the defeat by stating her intention of moving on to the next economic development opportunity – siting a federal prison on the same land earmarked for the MRS facility (McNutt 1994f).

Implications of the Case Study for Environmental Federalism and Environmental Justice in Oklahoma

Many of the concerns raised in the environmental justice and federalism contexts are exemplified by the Oklahoma tribes' involvement in the temporary MRS siting process. Conflict arose relating to federalism with both tribes' actions. There was conflict across jurisdictions, in part because of the potential for nuclear wastes to cross jurisdictional boundaries. The state, county, and neighboring tribes and communities all weighed in against the Tonkawa involvement in the process. Yet, the Native American tribes continued to assert their sovereignty as was shown by strong statements by the Tonkawa leadership. These are among the most basic issues in environmental federalism as mentioned above.

The case exemplifies other issues related to federalism as well. Lack of clarity about specific land ownership and the patchwork ownership patterns that characterize Indian Country in Oklahoma proved troublesome. The opponents to the Sac and Fox involvement specifically mentioned concerns about the patterns of land ownership that have non-Indians living in Indian Country and the ways those non-Indians would be affected by the decision to accept nuclear wastes without having been involved in making it. Concerns for tribal capacity (based on perceived weak internal regulations, expertise, and enforcement mechanisms) to manage such high level environmental contaminants were also raised. Functional jurisdictional issues became important as well with the Sac and Fox when concerns arose over what entity would have ultimate long-term responsibility for the nuclear wastes.

Concerns in the context of environmental justice are equally as troubling in this case. Perhaps the most basic concern is that tribes that faced significant economic hardships may have been lured by the financial incentives offered to prospective hosts of these nuclear wastes. It is not a just or equitable procedure, however, that preys upon the weaknesses of groups or communities to get them to accept a facility they might not approve of under better economic circumstances.

Other complexities within the environmental justice context arose as well. In both the Sac and Fox and the Tonkawa tribes, there was a concern voiced over procedural equity. In both tribes, there were those who argued that the entire tribe needed to be involved in making the decision about whether or not to apply for a MRS facility. In the Sac and Fox tribe, the concern led tribal members to seek and obtain procedural changes to increase input from members in the decision-making process. Communal processes were viewed as being of utmost importance.

The way that economic tradeoffs were considered was also telling in this case. The tribes, though interested in the economic benefits that could be provided by the MRS facility, showed concern for the impacts of the MRS on future generations and the long-term survival of the tribe. Rather than focusing on immediate profits, long-term considerations ultimately prevailed.

Based on the above case studies and the preceding discussions, we can conclude that environmental federalism and environmental justice are extremely complex in the Oklahoma context, particularly when Native American tribes are involved. Ultimately, the large number and diversity of tribes in Oklahoma; the interactions between tribes, states, and the national government; and concerns for environmental justice present fundamental challenges to the inherent fairness of a siting procedure that is ostensibly equitable.

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PART V

NEW TOOLS IN
ENVIRONMENTAL POLICY ANALYSIS

APPLICATION OF GIS IN ENVIRONMENTAL POLICY ANALYSIS

Mahesh N. Rao, Will Focht, and John A. Bantle

Role of Analysis in Policy Deliberation

In 1996, the National Research Council published an important prescription for how environmental risk-based policy should be formulated (Stern and Fineberg 1996). This publication redefines the relationship between policy analysis and policy deliberation.

In its previous prescription (NRC 1983), the NRC defined a process of environmental decision-making that has shaped the way that many federal and state environmental regulatory agencies implement risk-based programs. This paradigm embraced a linear process that attempts to separate facts and values. In risk assessment, scientists were asked to conduct value-neutral analysis of risk using the best data and risk models available. This assessment was then fed into the risk management process in which tradeoffs among competing values were made in selecting a risk reduction strategy. While the 1983 paradigm acknowledged that stakeholders have a legitimate role in risk management, their involvement in risk assessment was less important by virtue of the expert scientific nature of the enterprise.

In 1996, the NRC re-examined the risk analysis paradigm and derived a remarkably different approach (Stern and Fineberg 1996). In the new paradigm, risk-based decision-making is prescribed as an integrated and recursive process of technical analysis and political deliberation. The arbitrary separations of fact and value, expertise and dialogue, and assessment and management were abandoned in favor of a holistic integration. This new approach increases the trustworthiness of decision-making and better resolves controversies than does the former. Despite this (r)evolutionary change in thinking, there is little evidence that environmental agencies have abandoned the earlier paradigm. This may be due to the heavy emphasis on natural science and engineering training of decision-makers.

In the 1996 prescription, the interplay of analysis and deliberation takes place in both risk assessment and risk management. Analysis is used to inform policy deliberation so that the best information is brought to bear upon the problem to be solved ("getting the science right"). This role of analysis is not so different from that under the 1983 paradigm. The novel change is that deliberation is used not only to make a decision, but also to frame the analysis and to empower participants in understanding analytic findings ("getting the right science"). Thus, it is not solely within the discretion of the analyst to decide what information should be considered in the analysis, what models should be used to predict impacts, and how to evaluate alternative impact management schemes. Non-technical stakeholders should also participate in framing the issues that are salient to the decision problem. Such issues include deciding what information should be considered, what further studies should be performed to reduce uncertainty, what models should be used to predict impacts and to evaluate alternatives, what assumptions and defaults should be used in these models, and so on. New information, once provided to the deliberants, may stimulate another round of analyses to further inform deliberation. The careful integration of analysis and deliberation in a recursive manner is the most important element of the new paradigm.

This paper examines the role that GIS can play in informing policy deliberations while at the same time stimulating further analyses. As will be demonstrated, the graphical display capability of GIS, coupled with its powerful analytical capacity inherent in its underlying database, is well situated to facilitate the integration of environmental policy analysis and deliberation.

Use of GIS in Environmental Policy Analysis

Geographic Information Systems (GIS) is an important and increasingly useful tool in environmental policy analysis. GIS not only allows the visualization of spatial data to aid policy decision-making, but also allows scenario testing that can explore the anticipated outcomes of policy alternatives. We will use GIS to analyze the environmental threat to an amphibian population in Norman, Oklahoma and then discuss how the GIS-based analysis can inform policy designed to reduce this threat. The paper concludes with a discussion of issues raised by the analysis, which illustrates how policy deliberation can frame further analysis.

A GIS Case Study: Declining Amphibian Population

The decline in amphibian population in many parts of the world (Blaustein and Wake 1990; Fellers and Dorst 1993; Phillips 1990; Tyler 1991) deserves attention not only because it is disturbing in its own right but also because amphibians serve as potential indicators of the overall health of the environment. Several factors are hypothesized to contribute to population declines. Anthropogenic factors leading to habitat destruction and degradation clearly remain the most significant causes of amphibian disappearance (McNeely *et al.* 1990; Wilson 1988). For example, increased UV radiation from the depletion of stratospheric ozone has been suggested as one cause (Blaustein *et al.* 1994). However, lethal and sub-lethal concentrations of environmental toxicants such as pesticides, trace metals, and industrial organic chemicals can also trigger population declines (Carey and Bryant 1995). It is important to understand the causes of amphibian population declines in particular environmental settings in order to formulate appropriate policies that can restore the population.

Since environmental factors have a strong spatial component, GIS is ideally suited to investigating stressors that might be responsible and hence is a powerful analytical and planning tool to inform environmental policy deliberation.

Study Site

The study site (Figure 1)[1] is a landfill located south of the city of Norman in central Oklahoma on alluvium deposited by the Canadian River, which has been designated as a national toxicology study site by the U.S. Geological Survey (USGS). The landfill was operational from 1922 to 1985 with no restrictions on the type of wastes deposited. More than 40 semi-volatile and non-volatile compounds are found in the groundwater downgradient of the landfill (Dunlap *et al.* 1976). Many of these compounds are known xenobiotics and carcinogens. A reference site (Figure 2), approximately 5 miles upstream of the river, serves as a control area. GIS-related studies undertaken at the study site include environmental toxicity, amphibian biomonitoring, and ultra-violet radiation.

Environmental Toxicity Study

Toxicological assays such as FETAX (Frog Embryo Teratogenesis Assay – *Xenopus*) can be used to study the effects of environmental toxicants on amphibians. FETAX is a four-day, whole embryo, developmental toxicity test using the South African clawed frog (*Xenopus laevis*). The assay was initially developed as an indicator of potential human developmental health hazards (Dumont *et al.* 1982) and has found wide application in aquatic toxicological assessments (Dawson *et al.* 1985; Bantle *et al.* 1994; Fort *et al.* 1995). Surface and groundwater samples collected between January and April 1997 from the landfill and reference sites were tested using FETAX.

Most of the toxicity at the landfill site exists downstream of the landfill (Figure 3). Toxicity is particularly high at location NL4, a groundwater seep, at which 100% mortality was observed. At the reference site (Figure 4), only sporadic instances of higher than normal toxicity and malformation are found. This suggests that a leachate plume is emanating from the landfill.

The toxicity assessment results obtained from groundwater samples collected during November 1995 are summarized in Figure 5. This map clearly shows an inverse relationship between distance from the landfill and toxicity. This relationship suggests that the landfill is the source of the toxicity. Three mechanisms can account for the decrease of toxicity with distance. First, vertical and lateral dispersion

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[1] All figures and tables are located in an appendix at the end of this paper.

reduces contaminant concentration as the plume migrates away from the landfill. Second, the stream that flows across the groundwater plume migration route can lose water to the aquifer and dilute the contaminants. Third, the stream can intercept groundwater contaminants whenever it gains water from the aquifer as during times of high groundwater elevation. In either of these last two cases, the stream-groundwater interaction can decrease contaminant concentrations. The decreasing rate of toxicity with distance from the landfill provides valuable clues to the status of the plume of toxicants leaching from the landfill.

Figure 6 shows the typical malformations that were observed, including dorsal curvature of the tail, lack of gut development, and stunted growth. These malformations are consistent across sampling locations at the site.[2] Interestingly, we found that teratogenicity *increases* with distance, which suggests that the concentration of teratogens must also be increasing with distance – but this is not the case. The best explanation is that loss of toxicity allows more embryos to survive to be malformed.

Biomonitoring-Weather Study

Biomonitoring and weather data can be correlated and compared at Norman Landfill and reference sites to provide additional information on amphibian toxicity. Amphibian biomonitoring was conducted using drift fence arrays at both sites (Figures 7 and 8). This technique employs the use of pitfall and funnel traps placed at strategic points along an artificial barrier (drift fence). The barrier intercepts animals moving through the habitat and directs them toward the traps. Figure 9 depicts the total number of animals observed during the survey period. The biomonitoring data were then correlated with prevailing weather conditions (Table 1). Oklahoma Mesonet weather stations provide weather data at a 5-minute temporal scale. We found that the amphibian population correlates positively with rainfall and relative humidity, whereas the reptilian population, which is not declining, does not correlate with these variables. This suggests that amphibians are uniquely sensitive to moisture variation, thus providing another clue as to their decline.[3]

Utility of GIS to Inform Policy Deliberation

The correlation between distance from the Norman Landfill and frog embryo toxicity and teratogenicity provides strong evidence that the amphibian decline is due exposure to contaminants emanating from the landfill. In addition, the unique sensitivity of amphibians to rainfall and humidity and the positive correlation of these variables with population suggest that contaminant exposure is occurring through water. However, amphibian sensitivity to humidity is most at the contaminated site whereas sensitivity to rainfall is apparent at both the contaminated and reference sites. Finally, the relationship between groundwater and surface water contamination through their hydrologic connection suggests that surface water contamination is occurring from the migration of contaminants to surface water from groundwater during wet periods.

Tying these findings together, the following tentative explanations emerge. Amphibian decline near the Norman Landfill may be due, at least in part, to surface water contamination by the migration of leachate through groundwater to surface water. Dilution of the contamination occurs during rainfall periods when surface water runoff and stream flow are high and thus adverse effects are not manifest. However, contaminant concentrations in surface water may rise after stream flow subsides if groundwater elevations remain high. However, it is still possible that contamination carried to streams by surface runoff is also responsible. Moreover, it is still possible that weather itself – especially humidity – is also contributing to the decline since declines in population with lowered humidity was also noted at the reference site.

Though additional studies are underway to investigate this and other possible causes of decline, if the hypothesized cause is proven correct, then effective mitigation must include groundwater remediation.

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[2] The reader is referred to Bruner *et al.* (1998) for a detailed description of the surface and groundwater toxicity analysis of the landfill and reference sites.

[3] A three-year ultraviolet radiation field study is currently underway to investigate more closely the possible effects of UV on amphibian populations. These results are not yet available.

This was not immediately evident. Without the GIS study, it is possible that a policy that focused only on surface runoff contamination would have been pursued, which would likely have failed to reverse the amphibian population decline.

Utility of GIS to Frame Further Policy Analysis

Based on the spatial variations of toxicity in groundwater and surface water near the landfill, both landfill leachate and surface water runoff may be contributing factors to the observed decreases in amphibian populations. The short-term study indicates that weather may also play an important role in the population fluctuations. Since ecological studies require long-term evaluation, there is a strong need for sustained data collection and analysis. The resolution of this matter will depend on further GIS analysis of toxicity assessments from such long-term studies. Moreover, based on these preliminary results, additional studies should be undertaken to address the biogeochemical characteristics of the landfill. The USGS is already conducting extensive studies aimed at characterizing the subsurface flow characteristics of the site as part of the Toxic Substance Hydrology program. These studies, undertaken in conjunction with the toxicity tests of the surface waters and ground waters, will provide valuable information on the toxicity of the site. Evaluating these studies in the framework of a GIS will provide valuable insights in the spatial and temporal variation of the toxicity at the site.

Future Research

An important study that will be implemented soon involves amphibian habitat. A GIS-based habitat map will be generated using Landsat TM satellite data. This effort will provide valuable input to any indication of the habitat being a limiting factor to the amphibians.

Another needed study indicated by the preliminary analysis of toxicity is *in situ* toxicity experimentation. The preliminary results were based on lab analysis of the samples. Moreover, the significant toxicity observed at the lower stretches of the slough needs further validation. Conducting the FETAX test under ambient field conditions at selected sites will provide the necessary validation of the lab results. Further screening of the toxicity could be conducted by coupling the field-based FETAX tests with the Toxicity Identification and Evaluation (TIE). TIE tests can be used to identify the individual chemical stressors most responsible for population declines.

Conclusion

This paper demonstrates the application of GIS to integrate spatial environmental data from diverse sources to analyze impacts and identify sources of threats to ecological receptors. The data sources included surface water and groundwater toxicity analyses, amphibian biomonitoring results, and weather information gathered from Mesonet stations. The use of GIS in this case study facilitated the creation and use of a comprehensive risk database not only to explore causes of, and potential solutions to, amphibian population declines. This is of particular importance in judging the significance of competing causes of toxicity. Furthermore, the results of this preliminary study highlights the importance of spatial technology in creating an context conducive to dialog and consensus-building among stakeholders and policymakers by providing an impetus for further study and sustained monitoring. Use of the visual displays and analytical results of this project presented at public and professional meetings have resulted in continued funding of *in situ* experiments and monitoring efforts. Though we did not sponsor actual policy deliberations as part of this research, we hope that this paper demonstrates how GIS can be used to both inform policy deliberation and frame further analysis.

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Acknowledgments
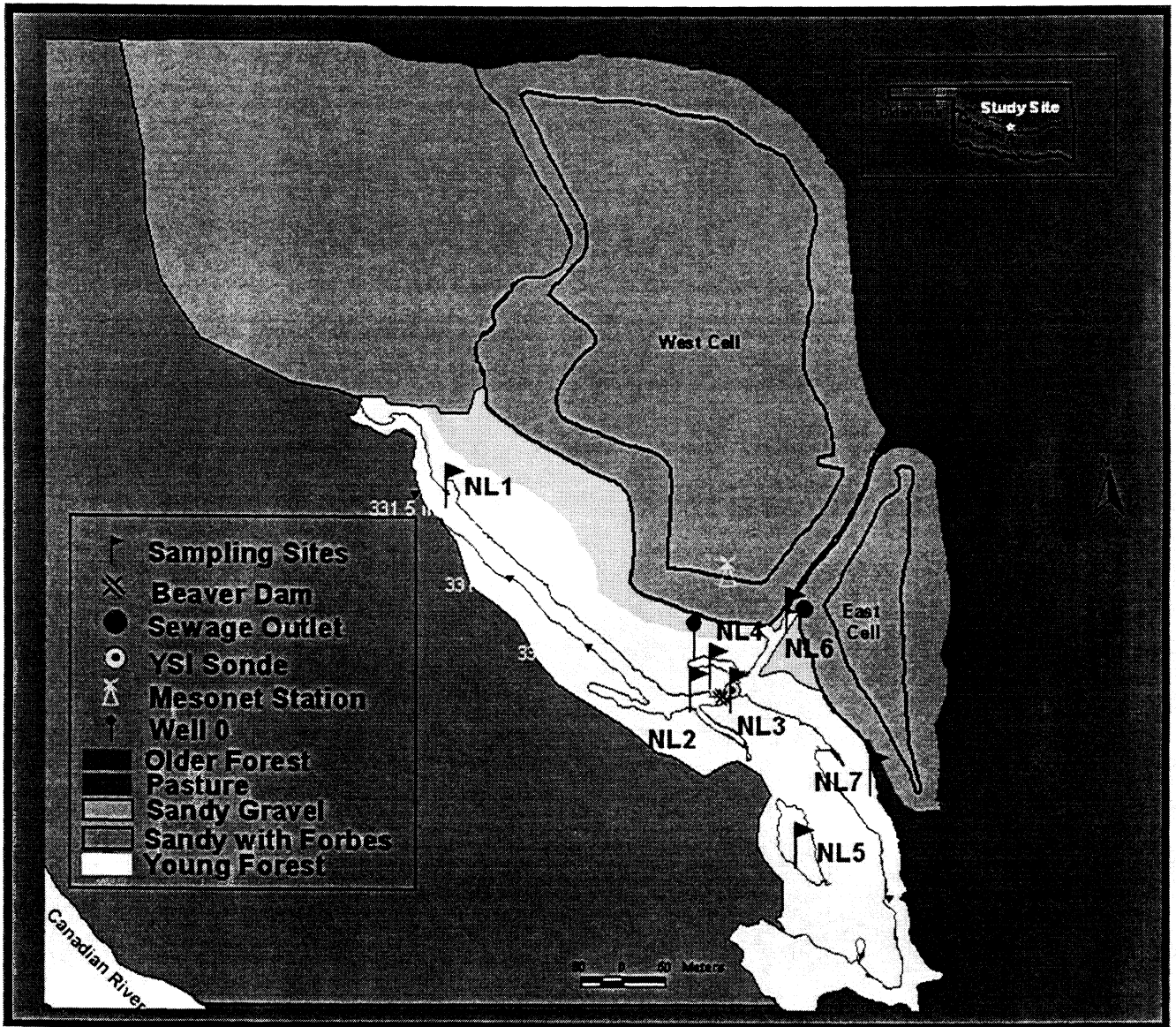
Appendix

[See next pages]

Figure 1. Map of the Norman Landfill Study Site
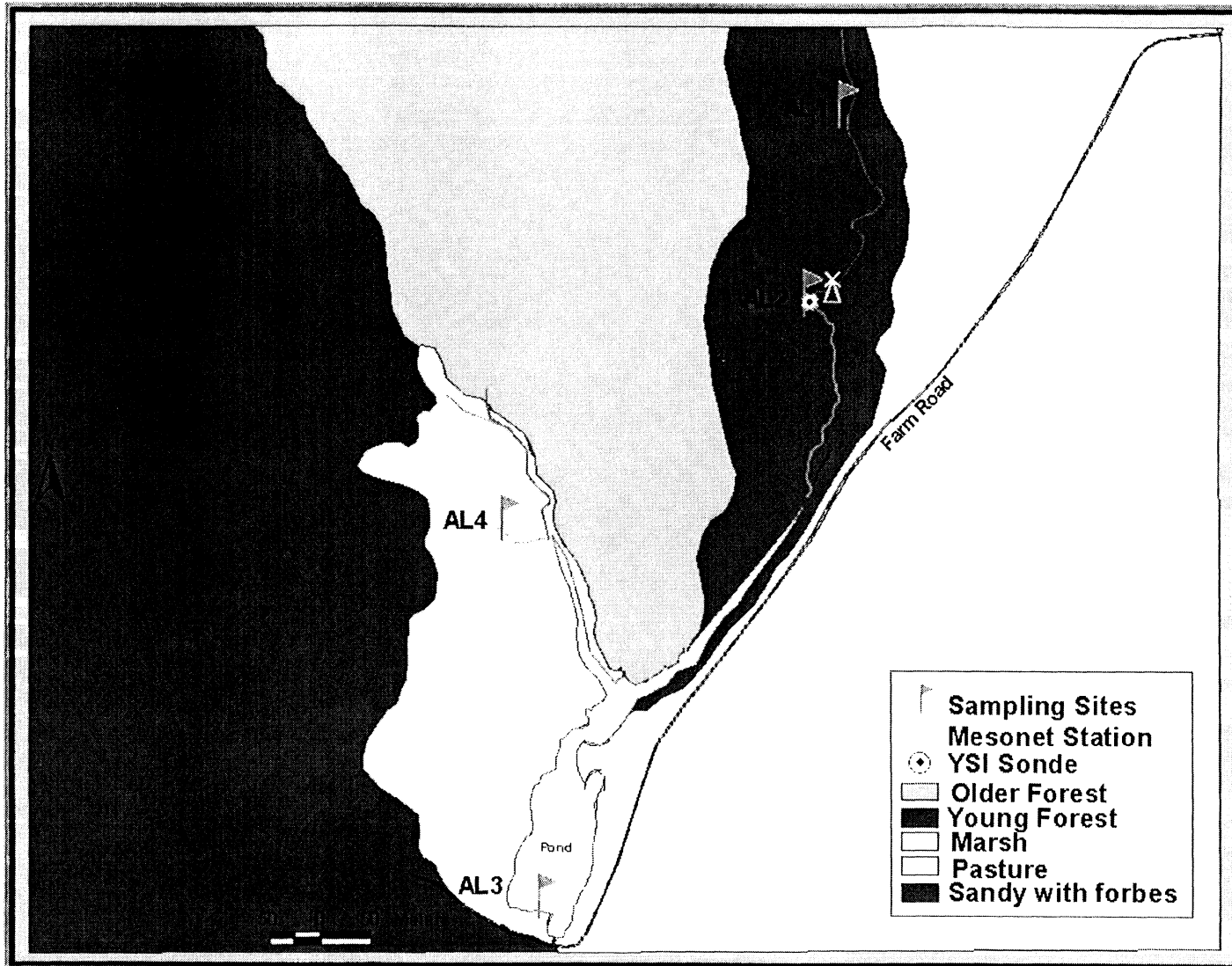
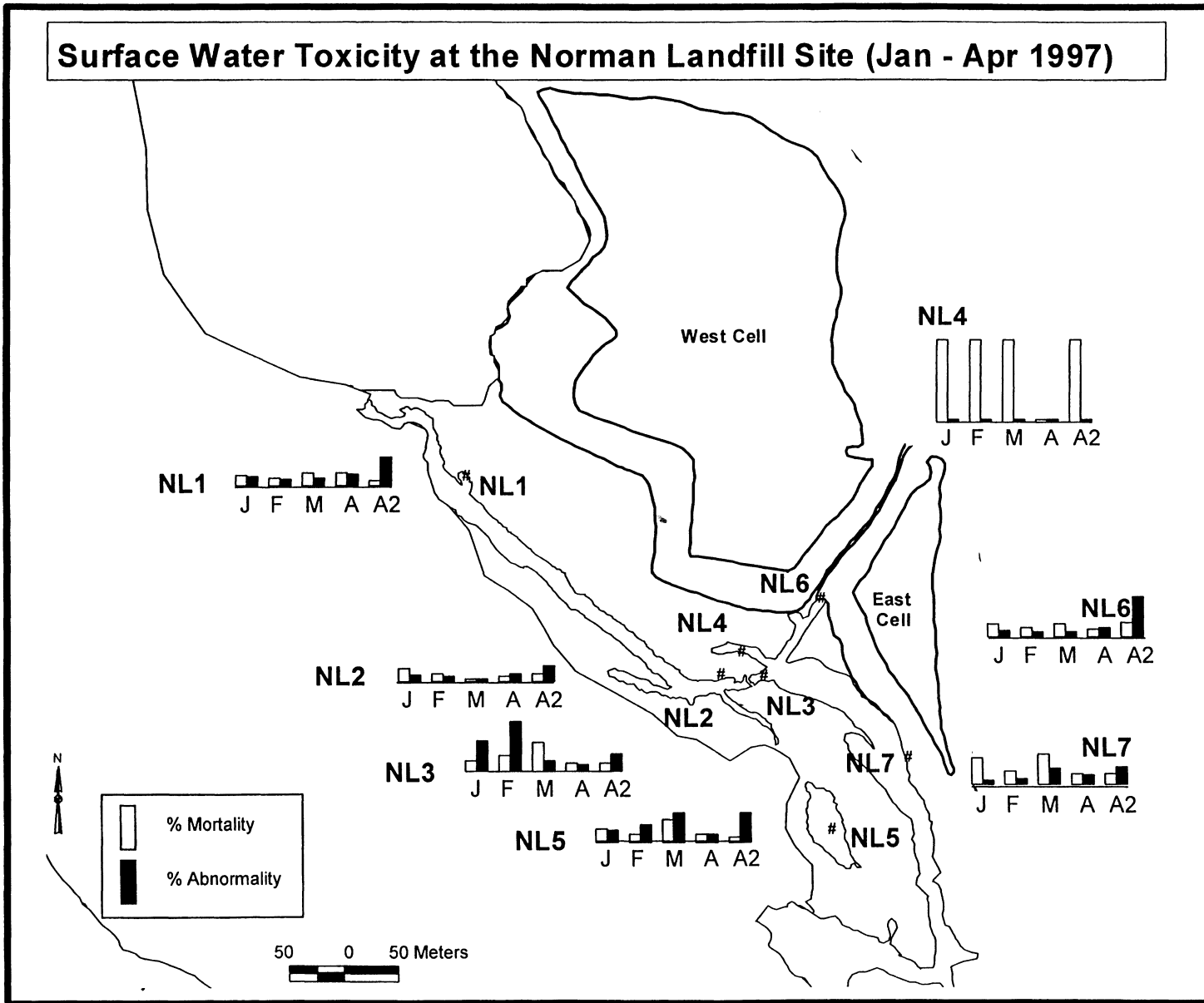**Figure 2. Higher Resolution Map of the Study Site**

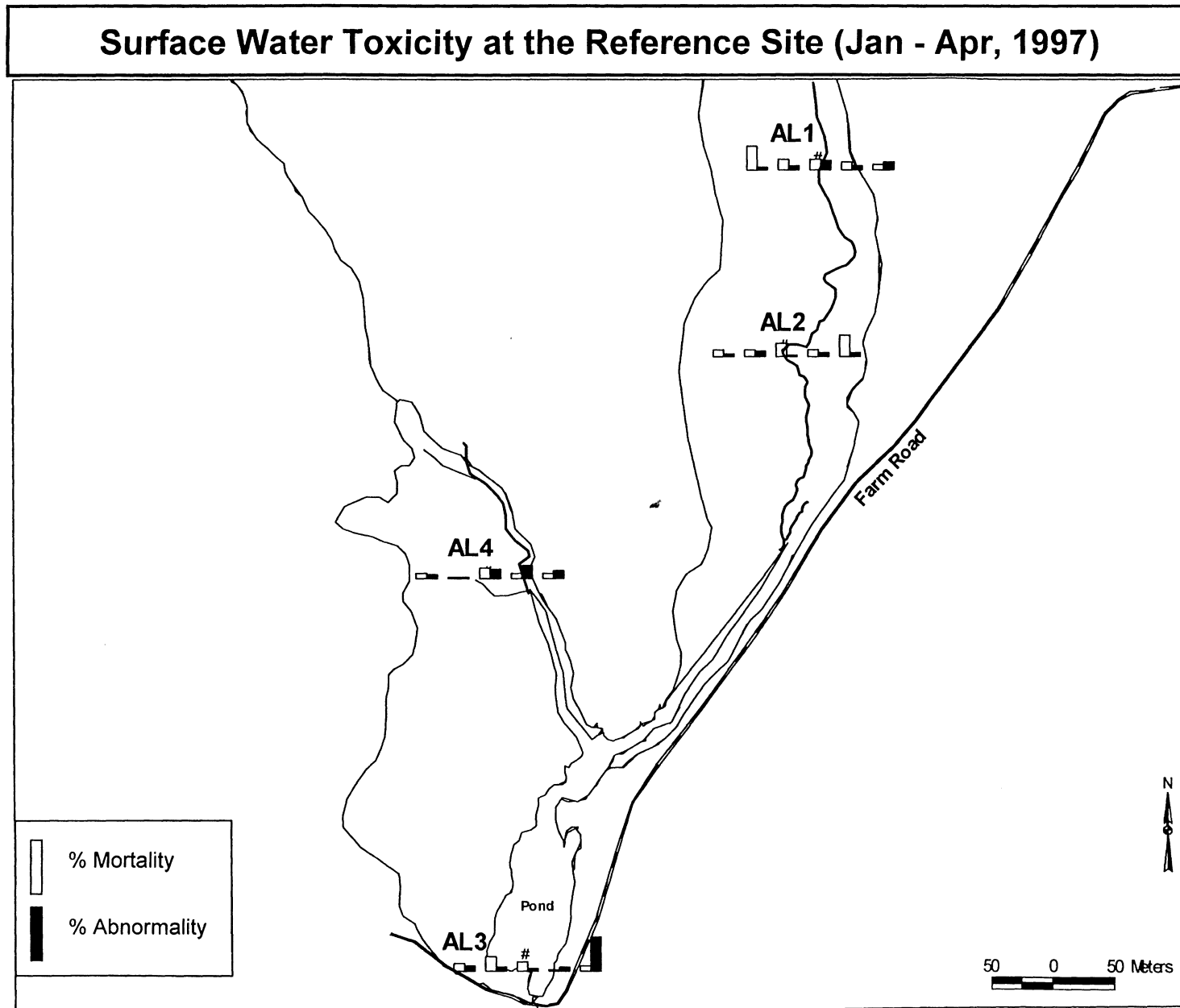Figure 3. Surface Water Toxicity

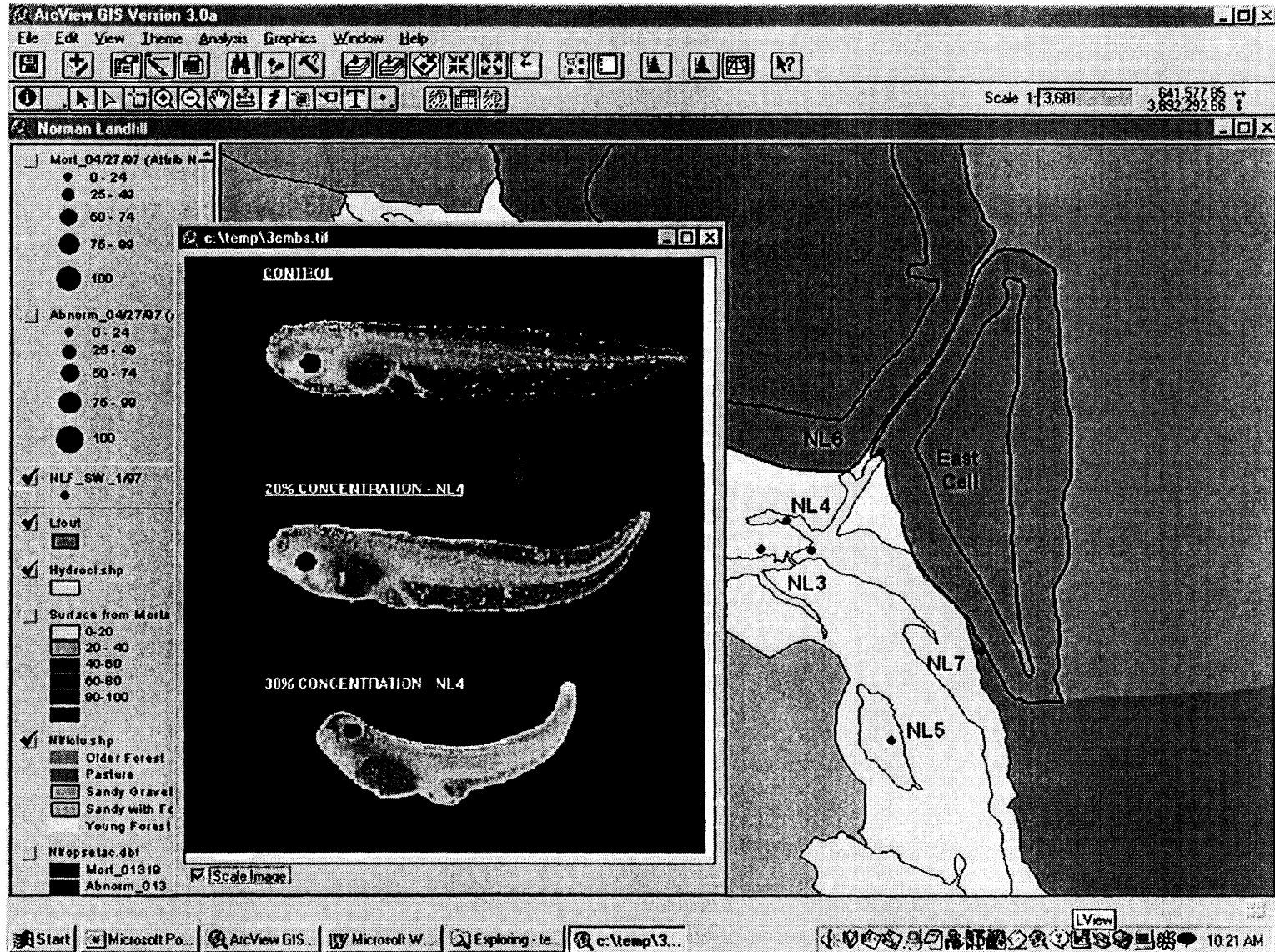Figure 4. Surface Water Toxicity

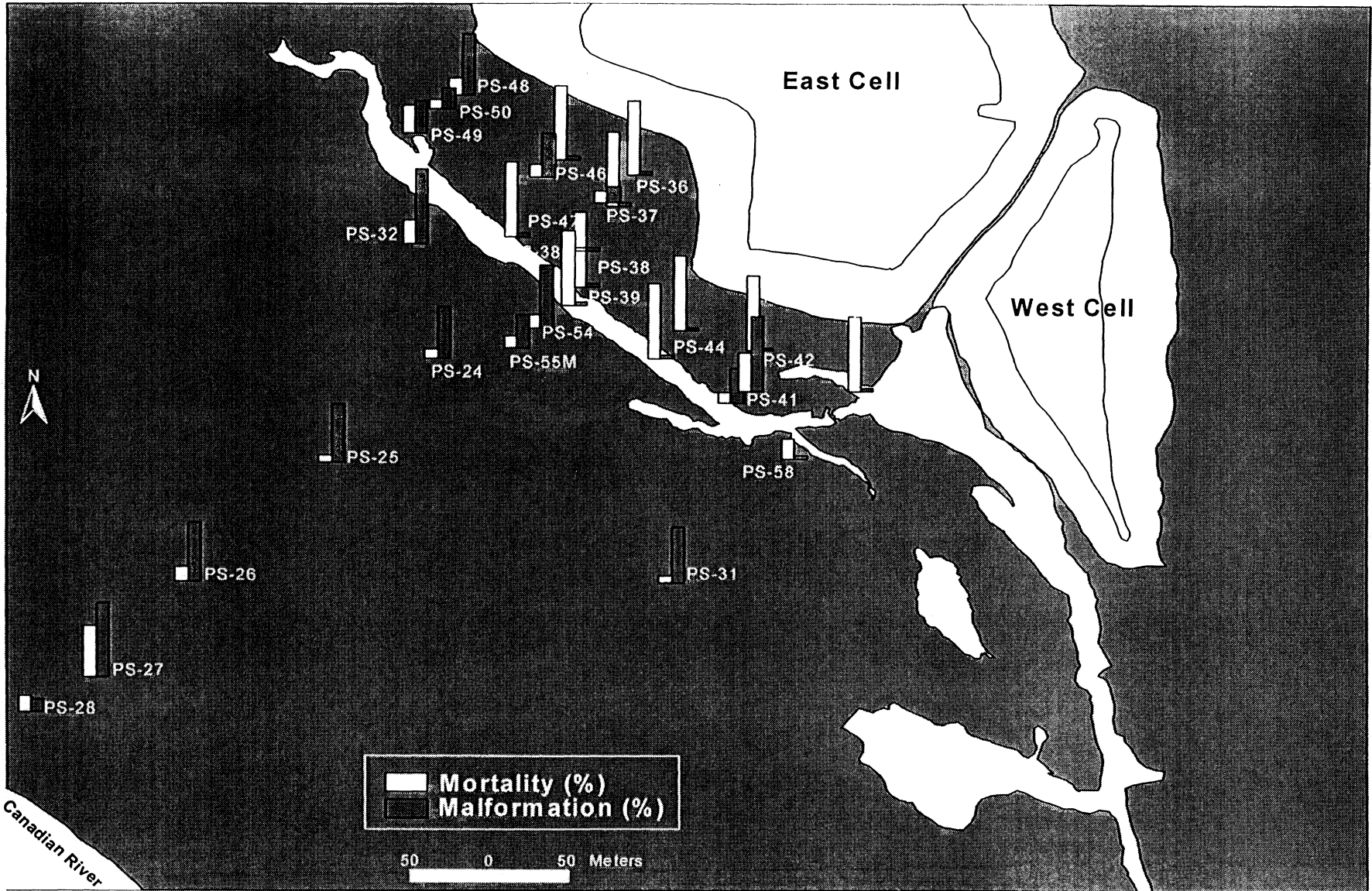**Figure 5. Hotlinked Image Showing Typical Embryo Malformations**
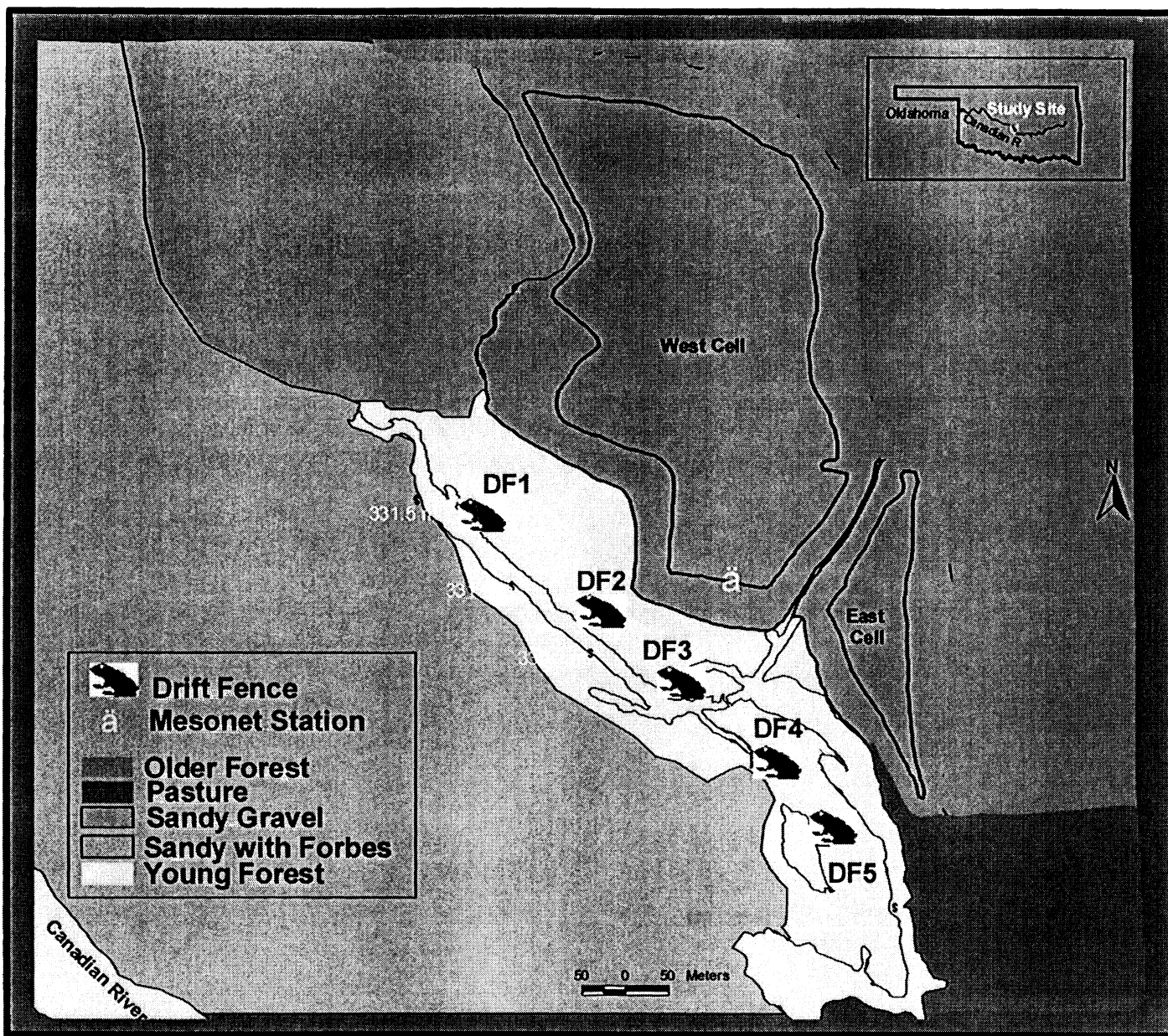
Figure 6. Groundwater Toxicity

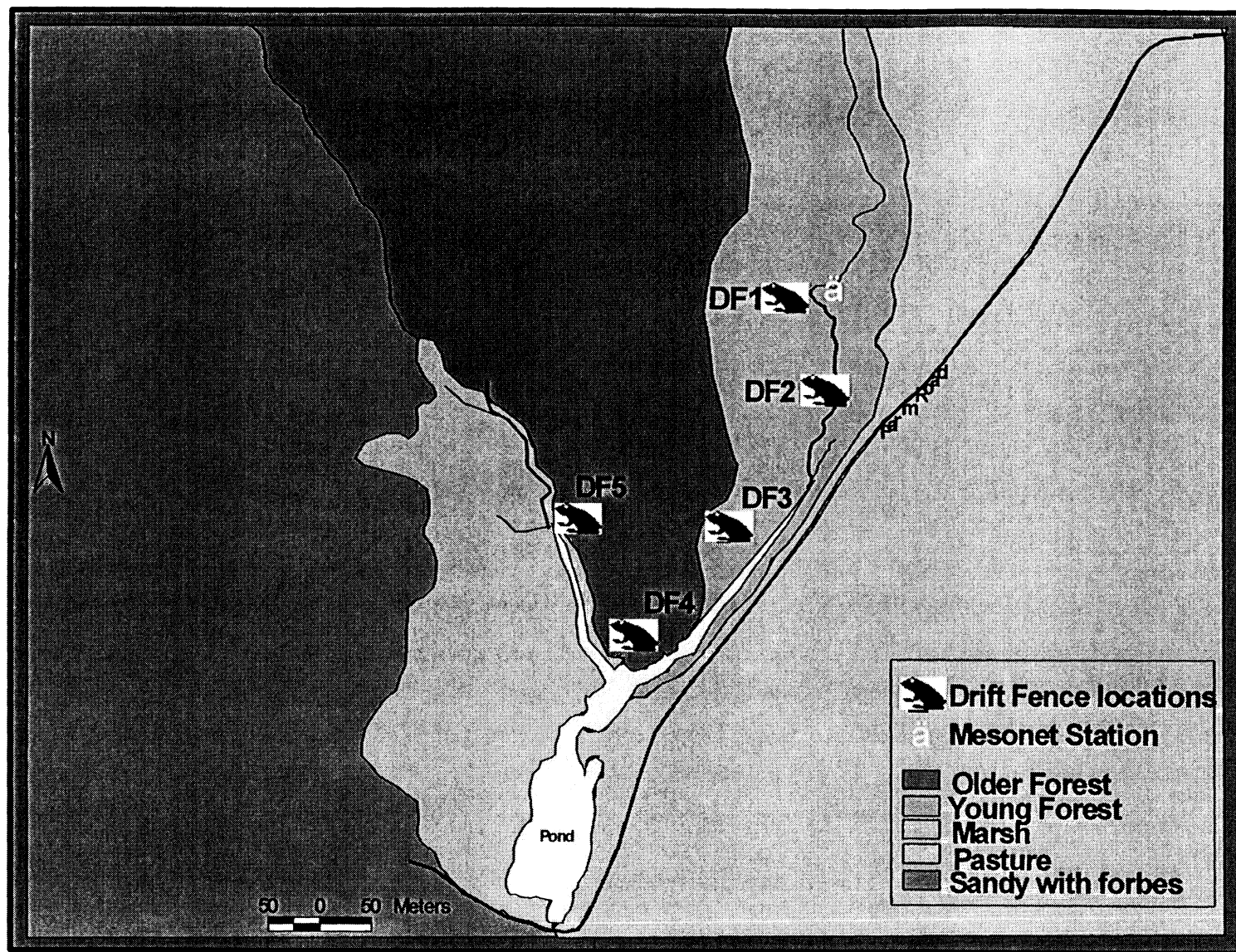**Figure 7. Drift Fence Locations at the Landfill Site**
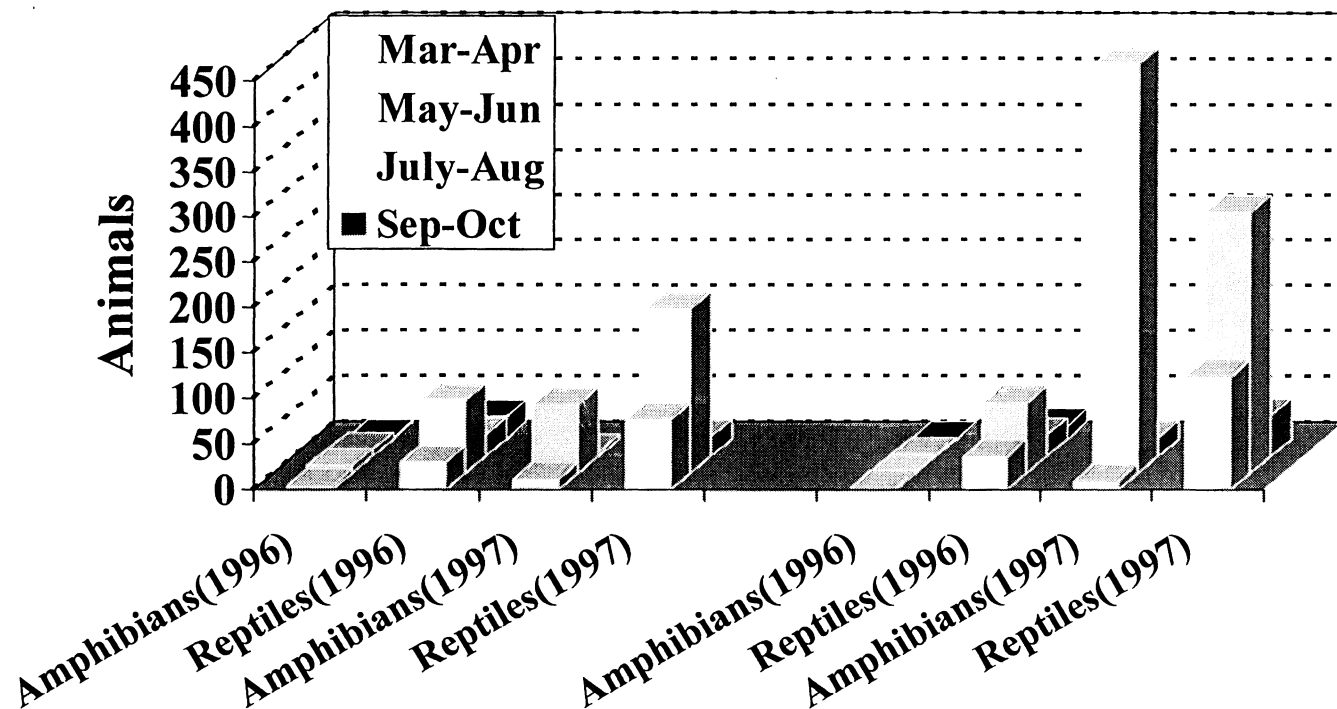
Figure 8. Drift Fence Locations

Figure 9. Total Number of Amphibians and Reptiles Observed at the Landfill and Reference Sites

Table 1

Correlation Coefficients (Pearson's *r*) of Biomonitoring Data vs. Weather Variables

for the Landfill (NLF) and Reference Sites (REF)

YEAR	SITE	SPECIES	RELATIVE HUMIDITY	AIR TEMP	WIND SPEED	RAIN	SOLAR RADIATION	NET RADIATION
1996	NLF	Amphibians	0.06	0.26	-0.21	**0.38***	0.24	0.00
		Reptiles	-0.16	0.23	0.08	0.12	**0.46***	**0.79***
	REF	Amphibians	0.13	0.27	-0.05	**0.51***	0.16	#
		Reptiles	0.04	**0.55***	-0.24	-0.11	**0.41***	#
1997	NLF	Amphibians	**0.35***	**0.19***	**-0.18***	0.02	-0.06	-0.12
		Reptiles	-0.04	**0.23***	-0.15	-0.14	**0.44***	**0.38***
	REF	Amphibians	**0.32***	**0.18***	-0.10	**0.42***	-0.02	#
		Reptiles	-0.07	**0.27***	-0.13	-0.02	**0.47***	#

* $p < 0.05$ significance

Net Radiation not recorded at reference site.

INFORMING POLICYMAKING WITH CONCEPT MAPPING

Will Focht, Michael A. Langston, and Richard Todd DeShong

Introduction to Concept Mapping

Concept mapping[1] is a technique designed to capture a person's view or conception of an issue or problem in a diagrammatic, rather than linear, form. The map can capture the values, beliefs, and assumptions, in addition to associative relationships, that an individual has about a problem. Concept mapping owes its origins to Kelly's (1955) Theory of Personal Constructs. He asserted that "man as a scientist continually checks the sense he makes of his world by using the current understanding (construct system) to anticipate and reach out for the future." He developed a formal "repertory grid" technique as a means for identifying this construct system and the constructs' relationships to each other. Concept mapping evolved from Kelly's repertory grid as a process that, unconstrained by formal structure, follows a "natural" conversation through which additional richness could be ascertained (Brown 1992; 1998:258).

The concept map is a representation of how a participant wishes the interviewer to understand the participant's world. It shows the relationships among concepts thereby translating cognitive complexity into an operant causal or implication network of argumentation. The map acts as the "transitional object" through which the participant and interviewer can jointly understand and reflect upon the significance of the participant's knowledge and wisdom within the context of the interview. It is not unusual for the map to help the participant gather her thoughts, reflect on the map, alter her thinking based on that reflection, and find ways to illuminate knowledge previously remaining as deep assumptions (Eden and Ackerman 1998). "The experience is often cathartic" (p. 287).

The meaning of an idea consists of its context – that is, the ideas that influence it – and the ideas that flow from it as consequences or outcomes. Comparing and contrasting ideas and elaborating their connections establish a rich context that makes understanding easier (Kelly 1963; Schein 1992; Bryson 1995:258). As the interviewer and participant view the map, they explore ideas and identify possible interpretations, which leads to a more complete understanding the problem.

Aggregate Maps

Clearly, a concept map belongs to the individual producing it. However, the real utility of concept maps comes after individual maps are merged, or aggregated, to produce a device to facilitate deliberation, referred to as a "group map" or "strategy map" (Eden and Ackerman 1998:286). An aggregate map that depicts the composite view of an entire social system allows for a holistic view of the problem, which can "act as the vehicle for negotiation in groups as maps are merged to present the aggregated views of a group" (Eden and Ackerman 1998:285).

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[1] We use the term "concept mapping" throughout this paper to avoid confusion with the vague term "cognitive mapping." Cognitive mapping has many definitions and is used interchangeably with mental mapping, schema mapping, mental modeling, and other terms. We wish to focus on people's conceptualizations of policy problems and their elements, hence our preference for the term "concept mapping." However, most of the literature that we cite in this introduction uses the term "cognitive mapping."

Alternative Concept Mapping Techniques

The cognitive mapping process was developed and refined over several years by Eden and his associates (Eden, Jones, and Sims 1983; Eden and Huxham 1988; Eden, Ackerman, and Cropper 1992; Ackerman 1993; Bryson and Finn 1995). Ackerman (1993), in particular, is a key contributor to this evolution. According to these researchers, the interviewer is charged with the "mapping" responsibility (the participant's ownership of it is gained by leaving the map displayed throughout the interview). Through frequent feedback, the interviewer attempts to recreate a map of a participant's cognition.

An alternative technique – the association-driven issue display (AID) – procedure, developed by Diane Austin (1994), allows the participant to create the map. This redeploys the interviewer into a support role and permits the interviewer to focus entirely on the evolving structure of the map being revealed by the participant. AID relies on the mapping of active symbols (i.e., schema landmarks) whose identity and relationships reflect the participant's cognitive representation of the problem. In this study, we employed a slight modification of the AID technique.

Generic Concept Mapping Guidelines

The following guidelines provide general suggestions for eliciting concept maps.

1. Planning. Before the interview, identify the issues that will be explored. This may include a candidate list of concepts that the participant may choose from to integrate, at his or her discretion, into the map. Of course, the participant can also add concepts to his or her map that are not included in the master list.[2] Also, allow at least 60 minutes to perform the interview, which includes a preliminary open-ended discussion and the concept mapping exercise. More commonly, a thorough interview will require two hours. Be prepared to terminate and resume the interview at a later time if the participant is tiring, distracted, or hurrying to meet another deadline; it is better to take longer to get fewer high quality maps than to rush through interviews and end up with more low quality maps.

2. Seating. Whenever possible, sit at right angles to the participant. Sitting opposite the interviewee tends to create an atmosphere competition, whereas sitting at right angles creates cooperation (see Argyle 1988). This position also allows the map to be shared more easily between the participant and the interviewer. This will not only validate the map but also reassure the participant that his or her statements and beliefs have been captured, thus building confidence and trust. This approach helps draw the interviewee into the mapping process as the map becomes visible as "a peculiar style of note taking" (Bryson 1995). Involving the participant in the map (however crude and messy it may look) creates quick ownership of the map being created.

3. Discussion. Begin with a broad inquiry that leads the participant into a discussion. For example, the interview may start by inviting the participant to discuss some of the strategic issues facing them or to comment on some of the issues mentioned by others including those from the candidate list.[3]

4. Agenda. Resist a "tight agenda" and instead allow the emerging map itself to constitute the agenda. This agenda is formed as the map prompts the interviewer to ask questions such as "how might that be done?," "why might that be important?," "what outcomes would you expect from...?," and "so what....?" Other questions will become apparent in exploring constructs that seem unlinked to others and when the intonation in the delivery of statements suggests that some themes are more important and therefore might be elaborated further (Bryson 1995). Typically, as the map unfolds, the interviewer will discover difficulties in linking (making sense of) constructs and will need to follow up with statements such as "I noted...but I don't think I understand what you meant" or "as you can see from my network of notes, I'm not certain how it relates to other things you've told me." This process

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[2] The process of allowing participants to present their own views on selected issues provides the basis for negotiating a group view of strategic issues. As maps are aggregated, all participants are more likely to feel they have contributed to determining the meaning of the issue – a requirement to maintain procedural justice and procedural rationality (Bryson 1995).

[3] Two other important prompts are recall of "critical issues" and "laddering" (Bryson 1995). The critical issues approach focuses on soliciting emergent goals, whereas laddering aids elicitation of an emergent goal system.

lets the participant guide the mapping process rather than being forced to accommodate the interviewer's agenda.

5. Exploration. Understand what the participant means (rather than says). When appropriate, use opportunities to gain confirmation of the emergent map. For example, when a natural break occurs, seize the opportunity to playback the material using the map as the basis for the feedback. This will enable the participant to validate the structure or to change it if necessary. The "playback" is not a simple repeat of what the participant said but rather a restatement that adds value derived from visual analysis of the map in its current form. For example, stating that "there seems to be cluster or theme about...which seems central to your thinking" invites confirmation or further elaboration such as, "actually no, I said a lot about the topic, but it is not really central, I should have said more about...." Therefore, the map should be a model of what the participant means, not specifically what the participant says. It is important to recognize that a participant can state their views only in a sequential manner, sometimes jumping from one topic to another, whereas the map can hold many arguments together simultaneously. Repetition of a concept is often a sign that the interviewee is uncertain whether the interviewer understands the concept correctly and is seeking reassurance. Discussing the map may alleviate this concern and allow them to address further concerns/issues.

6. Key Issues. Watch for landmarks that serve as focusing concepts (i.e., are central in importance or serve to anchor a portion of the map) or linkages between concept clusters. They often emerge early in the discussion and may be painful and worrisome, stimulate emotional responses, or are the primary focus of attention. Landmarks may also emerge from a rough analysis of the map's structure (Bryson 1995).

7. Ownership. Maintain the participant's ownership of the map by using his or her language in defining concepts and constructs. The participant should easily recognize his or her constructs in an aggregate or a congregate map. Paraphrasing should be done by the researcher only if he or she is confident that the paraphrase will result in the participant feeling "that's exactly what I meant."

8. Feedback. Provide frequent feedback on the evolving map. Value-added feedback produces confidence and trust in the participant and demonstrates that the researcher has listened well.

9. Review. Review the map with the participant at the conclusion of the interview. Often during the review process, the participant notices the absence of a key concept and provides further elaboration and extension. Prompt "off the record" comments, especially at the end of the interview. By providing sufficient time for a general review, the participant may utter statements "off the record" that can help the researcher to better understand the meaning of the map's constructs. The review ensures that the interviewer and participant leave no areas unexplored.

10. Review Again. Following the interview, study the map again, along with your notes and other information obtained from the interview and note any statements or linkages not added to the map that were revealed during the interview. Conducting this process immediately following the interview greatly increases the accuracy of the interpretation. If too much time elapses between the interview and the map review, then much may be forgotten. To capture deep knowledge, the map must reflect all aspects of the interview, not just the notes but also images and social interaction.

11. Record and Print the Map. A printed map provides the interviewee with a concrete record of the interview and shows the structured representation of their thinking. The printed map may be used as a focus for a second interview to elicit further development, modification, and clarification.

A Comment on Random versus Purposive Sampling of Participants

Two definitions of participant representativeness are used in selecting participants in social science research: *random sampling* in which every person in a population has an equal and unbiased opportunity to participate and *purposive sampling* in which participants are selected because they are believed to possess unique perspectives. If the purpose of the study is to generalize findings to the population, then random sampling is preferred. However, if the purpose is to ensure that all unique perspectives are represented, then purposive sampling is better because uncommon perspectives may be missed in a random sample. In other words, random sampling is better suited to sampling people as units of analysis

whereas purposive sampling is better suited to sampling perspectives as units of analysis. Since concept mapping involves the sampling of perspectives, we believe that purposive sampling is most appropriate.

Concept Mapping and Policy Framing

Concept mapping can be used to help policymakers obtain a rich understanding of relevant issues from the standpoint of stakeholders (Eden and Ackerman 1998:257). By examining the context and content of stakeholders' concept maps, policymakers are able to better understand the meaning of individual elements in the constructs and how elements fit together. This is especially valuable in formulating environmental policy, which typically involves complex issues, controversy, uncertainty, and value salience. More specifically, concept mapping can be used to prepare an aggregate map that represents the composite frame used by the stakeholder population to conceptualize the policy problem, which points the way toward formulating policies that can enjoy widespread public support.

In this case study, we used concept mapping as one of several methods to discover the concerns and preferences of participants regarding the management of adverse impacts in the Illinois River watershed (Focht et al. 2001; Meo et al. 1998; 1999; 2001a; 2001b; 2002). This study[4] is designed to test a protocol to increase the legitimacy of watershed management policymaking by enhancing stakeholder participation in it.

Concept Mapping Methodology Used in this Study

We used a modification of the Diane Austin's (1994) association-driven issue display procedure to conduct concept-mapping interviews. The interviewers introduced the exercise at the end of an open-ended interview in which the participant communicated their distress over the condition of the Illinois River Basin (IRB).

Sampling

To ensure that all unique perspectives are represented in a purposive sample, we started with *reputational* sampling, that is, with interviews of (1) those persons known to possess unique perspectives, (2) those persons thought to possess unique perspectives based on variation among relevant demographic (primarily occupational) and geographic (location in the IRB) characteristics, and finally (3) those persons who were expected to be familiar with the range of perspectives that existed among stakeholders. We began with a list of stakeholder names extracted from the attendance lists from Oklahoma Scenic River Commission meetings conducted to create an Illinois River Management Plan (1998) and with references by members of the research team and its collaborators who were familiar with stakeholders having an interest in IRB impacts and their management. This initial list identified activists, community opinion leaders, governmental officials, business owners, technical experts, and other interested and affected parties whom we knew would contribute valuable problem constructs. We supplemented these key interviews with others identified by "snowballing," that is, via reference by the key interviewees. Every attempt was made to include persons who had different perspectives. We interviewed 150 stakeholders in all and are satisfied that all unique perspectives were identified based on our careful selection of key interviewees and the increasing repetition of perspectives that we found as the interviews proceeded.

The Interview Discussion

Each interview began with a face-to-face, open-ended discussion in which we engaged the participant in a dialogue about his river basin impact concerns and their causes. Though this discussion was audiotape recorded for later transcription and content analysis,[5] we were careful to take written notes of the specific

[5] The results of the content analysis are not included herein except as they relate to the interpretation of concept maps.

concerns and causes that the participant mentioned. We continually prompted the participant for additional concerns and causes to help ensure that all were discussed. These discussions lasted anywhere from 30-90 minutes.

The Mapping Exercise

The concept mapping exercise followed the open-ended discussion. The mapping exercise required 30 to 60 minutes to complete. Altogether, we obtained 146 usable concept maps from the 150 interviews.

Impact List Development. After the interviewer explained the concept mapping exercise, the participant was asked to recall previously discussed impacts for possible inclusion into the map. The interviewer used notes taken during the open-ended discussion to prompt the participant to add additional impacts to the growing list, which was written on a flip chart, chalkboard, or other easily viewable device. In addition, the interviewer presented a "candidate list" of impacts (developed from prior review of Illinois River basin impact reports, prior interviews of those most knowledgeable about impacts, and impacts identified by the research team) and asked if the participant would like to add any additional concerns and causes to his list. It is important to note that the participant was instructed not to add impacts from the candidate list unless the participant had forgotten to mention it during the interview; the candidate list is nothing more than a compilation of impacts gleaned from various sources.

Relative Importance Designation. Once the personalized list of impacts was obtained, the participant was asked to select from this list those impacts that should be included in the map. The participant was encouraged to combine impacts if they were sufficiently similar. For those impacts that remained, the participant was asked to write each on an index card. Three sizes of cards were available, representing the relative importance that the participant placed on the impact. Impacts judged most important were written on 5" x 8" cards, those of moderate importance on 4" x 6" cards, and those of least importance on 3" x 5" cards (those judged to be of trivial or no importance were ignored, of course).

Perceived Knowledge Judgment. The interviewer then asked the participant to indicate the level of knowledge that she believed she had about each impact by affixing a colored dot on each card. Green dots were used to indicate high knowledge, yellow dots moderate knowledge, and red dots low knowledge.

Map Assembly. Next, the interviewer asked the participant to arrange the cards on the surface of a large sheet of paper such that the arrangement would reflect how impacts were conceptualized by the participant. The participant was told that any arrangement is permissible and that the arrangement should indicate to the observer how the participant "saw" or "thought about" IRB impacts in relation to each other. We engaged the participant in a discussion while the cards were placed on the paper. Occasionally, the participant would add additional cards or even delete cards from the map as a result of this discussion. For example, we may have sought further clarification with questions such as, "do you think that animal waste [or tourist trash, etc.] causes this?" According to Eden *et al.* (1979), it is this process of reflective mapping that gives the method its special value. Through prompted elicitation, the participant can have a "cathartic experience," which provides "added value" because it clarifies thinking (Eden 1992).

Map Labeling. After the participant was satisfied with the map, she was asked to label the entire map or portions thereof by writing descriptive explanations on colored cards and placing them on the map at appropriate locations. Labels are particularly useful for the interpretation of individual maps as well as the later development of aggregate maps. The labels also stimulate further reflection on the construction and interpretation of the map.

Self Identification. The interviewer then invited the participant to include himself into the map by writing the word "self" on a colored card and placing it on the map to indicate how he saw himself in relation to the impacts recorded in the map. According to Kaplan (1973), this knowledge of "self" (where one is situated within the map) is the crucial starting point for "adaptive behavior." The placement of self was indeed valuable in helping us see how the participant felt about the impacts (e.g., as a victim, as a manager, as a distant observer, etc.), which in turn helps us understand the bases of the participant's concerns.

Map Explanation. Finally, the interviewer asked the participant to explain the map by relating a coherent story that justified the selection and identification of impacts, the level of perceived knowledge about them, their relative importance, their inter-relationships as exhibited by their arrangement in the map, and their personal relationship to them. The interviewer would frequently ask questions to clarify the explanation. This explanation was audiotaped for later transcription and use in preparing an aggregate map and in reporting these results.

Data Recording

At the conclusion of the exercise, card placement was outlined on the paper, the cards and card outlines were similarly numbered (in case the cards, which were stapled to the paper, later became detached), and the participant code and date of interview were recorded in the corner of the paper. The paper with the stapled cards attached was then carefully folded and placed into the participant's data file.

Later, the outlined paper maps with attached cards were converted to computer graphic files using Microsoft Visio©. These graphical replicates of the maps made it easier to perform subsequent display and analysis. Four of these maps are included with this paper and will be discussed later.

The identity of the cards (impacts, self, and group labels), group membership, card size (relative importance), and dot color (perceived knowledge) were abstracted from the maps and entered in Microsoft Excel© for statistical analysis.

Map Coding

Based on a review of the maps and interview transcripts, 39 codes were developed to categorize impacts (see Table 1 in Appendix A).[6] Codes for each map were entered into Microsoft Excel© for statistical analysis.[7] The corresponding relative importance and perceived knowledge judgments were also entered. Finally, the position of the "self" card was entered as its association with one or more impact category codes. The spreadsheet was used to compute frequencies, modal relative importance, modal perceived knowledge, and contact with the self-card for each impact category.[8]

Map Interpretation

Three hierarchical levels of organization are important in map interpretation. The most basic level is that of the individual impacts. The second level concerns the relationships among impacts into clusters, inferred by card proximity and labels, which suggests how impacts are cognitively related. The highest level of organization concerns the arrangement of impact clusters in the entire map. It is also important to discern the central focus or foci (key landmark(s)) of the map, both through examination of the geometric arrangement of impacts and the placement of label cards.

Aggregate Map Assembly and Interpretation

An aggregate map is a compilation of individual maps that represents the key landmark features located within the social system construct. Aggregate maps are primarily constructed qualitatively. However, we did use quantitative information such as concept frequencies, modal importance scores, modal perceived knowledge scores, and placement of self-cards to inform our assembly. The aggregate map addresses all three hierarchical discussed above.

Initially, individual maps were divided into groups based on similarity of their construction. These were then assembled into group-specific aggregate maps. These smaller aggregates were then combined into a single aggregate map representing the social system impact construct.

Group similarity was first judged based on whether the maps contained one or multiple impact clusters (a third-level hierarchy analysis). Within these two groups, maps were then grouped according to their foci

[6] Codes were created only for those impacts that were included on at least two maps.

[7] Multiple impacts included on a single card were coded separately. Multiple impacts falling under the same category code were entered only once. Group labels were excluded.

[8] Hierarchical agglomerative cluster analysis (Ward's method) was also performed on these data to determine how participants grouped categories of impacts (to reveal similarity of categorical groupings across participants and to reveal which people produced similarly grouped impact categories). These findings are not included herein.

(a second-level hierarchy analysis). Foci were frequently represented by a single card placed at the center of the map (Figure 1 in Appendix A) or, less frequently, by a single card at one end of a group of cards arranged in a linear format (Figure 2 in Appendix A). Finally, aggregate map interpretation was informed by the meaning of the individual impact categories included in the aggregate map (a first level hierarchical analysis).

Individual Map Results

In the next section, we will discuss our creation of an aggregate map based on the results of our analysis of all 146 individual maps. However, by way of example, we have selected four maps that are exemplars of many of the maps we obtained for individual analysis.

The concept map presented in Figure 1 (Appendix A), created by an environmental lawyer with experience in litigation involving the Illinois River, is typical of a water quality-focused (WQ-F) map with its radial geometry. All impacts but litter directly are viewed as directly affecting water quality (litter is grouped with human waste as a recreational impact). Three impact clusters are labeled: "point sources," "non-point sources," and "recreational." She aligns herself most closely with "water quality" and "population growth." The most important impacts to water quality are septic tanks, human waste, and agricultural runoff from both Arkansas and Oklahoma. Other impacts are judged as moderately important while none are identified as having low importance. She believes that she has low knowledge of litter, human waste, city runoff, and septic tanks and moderate knowledge about wastewater plant effluent, water quality, agricultural runoff from both states, and population growth. We may summarize her frame thus: she is most affected by threats to water quality (most important) and population growth (less important), about which she has moderate knowledge; and recognizes that pollution sources and recreational impacts threaten water quality, though she knows less about septic tanks and recreational impacts from human waste (more important) and urban runoff (less important) than about impacts caused by agricultural runoff (more important) and sewage plant discharges (less important). Litter is not seen as a direct threat to water quality and is thus judged less important, though she admits that she does not know much about litter's impact. We will return to this map in our discussion of the aggregate map.

Figure 2 (Appendix A) presents a less common construction of a WQ-F map. This map is interesting because it is linear rather than radial. This participant is the owner of a float trip business on the river. His description indicates that the linear arrangement is analogous to chapters in a book. "Well, it all pertains to the same thing. The ending of the story would be water quality. In order to get to the end of the story, you've got to read the first few chapters and take care of business." Thus, water quality is again the key focus or anchor of his frame. All impacts are judged as highly important. He believes that he is most knowledgeable about drinking and trash but less knowledgeable about technical issues such as Arkansas sewage, poultry, and nurseries. He judges that he has moderate knowledge of erosion and water quality generally based on his personal experiences with the river. He sees himself as most impacted by the trash, erosion, and water quality because as he puts it "that's what I see every day." He entitled his map, "Clean up your ACT!" suggesting that he believes that impacts can best be managed through personal responsibility.

Contrasting the interpretations of the "self" card on these two maps is instructive. On the previous map, the "self" card was placed on the parts of the map with which she most closely identified and were most important to her. In the latter case, the "self" card was associated with the issues that most directly affected him. Other participants placed the self card near impacts over which they believed they have the most control or that have the greatest effects on the river. It is important therefore to explore with the participant how they relate to the impacts.

An eighth grade teacher who is a lifelong resident of the basin constructed Figure 3 (Appendix A). This map is typical of water quality- and socially-focused (WQ&S-F) maps with its two distinct impact clusters. The cluster on the right is anchored by water quality (most important) and is partially surrounded by pollution sources about which he sees himself as fairly knowledgeable and which are judged as moderately or least important. Note here that he judges as least important those impacts that are more indirectly associated with water quality and about which he knows the least. The cluster on the left is socially focused and seems to have two themes. One theme is his concern about restriction of access to the river by the Army Corp of Engineers (Corps), which restricts his ability to fish. The second theme relates to offensive behavior, which is seen as caused crowds of canoeists and exacerbated by their

alcohol consumption. He situates himself squarely within the social impact cluster and expresses that it is his "personal preference" that these impacts be reduced first. He is frustrated by "everyone [else's] concern" about water quality, which seems to be the focus of the "county and national government."

Figure 4 (Appendix A) presents another concept map from the WQ&S-F group, which was produced by a real estate agent in Tahlequah. One impact cluster is labeled "agricultural" and includes water quality concerns. The other cluster is labeled "people" and contains social concerns. She perceives herself as more knowledgeable about social concerns than the more technical water quality concerns. Water quality, drinking alcohol, litter, and the economy of Tahlequah are highly important to her frame. Interestingly, the "economy of Tahlequah" impact appears as a bridge joining these two clusters. She gives this impact even more prominence by placing her "self" card on it, which is not surprising given her occupation as a businesswoman in Tahlequah. She believes that the degradation of the river affects her most directly through its economic ramifications. The existence of this bridge points a way to fashioning policies that can successfully relate pollution impacts to behavioral impacts.

Aggregate Map Results

As discussed previously, aggregate maps are created to represent a composite concept map of the entire social system.[9] The aggregate map created from our review of 109 of the 146 concept maps we obtained from stakeholders in the IRB is discussed next.

The two most commonly encountered impact clusters concerned water quality impacts (n=64) and social impacts (n=45). Since 75 percent of the 146 concept maps in our study contained one or both of these two clusters, we will use only these maps, for the purposes of this paper, to illustrate how an aggregate map is constructed.[10]

To aggregate impact clusters, impact codes in WQ-F and WQ&S-F maps were isolated, sorted, and ranked by frequency of mention. Table 2 (Appendix A) lists the twenty most-encountered impact category codes in WQ-F and WQ&S-F maps along with their occurrence frequencies, relative importance frequencies, perceived knowledge frequencies, and the number of associations between the impact categories and the "self" card. This analysis of which categories to include in the aggregate map, modal importance rating, modal knowledge rating, and modal "self"-cluster association address the level one hierarchical analysis.

The relationships among impacts were assessed through a qualitative review of those maps containing WQ-F or WQ&S-F clusters. Most clusters in WQ-F maps surround a central card that is almost invariably stated as "water quality." Some participants described these arrangements as "spokes in a wheel." A few of the WQ&S-F maps contain single cards that link socially-focused clusters to water quality-focused clusters. These bridges are either economic impacts (n=2) or "self" cards (n=6).[11]

Figure 5 (Appendix A) presents the aggregate map that we assembled using key concepts taken from all WQ-F and WQ&S-F maps in our sample. It is easy to see that the map consists of three parts: a water quality-focused impact cluster, a socially-focused impact cluster, and a bridge. This map is considerably more complex than the individual maps because it represents a composite problem frame.

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[9] Another procedure to generate a social system concept map is to convene a focus group meeting and allow participants to generate a map as a group. We refer to this sort of social system map as a congregate map. We did not undertake to develop a congregate map in this project. However, we have included suggestions for convening a congregate mapping exercise in Appendix B.

[10] Subsequent work will seek to enrich this preliminary aggregate map with the incorporation of information gained from the remaining maps not considered in this analysis. Nevertheless, this work is sufficient to demonstrate the utility of concept mapping to reveal a social system problem frame for use in policy analysis and formulation.

[11] The reader is cautioned not to make too much of the low frequency of "bridge" cards found in these concept maps. Recall that we did not employ random sampling of participants and therefore do not intend to extend our statistical findings to the entire IRB population. Instead, we used purposive sampling to capture as many different frames of stakeholders' view of the IRB as possible. This allows us to assemble an aggregate map that is representative in the comprehensive sense (inclusive of all frames) though not in the statistical sense (generalizable to the population with respect to frequencies, variances, measures of central tendency, and so on).

The relative importance of impacts was determined based on their frequency of importance rating and not their frequency of mention. For example, the third-most common card, "Litter and Trash from Recreation," is rated as only moderately important because it was rated this way by more participants. Obviously, impacts that are of most common concern are not necessarily judged as most important. Note also that water quality impacts are generally judged more important than social impacts, indicating that water quality impacts dominate social impacts as concerns to social system as a whole. In the social cluster, note that overpopulation is the only impact rated as highly important, which suggests that stakeholders generally attribute social problems to recent increases in population. In the water quality cluster, note that wastewater effluents, animal feeding operations, and erosion are seen as the greatest threats to water quality. These impacts are the primary causes of water turbidity – the most important marker of poor water quality to most stakeholders. This finding also confirms that the level of understanding among stakeholders about the effects on turbidity caused by nutrient loading and soil erosion are rather sophisticated. Surprising to us is the relatively low importance attached to urination and defecation in the river by tourists. This concern, though expressed by many, is judged as relatively unimportant to water quality compared to other nutrient sources; again, confirming a level of sophisticated understanding that many outsiders do not credit.

Most perceive their level of knowledge as either high or low, with few moderate knowledge self-assessments. The impacts judged most familiar are those social and water quality impacts that are most visible such as cattle access to the river, animal feeding operations in Oklahoma, and water supply; whereas lower levels were accorded to more technically complex and controversial impacts such as urban runoff, urban development, wastewater effluents, septic systems, nursery runoff, and animal feeding operations in Arkansas. The low level of perceived knowledge for urban development and urban runoff is interesting because their obvious connection.

Comparing importance and perceived knowledge, we find no obvious relationship between these two judgments. Nevertheless, we believe it is useful to stress the high importance attached to familiar impacts such as water quality, population growth, and economics: population growth anchors the social cluster, water quality anchors its own cluster, and economics forms the bridge between the two clusters. We will return to this finding in discussing policy implications in the next section. It is also interesting to note the lower perceived knowledge about Arkansas municipal wastewater versus Oklahoma wastewater; this difference is probably due to a dearth of available information rather than any technical difference in the two operations.

Most participants placed themselves on or adjacent to the water quality card (Table 2, Appendix A). They identify strongly with the quality of the river and believe that the impacts that degrade water quality also affect them. However, a few others placed their "self" cards near the economic impact, suggesting that they recognize the relationship between the regional economy and IRB impacts. Upon careful reflection, we believe that it is appropriate to place two "self" cards in the aggregate map. The first, "self as affected," is placed on water quality indicating that stakeholders believe that water quality is the primary cause of impacts to their well-being. The second, "self as affecter," is meant to suggest that stakeholders recognize that economic activities, and their involvement in them, has a significant affect on water quality. In sum, stakeholders recognize that water quality in the Illinois River is most affected by human activity and therefore its protection must be assured through personal accountability. This, we believe, is a reason to remain optimistic about the future of the Illinois River and its economy.

Concept Mapping and Problem Framing

As posited at the beginning of this paper, concept mapping can provide valuable insight into policy deliberations by revealing problem frames. In our study, we identified several such insights.

First, many participants see the relationship between water quality impacts and their causes as simple and direct. Moreover, impacts that are judged most important tend to elicit lower levels of perceived knowledge. These findings suggest that policies designed to educate stakeholders on the complex relationships between causes and effects are both needed and welcome.

Second, pollution impacts are focused on water quality whereas social impacts are focused on population growth. Also, we have noted that water quality impacts are ranked as more important than social impacts. This suggests that though policies designed to reduce pollution threats to water quality should
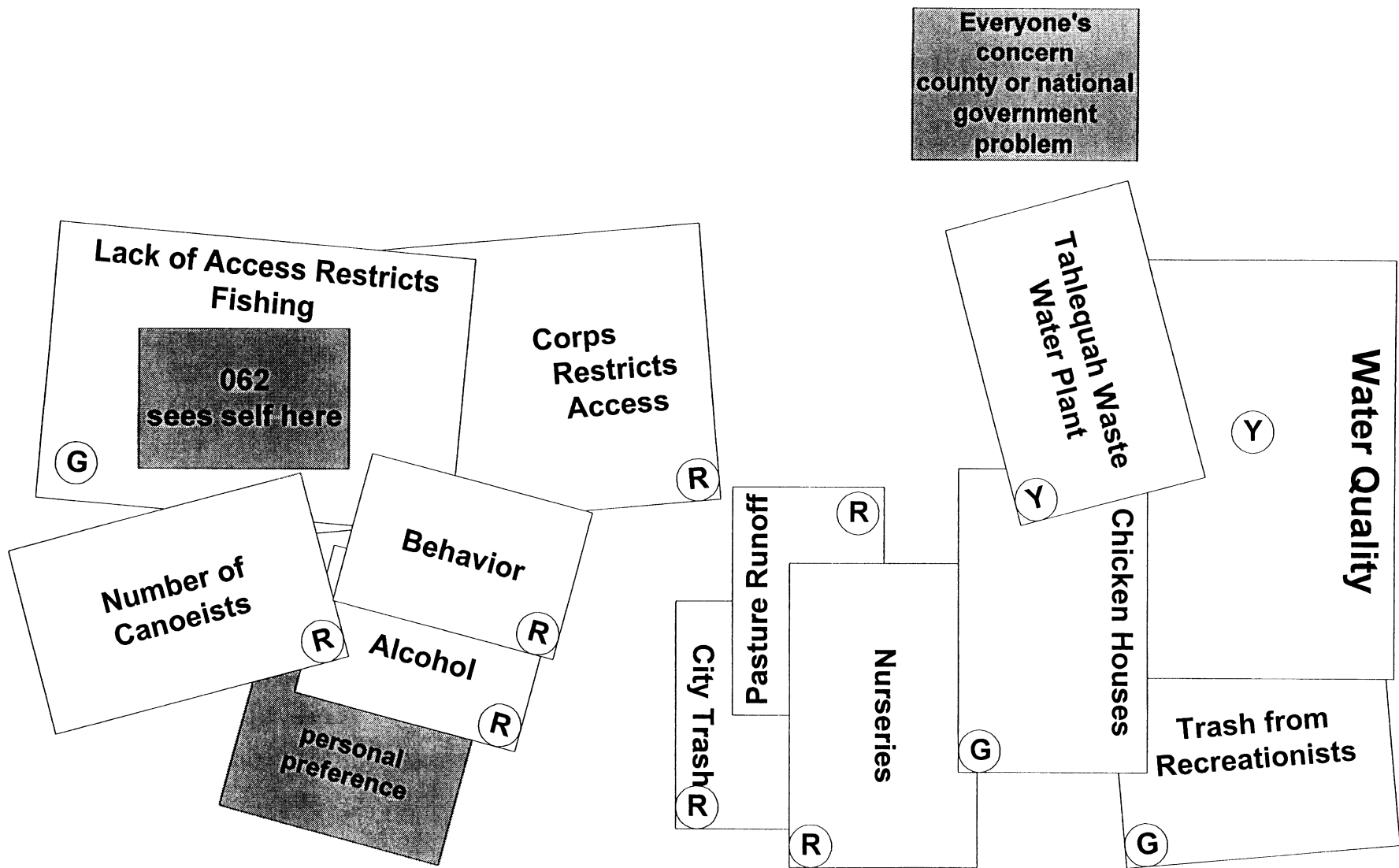
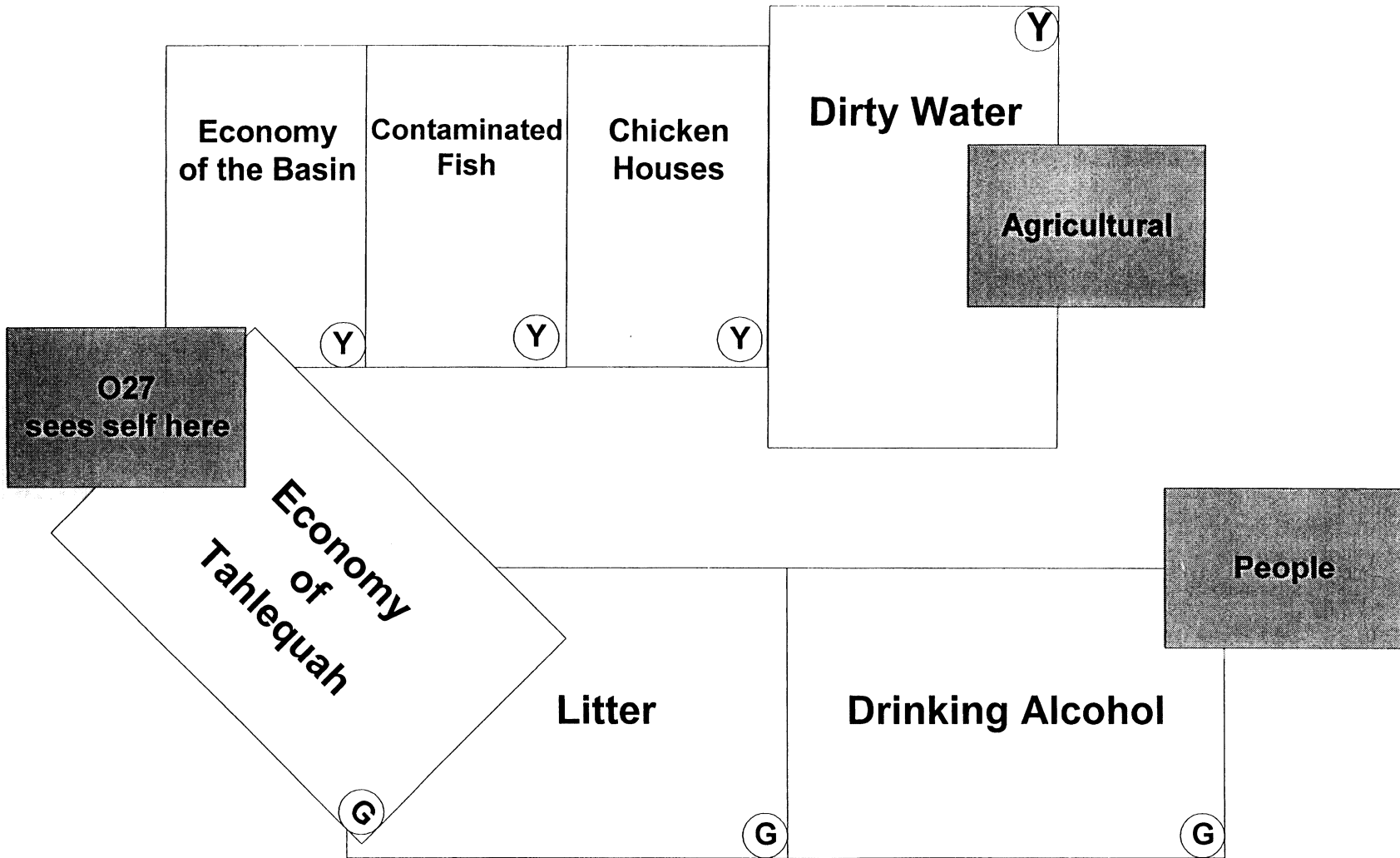Figure 3. Typical Two-Cluster Map Focused on Water Quality and Social Concerns

Figure 4. Two-Group Map with Economics Connecting Water Quality and Social Concerns

be pursued first, policies designed to address social impacts through better management of population and economic growth should not be ignored.

Third, the "self as affecter" card in the aggregate map reflects the notion frequently expressed in interviews that individuals must accept responsibility for impact mitigation. An increasing sense of personal responsibility may serve as a powerful impetus to reduce impacts in both clusters. An army of private individuals working to protect the river will be more effective (and politically legitimate) than will a government agency imposing its will on recalcitrant users of the resource.

Finally, and perhaps most importantly, both economic impacts and individuals are potential bridges that can link the two major impact clusters. Stakeholders recognize that the economy affects and is affected by both social and water quality impacts. Similarly, stakeholders recognize that they also affect and are affected by both social and water quality impacts. In other words, stakeholders recognize the systemic relationship among water quality, social impacts, economic growth, and their own individual welfares. Thus, the economy and self-interest not only provide potential avenues to address both social and water quality concerns, but also represent a means of balancing protection and sustainable use in an equitable manner.

Conclusions

The Utility of Concept Mapping

The concept map procedure provided significant insight into both individual and aggregated social system frames of the Illinois River degradation problem. These frames are important for understanding how stakeholders conceive threats to the Illinois River, which in turn point the way to impact management policies that are more likely to enjoy widespread stakeholder support. Purposive sampling provides perspectives that represent the full range of frames present in the social system. The construction of an aggregate concept map using a combination of qualitative and quantitative methods yields the integration of common and salient features of individual maps into a single social system frame. While other methods, such as content analysis of the open-ended interviews, might have detected the significant concerns regarding the basin, concept mapping allows graphical presentations of the relationships among these concerns. In this study, these relationships revealed the pivotal role that economics and individual responsibility can play in jointly addressing seemingly disparate concerns.

The Lesson of Concept Mapping

Participants in this study are focused primarily on protecting the river. Whether they reside inside or outside of the watershed, they share an abiding interest in protecting what they value. The Illinois River corridor is one of the most scenic areas in Oklahoma and is recognized as such by organizations such as Rand McNally (who claim that the Illinois River basin is the fourth most popular place in the United States to retire). The entire region, from northwest Arkansas to east-central Texas is experiencing a population growth rate exceeding 6% and approaching 15% in some locations. However, the basin is also experiencing the pressures of new demands for increased resources, infrastructure, and services. The results of the concept mapping study are instrumental in revealing how stakeholders conceptualize their impact concerns, which is important to formulating impact management policy that will be politically acceptable. Confronted with the complex and controversial issues of defining total maximum daily loads (TMDLs) for chemicals such as phosphorus and nitrogen, the need for municipal wastewater treatment facility upgrades, the cost to small farmers of compliance with new regulations concerning non-point source runoff and land application of animal waste, and the perceived distrust of government at all levels, policymakers need to be informed of stakeholder concerns and preferences if they wish their policies to be less vulnerable to strong opposition.

In Hindsight

Based on recent stakeholder workshops, the findings obtained from concept mapping have gained validation and credence. It appears that a consensus may already be developing within the IRB social system. The "blame game" that had found expression in the news media is being expressed by only a few today. The quiet majority believes that it is more likely that everyone is to blame and that impacts have been accumulating for a long time. Many also appreciate that it is going to take all stakeholder

groups to cooperate to solve the problems that threaten the basin; very few are under the delusion that they will be solved in the short term.   Finally, given the recent downturn in the economy, many stakeholders are recognizing the reflexive relationship between the regional economy and water quality. It indeed seems to be the case that the problem frames gained from interviews in 1998 and 1999 predicted policies being deliberated in late 2001.

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Appendix A: Tables and Figures

(See next seven pages.)

Appendix B: Congregate Map Guidelines

(See page 178.)

Table 1

Impact Category Code Definitions

Impact Code	Impact Cause Category	Definition / Example
$	Economic	Concerns about impacts on business viability, jobs, costs, etc.
AE	Aesthetic Concerns	Unspecified concerns over the appearance, odor, or serenity of the basin.
AFO-A	AFO Runoff-Nutrients in AR	Runoff from animal feeding operations including poultry, dairy, beef, and hog farms in Arkansas
AFO-O	AFO Runoff-Nutrients in OK	Runoff from animal feeding operations including poultry, dairy, beef, and hog farms in Oklahoma (or not specified)
AR	Agriculture runoff	Runoff from agricultural areas; includes cattle grazing areas, but not AFOs.
BEH	Inappropriate Behavior	Any behavior problem other than alcohol & drugs, or trespassing.
BEH-A		Behavior involving alcohol or drugs
BEH-T		Unauthorized movement onto private property
CATL	Cattle	Cattle accessing and defecating directly into the river.
CONFL	Conflict	Conflicts among stakeholder groups in the basin.
CR-C	Crowding from recreationists	Crowding on the river by large numbers of recreationists.
CR-S	Over population	Over population in the basin by residents.
DEV	Development	Building, structures, and clearing
ECH	Ecological Health	Unspecified concerns over wildlife, biodiversity, habitat, etc.
ER	Erosion	Erosion from any area source land clearing, deforestation, unpaved roads, Lake Francis, gravel mining, etc.
HF	Hunting, Fishing, etc.	Sport use of the river
HHC	Human Health Concerns	Unspecified concerns over threats to human health by sickness or disease.
ID	Industrial Discharge	Effluents from industries or businesses.
LT-C	Litter & Trash from Recreationists	Discarding of small trash items in the river by recreationists.
LT-S	Litter & Trash from Residents	Discarding of small trash items near or in the river by residents.
MED	Media Stigmatization	Unjustified media sensationalism of problems contributing to negative image of basin.
NonPNT	Non-Point Source	Unspecified non-point source pollution
NR	Nursery runoff	Runoff from plant nurseries
OSRC	Oklahoma Scenic Rivers Commission	Concerns over the mismanagement of the basin by the OSRC
PNT	Point Source	Unspecified point source pollution
REG	Government Regulations	Unspecified government regulations
RPRN	Riparian Areas	Concerns involving riparian (streamside) areas.
SAF	Safety	Unspecified concerns over floating, crime, accidents, etc.
SS	Septic System Leachate	Groundwater moving from domestic septic-drain fields laden with nutrients.
UD	Urination/Defecation	Defecation and urination directly into the river and dumping of sewage from houseboats by recreationists.
UR	Urban Runoff	Runoff from urban areas, including roads, businesses, and residences.
VD-A	Vegetative Debris Accumulation	Piles of vegetative debris
VD-R	Vegetative Debris Removal	Removal of log jams and other vegetative debris for recreation
WCD	Water Craft Discharges	Oil & gas discharges from watercraft.
WQ	Water Quality	Concerns regarding the quality of the water in the river.
WS-L	Inadequate Water Supply	Lack of drinking water supply due to poor water quality
WS-N		Lack of water due to water withdrawals
WW-A	Municipal WWTP Effluents in Arkansas	Effluent from domestic wastewater treatment plants in Arkansas; includes concerns about phosphorus.
WW-O	Municipal WWTP Effluents in Oklahoma	Effluent from domestic wastewater treatment plants in Oklahoma; includes concerns about phosphorus.

Table 2

Impact Categories Found in Water Quality-Focused Concept Maps

IMPACT CATEGORY CODE[12]	NUMBER OF MAPS WITH THIS CATEGORY	RELATIVE IMPORTANCE			PERCEIVED KNOWLEDGE			NUMBER OF ASSOCIATIONS WITH "SELF" CARD
		HIGH	MEDIUM	LOW	HIGH	MEDIUM	LOW	
WQ	100	**89**	9	2	**58**	4	37	**58**
AFO-O	93	**57**	29	7	**41**	14	38	12
LT-C	90	17	**40**	33	**50**	13	26	13
NR	61	15	**27**	19	19	18	**24**	2
WW-A	57	**35**	15	7	13	14	**30**	7
UD	53	10	21	**22**	14	**20**	19	8
WW-O	51	**24**	21	6	16	15	**20**	2
SS	43	11	**19**	13	15	12	**16**	2
BEH-A	33	12	**13**	8	**22**	4	6	8
ER	31	**14**	11	6	23	7	**32**	12
BEH	27	7	**16**	4	**13**	4	10	5
CR-C	27	7	9	**11**	**13**	3	11	5
CATL	24	4	9	**11**	**10**	5	9	2
AFO-A	21	**16**	3	2	4	3	**14**	4
UR	18	2	**12**	4	4	4	**10**	1
AR	11	**5**	**5**	1	**8**	3	3	2
WS-N	11	3	3	**5**	**6**	2	3	1
CR-S	9	**5**	3	1	**5**	2	2	3
LT-S	7	**3**	2	2	**5**	0	2	1
DEV	6	2	**3**	1	0	1	**5**	0

Bold numbers indicate modal (most frequently encountered) selections.

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[12] See Table 1 for code definitions.

Litter

Recreational

R

The Water Quality Wheel
Water Quality is the life blood of the system, the spokes on the wheel all impact Water Quality

Septic Tanks

Point Sources

R

R

Human Waste

City Runoff

R

Nonpoint Sources

Waste Water Plant Effluent Point Source

Y

sees self here

Water Quality

Y

OK Agricultural Runoff Nonpoint

Y

Population Growth

Arkansas Agricultureal Runoff Nonpoint
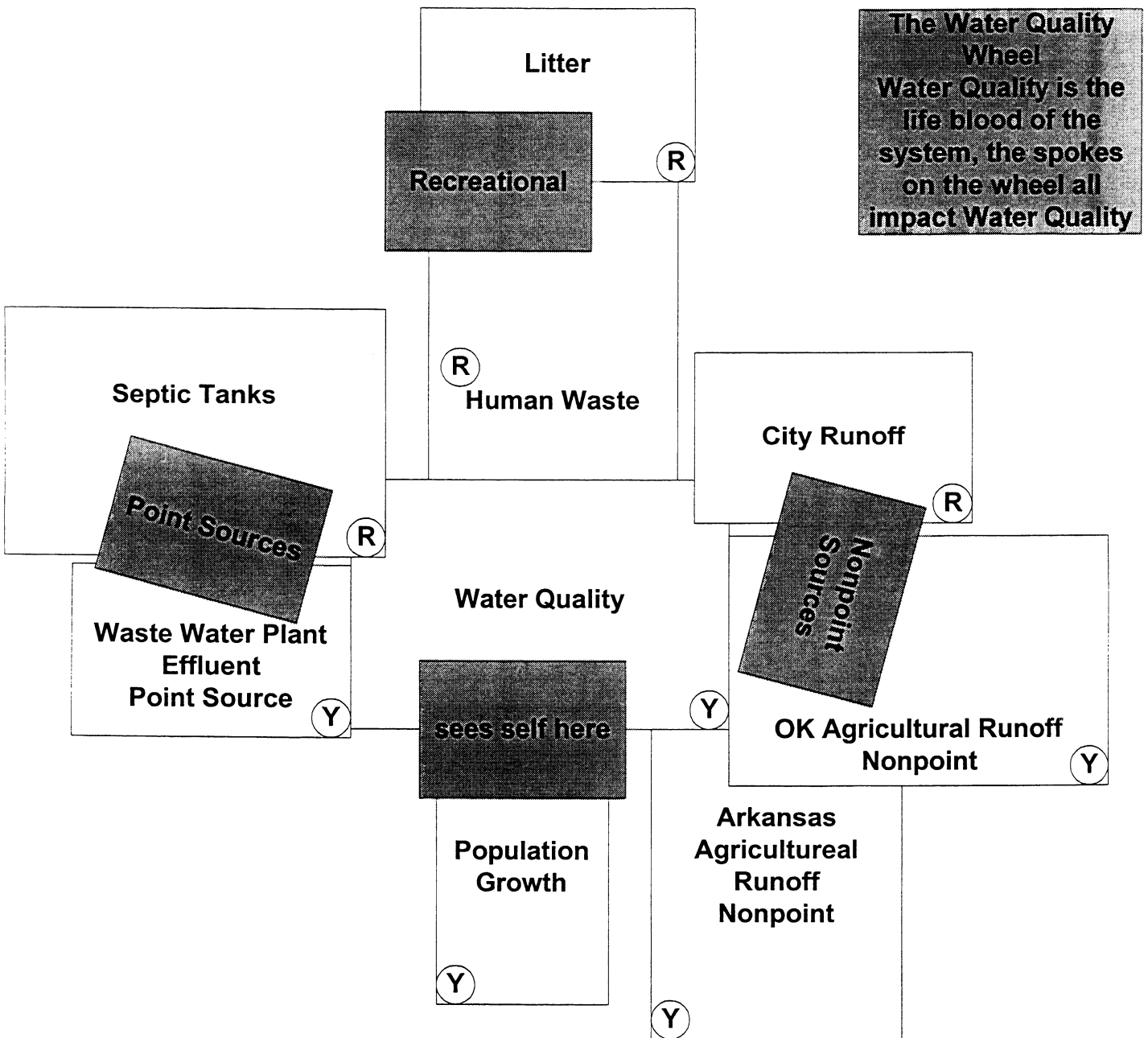
Y

Y

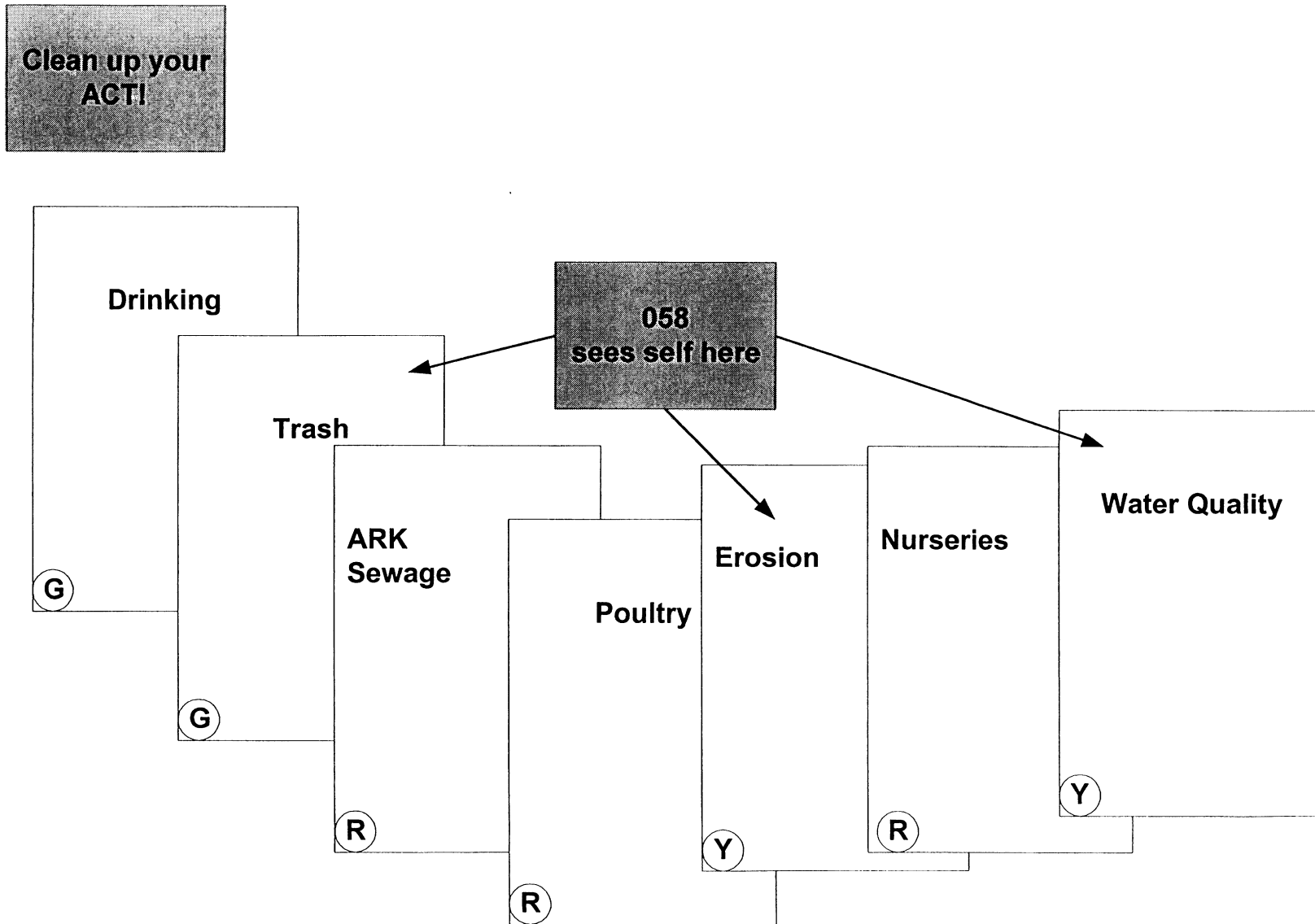**Figure 1. Typical Concept Map Showing One Group Focused on "Water Quality"**

Figure 2. Typical Concept Map Showing Linear Progression from the Anchor "WQ"

AUTHOR'S NOTES

John A. Bantle is Vice-President of Research at Ohio University in Athens, Ohio. Before taking this position, he was Associate Dean for Research in the College of Arts and Sciences at Oklahoma State University and Professor of Zoology. His research has focused on developmental ecotoxicology and bioindicators of ecotoxicology, using frog embryos (FETAX). He came to Athens from Oklahoma State University, where he had served as Associate Dean for Research in the College of Arts and Sciences and Regents Professor of Zoology. Dr. Bantle received a doctoral degree in zoology and developmental biology from Ohio State University in 1973 and completed a postdoctoral fellowship in anatomy in 1976 at the University of Colorado Medical School. He holds master's and bachelor's degrees in biology from Eastern Michigan University in 1970 and 1968, respectively.

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Michael A. Langston is a doctoral student in Environmental Science at Oklahoma State University, focusing on ecosystem management policy. He earned a B.S. in wildlife ecology from OSU and an M.S. in ecology from the University of Central Florida. He worked 14 years for an environmental research and consulting firm in Orlando, FL where most of his research focused on wetland ecology, wetland treatment of waste water, and the ecology of threatened or endangered species. His current research involves development of soil cleanup levels for oil spills in North Central Oklahoma and testing of a protocol for involving stakeholders in watershed management decisions.

James J. Lawler is professor of political science at Oklahoma State University, with specialties in public law, public policy, the judicial process, and criminal justice. He received a J.D. from the Harvard Law School and M.P.I.A. and Ph.D. degrees from the University of Pittsburgh. He is a member of the Pennsylvania Bar (inactive) and is licensed to practice before the U.S. Supreme Court. From 1993 to 1999, he was a certified mediator for the Oklahoma courts. He was named Outstanding Political Scientists for 1999 by the Oklahoma Political Science Association. His research includes conflict management, citizen participation in hazardous waste controversies, the Oklahoma judicial system, state judicial policymaking, and police professionalism.

Paula Owsley Long is a Ph.D. candidate in political science at the University of Oklahoma. She has an M.P.A. degree from the University of Oklahoma, an M.S. in rural sociology from the University of Missouri, and a B.A. in philosophy from Washington and Lee University. Her most recent work has been as a graduate teaching associate at the OU and research assistant for the Institute for Public Affairs at OU. Before moving to Oklahoma, Ms. Long worked in water resource planning for what was then the Soil Conservation Service, as the Natural Resources Program Coordinator for the Harry S. Truman Council of Governments in Joplin, Missouri, and finally as an Associate Planner at the Southwest Missouri Council of Governments at Southwest Missouri State University in Springfield. She has been a three-time winner of the John Halvor Leek Award for outstanding scholarship at the University of Oklahoma.

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Edward Sankowski is Professor of Philosophy at the University of Oklahoma.   He received his undergraduate education at the City University of New York and his doctorate from Cornell University.   He has taught at New York University, Northwestern University, Ohio State University, University of Illinois at Urbana-Champaign, and (in 1994, after the democratic elections there) at the University of Capetown, in South Africa.   His research interests include ethics (theoretical and applied), social and political philosophy, and philosophy of social science.   He has published numerous papers in scholarly journals, including *The American Philosophical Quarterly, Ethics, Philosophical Topics, The Monist, Social Theory and Practice*, etc.   He has been a funded participant in many National Endowment for the Humanities activities.

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The editor of this special issue and the editors of Oklahoma Politics appreciate the careful reading and helpful comments of the following two reviewers.

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