GLOBAL CORNERSTONES FOR ENVIRONMENTAL RECOVERY IN IRAQ: A COMPARATIVE LAW AND POLICY ANALYSIS OF LESSONS IN ENVIRONMENTAL RESPONSE AND REMEDIATION

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INTRODUCTION

With daily media reports of bloodshed in Iraq,[1] it is difficult for many people, especially Americans, to consider anything concerning Iraq other than how to restore security and political stability there. Continuing violence, including attacks on United Nations personnel, contract security forces, and civilian aid workers, presents a barrier to reconstruction and humanitarian relief.[2] Nevertheless, with the recent return of sovereignty to the

[1] *See, e.g.*, Jeffrey Gettleman, *The Occupation: 4 From U.S. Killed in Ambush in Iraq; Mob Drags Bodies*, N.Y. TIMES, Apr. 1, 2004, at A1; Karl Vick & Saad Sarhan, *Eight U.S. Troops Killed in Shiite Uprising*, WASH. POST, Apr. 5, 2004, at A1; CNN, *Iraq Police Find 2 Bodies, Possibly Westerners U.S. Forces Go Door-to-Door in Samarra Hunt* (Oct. 3, 2004), *at* http://www.cnn.com/2004/WORLD/meast/10/03/iraq.main/index.html (on file with journal).

[2] *See, e.g.*, Robert H. Reid, *Iraq Market Blast Kills 8, Violence Rises*, AP Online, Sept. 25, 2003, WL ASSOCPR (noting U.N. decision to reduce reconstruction efforts in light of rising violence); CNN, *Japan Works on Hostage Release* (Apr. 10, 2004), *at* http://www.cnn.com/2004/WORLD/meast/04/10/iraq.kidnap.japan.reax/index.html (on file with journal).

Iraqi people,[3] the country's leaders must now develop and implement plans for Iraq's recovery. Successful rebuilding under any blueprint will require simultaneous attention to numerous priorities.[4] Iraq's devastated environment—the focus of this Article—is just one sector in desperate need of consideration. However, because Iraq's environmental conditions are closely tied to many of the country's ailments, it is important to develop and implement a comprehensive policy for environmental recovery now.[5]

News accounts of environmental conditions in Iraq leave readers with the impression that the country has not taken steps to protect its environment for some time.[6] Yet a 1997 law, The Environmental Protection and Improvement Law, created an independent Environmental Protection and Improvement Directorate (EPID) within Saddam Hussein's government.[7] The Post-Conflict Assessment Unit of the United Nations Environment Programme determined that, despite the recent regime change and continuing instability, Iraq retains a "relatively sophisticated administrative structure and staffing to monitor and manage environmental issues."[8] In fact, the former EPID forms the core of the new Ministry of Environment created by the Coalition Provisional Authority and the Iraqi Governing Council.[9]

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[3] The interim Iraqi government, the U.S.-led Coalition Provisional Authority (CPA), dissolved and returned sovereignty to the Iraqi people on June 28, 2004. Dexter Filkins et al., *Transition in Iraq: The Turnover; U.S. Transfers Power to Iraq 2 Days Early*, N.Y. TIMES, June 29, 2004, at A1.

[4] *See generally* UNITED NATIONS/WORLD BANK, JOINT IRAQ NEEDS ASSESSMENT ¶ 1.4 (2003) [hereinafter JOINT NEEDS ASSESSMENT] (describing numerous reconstruction and rehabilitation needs of Iraq), *available at* http://lnweb18.worldbank.org/mna/mena.nsf/Attachments/Iraq+Joint+Needs+Assessment/$File/Joint+Needs+Assessment.pdf.

[5] *Id*. at 52–53.

[6] *See, e.g.*, Associated Press, *Iraq's Environment Also Needs Rebuilding*, May 2, 2003, 2003 WL 55563373; Frances Williams, *Cleanup of Pollution Urged to Reduce Health Risks*, FIN. TIMES, Apr. 25, 2003, at P8, (LEXIS, Herald Tribune File) (noting that "[i]t is not enough to ask what happened in the last two months, it is necessary to ask what has happened in the last two decades").

[7] UNITED NATIONS ENVIRONMENT PROGRAMME (UNEP), ENVIRONMENT IN IRAQ: UNEP PROGRESS REPORT 29 (2003) [hereinafter PROGRESS REPORT] (discussing the 1997 law and how, prior to this law, environmental concerns were handled through the Ministry of Health, Human Environment Directorate), *available at* http://postconflict.unep.ch/publications/Iraq_PR.pdf.

[8] *Id*. at 33.

[9] Iraq Coalition Provisional Authority Order No. 44, § 1.3 (Nov. 11, 2003), *available at* http://www.cpa-iraq.org/regulations/20031126_CPAORD44.pdf.

Yet the incorporation of this legacy department into Iraq's new government does not mean that the country's existing environmental management scheme, such as it is, should simply be redeployed. The longstanding lack of political will and resources to enforce and modernize Iraq's environmental laws made them utterly ineffective.[10] As a direct result, Iraq's environment is in deplorable shape.[11] Severely contaminated industrial sites, the absence of adequate waste management, damaged and insufficient drinking water and sanitation infrastructure, and the lack of a comprehensive water management strategy are each threatening sensitive ecosystems and causing obvious and extreme effects on human health.[12] Accordingly, the time is ripe to overhaul Iraq's environmental policies and practices.

The international community is well-suited to help assist Iraq in this undertaking. Many countries have experienced an analogous period of ecological hardship.[13] For that reason, the United Nations Environment Programme (UNEP) has called on the international community to work "to enhance the capacity and skills of the [Iraqi] environmental administration by providing training on environmental *best practices*."[14]

Unfortunately, it is difficult to assess what constitutes a "best practice" when evaluating general framework laws and broad-based policy decisions. Certain aspects of a given policy are invariably more effective than others. Moreover, many best practices may not transfer well from one government to another. Similarly situated countries can have radically disparate experiences enforcing identical laws.[15] Therefore, this Article does not attempt to hold out any one country's environmental

[10] *See generally* UNEP, DESK STUDY ON THE ENVIRONMENT IN IRAQ 28–52 (2003) [hereinafter DESK STUDY], *available at* http://postconflict.unep.ch/publications/Iraq_DS.pdf.

[11] *Id*.

[12] *Id*. at 30–32, 34–38, 49.

[13] This Article will draw several analogies to conditions facing the Russian Federation and Poland after the fall of Communism in each country.

[14] PROGRESS REPORT, *supra* note 7, at 33 (emphasis added).

[15] *See* Hans D. Jarass & Joseph DiMento, *Through Comparative Lawyers' Goggles: A Primer on German Environmental Law*, 6 GEO. INT'L ENVTL. L. REV. 47, 47 (1993) ("As any comparative lawyer will understand, difference and similarities in environmental law across countries cannot be understood simply by comparing their statutes, regulations and court decisions in a substantive area. . . . The impact of a given [European Community] directive varies greatly among the member states.").

policies or laws as a ready-made model for Iraq to adopt. However, the obstacles encountered by countries while developing their environmental legislation can provide useful lessons for those undertaking similar initiatives. Accordingly, the following discussion attempts to assimilate the lessons learned by countries facing environmental adversity into building blocks for Iraq's recovery efforts.

This Article is divided into three parts. Part I provides necessary background by reviewing the present environmental conditions in Iraq. Part II illustrates why Iraq should address these concerns now by showing how delays in enacting environmental reform in Russia and Poland ultimately degraded human health and created barriers to economic recovery in each country, respectively. This Part then suggests that Iraq can minimize these ill effects by simply seizing the opportunity for environmental policy development inherent in its present situation. Finally, Part III examines alternative means to address Iraq's legacy contamination problems. After recounting lessons learned form the United States' regulation under CERCLA, the Comprehensive Environmental Response, Compensation, and Liability Act,[16] and after examining the Polish government's use of privatization as a vehicle for environmental cleanup, this Part recommends that Iraq adopt a hybrid of these two approaches to resolve the perceived conflict between its need for foreign investment and its need for a comprehensive environmental recovery scheme.

I. A SURVEY OF THE STATE OF THE ENVIRONMENT IN IRAQ

Before discussing how other countries' experiences with extreme ecological hardship illuminate a path for environmental improvements in Iraq, it is useful to survey the environmental conditions currently confronting the Iraqi people. Accordingly, this section, drawing heavily from UNEP reports, will highlight Iraq's most chronic environmental issues.[17] The following collection of anecdotal accounts and observations is not intended

[16] Pub. L. No. 96-510, 94 Stat. 2767 (1980) (codified as amended at 42 U.S.C. §§ 9601–9675 (2000 & Supp. I 2001)).

[17] For a more detailed treatment of this environmental survey, see DESK STUDY, *supra* note 10; PROGRESS REPORT, *supra* note 7; UNEP, THE MESOPOTAMIAN MARSHLANDS: DEMISE OF AN ECOSYSTEM, EARLY WARNING AND ASSESSMENT TECHNICAL REPORT, U.N. Doc. UNEP/DEWA/TR.01-3 Rev. 1 (2001) [hereinafter MESOPOTAMIAN MARSHLANDS], *available at* http://www.grid.unep.ch/activities/sustainable/tigris/mesopotamia.pdf.

to provide a thoroughgoing assessment of Iraq's environmental conditions. Indeed, the lack of meaningful environmental data for the country is itself a significant problem.[18] Nevertheless, the comments that follow provide the background necessary for considering how and when to respond to the environmental legacy of Iraq's history.

A. *Overview*

Most environmental conditions in Iraq are interrelated and are tied to larger problems with the country's infrastructure. For the purposes of the treetop view intended here, however, Iraq's environmental problems can be summarized by reviewing five issue areas: (1) water resource management (including ground water); (2) ecosystem and biodiversity degradation; (3) waste and sanitation disposal; (4) oil and other industry pollution; and (5) the direct impacts of military conflicts.

1. *Water Resource Management*

Simply put, current water management practices in the Middle East do not provide enough water for everyone who needs it. The Tigris and Euphrates Rivers make modern society possible in a geographic region that would otherwise consist of only a harsh desert climate. These rivers, which run the length of Iraq, literally sustain life in the region. In fact, the Tigris and Euphrates nurtured one of the "great cradles of civilisation."[19] Roughly thirty percent of Iraq is composed of alluvial plains formed by the deltas of these two rivers.[20] However, Iraq does not exercise sole control over these precious waters. There are no permanent tributaries feeding the Euphrates River within Iraq.[21] Similarly, fifty percent of the water for the Tigris River, which runs through Iraq's population center in Baghdad, comes from outside the country.[22] Thus, Iraq is largely dependent on its neighbors' water management practices. While there are some bilateral agreements between neighboring countries concerning water management, there is no

[18] *See* DESK STUDY, *supra* note 10, at 6–7, 36 (2003) (noting that ongoing hostilities have limited field surveys and that there are no reliable data on the quantities of hazardous waste generated in Iraq).

[19] MESOPOTAMIAN MARSHLANDS, *supra* note 17, at ix.

[20] DESK STUDY, *supra* note 10, at 12.

[21] *Id*. at 28.

[22] *Id*.

comprehensive regional strategy to manage this heavily burdened water system.[23]

Without meaningful regional oversight, decades of unsustainable damming, both within and outside Iraq, have weakened both rivers. As of 1991, thirty-two dams had been constructed along the Tigris and Euphrates Rivers to support water storage, irrigation, and hydroelectric power systems.[24] The capacity of the dams on the Euphrates alone is more than five times the river's annual flow rate.[25] The resulting reductions in flow decrease each river's ability to flush pollutants and allow saline water to creep upriver from the Persian Gulf, thereby reducing the already small amount of groundwater suitable for drinking and irrigation. Moreover, the rivers are severely burdened by the direct, untreated discharge of industrial and sanitary waste into their waters.[26] This dire situation worsened after the complete collapse of Baghdad's sewer system during combat operations in 2003. After the city lost power, raw sewage from 3.8 million people began entering the Tigris River, unchecked and on a continuing basis.[27]

Poor distribution systems further aggravate attempts at water resource management. Prior to the 1991 Gulf War, Iraq's potable water pipelines reached only fifty-four percent of its rural population.[28] Despite efforts to minimize the impacts of war on the Iraqi civilian population, the water system has suffered from significant physical deterioration in the past thirteen years. The

[23] *Id*. (discussing the Joint Technical Committee on Regional Waters between Turkey and Iraq, a 1990 agreement between Syria and Iraq, and the absence of any agreement concerning water management among the three countries).

[24] *United States and the Iraqi Marshlands: An Environmental Response: Hearing Before the House Subcomm. on Middle E. and Cent. Asia, Comm. on Int'l Relations*, 108th Cong. 7 (2004) [hereinafter *MECA Environmental Response Hearing*] (statement of John Wilson, Senior Envtl. Officer, Bureau for Asia and the Near E., U.S. Agency for Int'l Dev.); *see also* Coalition Provisional Authority, *Partial Restoration of Iraqi Marshlands May Be Feasible* (noting that thirty-two dams were already built by 2001 along the Tigris and Euphrates rivers), *at* http://www.cpa-iraq.org/pressreleases/20040226_marsh_restoration.html (last visited Apr. 18, 2005) (on file with journal).

[25] DESK STUDY, *supra* note 10, at 30.

[26] *Id*. at 30–32.

[27] The collapse of water and sewage systems has been cited as the cause of a recent hepatitis outbreak in Baghdad. *See* James Glanz, *Hepatitis Outbreak Laid to Water and Sewage Failures*, N.Y. TIMES, Sep. 25, 2004, at A5.

[28] DESK STUDY, *supra* note 10, at 32.

international sanctions originally enacted after Iraq's invasion of Kuwait all but eliminated Iraq's ability to maintain and repair its municipal services.[29] As a result, much of the drinking water in the functional portion of the Iraqi water system is lost to leaks.[30] The transitional government, the Coalition Provisional Authority (CPA), working through the United States Agency for International Development (USAID), made the restoration of water and sewage systems a top priority.[31] Nevertheless, progress in this area remains hampered by, among other things, the fact that the water supply is itself a frequent target of insurgent attacks.[32]

2. *Ecosystem and Biodiversity Degradation*

The upstream uses and misuses of water have devastated the downstream Mesopotamian marshlands, a 20,000-square-kilometer network of wetlands surrounding the Tigris and Euphrates river deltas.[33] The recent dessication of these marshes is particularly troubling given their global significance. Historically, the marshlands were an area of great significance for Christianity, Islam, and Judaism.[34] Biblical scholars believe that the marshes are the likely site of the Garden of Eden and of the Great Flood, as well as the birthplace of the patriarch Abraham.[35] The marsh is also the traditional home of the Ma'dan, or "Marsh Arabs."[36] This semi-nomadic people follow a subsistence lifestyle, strongly tied to the health of the marsh's aquatic environment. With a population of 300,000–500,000, the Ma'dan are seen as distant relatives of the Sumerians and Babylonians—thus serving as "a

[29] *Id*. at 15 (noting that "the water distribution system has steadily deteriorated, due mainly to the lack of spare parts and maintenance").

[30] *See generally* Ralph Hassall, *Drying Out: Quality Concerns and Inadequate Equipment Plague Water System*, BAGHDAD BULL., Jul. 7. 2003, at 8 (reporting that of 11,000 km of water pipe in Baghdad, 5000 km are in need of repair), *available at* http://www.redstation.com/bb/Baghdad_Bulletin_003.pdf (on file with journal).

[31] *See* Coalition Provisional Authority, *Essential Services* (noting that water supply, sewerage, and municipal services are essential services that the coalition is working to restore), *at* http://www.cpa-iraq.org/essential_services.html (last visited Apr. 18, 2005) (on file with journal).

[32] PROGRESS REPORT, *supra* note 7, at 18.

[33] For a detailed description of the Mesopotamian marshlands, see MESOPOTAMIAN MARSHLANDS, *supra* note 17, at 3–21.

[34] *Id*. at 21.

[35] *Id*.

[36] *Id*. at 15.

living link between the present inhabitants of Iraq and the peoples of ancient Mesopotamia."[37]

Environmentally, the traditionally lush banks of the rivers and surrounding wetlands form the "largest wetland ecosystem in the Middle East and Western Asia."[38] The wetlands are home to over 134 species of birds and serve as an important resting ground on the intercontinental flyway for migratory birds.[39] In addition to birds, many fish fauna rely on the marsh. In fact, up to sixty percent of Iraq's inland fish catch is tied to the wetland ecosystem.[40] The Persian Gulf's marine fishery is dependent on the marsh as well since a variety of marine fish migrate upstream.[41] Moreover, marshes traditionally protected the region's fish resources by filtering potentially harmful contaminants.[42]

Despite the Mesopotamian marsh's historical significance and environmental importance to the region, preventable action facilitated a ninety-percent collapse of the wetland in the decade preceding the year 2000.[43] As previously discussed, the unsustainable damming practices of countries throughout the region have a substantial impact on the flow rates of the Tigris and Euphrates.[44] Accordingly, some experts believe that these water works have single-handedly caused the disappearance of the marshland ecosystem.[45] However, the recently-ousted Iraqi government took actions that expedited this process. Starting in 1951, Iraq embarked on a program to create drainage systems to combat increasing soil salinization.[46] After the 1991 Gulf War, "rebel" Shi'ite forces took refuge in the southern marshlands, which fell within the protection of the U.S.-enforced southern no-

[37] *Id*.

[38] PROGRESS REPORT, *supra* note 7, at 22.

[39] MESOPOTAMIAN MARSHLANDS, *supra* note 17, at 18–19 (also noting that the marsh has served as home to nearly two-thirds of West Asia's wintering waterfowl, estimated at several million birds).

[40] *Id*. at 20 (citing a 1990 estimate by the Food and Agriculture Organization of the United Nations (FAO)).

[41] *Id*. at 20–21.

[42] Desk Study, *supra* note 10, at 44.

[43] PROGRESS REPORT, *supra* note 7, at 24.

[44] *See supra* text accompanying notes 24–32.

[45] MESOPOTAMIAN MARSHLANDS, *supra* note 17, at 36.

[46] As extensive damming decreased river flow rates, more saline water crept up the rivers and was introduced into irrigation systems that had no return water flow. Salt was simply deposited on land and remained in the soil as the water evaporated or entered the water table. *Id*.

fly zone.[47] In response, Saddam Hussein's regime added to existing drainage systems and deliberately drained the wetlands, subsequently flushing and burning the surrounding villages.[48] The UNEP views the disappearance of the Mesopotamian marshlands as "one of the world's greatest environmental disasters."[49] In 2003, UNEP experts predicted that the entire ecosystem would be lost in three to five years.[50]

Fortunately, there is recent cause for hope. With a "good water year" in 2003, and with grass-roots efforts by the Marsh Arabs to disassemble the existing drainage canals and mechanisms, water has started to return to the marsh.[51] Yet, some of the sluice gates have been reopened (diverting water to towns for drinking) at the behest of angry mobs.[52] Clearly, the situation is tense. Given the scarcity of water, the competing interests in its use, and the numerous stakeholders involved, any long-term solution to recovery in this area will be exceedingly complex.

3. *Waste and Sanitation Systems*

While the *scarcity* of water is the source of widespread problems, an *overabundance* of domestic, demolition, and clinical waste is creating urgent health concerns in Iraq's metropolitan areas. From April to August of 2003, the CPA implemented a public works project to clean Baghdad's streets, employing 100,000 Iraqis to remove over one million cubic tons of refuse.[53] Nongovernmental organizations, such as the United Nations Children's Fund (UNICEF), the Cooperative for American Relief Everywhere (CARE), and the World Health Organization (WHO), have undertaken similar initiatives.[54] To date, these efforts have

[47] *See MECA Environmental Response Hearing*, *supra* note 24, at 9–10 (prepared statement of Gordon West, Acting Assistant Adm'r, and John Wilson, Senior Envtl. Officer, Bureau for Asia and the Near E., U.S. Agency for Int'l Dev.).

[48] *Id*.

[49] *See* MESOPOTAMIAN MARSHLANDS, *supra* note 17, at viii.

[50] DESK STUDY, *supra* note 10, at 44 ("the entire wetland system is likely to be lost within three to five years").

[51] PROGRESS UPDATE, *supra* note 7, at 24.

[52] *Id*.

[53] *Id*. at 16.

[54] *Id.* at 17 (stating that, with UNICEF support, the municipalities of Al Adhamiyah and Rusafah—comprising an estimated workforce of 600,000 to one million people—removed waste from approximately thirty-eight percent of the area of Baghdad).

made significant strides in the collection and removal of trash, thereby reducing the spread of infectious disease. However, the resulting mounds of waste are overfilling preexisting and newly created temporary landfills.[55]

Unfortunately, these landfills are neither sanitary, nor secure. The UNEP and WHO are concerned that the waste in these dumps likely contains depleted uranium, unexploded military ordnance, hazardous clinical waste, and asbestos.[56] The presence of these hidden hazards intermingled with household refuse may present immediate health risks to the many children who scavenge dump sites for aluminum and other valuable metals.[57] In response to the sanitation crisis, the United Nations Development Group (UNDG), working with the World Bank, has identified the adoption of a comprehensive strategy for sanitation as an immediate, emergency need.[58]

4. *Oil and Other Industrial Pollution*

The well-understood problems associated with solid waste in Iraq's cities serve as a harbinger for a potentially larger, hidden threat to public health: the inadequate treatment and storage of hazardous industrial waste. Little is known about waste management practices employed in Iraq. Indeed, there is no recorded data concerning how much hazardous waste the country produces.[59] However, estimates using waste inventories from Middle Eastern oil-producing countries with similar GDPs indicate that Iraq likely produces two to eight times more industrial waste per capita than the Unites States.[60] This estimate equates to a range of 32 to 224 kilograms per year of hazardous waste per person.[61] This staggering figure shows the magnitude of the

[55] *Id*.

[56] *Id.* at 16.

[57] *Id*. (discussing a photo-essay report by the International Rescue Committee depicting children recycling aluminum and other metals from unguarded refuse and military equipment).

[58] JOINT NEEDS ASSESSMENT, *supra* note 4, at 22.

[59] *See* DESK STUDY, *supra* note 10, at 36 (noting that "there are no reliable data on the quantities of hazardous waste generated in Iraq").

[60] *Id*.

[61] This calculation is based on the per capita rate of hazardous waste generation in the United States (16–28 kg/yr). *See* UNEP, GLOBAL ENVIRONMENT OUTLOOK 2000 (1999), http://www.grida.no/geo2000/english/0113.htm (on file with journal).

challenge of finding, controlling, and cleaning hazardous waste sites in Iraq.

Initial environmental field surveys of industrial complexes support this alarming projection. While security concerns continue to limit the survey efforts of environmental and humanitarian organizations, initial reports reveal what environmentalists feared: "discharges of untreated effluent to surface waters, spillages and discharges of chemicals to soils and groundwater, and widespread uncontrolled emission of particulates and gases from stacks."[62] The following anecdotal accounts and general observations from field reports, summarized here by industry sector, illustrate the breadth and depth of likely industrial contamination problems.

a. *Oil Production*

Iraq's biggest asset may also be its biggest environmental liability. The country's proven oil reserves, second in size only to those of Saudi Arabia, drove Iraq's economy prior to its invasion of Kuwait.[63] Yet, for a time, oil production may have created more problems than profit for the country. Shortly after Iraq invaded Kuwait, the U.N. Security Council banned all imports from Iraq and banned exports to Iraq not "intended strictly for medical purposes, and, in humanitarian circumstances, foodstuffs."[64] When humanitarian conditions declined under the weight of these sanctions, the Security Council established the Oil-For-Food Program (OFFP) to help Iraq obtain much-needed foodstuffs and medical supplies.[65]

Ironically, this program may have aggravated declining environmental conditions at oil production facilities. The OFFP placed an increased demand for production on an industry with little or no access to modern technology or spare parts. This increased production, in turn, inevitably caused increased oil spills in industrial complexes with decreased capability to detect or respond to the leaks.[66] Citizen reports also indicate that the state-

[62] PROGRESS REPORT, *supra* note 7, at 5.

[63] *See* DESK STUDY, *supra* note 10, at 17 (noting that "prior to the 1990 invasion of Kuwait, [Iraq] had an output of 3 million barrels of oil per day," which generated "95% of [Iraq's] foreign exchange earnings").

[64] S.C. Res. 661, U.N. SCOR, 2933d mtg., at 19, U.N. Doc. S/RES/0661 (1990), *available at* http://www.un.org/Docs/scres/1990/scres90.htm.

[65] S.C. Res. 986, U.N. SCOR, 3519th mtg., at 101, U.N. Doc. S/RES/986 (1995), *available at* http://www.un.org/Docs/scres/1995/scres95.htm.

[66] DESK STUDY, *supra* note 10, at 19–20, 37–38.

owned oil facilities routinely engaged in unsustainable practices, such as overpumping and injecting production waste back into shallow aquifers.[67] These practices may not only have harmed the environment but may have inflicted long-term damage to untapped reserves.[68] The chief environmental concerns resulting from the oil industry include: (1) widespread oil contamination, (2) groundwater pollution, and (3) inappropriate disposal of production byproducts such as tank sludge, mercury-contaminated pipes, and drill material.[69]

b. *The Military Industrial Complex*

The oil industry was not the only sector with increased demands for production. Saddam Hussein's regime committed much of Iraq's limited resources to continually growing or rebuilding its military capability.[70] Accordingly, Iraq developed weapons production and storage facilities, including those used to produce weapons of mass destruction, throughout the country.[71] While many weapons facilities were targeted and destroyed during the 1991 Gulf War and 2003 conflict, the health hazards inherent in these facilities remain a threat to the surrounding environment and population even after their demolition.

The Al Qa Qaa Complex, while one of the more benign facilities cataloged, provides a good example of the persistent hazards these sites pose. Located roughly thirty kilometers south of Baghdad, this complex manufactured rocket propellants, explosives, and munitions using nitric, sulphuric, and sulphonic acids, as well as other solvents.[72] The site was attacked during the 1991 Gulf War.[73] Subsequent failure of the on-site wastewater treatment plant allowed acids, solvents, and related byproducts to

[67] *Id*. at 20.

[68] *Id*.

[69] *Id*. at 37–38.

[70] *See generally id*. at 19–24 (noting, inter alia, high levels of government military and security spending in Iraq after the 1991 Gulf War despite steadily declining infrastructure, mass poverty, and food shortages under U.N. economic sanctions).

[71] For a summary description of Iraq's chemical and biological weapons production and storage facilities, as confirmed by inspectors from the International Atomic Energy Agency (IAEA) and the U.N. Special Commission (UNSCOM) and its successor—the U.N. Monitoring, Verification, and Inspection Commission (UNMOVIC), see DESK STUDY, *supra* note 10, at 52–64.

[72] PROGRESS REPORT, *supra* note 7, at 7.

[73] *Id*.

enter nearby streams and rivers.[74] The site also contains open and buried storage bunkers, as well as hazardous waste landfills with unknown contents.[75] Little is known about the present condition and structural integrity of these facilities. Given the potential hazards involved, UNEP declared "an urgent need to assess the environmental situation . . . ; [to] clean up looted acids and solvents[;] [to] repair . . . tanks, vessels, and pipe-work; and [to] remediate the hazardous waste landfills."[76]

c. *Cement Factories*

Iraq's domestic cement factories also pose significant risks to human health and the environment. The typical air emissions from cement kilns contain an array of heavy metals, including barium, beryllium, chromium, arsenic, nickel, cadmium, lead, thallium, and mercury.[77] While many of Iraq's cement plants are equipped with pollution control equipment, a survey of fifteen cement kilns conducted by Iraq's government in 2000 determined that "none of the [pollution abatement] equipment functioned efficiently."[78] Many of Iraq's cement plants are located near population centers.[79] Given the demand undoubtedly placed on these facilities during reconstruction after the 1991 Gulf War, let alone the demand from present reconstruction efforts, it is reasonable to assume that high concentrations of heavy metals escaped from these plants and contaminated the surrounding surface soil and waters.[80]

d. *Fertilizer Plants*

Iraq's bountiful fertilizer production facilities pose another environmental contamination threat.[81] The chemical process used to make fertilizer consumes large amounts of raw material including sulphuric acid, phosphoric acid, nitric acid, hydrofluoric

[74] *Id*.
[75] *Id*.
[76] *Id*.
[77] *Id*. at 10.
[78] *Id*.
[79] *Id*. (noting that the majority of cement factories are located along the Euphrates river, with the Hammam Al-Alil, AlKufa, Al-Samawa, and Al-Sadda factories located near urban centers).
[80] *Id*.
[81] Prior to the 1991 Gulf War, "Iraq was one of the world's largest exporters of fertilizer." PROGRESS REPORT, *supra* note 7, at 10.

acid, and ammonia.[82] Accordingly, fertilizer plants routinely release nitric oxides, sulphur oxides, and ammonia into the air. Moreover, the production process generates large amounts of wastewaters and solid waste.[83] As in the other industrial sectors previously discussed, the lack of spare parts and maintenance during a decade of economic sanctions created an atmosphere conducive to significant environmental harm.[84] This situation explains UNEP field reports that Iraq's fertilizer plants have caused environmental harm "through emission of process specific chemicals into the air, [uncontrolled] discharges into [reservoirs and rivers], and storage and solid waste problems."[85]

e. *Pesticide Production and Storage Facilities*

One final example of looming industrial contamination stems from Iraq's use of pesticides. While agriculture was not a major sector within the Iraqi economy before the 1991 Gulf War, in the wake of import bans it has come to play an increasingly important role in the country.[86] Accordingly, there has been an increased need for pesticide production in recent years. Pesticides are formulated in Iraq under the auspices of the Al-Tarik State Company.[87] Notably, the sites operated by this state-owned enterprise were also part of Iraq's chemical weapons program.[88] Not surprisingly, citizens living in proximity to pesticide storage facilities are increasingly concerned about the security of these sites and about what they might contain.[89] Looting has likely compromised the integrity of many such installations. Moreover, there have been reports that many of these facilities contain chemicals long since banned from the market.[90] As in the other industrial sectors discussed above, the extent of environmental damage caused by these production facilities and their on-site

[82] *Id*.
[83] *Id*.
[84] *Id*. at 11.
[85] *Id*.
[86] *Id*. at 22; *see also* Bureau of Near Eastern Affairs, U.S. Dep't of State, *Background Note: Iraq* (Aug. 2004) (estimating that 44% of Iraq's workforce is tied to the agriculture sector), *at* http://www.state.gov/r/pa/ei/bgn/6804.htm (on file with journal).
[87] PROGRESS REPORT, *supra* note 7, at 11.
[88] *Id*.
[89] *Id*.
[90] *Id*.

chemical stores remains largely unknown.

5. *Impacts of Armed Conflict*

The above synopsis of environmental conditions details the debilitating ramifications of years of warfare and strict economic sanctions. Other direct impacts on the environment from the 1991 and 2003 conflicts in Iraq warrant specific mention as well. Specifically, the large-scale release and ignition of crude oil, the widespread use of depleted uranium, and the extensive looting resulting from government instability pose continuing environmental contamination problems on a significant scale.

The 1991 Gulf War saw the largest intentional release of crude oil into the environment in recorded history.[91] An estimated six to eight million barrels were deliberately spilled into the Gulf, and retreating Iraqi forces uncapped and set ablaze oil wells in Kuwait and Iraq.[92] In both the 1991 and 2003 conflicts, Iraqi forces also set fire to oil-filled trenches placed throughout Baghdad to conceal the city from aerial surveillance and precision targeting systems.[93] The spilled liquid crude caused widespread soil, groundwater, and coastal contamination.[94] The dense smoke from oil-trench and well-head fires created pervasive air pollution and, ultimately, soil contamination from unburned hydrocarbons and particulate matter.[95] Additionally, the contaminated firewater used in putting out these fires further contaminated the surrounding soil and groundwater.[96]

Oil was not the only controversial "weapon" in the 1991 Gulf War. Environmentalists and humanitarian organizations criticized British and U.S. forces' use of depleted uranium (DU), a toxic and radioactive heavy metal found in certain munitions and protective

[91] For more information on the effects of oil released into the environment during the 1991 Gulf War, see generally WORLD CONSERVATION MONITORING CENTRE (WCMC), GULF WAR ENVIRONMENTAL INFORMATION SERVICE IMPACT ON THE MARINE ENVIRONMENT (1991), *available at* http://www.unep-wcmc.org/latenews/Gulf_war1991/Gulf.pdf; WCMC, GULF WAR INFORMATION SERVICE: IMPACT ON THE LAND AND ATMOSPHERE (1991), *available at* http://www.unep-wcmc.org/latenews/Gulf_war1991/Gulf2.pdf.

[92] DESK STUDY, *supra* note 10, at 65, 67 (noting that "[m]ore than 600 Kuwaiti oil wells were set on fire by retreating Iraqi troops, burning between 2.5 and 6 million barrels of oil per day").

[93] *Id*. at 72; PROGRESS REPORT, *supra* note 7, at 13.

[94] DESK STUDY, *supra* note 10, at 72–74.

[95] *Id*.

[96] PROGRESS REPORT, *supra* note 7, at 13.

armor, in both the 1991 and 2003 conflicts.[97] While the risk of cancer from low-level exposure is thought to be minimal, dust from DU can irradiate the lungs and other internal organs if inhaled, creating the possibility of long-term health complications.[98]

Finally, perhaps the most troubling problems arising since the fall of the Saddam Hussein's regime stem from widespread looting. An International Atomic Energy Agency (IAEA) report on the Tuwaitha Nuclear Research Facility illustrates the dangers of ongoing pillaging from Iraq's industrial facilities.[99] The Tuwaitha facility, comprising fifty-six square kilometers and more than 100 buildings, was part of the Iraq's nuclear weapons program.[100] Most equipment tied to weapons production was destroyed on site under IAEA supervision after the 1991 Gulf War.[101] Some radioactive material, however, including 1.8 tons of low-enriched uranium and 500 tons of natural uranium, remained in sealed storage at the facility.[102] A team of IAEA inspectors, visiting the site in June 2003, determined that "10 kg of uranium compounds could have been dispersed."[103] Many containers were missing and others had been emptied onto the floor, which was covered by uranium compounds.[104] Subsequent investigations show the potentially alarming ramifications of this incident. A Greenpeace response team, which offered to exchange clean

[97] Many NGOs have called for a ban on the use of DU. *See, e.g.*, INTERNATIONAL ACTION CENTER, METAL OF DISHONOR, DEPLETED URANIUM: HOW THE PENTAGON RADIATES SOLDIERS AND CIVILIANS WITH DU WEAPONS (Depleted Uranium Education Project ed., 1997); Campaign Against Depleted Uranium (CADU), *Introduction*, *at* http://www.cadu.org.uk/intro.htm (last visited Feb. 21, 2005) (on file with journal). For a collection of news reports on this controversy, see Christian Science Monitor, *Trail of a Bullet*, *at* http://www.csmonitor.com/atcsmonitor/specials/uranium (last visited June 18, 2005) (on file with journal).

[98] UNEP, *Depleted Uranium Awareness* (n.d.), *available at* http://postconflict.unep.ch/publications/DUflyer.pdf (last visited Feb. 21, 2005).

[99] *See Letter Dated 15 July 2003 from the Secretary-General to the President of the Security Council*, Annex, Enclosure, at 3, U.N. Doc. S/2003/711 (2003) [hereinafter Tuwaitha Report].

[100] PROGRESS REPORT, *supra* note 7, at 7.

[101] *Id*.

[102] *Id*. at 8.

[103] *Id*.; *see also* PROGRESS REPORT, *supra* note 7, at 8 (noting that "an estimated 20 percent of the containers which stored the uranium had been taken from the site").

[104] *See* Tuwaitha Report, *supra* note 99.

barrels for those contaminated by uranium, recorded radioactivity levels as high as 10,000 times normal background levels in villages surrounding the Tuwaitha facility.[105]

It is important to note that looting at other industrial complexes, even at those less hazardous than the nuclear research facility discussed here, could create even more significant health risks given the type of chemicals routinely stored at the oil, cement, fertilizer, and pesticide facilities described above. The sporadic chemical releases associated with such looting could create pinpoint hotspots in many urban areas.

B. *Current Environmental Response Efforts: Necessary in the Near Term but Insufficient for the Long Run*

Of the various environmental problems present in Iraq, those posing the most visible threats to human health are (deservedly) receiving a great share of attention.[106] When not addressing imminent health risks through emergency response operations, however, humanitarian and reconstruction organizations often consider environmental conditions only in the context of larger systemic problems. For example, a United Nations-World Bank Iraqi needs assessment, commissioned to inform potential donors of Iraq's specific reconstruction needs, studied fourteen priority sectors, including education, health, employment, and infrastructure.[107] The environment, along with gender and human rights, was considered a cross-cutting theme and, as such, was primarily addressed as it related to each sector individually.[108] Ultimately, the report identified emergent needs (to be dealt with during 2004) and medium-term priorities (action items to be addressed within the next three years) for each of the fourteen priority sectors.[109]

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[105] PROGRESS REPORT, *supra* note 7, at 8.

[106] JOINT NEEDS ASSESSMENT, *supra* note 4.

[107] *See* JOINT NEEDS ASSESSMENT, *supra* note 4, at v (describing sector priorities for education; health; employment creation; water and sanitation; transport and telecommunications; electricity; housing and land management; urban management; agriculture, water resources, and food security; state-owned enterprises; investment climate; mine action; and government institutions).

[108] *Id*. at ix.

[109] *Id*. at 1. The cost estimates for the identified reconstruction needs in specified sectors totaled $35.8 billion. *Id*. at 54–55. Fortunately, over seventy states, numerous multilateral organizations, and NGOs pledged to donate nearly this entire amount at a donor's conference in Madrid, Spain, in October 2003. In

Many of the chronic environmental problems detailed above either fall within these sector priorities or are considered a top concern for U.S.-led reconstruction efforts. Accordingly, numerous states and organizations are already undertaking steps toward improving Iraq's environment by simply addressing the need assessment's listed priorities. As previously noted, USAID is working to restore water and sanitation systems to pre-March 2003 levels, with additional plans for increasing each system's capacity.[110] NGO projects, such as the Iraqi Foundation's Project Eden Again, are starting to coordinate a much-needed regional approach to the restoration of the Mesopotamian marshlands and to the broader issue of water resource management.[111] Slowly but surely, Iraq's streets are being cleared of wastes and the potential hazards that lie therein as part of health and sanitation recovery plans.[112]

However, the piecemeal environmental response facilitated by this sector-assessment approach will not solve Iraq's complex environmental ailments. While the United Nations-World Bank needs assessment calls for the cleanup of environmental hot spots and advocates the strengthening of environmental governance, it neither envisions, nor directly funds, a comprehensive approach to achieving these goals.[113] The following section describes why Iraq must implement a holistic environmental policy based on sustainable development and why now is the time to embrace this concept.

II. HISTORY SHOWS NOW IS THE TIME FOR ENVIRONMENTAL REFORM IN IRAQ

Iraq stands at a crossroads in many respects. The country is confronted with the need to redevelop its infrastructure,

addition, the CPA estimated that sectors not covered by the U.N.-World Bank assessment would require an additional $19.4 billion in reconstruction aid. *Id*. at 54–55.

[110] *See supra* text accompanying notes 31–32.

[111] *See MECA Environmental Response Hearing*, *supra* note 24.

[112] *See supra* text accompanying notes 53–54.

[113] Admittedly, the *Joint Needs Assessment* recognizes that "[i]f left unaddressed, [Iraq's] environmental problems will undermine sustainable development and become a barrier to peace, recovery, and quality of life." JOINT NEEDS ASSESSMENT, *supra* note 4, at 52. However, environmental protection or recovery is not specifically mentioned as a "priority area[] for Iraq's reconstruction." *Id*. at 3.

environment, and social services in an atmosphere of widespread unemployment, poverty, hunger, sickness, and political uncertainty.[114] The road to recovery from this desperate situation includes the need to make many fundamental policy decisions. One such decision concerns the role environmental policy will play in reconstruction efforts. Since there are inevitable limits to the amount of international donations Iraq will receive, there is an inherent pressure to jumpstart the country's economy, at any cost, in order to generate revenue for much-needed improvements. Thus, the temptation to postpone environmental improvements in favor of quick economic growth is great. This mindset is consistent with a perspective that industrial growth is only a side effect of industrial wealth and not a significant problem for developing nations.[115]

The perception that a country must choose between one of two alternate paths, growing or greening, has changed. In 1992, over 108 heads of state embraced the concept of sustainable development—"an alternative approach to one simply based on economic growth"—at the U.N. Conference on Environment and Development (the Earth Summit) in Rio de Janeiro, Brazil.[116] Designed to "meet the needs of the present without compromising the ability of future generations to meet their own needs," sustainable development is founded on the proposition that economic development, social development, and environmental protection are interdependent systems.[117] This proposition was strongly reaffirmed in 2002 when over ten thousand delegates from 193 countries and intergovernmental organizations met in Johannesburg, South Africa, for the World Summit on Sustainable Development.[118]

It is not the purpose of this Article to extol the virtues of

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[114] *See generally* DESK STUDY, *supra* note 10, at 13–17 (discussing key social issues facing Iraq).

[115] UNITED NATIONS, THE WORLD CONFERENCES: DEVELOPING PRIORITIES FOR THE 21ST CENTURY 22 (1997).

[116] *Id*.

[117] *Report of the United Nations Conference on Environment and Development*, Annex I, U.N. Doc. A/Conf.151/26 (vol. 1), U.N. Sales No. E.73.II.A.14 and corr. (1992), *available at* http://www.un.org/documents/ga/conf151/aconf15126-1annex1.htm.

[118] UNITED NATIONS, THE ROAD FROM JOHANNESBURG—WORLD SUMMIT ON SUSTAINABLE DEVELOPMENT, WHAT WAS ACHIEVED AND THE WAY FORWARD (2003), *available at* http://www.un.org/esa/sustdev/media/Brochure.PDF.

sustainable development by advocating the implementing guidelines set forth in the Rio Declaration on Environment and Development,[119] Agenda 21,[120] and the subsequent Johannesburg Declaration and Plan of Implementation.[121] Practically speaking, it could be difficult to "sell" hortatory nonbinding agreements to a country such as Iraq in a time of national crisis. History shows, however, that countries that depart from the principles set forth in these documents do so at their own peril. *Hard* lessons, especially those learned through delays in economic growth and declining health conditions, may carry more weight than *soft* law with a country looking to recover from desperate times.

Accordingly, this section uses three lessons from Russia, Poland, and the United States to show the wisdom of enacting widespread environmental reform in Iraq now. First, this section discusses how Russian's decision to delay implementing and enforcing environmental reforms led to extensive public health problems. Given the similarities between Russia's and Iraq's industrial contamination, the Iraqi people could face a similar decline in health if that country allows similar delays. Second, this section shows how Poland's experience with foreign investors in privatizing state-owned entities (SOEs) demonstrates the need to set environmental standards and cleanup liabilities as early as possible. Lastly, this section's discussion of a unique domestic statute from the state of California illustrates how uncertainty, such as that existing in Iraq, can be a powerful tool for motivating industries to *help* establish environmental standards.

[119] Rio Declaration on Environment and Development, *in Report of the United Nations Conference on Environment and Development*, Annex I, at 3, U.N. Doc. A/Conf.151/26/Rev.1 (Vol. 1) (1992).

[120] Agenda 21, *in Report of the United Nations Conference on Environment and Development*, *supra* note 119, Annex II, at 9; *see also* Div. for Sustainable Dev., U.N. Dep't of Econ. & Social Affairs, *Agenda 21* ("Agenda 21 is a comprehensive plan of action to be taken globally, nationally and locally by organizations of the United Nations System, Governments, and Major Groups in every area in which human impacts on the environment."), *at* http://www.un.org/esa/sustdev/documents/agenda21/index.htm (last updated Dec. 15, 2004) (on file with journal).

[121] *Report of the World Summit on Sustainable Development*, at 1, 7, U.N. Doc. A/Conf.199/20* (2002).

A. *Lessons from the Russian Federation: Delaying Environmental Reform and Enforcement May Endanger Public Health*

When the *glasnost* policy of Mikhail Gobachev increased the availability of information from behind the "Iron Curtain," the world learned for the first time the gravity of environmental damage wrought by communist-controlled "smoke-stack" economies and their high-density clustering of industrial complexes. These environmental conditions have since been well documented.[122] While there are many differences between the fall of communism in the former Soviet Union and the fall of Saddam Hussein's regime in Iraq, both countries find themselves similarly situated in many respects. Both Russia and Iraq are undergoing the transition to open market economies while simultaneously starting to employ democratic principles throughout their respective governments. Both countries possess significant oil reserves and the intent to leverage their supply to drive their respective recovery efforts.[123] Moreover, both Iraq and Russia must deal with crumbling infrastructure.[124] Fortunately, similar situations need not lead to similar outcomes. Iraq may avoid the path followed by Russia, which some critics have accused of forgoing the enforcement of environmental standards and remediation to concentrate on short-term economic recovery.[125]

A summary of current environmental problems in Russia shows additional similarities to conditions in Iraq. As recently as June 2003, roughly twelve years after the fall of communism, Russian President Vladimir Putin acknowledged that "15 percent of Russia could be classified as an environmental disaster zone."[126]

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[122] For a comprehensive review of environmental conditions in the former Soviet Union after the fall of communism, see D. J. PETERSON, TROUBLED LANDS: THE LEGACY OF SOVIET ENVIRONMENTAL DESTRUCTION (1993).

[123] *See* Sabrina Tavernise, *Pollution Gets a Shrug as Production Booms*, INT'L HERALD TRIB., Oct. 6, 2003, at 2 (describing how economic interests have prompted an oil rush in the Siberian wilderness); *see also supra* text accompanying note 53.

[124] *See, e.g.*, *supra* text accompanying notes 28–31 (discussing Iraq's troubled water distribution system); Jeanne Whalen, *Economic Necessity Drives Russia's Foreign Policy*, WALL ST. J., Sep. 12, 2002, at A12 (noting that Russian President Valdimir Putin's main aims are to boost Russia's economic growth, pay its foreign debt, and fix its "crumbling infrastructure").

[125] Tavernise, *supra* note 123 (quoting Victor Danilov-Danilyan, chairman of the Russian State Ecology Committee from 1991 to its dissolution).

[126] *Id*.

Like Iraq, Russia suffers from a lack of safe drinking water. According to some estimates, seventy-five percent of Russia's water is polluted to some degree, while fifty percent is unsuitable for drinking.[127] Seventy-four million hectares of land are contaminated by "industrial toxic agents, pesticides, and . . . chemicals."[128] This situation is reminiscent of the unknown contamination caused by various Iraqi industries during a decade of U.N. sanctions.[129] Similar to the concerns raised by the looting at Iraq's Tuwaitha facility, the safety and security of Russian storage facilities for hazardous waste—including radioactive material—is in doubt.[130] Moreover, largely unregulated oil drilling practices have led to "[oil] wells leaking all over the place and big oil spills in marshes."[131] This situation has its Iraqi analog in the unsustainable oil production practices witnessed in Iraq during the Oil-For-Food Program.[132] Given the similarities of these environmental problems, Russia's response to its ecological conditions is especially valuable to Iraq as a lesson about what not to do.

Viewed strictly from a legal perspective, Russia tackled these pollution problems head on. A 1993 constitutional provision guaranteed each citizen's right to a clean environment.[133] Among other environmental policy reforms and economic incentives, Russia implemented a Federal Law on Ecological Examination, laying the groundwork of an environmental impact assessment regime in 1995.[134] In 1996, the country formally embraced a

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[127] FED. RESEARCH DIV., LIBRARY OF CONG., RUSSIA: A COUNTRY STUDY 139 (Glenn E. Curtis ed., 1998) [hereinafter RUSSIA: COUNTRY STUDY].

[128] *Id*. at 144.

[129] *See supra* text accompanying notes 59–90.

[130] *See* WORKING PARTY ON ENVTL. PERFORMANCE, ORG. FOR ECON. COOPERATION & DEV. (OECD), ENVIRONMENTAL PERFORMANCE REVIEWS (1ST CYCLE): CONCLUSIONS AND RECOMMENDATIONS, 32 COUNTRIES (1993–2000), at 293 (1999) [hereinafter ENVIRONMENTAL PERFORMANCE REVIEWS], *available at* http://www.oecd.org/.

[131] Tavernise, *supra* note 123 (quoting a Western oil executive's description of one of the oldest and largest oil fields in West Siberia).

[132] *See supra* text accompanying notes 63–69.

[133] KONST. RF. part 1, ch. 2, art. 42 (1993) (Vladimir V. Belyakov & Walter J. Raymond trans., 1994) ("Every person shall have the right to a favorable environment, reliable information on its condition and compensation for damage inflicted on his/her health or property by environmental laws."); *see also* RUSSIA: COUNTRY STUDY, *supra* note 127, at 151.

[134] *See* ENVIRONMENTAL PERFORMANCE REVIEWS, *supra* note 130, at 290; *see also* RUSSIA: COUNTRY STUDY, *supra* note 127, at 152 (noting that the State

strategy for implementing sustainable development practices.[135]

In the grips of continued economic instability, however, Russia stepped back from *enforcing* these and other preexisting environmental commitments. In May 2000, President Putin eliminated the State Committee for Environmental Protection, transferring its responsibilities to the Ministry of Natural Resources.[136] Today, compliance with environmental standards is largely left up to "the consciences of the oil companies themselves."[137] As President Putin bluntly stated: "Right now, industries are not held responsible for harming the environment."[138]

This tendency toward inaction may be explained, in part, by the decline of public support for environmental reform.[139] In 1989, the Soviet Union experienced a green movement.[140] In an era of outwardly dangerous environmental conditions, nearly one-third of respondents to an environmental survey voiced their willingness to "sacrifice economically to improve the [environmental] situation."[141] However, this poll also indicated that public concern centered chiefly on "local problems with immediate impact."[142] It is important to note that the United Nations-World Bank Joint Iraqi Needs Assessment seems to focus on the environment in the same way—looking primarily at sector-based conditions posing current problems.[143] As the more alarming health threats in Russia were addressed, and as economic conditions declined, the conviction of

Duma passed a law in 1995 requiring environmental impact assessments for a variety of construction and development projects).

[135] *See* ENVIRONMENTAL PERFORMANCE REVIEWS, *supra* note 130, at 295.

[136] David Hoffman, *Putin Abolishes Russia's Lone Environmental Agency*, WASH. POST, May 23, 2000, at A30; *see also* ENVIRONMENTAL PERFORMANCE REVIEWS, *supra* note 130, at 290–91.

[137] Tavernise, *supra* note 123.

[138] *Id*.

[139] *See generally* RUSSIA: COUNTRY STUDY, *supra* note 127, at 148 (concluding that "[p]ublic enthusiasm for environmental improvement followed the same curve as enthusiasm for democratic and economic reform").

[140] Many have suggested that green movements in the former Soviet Union and throughout Eastern and Central Europe led, or at least helped facilitate, the fall of communism in these regions. *See* J. Calvitt Clarke III, *Russia and the Collapse of Communism in Eastern Europe: Lecture to Graduate School of International Relations, Nihon University, Shizuoka, Japan*, May 28, 1993, *at* http://users.ju.edu/jclarke/wizzr.html (on file with journal).

[141] RUSSIA: COUNTRY STUDY, *supra* note 127, at 148.

[142] *Id*.

[143] *See supra* note 113 and accompanying text.

the green movement weakened.[144]

In addition to waning public support, other obstacles stood in the way of enforcing environmental goals. Russia's judiciary was inexperienced with environmental enforcement.[145] Moreover, the dire financial conditions of potentially liable parties made winning judgments on environmental claims a pyrrhic victory at best.[146]

Regardless of the proximate cause, the result of Russia's de facto nonenforcement policy for its environmental laws has been a public health crisis that still plagues the country. At 58.5 years, the life expectancy for Russian males is the lowest in the developed world—a situation arising from Russia's crumbling health care system, which President Putin has called a "national emergency."[147] Moreover, the nation's mortality rate exceeds its birth rate.[148] Even with the influx of immigrants from former Soviet republics, Russia's population is steadily shrinking.[149]

Admittedly, it is difficult to parse the portions of Russia's continuing health troubles caused by environmental conditions from those caused by other factors. Russian and U.S. health experts attribute recent increases in infant mortality, childhood birth defects, and respiratory and gastrointestinal illness to declining social conditions and a related rise in malnutrition, alcoholism, and stress.[150] Additionally, a crumbling, under-funded state health care system is partially to blame for recent systemic

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[144] RUSSIA: COUNTRY STUDY, *supra* note 127, at 148 (stating that "by 1992 economic hardship began to wilt the zeal for reform").

[145] *Id*. at 152 (noting that Russia's judiciary was only a "rubber-stamp branch of government in the Soviet system").

[146] Rebecca Clay, *The Ailing Mother Russia*, 102(2) ENVTL. HEALTH PERSP. 160 (Feb. 1994) ("Russian experts estimate that if existing environmental fines were levied on all of the country's industrial businesses, 60% would go bankrupt."), *available at* http://ehp.niehs.nih.gov/docs/1994/102-2/focus1.html.

[147] Jeanne Whalen, *Russia's Health Care is Crumbling: Dire Lack of Funds Creates Sick, Dwindling Populace and 'National Emergency*,*'* WALL ST. J., Feb. 13, 2004, at A9.

[148] *Id*.

[149] *Id*.

[150] Mark MacKinnon, *Health Problems Hit Children of Russia: Falling Standards Make Care in Soviet Era Seem Like Good Old Days*, THE GLOBE AND MAIL, May 29, 2003, at A14; *see also* NATALIA S. GAVRILOVA ET AL., MORTALITY CRISIS IN RUSSIA: NEW HEALTH THREATS 2 (2002) (arguing that ninety-five percent of the variation in Russia's mortality rate is tied to (1) social stress, (2) asocial behavior (such as drug dependence), and (3) certain chronic diseases), *available at* http://longevity-science.org/PAA-2002-Russia.pdf.

declines in public health.[151]

Arguably, however, these factors aggravated a situation already attributable to poor environmental conditions. Medical experts have found numerous links between environmental degradation and at least some of Russians' health problems. A 1999 Nation Intelligence Council (NIC) report, *The Environmental Outlook in Russia*, noted several studies tying Russian health concerns to environmental conditions:[152]

- A 1994 World Bank report noting documented cases in several Russian cities of developmental problems among children ingesting lead, of air pollution causing acute and chronic respiratory problems such as bronchitis and asthma, and of nitrates in drinking water causing methemoglobinemia among newborns—which prevents blood cells from absorbing oxygen and leads to slow suffocation.[153]

- A 1996 joint study by the Russian Ministry of Health and the U.S. Centers for Disease Control and Prevention finding that one-quarter of kindergarten pupils in the city of Saratov had lead concentrations above the threshold at which intelligence is impaired.[154]

- A Russian study of children in St. Petersburg finding their mercury levels to be 1.5 to two times higher than is typical of children in London and New York, and another study of children in Klin, cited by Laurie Garrett in a 1997 article for *Newsday*, finding high rates of asthma, chronic digestive diseases, and

[151] Whalen, *supra* note 147, at A9.

[152] Nat'l Intelligence Council, *The Environmental Outlook in Russia, National Intelligence Estimate* (Jan. 1999), *at* http://www.cia.gov/nic/special_russianoutlook.html (on file with journal). The National Intelligence Council (NIC) is a strategic think tank for the U.S. Intelligence Community. It produces, inter alia, National Intelligence Estimates—"authoritative written judgments on national security issues"—to provide policymakers with "the best, unvarnished, and unbiased information." Nat'l Intelligence Council, *NIC Mission*, *at* http://www.cia.gov/nic/NIC_about.html (last visited Mar. 27, 2005) (on file with journal).

[153] Nat'l Intelligence Council, The Environmental Outlook in Russia, *supra* note 152.

[154] *Id*.

endocrine system problems.[155]

- The Russian Ministry of Health estimates noting that children exposed to higher levels of air pollution generally suffer seventy percent more illnesses than those living in unpolluted areas, and the Russian State Report on the Environment for 1994 citing air pollution as a contributing factor to seventeen percent of childhood and ten percent of adult illnesses.[156]

Given this well-established link between environmental conditions and public health, the lesson from Russia is clear: bad ecological conditions do not get better with age. The Russian experience shows that ignoring environmental contamination problems ultimately places a strain on public health. This, in turn, stymies economic growth by weakening the workforce and diverting government resources to support public health care systems.[157]

Many of the ailments attributed to environmental contamination, such as lead and mercury poisoning, arise from long-term accumulations of pollutants in the body.[158] Thus, the longer contamination is permitted to linger in the human environment, the more people are subject to its ill effects. These invisible threats do not present the type of obvious environmental hazards that typically trigger citizen outcry.[159] As mentioned above, the Russian Federation's early environmental reforms were arguably sustained, albeit for only a brief period, by citizen

[155] *Id*.

[156] *Id*.

[157] Arguably, Russia has not diverted enough resources to its health care system. *See generally* Whalen, *supra* note 147, at A9.

[158] *See generally* AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY (ASTDR), U.S. DEP'T OF HEALTH & HUMAN SERVS., TOXICOLOGICAL PROFILE FOR LEAD (July 1999) (describing the adverse effects of lead exposure), *available at* http://www.atsdr.cdc.gov/toxprofiles/tp13.pdf; ASTDR, U.S. Dep't of Health & Human Servs., *ToxFAQs: Mercury* (Apr. 1999) (describing adverse effects of mercury exposure), *available at* http://www.atsdr.cdc.gov/tfacts46.pdf (on file with journal).

[159] *See generally* Centers for Disease Control and Prevention, *About Childhood Lead Poisoning* (noting that, "[b]ecause lead poisoning often occurs with no obvious symptoms, it frequently goes unrecognized"), *at* http://www.cdc.gov/nceh/lead/about/about.htm (last updated Oct. 29, 2003) (on file with journal).

concern for "obvious problems with local impact."[160] However, since Russia's present public health troubles are not solely tied to obvious hazards, public demand was not an adequate barometer for the level of environmental commitments needed to protect the public health.[161]

This lesson is particularly salient for Iraq. The illnesses in Russia attributed to environmental degradation and contamination did not come from the type of deplorable conditions addressed in the sector-specific priorities of the UNDG-World Bank needs assessment for Iraq.[162] Yet, given the unknown disposition of numerous chemicals used in Iraq's industries,[163] the widespread soil and surface water contamination from oil spills and fires,[164] and the unknown hotspots created by looting from industrial facilities,[165] such illnesses are precisely the type Iraq might expect to face in the coming years. Accordingly, it cannot afford to delay implementing and enforcing environmental reforms.

B. *Lessons from the Privatization of Poland: Countries Must Clarify Environmental Liabilities to Facilitate Investment*

Poland's experience with privatizing its numerous state-owned enterprises (SOEs) provides another cautionary tale for Iraq. After the fall of communism in 1989, Poland, like Russia, began its transition to an open market economy. A key component of this process was the privatization, or conversion, of many of the over eight thousand SOEs to private ventures.[166] Poland's initial unwillingness to address environmental issues during its massive privatization effort placed the government at a disadvantage in the

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[160] *See supra* text accompanying notes 139–44.

[161] Obviously, public outcry can indicate a need for environmental response. The point here is simply that environmental reform should not be dependent on public complaints when many health hazards will not be obvious to those affected.

[162] *See* JOINT NEEDS ASSESSMENT, *supra* note 4, at 53 (articulating a general need to clean up environmental hotspots).

[163] *See supra* text accompanying notes 53–90.

[164] *See supra* text accompanying notes 91–98.

[165] Examples are recounted in *supra* text accompanying notes 99–105.

[166] *See generally* Susan S. Cummings, *Environmental Protection and Privatization: The Allocation of Environmental Responsibility and Liability in Sale Transactions of State-Owned Companies in Poland*, 17 HASTINGS INT'L & COMP. L. REV. 551, 557 n.13 (1994) ("In 1990 there were 8,441 state-owned enterprises in the 'productive' sector that could be subject to privatization by theMinistry of Privatization.").

privatization process.[167] Admittedly, privatizing Iraq's SOEs will have a minimal effect on Iraq's economic recovery. In comparison to the thousands of SOEs privatized in Poland, Iraq has only 192—most of which have "little worth beyond the value of their land and buildings."[168] However, on September 21, 2003, Iraq announced a foreign investment policy that would make it one of the most open countries to foreign investment in the world.[169] While there may be significant differences between the privatization of SOEs and foreign investment in private business, the presence, or absence, of a means to address environmental liabilities is relevant to any potential investor. Accordingly, the following lessons from Poland are applicable to Iraq today despite the potential differences in the underlying transactions.

Poland did not initially take environmental compliance issues into account when developing its privatization scheme.[170] In 1990, the country passed laws establishing both the procedures for privatization and a government ministry to oversee the process.[171] Neither law empowered the Ministry of Privatization to deal with environmental liability issues in the context of transferring business entities.[172] Indeed, these laws, along with other guidance regulating foreign investment, did not even mention environmental issues.[173] Moreover, Poland's Ministry of Environment, Natural Resources, and Forestry was not afforded the opportunity to provide input to these acts.[174]

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[167] *Id*. at 559.

[168] JOINT NEEDS ASSESSMENT, *supra* note 4, at 41.

[169] Iraq Coalition Provisional Authority Order No. 39, § 7.2 (Sept. 19 2003), *available at* http://www.cpa-iraq.org/regulations/20031220_CPAORD_39_Foreign_Investment_.pdf; *see also* JOINT NEEDS ASSESSMENT, *supra* note 4, at 11 ("The law permits full foreign ownership of businesses in all sectors (with the exception of natural resources), permits foreign firms to enter Iraq as direct owners of branches or through joint ventures, provides for national treatment of foreign firms and permits the full and immediate reparation of profits.").

[170] Cummings, *supra* note 166, at 558.

[171] Ustawa z dnia 13 lipca 1990 r. o prywatyzacji przedsiębiorstw państwowych [Law of July 13, 1990 on the Privatization of State-Owned Enterprises], 1990 Dz.U., no. 51, item 298 (as cited and discussed in Cummings, *supra* note 166, at 553 n.3, 559 n.17); Ustawa z dnia 13 lipca 1990 r. o. utworzeniu urzędu Ministra Przekształceń Własnościowych [Law of July 13, 1990 Creating the Ministry of Privatization], 1990 Dz.U., no 51, item 299 (as cited and discussed in Cummings, *supra* note 166, at 553 n.4, 559 n.17.)

[172] Cummings, *supra* note 166, at 559.

[173] *Id*. at 559 n.17.

[174] Elżbieta M. Zechenter, *The Socio-Economic Transformation of Poland:*

This oversight has several possible explanations. First, as with Russia and Iraq, Poland had a history of not enforcing its environmental laws—a fact commonly attributed to the tendency for communist governments to value immediate economic progress over long-term environmental protection, and many citizens advocated a return to this state of affairs.[175] Second, policymakers apparently thought that injecting environmental considerations into the privatization process would slow down the transfers, thereby delaying potential sources of revenue.[176] Since economic and social pressures demanded speed and efficiency in the privatization process, government officials tried hard to streamline the process as much as possible,[177] and streamlining meant ignoring environmental considerations. Third, initial privatization transactions made Polish officials question investors' true motivations for raising environmental concerns.[178] Some investors tried to use last-minute complaints about future environmental liabilities as leverage for negotiating a lower transfer price.[179] Accordingly, Polish privatization officials came to see environmental considerations as just another barrier to achieving the best transfer price for the state in the shortest amount of time.[180]

Ironically, it was the *lack* of precision of environmental standards that caused delays in privatization.[181] Investors,

Privatization and the Future of Environmental Protection, 6 GEO. INT'L ENVTL. L. REV. 99, 126 (1993).

[175] *See* Mark Kristiansen, *Incorporating Environmental Law in the Context of Privatization Transactions in Hungary, Poland, and Russia*, 48 ADMIN. L. REV. 627, 638–39 (1996) (noting Poland's history of nonenforcement and the communist practice of placing "economic progress over the need for long-term environmental protection"); *see also* Cummings, *supra* note 166, at 557.

[176] Cummings, *supra* note 166, at 592–94.

[177] *Id*.; *see also* FED. RESEARCH DIV., LIBRARY OF CONG., POLAND: A COUNTRY STUDY 64 (Glenn E. Curtis ed., 1992) [hereinafter POLAND: COUNTRY STUDY] (noting that "government policy steered carefully away from measures that would sacrifice economic development"); Ruth Greenspan Bell, *Industrial Privatization and the Environment in Poland*, 22 Envtl. L. Rep. (Envtl. L. Inst.) 10,092 (1992) (discussing how "the Poles wish[ed] to greatly increase the pace of privatization [to increase tax revenue]").

[178] *See* Kristiansen, *supra* note 175, at 640 (noting the Polish government's skepticism toward environmental issues raised by investors).

[179] Cummings, *supra* note 166, at 558.

[180] *Id*.

[181] *See* Zechenter, *supra* note 174, at 124; *see also* Cummings, *supra* note 166, at 558.

particularly those familiar with the liability schemes of Western environmental regulations (such as those in the U.S. Superfund, discussed in Part III.A), demanded clarification about their future environmental responsibilities.[182] Specifically, investors pressed for assurances about both (1) future environmental compliance obligations and (2) liability for prior contamination.[183] Since Polish law at the time did not allocate responsibility for latent contamination problems,[184] and since enforcement of existing environmental performance standard was "spotty" at best, these concerns were not easy to resolve.

In response, the Ministry of Privatization began negotiating environmental terms within the individual privatization agreements.[185] Unfortunately, this approach did not favor a ministry inexperienced at dealing with environmental issues.[186] Since there was no organic environmental expertise within the Ministry of Privatization as originally formed, foreign investors had the upper hand.[187] Many were able to negotiate transfer prices based on compliance with Western performance and remediation standards, thus reducing the value to be paid for the SOE, while relying on the fact that after the transfer was complete there would still be no legally binding obligation to clean up pollutants on site.[188]

Poland eventually adapted its privatization process to respond to these increasingly visible weaknesses.[189] The lesson from these early difficulties provides a warning for Iraq. As was Poland, Iraq is under great pressure to jumpstart its economic engine. While oil production, which will remain under strict state control, will likely drive Iraq's economy as it did before U.N. sanctions, foreign investment in the private sector remains a critical component to Iraq's recovery.[190] Moreover, the capital-intensive nature of the oil

[182] *Id.* at 558; Zechenter, *supra* note 174, at 126.
[183] Cummings, *supra* note 166, at 558.
[184] *See infra* text accompanying notes 292–302.
[185] Cummings, *supra* note 166, at 592.
[186] *See id*. at 559 & n.18.
[187] *See id*.
[188] *Id*. at 559 n.18.
[189] *See infra* text accompanying notes 303–09.
[190] *See* JOINT NEEDS ASSESSMENT, *supra* note 4, at vii ("The involvement of the private sector in the economy as a whole will be essential since public resources are unlikely to be adequate to provide the needed volume of investment.").

industry produces limited employment creation potential.[191] Since an estimated fifty percent of the Iraqi workforce is unemployed or underemployed, sustainable job creation outside the oil industry is vitally important.[192] Given this need for private sector development, Iraq will want to do all it can to ensure a smooth flow of foreign investment. Poland's experience shows that this smooth flow depends, in part, on establishing clear environmental expectations and responsibilities as soon as possible.

C. *Lessons from California's Proposition 65: Incentive-Conscious Laws Make Uncertainty a Window of Opportunity*

While foreign investors successfully used the lack of clear pollution abatement and remediation standards in Poland to the disadvantage of Poland's government during privatization negotiations, countries need not fall victim to their own regulatory vacuums. Rather, uncertainty can be leveraged to a government's benefit as well. The State of California's experience with its Safe Drinking Water and Toxic Enforcement Act of 1986, passed as voter initiative Proposition 65, illustrates this point.[193] By giving industry the burden of resolving scientific uncertainty, Proposition 65 expedited the glacial pace with which chemical exposure standards are frequently set. Iraq may be able to hasten the (re)development of its own environmental laws by studying and adapting the forces and mechanisms behind this burden-shifting strategy.

The mechanics of Proposition 65 are fairly straightforward. The law requires the Governor of California to "list those chemicals known to the state to cause cancer or reproductive toxicity."[194] After a substance has been "listed" for twelve months, businesses may not expose any individual to the chemical "without first giving clear and reasonable warning."[195] Additionally, once a listed carcinogen or reproductive toxin has been published for twenty months, businesses are prohibited from "knowingly discharg[ing] or releas[ing]" the chemical "into any

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[191] *Id*. at 8.
[192] *Id*. at 8 n.15.
[193] CAL. HEALTH & SAFETY CODE ANN. §§ 25249.5–25259 (West 1999).
[194] *Id.* § 25249.8.
[195] *Id.* §§ 25249.6, 25249.10(b).

source of drinking water."[196] Proposition 65 empowers individual citizens, including unaffected third parties, to file lawsuits "in the public interest" to ensure compliance with its provisions.[197] To further encourage such suits, the general hazardous waste provisions originally compensated successful plaintiffs for attorney's fees incurred in bringing suit and provides plaintiffs a "bounty" of up to twenty-five percent of the civil penalties assessed against the defendant.[198]

There are two primary exceptions to the law's operational requirements. An exposure that "poses *no significant risk* assuming lifetime exposure at the level in question" does not require a public warning.[199] Similarly, discharges that "will not cause any *significant amount* of the discharged or released chemical to enter any source of drinking water" are not prohibited.[200] Under both exceptions, the burden of proof for showing what "significant" means is borne by the defendant.[201]

Placing this burden of proof on potential industrial polluters is the law's most important feature—at least with respect to its potential applications for Iraq. Under most American environmental laws, the federal government must justify the exposure level at which a substance becomes subject to regulation.[202] If agencies cannot practically execute a regulatory scheme until its threshold enforcement levels are set, industry has strong incentives to delay the process used in determining these trigger values.[203] By requiring polluters to prove that a given exposure or discharge is safe, Proposition 65 reverses the economic incentives for industry.[204] As David Roe, co-author of

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[196] *Id.* §§ 25249.5, 25249.9(a).

[197] *Id.* § 25249.7(d).

[198] CAL. HEALTH & SAFETY CODE ANN. §§ 25192(a)(2), 25249.7(j) (West 1992). The current version of the law provides for payment of twenty-five percent of civil and criminal penalties only to city attorneys, city prosecutors, district attorneys, or the Attorney General. CAL. HEALTH & SAFETY CODE ANN. § 25192(a)(2) (West Supp. 2005).

[199] CAL. HEALTH & SAFETY CODE ANN. § 25249.10(c) (West 1999).

[200] *Id.* § 25249.9(b)(1).

[201] *Id.* §§ 25249.9(b)(2), 25249.10(c).

[202] *Cf.* ROBERT V. PERCIVAL ET AL., ENVIRONMENTAL REGULATION: LAW, SCIENCE, & POLICY 343–85 (4th ed. 2003).

[203] David Roe, *An Incentive-Conscious Approach to Toxic Chemical Controls*, 3 ECON. DEV. Q. 179, 181 (1989).

[204] *Id.*; *see also* William S. Pease, *Identifying Chemical Hazards for Regulation: The Scientific Basis and Regulatory Scope of California's*

Proposition 65 explained, "Continued ambiguity about 'how much is too much' of a particular chemical is no longer helpful; instead, ambiguity creates worrisome legal risks."[205]

It was precisely such "worrisome legal risks" that drove foreign investors to seek agreements from the Polish government about their future environmental liabilities during that country's privatization efforts. Unlike the Polish government, however, the drafters of Proposition 65 leveraged the power of these legal risks by putting the burden on industry to resolve scientific uncertainty. To remove the cloud of looming liability from over their heads, industries worked with government to quickly establish "significant risk" levels for hundreds of substances.[206] Indeed, "[t]oxicologists from all over the country swarmed to California to participate in regulatory proceedings implementing the Act."[207] As a result, instead of enduring protracted agency hearings and being inundated by conflicting expert opinions as to proper regulatory thresholds, California enjoyed widespread cooperation and "a far more rapid assessment of carcinogens and reproductive toxicants than has occurred under other state and federal legislation."[208]

Admittedly, the substantive content of Proposition 65 is of little practical use to Iraq. The California law relies on the ability of information (from required warnings) to alter consumer decisions. When consumers stop using a "labeled" good in favor of a competitor's product, the market creates an incentive for the labeled good's manufacturer to avoid, or reduce, the use of "listed" chemicals. To be effective, however, this scheme likely requires well-informed consumers who are free to choose among alternative products.[209] Unfortunately, Iraqi "consumers" are likely years from having the choice of products in a free and open market. Moreover, the state of Iraq's judicial system is such that it likely could not support widespread citizen suits.[210]

Proposition 65 List of Carcinogens and Reproductive Toxicants, 3 RISK 127, 127–28 (1992) (noting that Prop 65 gives businesses "an economic incentive to avoid using listed chemicals or to keep exposures and discharges below levels that would pose any significant health risk").

[205] Roe, *supra* note 203, at 181.

[206] PERCIVAL ET AL., *supra* note 202, at 476.

[207] *Id*.

[208] Pease, *supra* note 204, at 163.

[209] PERCIVAL ET AL., *supra* note 202, at 113–14.

[210] *See infra* text accompanying notes 285–91.

Nevertheless, Proposition 65's use of burden shifting to leverage uncertainty in favor of state regulatory expediency is a potentially powerful concept for Iraq. By understanding investors' incentives, and by shifting burdens to make these incentives work in the government's favor, Iraq has the opportunity to enlist the scientific expertise and resources of foreign industry. For example, if Iraq were to require potential investors to show that a proposed manufacturing process or hazardous waste treatment regimen is safe for its population, investors would have an immediate incentive to help determine what "safe" means in Iraq. Combined with a legitimate capacity to enforce violations, such a scheme could have investors quickly committing their resources, as in California, to help the country establish its environmental standards.

III. ASSORTED LESSONS IN ENVIRONMENTAL REMEDIATION

Understanding the health hazards posed by subjugating environmental policy to economic growth and appreciating how the uncertainty arising from loose enforcement of incomplete environmental laws creates an opportunity to leverage investors' resources are two critical steps toward shaping Iraq's environmental recovery. Yet, these realizations do not yield the answer to the difficult substantive question of what Iraq's specific environmental policies should be. As Poland's experience with privatization indicates, there are two distinct worlds of environmental regulation with which potential investors are concerned: (1) standards regarding future operations and (2) liability for cleaning up pollution resulting from past actions.[211] It is beyond the scope of this Article to explore the myriad of mechanisms, bases for control, and regulatory targets Iraq could choose to manage future pollution. Instead, this final section explores alternative approaches to addressing the remaining investor concern: Iraq's legacy of contamination problems.

The divergent approaches taken by United States and Poland in cleaning up their respective pollution problems provide a variety of lessons for Iraq to consider in shaping its own remediation strategy. Each country encountered difficulties in enacting its chosen scheme. For example, the U.S. experienced a slowdown in the redevelopment of former industrial sites under its Superfund

[211] *See supra* text accompanying notes 182–83.

program.[212] Poland, on the other hand, realized that its initial efforts to use privatization as a vehicle for environmental cleanup were plagued by inconsistent, and often uninformed, standards.[213] Naturally, both countries refined their policies to overcome these difficulties. Some alterations were successful, some were not. Regardless, the lessons learned in the process provide insight into the possible obstacles to environmental remediation in any country. Thus, the evolution of these entirely different approaches creates building blocks for Iraq. By reviewing and synthesizing the experiences of United States with those of Poland, the following discussion provides a sound foundation for building an Iraqi environmental remediation policy.

A. *The "Superfund" Approach—Lessons from the United States*

In 1978, media reports about mysterious substances "bubbling up" on playgrounds and in basements rallied citizens of Niagara Falls, N.Y., to call for a government investigation.[214] The resulting inquiry determined that the fifteen-acre residential community of Love Canal had been built atop a chemical dump.[215] Health officials quickly tied previously inexplicable health problems and mysterious odors to leaks from nearly forty-two million pounds of hazardous substances that had been buried in drums at the site.[216] Shortly after the state of New York issued emergency health warnings to area residents, President Jimmy Carter declared the community of Love Canal a federal disaster area, facilitating the relocation of affected families.[217] Congress was also spurred to action. Faced with the likelihood of other "Love Canals"

[212] *See* Julia A. Solo, Comment, *Urban Decay and the Role of Superfund: Legal Barriers to Redevelopment and Prospects for Change*, 43 BUFF. L. REV. 285 *passim* (1995) (arguing that the broad liability and extensive costs of cleaning up contaminated properties imposed by Superfund dissuade business owners from redeveloping former industrial land).

[213] Cummings, *supra* note 166, at 604.

[214] *See* State University of New York at Buffalo, *Love Canal Collection: Background on the Love Canal*, *at* http://ublib.buffalo.edu/libraries/projects/lovecanal/background_lovecanal.html (last updated Oct. 17, 2001) (on file with journal).

[215] *Id*.

[216] *Id*.

[217] *Id*.

throughout the country,[218] and realizing that the nation's environmental laws did not provide adequate means to address present threats from past pollution,[219] Congress enacted the Comprehensive Environmental Response, Liability, and Compensation Act (CERCLA).[220]

The frequently cited purposes of CERCLA are "(1) to provide for cleanup if a hazardous substance is released into the environment or if such release is threatened, and (2) to hold responsible parties liable for the costs of these cleanups."[221] To achieve these ends, CERLCA grants the federal government enforcement authority to conduct both short-term removal actions and long-term remediation actions and imposes sweeping liability on a broad class of potentially responsible parties (PRPs).[222]

CERCLA provides broad statutory authority for environmental response operations. Section 104 empowers the Environmental Protection Agency (EPA), acting under presidential delegation,[223] to respond "whenever (a) any hazardous substance . . . or (b) . . . any pollutant or contaminant which may present an imminent and substantial danger to the public health" is "released" into the environment.[224] Expansive definitions of "hazardous substance" and "release" make this regulatory authority particularly strong.[225] Additionally, CERCLA gives the

[218] *See* H.R. REP. NO. 96-1016, pt. 1, at 18 (1980) (predicting that "as many as 30,000–50,000 [hazardous waste] sites exist, of which between 1,200–2,000 pose a serious risk to public health").

[219] *Id*.

[220] Pub. L. No. 96-510, 94 Stat. 2767 (1980) (codified as amended at 42 U.S.C. §§ 9601–9675 (2000 & Supp. I 2001)). However, CERCLA was not simply a reaction to the situation at Love Canal. PERCIVAL ET AL., *supra* note 202, at 224 (noting that "it is important to understand that in many respects CERCLA represents a natural adaptation of centuries of common law developments as extended by modern environmental statues").

[221] *See* H.R. REP. NO. 99-253, pt. 3, at 15 (1985).

[222] *See* 42 U.S.C. §§ 9604, 9607 (2000).

[223] *See* Exec. Order No. 12,580, 52 Fed. Reg. 2923, 2925 (Jan. 29, 1987). This executive order also gives other federal agencies, such as the U.S. Coast Guard, authority to respond in accordance with the National Contingency Plan.

[224] 42 U.S.C. § 9604(a)(1) (2000). Additionally, the government may act when there is a "substantial threat" of a release. *Id.*

[225] CERCLA defines hazardous substances broadly by extensive cross-reference to a variety of sections of other U.S. environmental statutes, including the Federal Water Pollution Control Act (33 U.S.C. §§ 1317(a), 1321(b)(2)(A) (2000)), the Solid Waste Disposal Act (42 U.S.C. § 6921 (2000)), and the Clean Air Act (42 U.S.C. § 7412 (2000)). 42 U.S.C. § 9601(14) (2000). Similarly,

government options on how to proceed. On finding a qualifying threat to the public health, the EPA can order a potentially responsible party to undertake cleanup operations.[226] Alternatively, the EPA can address the problem itself and later attempt to recover the costs in court.[227]

To further ensure the government's ability to respond to environmental problems, Congress created a trust fund—known throughout the world as the "Superfund."[228] When the government chooses to undertake cleanup operations itself, when a PRP cannot be identified, or when a known responsible party is insolvent and leaves an "orphan share" of the response costs, EPA can use the trust to fund cleanup operations.[229] This fund was initially supported by an excise tax on crude oil and certain taxable chemicals.[230] However, Congress has since let this taxing authority expire, [231] leaving the trust to rely on its only other source of funding: the financial liability of potentially responsible parties.[232]

This sweeping liability regime is perhaps CERCLA's most

CERCLA defines "release" broadly to include any "spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment (including the abandonment or discarding of barrels, containers, and other closed receptacles containing any hazardous substance or pollutant)." 42 U.S.C. § 9601(22) (2000).

[226] 42 U.S.C. § 9606(a) (2000). To facilitate speedy compliance, such administrative orders are not subject to judicial review when issued in emergency situations. *Id.* § 9613(h).

[227] *See id.* § 9607 (2000) (providing recovery mechanisms for EPA response costs).

[228] *Id.* § 9507.

[229] *Id.* § 9611. In accordance with 42 U.S.C. § 9611(a)(2), however, the EPA may only use this fund to conduct long-term remedial operations if the site is listed on the National Priorities List (NPL) under 42 U.S.C. § 9605(a)(8)(B).

[230] Pub. L. No. 96-510, § 211, 94 Stat. 2767, 2798 (1980) (codified as amended at 42 U.S.C. § 4661 (2000)).

[231] The last authorization of the taxing authority on November 5, 1990, expired on January 1, 1996. *See* Omnibus Budget Reconciliation Act of 1990, Pub. L. No. 101-508, 104 Stat. 1388; 26 U.S.C. § 4611(e)(1) (2000) ("[T]he Hazardous Substance Superfund financing rate [for crude oil and petroleum] under this section shall apply after December 31, 1986, and before January 1, 1996."); *see also* 26 U.S.C. § 4661(c) (2000) ("No tax shall be imposed under this section [for specified chemicals] during any period during which the Hazardous Substance Superfund financing rate under section 4611 does not apply.").

[232] 42 U.S.C. § 9607.

unique feature.[233] The Act extends liability to four classes of parties: (1) the *current* owner and operator of a vessel or a facility where the release occurred; (2) the owner or operator of the location *at the time of the release*; (3) any person who *arranged for the disposal* of the hazardous substance (often the generator of the waste itself); and (4) any person who *accepted such substances for transport* to disposal or treatment facilities.[234] These parties are liable for "(a) all costs of removal and remedial action incurred by the United States Government"; (b) other "necessary costs"; (c) environmental damages; and (d) the costs of health assessments or studies related to the site in question.[235] Most notably, courts have interpreted CERCLA's language[236] to impose strict,[237] joint and several,[238] and retroactive liability.[239] In other words, all

[233] *See* UNEP, LIABILITY AND COMPENSATION REGIMES RELATED TO ENVIRONMENTAL DAMAGE 2, 55 (distributed for expert meeting scheduled May 13–15, 2002) (determining that, after reviewing twenty-seven multilateral environmental agreements, two draft multilateral agreements, twenty-six regional environmental agreements, and twenty-six national environmental laws, "[t]he U.S.A.'s CERCLA has the broadest scope [of any scheme] for imposing liability" related to environmental damage), *available at* http://www.unep.org/DEPI/programmes/Liability-compen-papers.pdf.

[234] 42 U.S.C. § 9607(a)(1)–(4) (2000).

[235] *Id.* § 9607(a)(4)(A)–(D).

[236] While CERCLA's statutory language only references "section 1321 of Title 33" (the Clean Water Act) in defining the type of liability to be applied, 42 U.S.C. § 9601(32) (2000), courts have interpreted this reference, in light of its legislative history, to impose strict, joint and several liability. For further insight into the "compromise" that created this somewhat awkward construction, see PERCIVAL ET AL., *supra* note 202, at 258 (quoting Philip Cummings, *Completing the Circle*, ENVTL. FORUM, Nov.–Dec. 1990, at 11, 15).

[237] *See, e.g.*, OHM Remediation Servs. v. Evans Cooperage Co., 116 F.3d 1574, 1578 (5th Cir. 1997) ("Because [CERCLA] imposes strict liability, plaintiffs generally need not prove causation . . . ." (citing, inter alia, In re Bell Petroleum Servs., 3 F.3d 889 (5th Cir. 1993))); United States v. Monsanto Co., 858 F.2d 160, 167 (4th Cir. 1988) ("We agree with the overwhelming body of precedent that has interpreted section 107(a) as establishing a strict liability scheme."); New York v. Shore Realty Corp., 759 F.2d 1032, 1042 (2d Cir. 1985) ("Congress intended that responsible parties be held strictly liable, even though an explicit provision for strict liability was not included in the compromise.").

[238] *See, e.g.*, B.F. Goodrich v. Betkoski, 99 F.3d 505, 514 (2d Cir. 1996) ("Liability under the Act is joint and several, unless potentially responsible parties can prove that the harm is divisible."); O'Neil v. Picillo, 883 F.2d 176, 178 (1st Cir. 1989) ("[D]amages should be apportioned only if the *defendant* can demonstrate that the harm is divisible."); American Cyanamid Co. v. O'Neil, 883 F.2d 176, 178 (1st Cir. 1989).

[239] *See, e.g.*, United States v. Olin Corp., 107 F.3d 1506, 1513 (11th Cir. 1997) ("By imposing liability upon former owners and operators, Congress

potentially responsible parties are equally liable for all of the aforementioned costs, regardless of fault, and regardless of each party's level of contribution to the hazard.[240] Moreover, the legality of any disposal actions at the time of release is not a defense to liability, even if the "release" creating the problem predated CERCLA's enactment.[241]

The Superfund program arguably became this country's most contentious environmental regulation after it was enacted.[242] After thirteen years of response operations under CERCLA, The Business Roundtable[243] argued that "no country has adopted a program that is as cumbersome, inefficient, slow and costly as the U.S. Superfund Program."[244] While the program continues to draw a variety of criticisms,[245] two recurring complaints provide

manifested a clear intent to reach conduct preceding CERCLA's enactment."); United States v. Dico, Inc., 189 F.R.D. 536, 538 (S.D. Iowa 1999) (discussing an earlier decision, which found "the statutory scheme itself [to be] overwhelmingly remedial and retroactive . . . [and that] [i]n order to be effective, CERCLA must reach past conduct" (quoting United States v. Northeastern Pharm. & Chem. Co., Inc. (NEPACCO), 810 F.2d 726 (8th Cir. 1986))).

[240] *See* H.R. REP. NO. 99-253, pt. 3, at 15 (1985) (explaining that under CERCLA, "liability may be imposed without fault, and each responsible party may be held liable for the entire cost of cleanup, even if that party's contribution to the waste site was minimal"). *But see infra* text accompanying notes 274–80 (describing the right of PRPs to recoup some costs from other PRPs through a contribution action).

[241] *See, e.g.*, United States v. Dickerson, 640 F. Supp. 448, 451 (D. Md. 1986) (rejecting the argument that the defendant should not be liable because she had "acted in a proper and reasonable manner, exercised due care, complied with all laws and regulations concerning waste disposition and otherwise conducted [its] operations reasonably and lawfully").

[242] *See, e.g.*, Michael V. Hernandez, *Cost Recovery or Contribution?: Resolving the Controversy over CERCLA Claims Brought by Potentially Responsible Parties*, 21 HARV. ENVTL. L. REV. 83, 83 (1997) ("Few statutes have generated more controversy and litigation than the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980.").

[243] Business Roundtable is an "association of chief executive officers of leading U.S. corporations." Business Roundtable, *About Us*, *at* http://www.businessroundtable.org/aboutus/index.html (last visited Feb. 18, 2005) (on file with journal).

[244] BUSINESS ROUNDTABLE, COMPARISON OF SUPERFUND WITH PROGRAMS IN OTHER COUNTRIES 1 (1993), *available at* http://www.businessroundtable.org/pdf/38.pdf.

[245] *See* PERCIVAL EL AL., *supra* note 202, at 284–85 (summarizing the major complaints about CERCLA as: (1) "[j]oint and several liability results in unfair allocations of financial responsibility[,]" (2) "[c]leanup standards are too stringent[,]" (3) a "litigation-driven system funnels too much CERCLA money

insight into the program that are particularly relevant for Iraq to consider in shaping its remediation strategy: (1) joint and several liability is often perceived as unfair and, consequently, can deter redevelopment of industrial sites, and (2) the reliance on litigation to fund recovery efforts increases transaction costs, potentially diverting funds from response efforts.

1. *Broad Liability and Its Implications for Potential Investors*

Industry reactions to the exceedingly broad scope of liability under CERCLA, whether justified or not, have important implications for Iraq, given its need for business development.[246] CERCLA's liability regime altered business investment practices in the United States.[247] Wanting to avoid becoming a "current owner" of a contaminated site, many businesses backed away from investing in former industrial facilities in favor of developing more pristine land.[248] This practice left many polluted sites, commonly referred to as brownfields,[249] sitting idle around the country.[250] The implication of this situation for Iraq is twofold. Were Iraq to adopt CERCLA-like liability as an approach to conducting environmental remediation, investors might choose to develop new land, thus adding to the potential sources of pollution. Alternatively, companies might choose to avoid investing in the environmentally ravaged county altogether. Neither possibility is particularly attractive for a country counting on private industry redevelopment to reduce unemployment and boost economic output.

Lawmakers in the United States attempted to alleviate the

into transaction costs and too little into site cleanup[,]" (4) "the cleanup process is too slow and often ineffective[,]" and (5) "remedies are uneven from site to site").

[246] For discussion of the need for small business development in Iraq, see *supra* text accompanying notes 166–69.

[247] Solo, *supra* note 212, at 300–01.

[248] *Id*. at 286–87.

[249] "The term 'brownfield site' means real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant." 42 U.S.C. § 9601(39)(A) (Supp. I 2001).

[250] *See* S. REP. NO. 107-2, at 1 (Mar. 12, 2001) (estimating "that there are more than 450,000 brownfield sites nationwide that blight our communities, pose health and environmental hazards, erode our cities' tax base, and contribute to urban sprawl and loss of farmland"). *See generally* U.S. Conference of Mayors, *Recycling America's Land* (1998), *at* http://www.usmayors.org/uscm/brownfields/index.html (on file with journal).

reaction to CERCLA's retroactive, strict, joint and several liability in several ways.[251] When Congress reauthorized the Superfund program in 1986, it clarified an existing defense for third parties who unknowingly purchased contaminated land.[252] However, in order to qualify for this so-called "innocent landowner defense,"[253] an investor must have undertaken an appropriate inquiry (due diligence) into the previous use of the land, and have acted with "due care" in acquiring the property.[254] Moreover, parties that entered into a "contractual relationship"—defined to include contracts for the sale or transfer of land[255]—with potentially responsible parties were not eligible to invoke the defense.[256] Since these provisions did not provide any mechanism to purchase contaminated land without fear of CERCLA's joint and several liability, the 1986 amendments did not abate investors' concerns.

Under continued pressure to facilitate the redevelopment of a growing number brownfields, Congress enacted the Small Business Liability Relief and Brownfields Revitalization Act (SBLRBRA).[257] This law added a means for "bona fide prospective purchasers" to acquire property with known contamination while limiting CERCLA's statutory liability for

[251] The following discussion highlights just two of the many legal and administrative CERCLA reform initiatives. For links to more information on CERCLA reform, see EPA, *Superfund Reforms*, *at* http://www.epa.gov/superfund/programs/reforms/index.htm (last updated Mar. 31, 2004) (on file with journal).

[252] *See* Superfund Amendments and Reauthorization Act of 1986, Pub. L. No. 99-499, § 101(f), 100 Stat. 1613, 1616–17 (1986) (codified as amended in 42 U.S.C. § 9601(35) (2000 & Supp. I 2001)).

[253] *Id*.; *see* EPA, EPA 330-B-98-001, HANDBOOK OF TOOLS FOR MANAGING FEDERAL SUPERFUND LIABILITY RISKS AT BROWNFIELDS AND OTHER SITES 8 (Nov. 1998), *available at* http://www.epa.gov/brownfields/liab_handbook.htm.

[254] 42 U.S.C. § 9607(b)(3) (2000) (requiring defendant to show that "he exercised due care with respect to the hazardous substance concerned, taking into consideration the characteristics of such hazardous substance, in light of all relevant facts and circumstances" and that "he took precautions against foreseeable acts or omissions of any such third party and the consequences that could foreseeably result from such acts or omissions").

[255] § 101(f), 100 Stat. 1616 (codified as amended at 42 U.S.C. § 9601(35)(A) (2000 & Supp. I 2001)) ("The term 'contractual relationship' . . . includes, but is not limited to, land contracts, deeds, easements, leases, or other instruments transferring title or possession . . . .").

[256] 42 U.S.C. § 9607(b)(3).

[257] Pub. L. No. 107-118, 115 Stat. 2356 (2002) (codified at 42 U.S.C. §§ 9601–9675 (2000 & Supp. I 2001)).

current owners.[258] However, to qualify for this program, a party must show, inter alia, (1) that any contamination at the facility stems from hazards released into the environment prior to acquiring the property, (2) that the buyer complied with due diligence requirements to determine the scope of the problem, and (3) that the prospective purchaser took reasonable steps to prevent the situation from deteriorating after taking possession of the site.[259] On meeting these conditions, the bona fide potential purchaser's liability is limited to the increase in the fair market value of the property that results from government-led cleanup operations.[260]

While SBLRBRA's efforts to stimulate investment in abandoned industrial sites have had some success in the United States,[261] it is not clear that a similar approach would allay investors' concerns in Iraq. Importantly, foreign businesses are not allowed to own land in Iraq.[262] Under current Iraqi government policies, foreign investors are limited to entering into a forty-year lease.[263] The inability to own property would likely decrease incentives to invest under a SBLRBRA-type program, since, unlike in the United States, investors would not be able to profit from any appreciation in the property's value above the cost of recovery efforts.

Nevertheless, Iraq may still benefit from employing some type of broad-based liability regime. In addition to providing a funding mechanism, liability serves to deter future pollution.[264] Indeed, CERCLA's authors intended the strict, joint and several liability provided by the Superfund program to "induce potentially

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[258] 42 U.S.C. § 9607(r) (Supp. I 2001).

[259] *Id.* § 9601(40)(A)–(D).

[260] *Id.* § 9607(r)(4)(A).

[261] *See, e.g.*, EPA, REMOVING THE STING OF CONTAMINATION AND REPAIRING BLIGHTED AREAS, *available at* http://www.epa.gov/swerosps/bf/success/nocleanup.pdf (last updated Feb. 25, 2004); *see also* EPA, *Brownfields Success Stories* (linking to brownfield success stories), *at* http://www.epa.gov/brownfields/success.htm (last updated Sept. 17, 2004) (on file with journal).

[262] Iraq Coalition Provisional Authority Order No. 39, *supra* note 169, § 8.1.

[263] *Id*. § 8.2.

[264] Rena I. Steinzor & Linda E. Greer, *In Defense of the Superfund Liability System: Matching the Diagnosis and the Cure*, 27 Envtl. L. Rep. (Envtl. L. Inst.) 10,286, 10,290 (June 1997) ("The Superfund liability scheme has done far more than any other factor to galvanize private-sector concern about [waste management, minimization, and treatment], and virtually everyone acknowledges the importance of its deterrent effect.").

responsible persons to voluntarily mitigate damages rather than simply rely on the government to abate hazards."[265] The incentive to minimize risk and operate cleanly created by CERCLA's liability scheme, while admittedly difficult to quantify, would be especially useful in Iraq, given the present lack of environmental enforcement or monitoring capability there. After twelve years of operating under U.N. sanctions without spare parts and any capital for improvement, Iraq's industry leaders and environmental officials are less familiar with modern pollution control technologies and practices than the foreign businesses recruited to start operations in the region.[266] Thus, foreign businesses are arguably in a better position, at least in the short run, to provide and to help choose pollution control options. By adopting a retroactive liability scheme similar to that in CERCLA, Iraq could create incentives for foreign businesses to operate with the modern standards to which they are accustomed. Admittedly, this approach would have to walk a fine line between creating too much uncertainty about future liability, thereby deterring investment altogether, and creating enough incentives to ensure that industry does not take advantage of the lack of enforceable pollution abatement standards.[267]

2. *Transaction Costs in a Litigation-Driven Funding System*

Another oft-heard complaint about CERCLA is that the litigious nature of the program siphons monies that would otherwise be dedicated to cleanup operations and gives them to lawyers.[268] Indeed, such beliefs led Representative Michael G. Oxley (R-Ohio), then-chairman of the House Subcommittee on Commerce, Trade, and Hazardous Waste, to refer to CERCLA as "a scholarship program for lawyer's kids."[269] Those considering

[265] S. REP. NO. 96-848, at 31 (1980).

[266] *See* PROGRESS REPORT, *supra* note 7, at 31 ("[T]he [Iraqi Environment] Directorate's capacity has been seriously degraded. . . . In order for the new ministry to be an effective player in the reconstruction of Iraq, and to integrate environmental concerns into the development process, the technical and monitoring capacities of the ministry need to be strengthened.").

[267] *See infra* text accompanying notes 345–47.

[268] *See, e.g.*, NATIONAL Center for Policy Analysis, *Super Fund for Lawyers* ("The entire insurance industry spent about $1.3 billion on Superfund claims between 1986 and 1989—of which about $1 billion or 77 percent went to lawyers."), *at* http://www.ncpa.org/ea/eaja92/eaja92a.html (last visited Feb. 23, 2005) (on file with journal).

[269] Adam J. Smargon, *Superfund and Retroactive Liability: Is It Really Fair?*,

ways to clean up Iraq's contaminant-related health threats should seek to design as efficient a system as possible. Accordingly, the debate over CERCLA's financial effectiveness holds potential lessons for Iraq. Ultimately, however, it is not the costs of litigation but the litigation itself that would be problematic for the country.[270]

The specific concern is that lawsuits are "inherently highly inefficient" as a funding source.[271] This inefficiency, the argument goes, is manifest in high transaction costs: the legal and administrative costs, as opposed to operational expenses, incurred in removal and recovery efforts. For CERCLA's opponents, this "wastefulness" is aggravated by the fact that "few statutes have generated more . . . litigation."[272] Since the measures required to remove contaminants are often very costly, PRPs have strong incentives to try and avoid CERCLA's liability net.[273]

Ironically, one of Congress's attempts to overcome CERCLA's supposed "unfairness" increased the transaction costs of PRPs. In the Superfund Amendments and Reauthorization Act of 1986 (SARA),[274] Congress provided potentially responsible parties with a statutory right of contribution against other PRPs.[275] Under this amendment, "[a]ny person can seek contribution from any other person who is liable or potentially liable"[276] under CERCLA's liability scheme.[277] Specifically, SARA authorized

at http://www.afn.org/~recycler/politics.html (last updated June 28, 1999) (on file with journal).

[270] *See infra* text accompanying notes 285–90.

[271] John Quarles & Michael W. Steinberg, *The Superfund Program at its 20th Anniversary*, 31 Envtl. L. Rep. (Envtl. L. Inst.) 10,706, 10,708 (2001).

[272] *See* Hernandez, *supra* note 242, at 83.

[273] *See Reauthorization of Superfund: Hearings before the Subcomm. on Water Res. of the Comm. on Pub. Works & Transp.*, 99th Cong. 1339–40 (1985) (noting incentive for companies to avoid the enormous costs associated with CERCLA cleanups).

[274] Pub. L. No. 99-499, 100 Stat. 1613 (1986) (codified as amended in scattered sections of 42 U.S.C. §§ 9601–9675).

[275] Prior to congressional action, many U.S. courts had found an implied right to contribution in the statute. *See, e.g.*, United States v. Chem-Dyne Corp., 572 F. Supp. 802, 810 (S.D. Ohio 1983) (noting that at common law, "when two or more persons acting independently caused a distinct or single harm for which there is a reasonable basis for division according to the contribution of each, each is subject to liability only for the portion of the total harm that he has himself caused").

[276] 42 U.S.C. § 9613(f) (2000).

[277] *Id.* § 9607(a); *see also supra* text accompanying notes 236–39.

courts to "allocate response costs among liable parties using such equitable factors as the court determines are appropriate."[278] By opening the courthouse doors to PRPs to sue one another, the cumulative costs of litigation rose.[279] While such private-party suits have limited impact on government cleanup costs, the increased legal expenses incurred by big business and its insurers motivated these industries to call for the repeal of CERCLA's strict, joint and several, and retroactive liability in favor of a tax-based public works initiative.[280]

Yet, other experts contend that the bottom-line cost to PRPs under various public works proposals would be comparable to those experienced under the current system.[281] Noting that

[278] 42 U.S.C. § 9613(f)(1) (2000).

> Most [courts] have looked to what are referred to as the "Gore factors," proposed by then Senator Albert Gore[,] as a method to apportion joint and several liability. These factors are: (1) the ability of the parties to demonstrate that their contribution to a discharge, release, or disposal of a hazardous waste can be distinguished; (2) the amount of hazardous waste involved; (3) the degree of toxicity of the hazardous waste; (4) the degree of involvement of the parties in the generation, transportation, treatment, storage, or disposal of the hazardous waste; (5) the degree of care exercised by the parties with respect to the hazardous waste concerned, taking into account the characteristics of such hazardous waste; and (6) the degree of cooperation by the parties with Federal, State, or local officials to prevent any harm to the public health or the environment.

United States v. Vertac Chem. Corp., 79 F. Supp. 2d 1034, 1036–37 (E.D. Ark. 1999) (citing Control Data Corp. v. S.C.S.C. Corp., 53 F.3d 930, 935 (8th Cir. 1995)). *But see* Boeing Co. v. Cascade Corp., 207 F.3d 1177, 1187 (9th Cir. 2000) ("Congress rejected the amendment that would have listed the Gore factors as the basis for allocating liability. The trial court is therefore not limited to the Gore factors.").

[279] *See* JAN PAUL ACTON & LLOYD S. DIXON, SUPERFUND AND TRANSACTION COSTS: THE EXPERIENCES OF INVESTORS AND VERY LARGE INDUSTRIAL FIRMS 33–59 (Rand 1992); LLOYD S. DIXON ET AL., PRIVATE SECTOR CLEANUP EXPENDITURES AND TRANSACTION COSTS AT 18 SUPERFUND SITES (Rand 1993).

[280] *See, e.g.*, Rena I. Steinzor, *The Reauthorization of Superfund: The Public Works Alternative*, 25 Envtl. L. Rep. (Envtl. L. Inst.) 10,078, 10,079 (Feb. 1995) (commenting on a Public Works proposal put forward by the Alliance for a Superfund Action Partnership (ASAP), a group consisting of "the [NAACP], several large insurance companies, several manufacturing sector companies, large and small business trade associations, local governments, leaders of community groups, and a public health professional").

[281] KATHERINE N. PROBST ET AL., FOOTING THE BILL FOR SUPERFUND CLEANUP, WHO PAYS AND HOW? 25–53 (1995) (noting that the cost difference between the current Superfund program and an alternative approach that would eliminate liability for wastes disposed of before 1987 is less than four percent).

"government cleanups cost significantly more than cleanups implemented by the private sector,"[282] CERCLA's supporters argued that "[i]n one way or another, industry will pay supposedly unnecessary costs, either to lawyers or in taxes."[283] Accordingly, the complaints about high transaction costs may have been more about which industries pay, and how they pay, rather than finding a more efficient solution to affecting cleanup operations.[284]

For Iraq, however, the financial costs of potential litigation are not as threatening as the sheer strain any litigation-driven program would place on its judiciary. Thus, the debilitating transaction "cost" would be the time needed to push environmental cases through Iraqi courts. Until recently, the Iraqi judicial branch was not independent.[285] Judges were appointed, assigned, monitored, and promoted by the Minister of Justice, an executive authority.[286] Moreover, the Iraqi judges under Saddam Hussein's regime made pleasing the Ba'ath party their number-one priority, relegating the dispensing of justice to a secondary concern.[287] And who could blame them? Rulings not in alignment with official government policy could be viewed as a threat to the regime.[288] According to reports from U.S. Army civil affairs divisions working to help restore the Iraqi judicial system, "the slightest deviation from regime policies led to dismissal and imprisonment."[289] As a result, Iraq's legal system "has been in tatters for the past 30 years."[290] While the international community is helping Iraq rejuvenate its judicial system,[291] it may

[282] Steinzor & Greer, *supra* note 264, at 10,294.

[283] *Id*.

[284] Smargon, *supra* note 269.

[285] Marcia Coye, *Toward an Iraqi Legal System*, NAT'L L.J. (Apr. 25, 2003), http://www.law.com/jsp/article.jsp?id=1050369446809# (on file with journal).

[286] *Id*.

[287] Craig T. Trebilcock, *Note From the Field: Legal Cultures Clash in Iraq*, ARMY LAW., Nov. 2003, at 49.

[288] *Id*. at 48.

[289] *Id*. at 48 (citing a May 9, 2003, interview with Haithem Mohound, Iraqi Judge, in Al Kut, Iraq).

[290] Integrated Reg'l Info. Networks, United Nations, *IRAQ: Judiciary Receives Boost from UK Training Funds*, Feb. 18, 2004 (quoting the United Kingdom's Secretary of State Hilary Benn as characterizing Iraq's judicial system over the last thirty years as "deeply politicised," with widespread "corruption, torture, and other abuses by law enforcement agencies"), *at* http://www.cidi.org/humanitarian/hsr/iraq/ixl38.html (on file with journal).

[291] *Id*.; *see also* Trebilcock, *supra* note 287, at 49–50 (discussing efforts by

be unwise to burden this frail system with responsibility for keeping funds flowing to environmental recovery efforts under a litigation-driven funding scheme, or with the burden of resolving contribution disputes between potentially responsible parties.

B. *Environmental Audits and Escrow Accounts—Additional Lessons from Poland*

In addition to showing that countries must clarify environmental liabilities to facilitate investment,[292] Poland's experience with privatization provides several poignant lessons for Iraq. At roughly the same time Congress passed CERCLA, Poland's communist government enacted a law with potentially similar broad liability for soil and water contamination. The 1980 Environmental Protection and Development Act (the 1980 Act)[293] purported to require persons conducting economic activity in Poland to undertake measures to eliminate harmful impacts on the environment and to restore the environment to its "proper state" in the event of any harm.[294] If restoration was impracticable, the law subjected violators to a penalty to be paid into a national or regional fund designated for environmental protection.[295]

Unfortunately, other provisions within the law virtually ensured its ineffectiveness.[296] For instance, the 1980 Act's preamble explained that "environmental protection should only be understood within the context of the needs of Poland's national economy."[297] Additionally, the 1980 Act neither defined contamination, nor established what constituted sufficient cleanup.[298] Not surprisingly, when foreign businesses were

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the United States Army to help restore Iraqi courts in southern Iraq).

[292] *See supra* Part II.B.

[293] Ustawa z dnia 31 stycznia 1980 r. o ochronie i kształtowaniu środowiska [Law of Jan. 31, 1980 on the Protection and Management of the Environment], 1980 Dz.U, no.3, item 6 [hereinafter Polish Environmental Protection Law] (as cited in Cummings, *supra* note 166, at 562 n.23).

[294] Polish Environmental Protection Law, 1980 Dz.U, no.3, item 6, art. 82(1), as amended (as cited and discussed in Cummings, *supra* note 166, at 562 n.23, 578 nn. 91, 93).

[295] Polish Environmental Protection Law, 1980 Dz.U, no.3, item 6, art. 82(3) (as cited and discussed in Cummings, *supra* note 166, at 562 n. 23, 578 nn. 91, 93.

[296] Zechenter, *supra* note 174, at 115 (noting that the 1980 Act "was full of internal contradictions that hampered serious enforcement efforts").

[297] *Id*. at 115.

[298] *Id*. at 129.

beginning to invest in Poland's newly opened market, nearly ten years after the law's enactment, the 1980 Act's provisions had yet to be used to create a legal obligation to remediate contaminated land.[299]

Nevertheless, foreign investors were concerned that Polish authorities would view them as "deep pockets" and invoke the 1980 Act's potentially sweeping provisions to require cleanups for newly acquired properties with past pollution problems.[300] To overcome this fear, and to facilitate urban redevelopment, Poland was forced to address the issue of environmental liability.[301] Yet, rather than clarifying enforcement policies within the existing legal scheme or simply amending its laws, as the U.S. had done, the newly democratic Polish government turned to a different set of tools to allay investor's concerns: environmental audits and escrow accounts.[302]

Initial investors' ability to drive down the purchase price of Poland's industries led to public protests over the resulting reduction in government proceeds.[303] Facing charges of corruption, Poland's Ministry of Privatization took steps to better its performance.[304] This goal necessarily involved improving its negotiating position with investors. Accordingly, it started requiring potential buyers to conduct pre-acquisition environmental audits of Polish enterprises so that government officials would be better informed when the time came to settle on

[299] Cummings, *supra* note 166, at 599 (noting that, despite the 1980 Act, there is "no legal obligation to remediate existing environmental contamination").

[300] *See* Kristiansen, *supra* note 175, at 642.

[301] *See supra* text accompanying notes 166–92.

[302] The following discussion recounts the Polish government's experience with pre-acquisition audits and escrow accounts as undertaken in the course of its capital privatization program. In this form of privatization, state-owned enterprises were essentially sold as going concerns. It is important to note that capital privatization was just one of several methods uses to convert Polish enterprises into private businesses. For an overview of the various paths to privatization, see Cummings, *supra* note 166, at 583–91; Zechenter, *supra* note 174, at 122–34; GRETTA GOLDENMAN ET AL., ENVIRONMENTAL LIABILITY AND PRIVATIZATION IN CENTRAL AND EASTER EUROPE 27–35 (1994). Additionally, it is important to stress that escrow accounts were not the only instruments used by the Polish government to resolve environmental issues. While reluctant to do so, the Ministry of Privatization granted limited indemnifications in certain instances to ensure that its sales were finalized. Cummings, *supra* note 166, at 602.

[303] Zechenter, *supra* note 174, at 127–28.

[304] *Id*. at 128.

a transfer price.[305] Interestingly, the Privatization Ministry based its authority to mandate these environmental studies on privatization laws instead of on Polish environmental legislation.[306] This systemic reluctance to use environmental personnel or regulations would soon haunt the ministry.

While environmental audits provided more insight into the liabilities arising from past contamination, the audits themselves did not help in assigning responsibility for the conditions they documented. Thus, the Polish government was still faced with a quandary. It was reluctant to indemnify investors for a situation that the state itself created because it did not want to take on the enormous financial obligations arising from the cost of remediating industrial pollution from decades of communist-controlled heavy industry.[307] Yet, at the same time, Polish officials did not want to transfer liability for past pollution to prospective purchasers since such transfers would reduce the value the state could realistically demand for the property.[308] Ultimately, the Ministry of Privatization adopted an interesting, if not controversial, compromise. It began to set aside a negotiated amount of money from each privatization transaction to provide a ready source of funds for site cleanup operations and to establish and cap the liability of foreign investors.[309] These "environmental escrow accounts" (or escrow agreements) provided investors with needed certainty about their liability for past pollution, effectively limiting their liability to the amount in escrow, while allowing the government to show better proceeds on the sale of the industry than if it had been discounted for environmental damage.

While each escrow account arrangement was unique,[310] the

[305] *Id*.; *see also* Ruth Greenspan Bell & Thomas Adam Kolaja, *Capital Privatization and the Management of Environmental Liability Issues in Poland*, *in* GOLDENMAN ET AL., *supra* note 302, at 109, 112 (1994). For background on environmental audits, see GOLDENMAN ET AL., *supra* note 302, at 61–66.

[306] Zechenter, *supra* note 174, at 128 n.213 (stating that "[t]he legal basis for the audits is based on the requirement that the privatized enterprise must be valued by means of an economic and financial assessment" (citing the Law of July 13, 1990 on the Privatization of State-Owned Enterprises, *see supra* note 171)).

[307] Cummings, *supra* note 166, at 602.

[308] *Id*.

[309] Bell & Kolaja, *supra* note 305, at 120–21.

[310] Cummings, *supra* note 166, at 600. Susan Cummings, the author of the cited law review article, served as an attorney in the Polish Ministry of Privatization, Department of Capital Privatization, Interministerial

underlying premise was that an investor could be reimbursed from a special account for expenses incurred in cleaning up problems identified in the pre-acquisition audit.[311] To encourage timely industry-led cleanups, the life of the account was limited to a set period of time—normally between three and five years.[312] Any unused funds remaining at the end of the term would be forfeited to the state.[313] Some arrangements included an additional provision requiring that cleanup operations commence within twelve months after the date of sale.[314] Additionally, the Ministry of Privatization required investors to make a negotiated contribution to the account when drawing from escrowed funds.[315] This requirement provided an economic incentive to industry to conduct cost-effective cleanup operations.[316]

This escrow account concept provides a potentially potent solution to Iraq's immediate environmental remediation needs. Iraq may not have the ability to undertake widespread government-funded cleanups if it is to contain and begin remediating potentially widespread hot spots quickly. By creating escrow accounts similar to those employed in Poland, Iraq could use foreign lease deals as a force multiplier, enlisting numerous businesses in a war on environmental degradation. Simultaneously, businesses would gain an effective decrease in the rental price for improving their working environment.

However, no policy is without its flaws. As with CERCLA's liability-based approach to remediation, Poland's use of escrow accounts drew frequent criticism.[317] The following concerns about inconsistencies and ill-defined standards in the account development process, along with Poland's response to these difficulties, provide practical tips for any country considering a

Environmental Unit. She recounts first-hand experience with the various escrow account arrangements.

[311] *Id*.

[312] Zechenter, *supra* note 174, at 129 (describing typical time limit of five years).

[313] Cummings, *supra* note 166, at 600.

[314] Bell & Kolaja, *supra* note 305, at 121.

[315] *Id*.

[316] *Id*. To further ensure cost-effective cleanup, the Ministry of Privatization also required that clean up contracts be subject to a competitive bidding process. *Id*.

[317] Cummings, *supra* note 166, at 601; *see also* Zechenter, *supra* note 174, at 129.

similar scheme.

1. *Government Environmental Personnel Need to Play a Prominent Role in Land Development Negotiations and Planning*

A ministry whose primary function was to generate revenue while limiting the state's liability for past contamination initially handled Poland's efforts at setting up environmental escrow accounts.[318] The lack of environmentally trained personnel within this organization quickly proved problematic. The state-required pre-acquisition audits gave investors enough certainty to pursue privatizations transactions. However, since Poland did not have national standards for determining when a site was polluted and, conversely, when it had been cleaned sufficiently,[319] investors insisted that these values be set in their respective privatization contracts.[320]

Unfortunately, the Ministry of Privatization was inadequately staffed to make these determinations.[321] Neither the country's foreign investment law, nor the law establishing the Ministry of Privatization itself provided the agency with its own environmental experts.[322] Rather than asking the Ministry of Environmental Protection for assistance, however, the Ministry of Privatization simply did the best it could to close the deal with each investor on its own.[323] In fact, the Ministry of Environmental Protection was often specifically excluded from the privatization process.[324]

The ensuing case-by-case approach to resolving environmental concerns created several problems. First, it meant that adjacent privatized industries could end up with different remediation standards imposed under their respective contracts.[325]

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[318] *See supra* text accompanying notes 166–92.

[319] Zechenter, *supra* note 174, at 129 (Poland has not yet formulated its legal standards as to what constitutes contamination, i.e. "how dirty is dirty," and as to what constitutes a successful cleanup, i.e., "how clean is clean").

[320] *Id*.; *see* Bell, *supra* note 177 at 10,095 (describing how cleanup standards and other important details were established by negotiation, often with reference to European Commission or other Western European standards).

[321] *See supra* note 171 and accompanying text.

[322] *Id*.

[323] Cummings, *supra* note 166, at 603 (stating that "the Ministry of Privatization was initially reluctant to allow representatives from the Ministry of Environmental Protection to participate in the privatization process").

[324] *Id*.

[325] *Id*. at 600 ("In different capital privatization sale contracts, the Polish government devised different means to resolve an investor's concerns with

Second, the ad hoc nature of the process made it hard for foreign investors to learn Poland's system until they were embroiled in it.[326] Third, environmentalists expressed concern that the resulting inconsistent and ill-defined pollution standards created "misplaced incentives" for companies to spend money cleaning up past problems (in order to be reimbursed from the escrow account) instead of investing in control technologies that could potentially be more beneficial to human health.[327]

Recognizing these shortcomings, the Polish government created the Interministerial Environmental Unit (IEU) within the Ministry of Privatization.[328] Composed of experts on loan from the Ministry of Environmental Protection and the State Inspectorate for Environmental Protection, the IEU was designed to "implement a pro-active approach to environmental issues affecting capital privatization and to assist the resolution of environmental issues arising in other privatization processes upon request."[329]

The IEU immediately provided benefits to both government and industry.[330] It quickly developed working relationships with regional environmental officials to acquire an even better understanding of industries' impacts on the environment.[331] With newfound technical capabilities, the privatization staff began replacing vague guidelines with institutionalized rules and environmental standards for use in the privatization process.[332] With firmer standards, the information provided by environmental

environmental liabilities by allocating financial responsibility for liabilities in different ways according to the needs of the particular situation.").

[326] *Cf*. Kristiansen, *supra* note 175, at 643 ("Case-by-case determinations also make it impossible for future investors to lean how the system operates.").

[327] *See* Zechenter, *supra* note 174, at 129.

[328] *Porozumienie mi(e)dzy Ministrem Ochrony Srodowiska, Zasobów Naturalnych i Lesnictwa oraz Gtównym Inspektorem Ochrony Srodowiska a Ministrem Przeksztatcen Wtasnosciowych w sprawie powotania stategO mi(e)dzyresortowego zespotu d/s uwzgl(e)dniania zagadnien ekologicznych w procesie prywatyzacji kapitatowej* [Understanding Between the Ministry of Environmental Protection, Natural Resources and Forestry, Chief Inspector of Environmental Protection, and the Ministry of Privatization for the Creation of a Permanent Interministerial Unit to Resolve Environmental Issues in Capital Privatization] (May 19, 1992) (as cited and discussed in Cummings, *supra* note 166, at 603 n. 188 and accompanying text).

[329] Cummings, *supra* note 166, at 603.

[330] *Id*. at 605–08.

[331] *Id*. at 605.

[332] *Id*. at 605–06.

audits took on greater meaning. Thus, it became easier for all parties to calculate the costs associated with a given site.[333] Additionally, the unit was able to draw on its inherent familiarity with Poland's other environmental laws to provide potential buyers with meaningful insight into future compliance requirements—something the early Ministry of Privatization staff simply could not do.[334] By putting environmental decisions in the hands of those better-trained to handle them, the Polish government ultimately created an environment more conducive to foreign investment.[335]

The evolution of the IEU thus illustrates the need for and advantages of integrating government environmental personnel into industrial redevelopment proceedings. Doing so helps remove uncertainty and inconsistency regarding cleanup costs and future compliance requirements for the prospective investor that would otherwise be resolved, if at all, through lengthy negotiations or post hoc litigation. By leveraging technical expertise up front, the government provides lower-risk investments, and ultimately, increases state revenue through increased volume. Additionally, by fielding its best players—or at least understanding which game is being played—a government decreases the chances its officials will be disadvantaged in negotiations with foreign investors.

Regardless of whether Iraq chooses to implement an escrow account mechanism to facilitate environmental remediation, its Ministry of Environment can draw from Poland's experiences in this area. Iraq's environmental officials should insert themselves into redevelopment and investment negotiations. Failure to do so could place the government at a disadvantage and would constitute a lost opportunity to leverage foreign resources for environmental purposes.

2. *Escrow Accounts Should Not Be a Country's Sole Remediation Strategy*

Despite its benefits, integrating government environmental experts into redevelopment planning did not resolve a fundamental objection to Poland's use of escrow accounts. Critics point out

[333] *Id*. at 606; *see also* Kristiansen, *supra* note 175, at 642–43 (noting that the Unit's consistent approach was beneficial to investors).

[334] Cummings, *surpa* note 166, at 607.

[335] See Kristiansen, *supra* note 175, at 643 (noting the benefits to foreign investors of Poland's consistent approach to environmental issues).

that reliance on privatization to affect environmental remediation allowed foreign (or domestic) investors to decide which sites would be cleaned up first.[336] Consequently, they argue, this policy hindered the government's ability to find and address hot spots posing the greatest threats to human health.[337]

By requiring escrow accounts, Poland gained valuable information that could have helped it target its greatest public health threats. Pre-acquisition audits, a prerequisite for establishing an escrow account, provided government officials with detailed environmental data without expending limited government resources. In this regard, the program saved money for possible later use in mitigating health threats. However, early tension between the Ministries of Privatization and Environment may have inhibited the government's ability to make effective use of this data. Moreover, by tying up funds in escrow, Poland admittedly limited the resources it had available to address health risks from hot spots that were not the subject of escrow-backed cleanup agreements. Ultimately, then, assertions that escrow accounts hindered Poland's ability to conduct a "worst first" remediation strategy were valid.

Despite this drawback, Iraq should not rule out developing its own environmental escrow accounts. Given the lack of environmental data available in Iraq, the country can likely use all the help it can get to determine where its problems lie. Environmental audits from prospective investors could be compiled with information collected by international organizations, NGOs, and any state-initiated studies to help create a basis for prioritizing environment response operations.[338] More importantly, the economic incentives provided by escrow accounts would effectively recruit industry to undertake cleanup operations on the country's behalf. Poland's experience shows that a key to integrating this strategy successfully is to ensure that the proper government environmental officials are included in the process

[336] GOLDENMAN ET AL., *supra* note 302, at 3.

[337] GOLDENMAN ET AL., *supra* note 302, at 77 (arguing that "there is little, if any, correlation between sites for which foreign investment funds are available and the sites which need remedial action the most").

[338] Admittedly, modern multinational corporations will almost certainly undertake environmental studies (including audits and impact assessments) for their own benefit, without being required to do so. Accordingly, Iraq need not adopt an escrow account program just to get access to environmental information.

from the start. Additionally, to guarantee that those sites posing the greatest threats to human health are addressed first, Iraq should not rely solely on escrow accounts to address past pollution problems.

C. *Applying the Lessons by Combining the Approaches: A Proposed Remediation Framework*

While escrow agreements may not provide a sufficient remediation mechanism by themselves, the inherently adaptable nature of these contract provisions makes them well suited for integration within other legal schemes. Thus, Iraq may be able to overcome the shortcomings of Poland's approach[339] by combining it with complementary cleanup strategies. Many of the aforementioned difficulties encountered by Poland and the United States can be resolved by *combining* their respective pollution response approaches. Accordingly, Iraq should consider enacting a CERCLA-based environmental protection scheme that is augmented by escrow provisions. This hybrid approach would entail assigning joint and several liability to a broad class of actors, while simultaneously providing investors the opportunity to "contract out" of responsibility for *past* contamination through escrow agreements addressing designated sites. The following discussion suggests some of the potential advantages such a policy might bring.

Under the proposed hybrid approach, CERCLA's strengths would remove the weaknesses of an escrow-based remediation program. The broad statutory response authority given to the U.S. government under CERCLA[340] would provide Iraq the versatility it will need to address a growing list of environmental problems.[341] By empowering the Iraqi Ministry of Environment to order cleanup operations or undertake them on its own, Iraqi officials would be able to ensure that the "worst" industrial hazards are

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[339] *See supra* text accompanying notes 336–38.

[340] *See supra* notes 236–39 and accompanying text.

[341] Since so little is known about the state of Iraq's environment, it is hard to determine precisely what authorities it will need to protect its public's health and to preserve its natural resources for future generations. However, given the breadth and depth of possible hazards highlighted in *supra* text accompanying notes 19–90, Iraq should enact broad authority to ensure adequate response capabilities.

given priority, thereby avoiding the site selection concerns[342] associated with Poland's reliance on privatization as its primary vehicle for cleanups. Moreover, by establishing and funding an "Iraqi Superfund," the government would ensure that resources would be available for immediate action, even if other funds were tied up, at least temporarily, in environmental escrow accounts.[343]

Additionally, the program's liability scheme would serve as an interim pollution control regulation. By combining a broad liability scheme with expansive definitions for the type of "releases" and "hazardous substances" subject to government action, Iraq would provide its environmental officials with a means to address ongoing pollution problems. Moreover, until operational standards can be updated, Iraq could use the threat of broad legal liability as the U.S. Congress envisioned—to induce potentially responsible parties "to voluntarily mitigate [or even eliminate] damages."[344]

Just as using CERCLA's provisions as a legal backstop would remove many problems from Poland's remediation scheme, integrating escrow agreements into the legal landscape would reduce the investment-inhibiting risks associated with CERCLA's liability scheme. Poland started requiring escrow accounts to avoid having to devalue its industries.[345] By employing similar escrow agreements, Iraq could potentially increase the rental and tax revenue created by investment in the private sector. While Polish officials made environmental accounts a mandatory part of privatization agreements, Iraq would only have to make them a voluntary alternative to CERCLA-like liability. To avoid the "worrisome legal risks" of strict, joint and several, and retroactive

[342] *See supra* text accompanying note 337.

[343] The issue of how to fund an Iraqi Superfund presents an interesting topic for environmental scholars to address. The U.S.-led interim Iraqi government set a marginal tax rate of fifteen percent for individuals and business entities alike to help encourage foreign investment. Iraq Coalition Provisional Authority Order No. 49, § 3.1 (Feb. 19 2004), *available at* http://www.cpa-iraq.org/regulations/20040220_CPAORD_49_Tax_Strategy_of_2004_with_Annex_and_Ex_Note.pdf. Accordingly, efforts to impose petroleum, chemical, or other industry-specific environmental taxes might meet strong opposition. At the risk of putting all the eggs in one basket, the oil sector's unquestioned viability would seem to make it well suited to handle a minimal environmental tax that could help get the country's environment back on its feet.

[344] S. REP. NO. 96-848, at 31 (1980); *see supra* text accompanying notes 264–67.

[345] *See supra* text accompanying notes 309–16.

liability,[346] companies would be eager to negotiate escrow agreements with Iraqi officials. Moreover, the opportunity to set environmental liabilities for past pollution would help create an investor-friendly climate by reducing uncertainty in an otherwise uncertain region.[347] Consequently, this hybrid approach could improve Iraq's ability to attract business developers, thereby increasing sources of revenue, while ensuring that a percentage of the profits are readily available to address public health concerns and other environmental needs.

Additionally, using business contracts to establish environmental responsibilities would reduce the transaction costs typically associated with CERCLA's litigation-dependent funding mechanism.[348] Rather than having to sue a party for cleanup costs, Iraq could simply invoke the negotiated contractual terms of the pertinent environmental escrow agreement. If a party failed to meets its obligations, the Iraqi government could sue for breach of contract. Thus, most enforcement lawsuits would be simpler under this type of system. Instead of dealing in unfamiliar environmental concepts, Iraqi judges would adjudicate standard contract claims. Alternatively, Iraq could choose to remove the burden of enforcing these agreements from its courts altogether. If investors agreed, the Iraqi government could incorporate a forum selection clause or arbitration agreement into the terms of each contract.[349] By removing potential legal disputes to an international forum, such provisions would lessen the chances of straining Iraq's domestic judicial system.

Obviously, Iraq would need to resolve many other issues before this proposed concept would work. Since establishing the environmental damages and potential cleanup costs is a prerequisite to setting useful escrow account values for a given site, Iraq would need to quickly establish or adopt contamination and remediation standards to define "what is dirty" and "what is

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[346] *See supra* text accompanying notes 251–67 (discussing risks associated with brownfields in the United States).

[347] Obviously, reducing political uncertainty and improving security in the country remain prerequisites to creating an investor-friendly climate.

[348] *See supra* text accompanying notes 268–84.

[349] For a discussion of the advantages of using contractual agreements and arbitration for environmental management in developing nations, see Michelle Flores, Note, *A Practical Approach to Allocating Environmental Liability and Stabilizing Foreign Investment in the Energy Sectors of Developing Countries*, 12 COLO. J. INT'L ENVTL. L. & POL'Y 141, 153–58 (2001).

clean." Even with the best environmental standards, however, there would always be a risk of escrowing more or less than the actual cost of site remediation. Iraq would need to determine how to handle these situations. Among many other issues, the country would also have to decide what to do with funds forfeited from escrow accounts.[350] Despite these lingering questions, the potential benefits described above suggest that Iraq should, at the very least, explore a hybrid approach similar to the one presented here.

CONCLUSION

Iraq is facing considerable challenges on many fronts. It must institute order, tend to its sick, and feed its hungry while working to rebuild its infrastructure, reestablish its economy, and restore its environment. Fortunately, the Iraqi people can benefit from the lessons learned by countries facing similar challenges. Their respective solutions to overcoming ecological adversity, whether successful or not, provide practical insights for immediate application in Iraq's reconstruction.

Importantly, these lessons show that now is the time to take on environmental reform. The experiences of Russia and Poland demonstrate that Iraq must promptly establish its environmental policies to avoid an even larger public health crisis and to remove investment-inhibiting legal uncertainties. Iraq should not view this task as a burden but rather as an opportunity. California's experience with Proposition 65 proves that incentive-conscious policies can leverage uncertainty for government ends. Thus, the need to undertake environmental reform gives the Iraqi government an opening to enlist external resources into its recovery efforts.

Iraq's blueprint for environmental recovery will need to address both future operating standards and past pollution. Since early field surveys suggest that Iraq faces a looming health threat from industrial contamination, this Article focused on two alternative remediation strategies. Ultimately, this review showed that the programs developed in the United States and Poland

[350] Funds might be forfeited, inter alia, through failure to start cleanup operations within a specified time, or failure to act at all during the designated term of the underlying agreement. Bell & Kolaja, *supra* note 305, at 121. The most obvious alternative would be to have the money revert to an Iraqi Superfund for use on projects not covered by other escrow account agreements.

complement each other's weaknesses. Thus, by combining a CERCLA-based environmental protection law with environmental escrow agreements, Iraq would gain broad response capabilities, create incentives for self-policing, and provide investors with a viable means to reduce legal uncertainty while simultaneously encouraging timely cleanup operations. Admittedly, this proposal is just one of many possible solutions. Even if Iraq does not pursue this hybrid approach, the country can learn from the difficulties the United States and Poland encountered in developing its component parts. The divergent evolutions of these programs show the importance of managing investor's concerns, minding transactions costs, and creating ample ability to address the "worst" sites first. Collectively, these lessons serve as cornerstones for environmental recovery in Iraq.