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Katherine M. Kelly

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# DECLARING WAR ON THE ENVIRONMENT: THE FAILURE OF INTERNATIONAL ENVIRONMENTAL TREATIES DURING THE PERSIAN GULF WAR

Katherine M. Kelly\*

## INTRODUCTION

The war in the Persian Gulf involving Iraq, the Allied forces and the United States demonstrated that governments relegate environmental concerns to the background when they resort to military actions to solve international disputes. Vast destruction of marine and desert ecosystems, as well as alteration of the atmosphere, occurred in a short time period during the Gulf War.<sup>1</sup> The present international legal framework designed to prevent ecological devastation during military hostilities is ineffective.<sup>2</sup> This Comment examines current international treaties, addresses their weaknesses, and suggests ways in which they can be strengthened to deter or punish potential perpetrators of environmental destruction in the course of warfare.

Part I describes the history of environmental modification warfare, and the extent to which armed forces carried out such ecological destruction during the Persian Gulf War. Part II analyzes current international treaties designed to prevent large-scale environmental devastation during military hostilities. In addition, Part II delineates post-conflict actions taken by states, the United Nations, and other international organizations to restore the environment and to elicit compensation from the perpetrators of ecological destruction. Finally, Part II explores steps that the United Nations should have taken at the end of the Gulf War to enforce treaties against Iraq prohibiting environmental modification warfare. Part III suggests alterations to strengthen existing treaties prohibiting environmental modification warfare that may prevent such monumental ecological ruin in future armed conflicts.

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\* J.D. Candidate, 1993, Washington College of Law, The American University.

1. See e.g., Frank Barnaby, *The Environmental Impact of the Gulf War*, 21 THE ECOLOGIST 166, 168 (1991) [hereinafter Barnaby] (stating that the Gulf War was the most environmentally damaging war in history). Official secrecy and a lack of independent scientific assessment of the damage frustrated measurement of the environmental impact of the war. *Id.* at 166.

2. *Id.* at 172. Conventions to prevent environmental destruction during warfare lack the detail, clarity, and authority to restrict ecological damage. *Id.* Furthermore, because the terms of the treaties are ambiguous, they can be easily manipulated to provide self-interested interpretation. *Id.*

## I. HISTORICAL PERSPECTIVE

## A. THE HISTORY OF ENVIRONMENTAL MODIFICATION

Environmental modification and destruction have been problems throughout the history of warfare.<sup>3</sup> For centuries armies have used environmental warfare, or the military manipulation of battle terrain and the elements, to destroy the enemy.<sup>4</sup> Environmental warfare has become increasingly complex as military technology has advanced.<sup>5</sup>

One of the earliest examples of strategic military destruction of the environment occurred during the Punic Wars of the third century B.C., when armies poisoned wells, ruined crops, and destroyed arable land with salt.<sup>6</sup> Similar environmental modification has occurred during military actions up to the present day. During the Franco-Dutch War of 1672-1678, the Dutch destroyed their own dikes in an effort to flood the land to prevent the French army from conquering the Netherlands.<sup>7</sup> In the Second Sino-Japanese War of 1937-1945, a more devastating use of flooding occurred.<sup>8</sup> The British destroyed major dams in the Ruhr Valley during World War II, and the Germans followed suit by intentionally flooding farmland in the Netherlands with salt water.<sup>9</sup>

The United States used similar flooding tactics by bombing irrigation dams in North Korea during the Korean War,<sup>10</sup> but the most extensive and technologically advanced American use of environmental warfare occurred during the Vietnam War. Dense vegetation thwarted American military efforts in Vietnam, which led to rapid research for methods to control the environment in order to suppress the Viet Cong guer-

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3. See Michael G. Renner, *Military Victory, Ecological Defeat*, 4 *WORLD WATCH* 27, 33 (1991) [hereinafter Renner] (asserting that warfare and environmental protection have always been ultimately antagonistic).

4. *Id.*

5. See *id.* (stating that as advanced technology increases the range, power, and speed of weapons, the environmental impact of warfare also grows). Modern industrial sites become obvious targets during warfare, many of which have the potential to unleash widespread destruction on the environment. *Id.*

6. *Id.* at 33.

7. See Arthur H. Westing, *Environmental Warfare*, 15 *ENVTL. L.* 645, 651 (1985) [hereinafter Westing] (explaining the Dutch creation of the Holland Water Line).

8. *Id.* In 1938, the Chinese destroyed the Huayuankow dike on the Yellow River in order to slow advancing Japanese troops. The resulting flood drowned thousands of Japanese soldiers, destroyed large tracts of farmland, and killed hundreds of thousands of Chinese civilians. *Id.* The river was not contained again until 1947. *Id.*

9. *Id.* at 652. In May 1943, the British demolished the Mohne and Eder dams, severely affecting local industry and the environment. *Id.* In 1944, German troops ruined 200,000 hectares of farmland in the Netherlands with sea water, requiring major rehabilitation efforts to return the land to a productive state. *Id.*

10. *Id.* The Americans considered this program to be one of their most successful air operations. *Id.*

rillas.<sup>11</sup> The American military employed several modern techniques to clear the rainforests and slow the movement of the Viet Cong.<sup>12</sup> American armed forces utilized herbicides and defoliants to clear the jungle and reduce food supplies.<sup>13</sup> The United States Army used large, bladed tractors known as "Rome ploughs" in this deforestation effort.<sup>14</sup> In its most technologically advanced action, the military attempted to use "cloud-seeding" techniques to increase rainfall in certain areas in order to slow guerilla actions and to impede the supply maneuvers of the North Vietnamese Army.<sup>15</sup>

#### B. ENVIRONMENTAL MODIFICATION IN THE GULF WAR

In early 1991, Iraq used less technologically advanced, but more destructive, environmental modification warfare. During the Gulf War, Iraqi forces used Kuwait's petroleum-producing facilities to decimate the environment in an attempt to thwart the efforts of the Allied forces.<sup>16</sup> Bombings and the movement of military hardware through the desert caused vast ecological destruction.<sup>17</sup> Experience has shown that

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11. See Lawrence Juda, *Negotiating a Treaty on Environmental Modification Warfare: The Convention on Environmental Warfare and Its Impact Upon Arms Control Negotiations*, 32 INT'L ORG. 975, 976 (1978) (inferring that the United States considered environmental modification techniques necessary to interfere with the guerilla tactics of the North Vietnamese). Guerrilla warfare in Vietnam was based on the teachings of Mao Tse-Tung, who stressed the need for quick and effective actions to surprise the enemy. *Id.* Such warfare required the guerrillas to use the natural environment for cover and camouflage during attack, and to disguise supply bases. *Id.* By destroying the environment itself, the American military hoped to expose and defeat the Viet Cong. *Id.*

12. *Id.* During the Vietnam War, environmental modification was widely employed for the first time. *Id.* While nearly all types of warfare cause a detrimental impact on the environment, the main purpose of environmental modification warfare is ecological manipulation. *Id.* Destruction of the enemy is sought through the alteration of natural processes. *Id.* Thus, environmental destruction is not merely a consequence of other military objectives, it is the military objective. *Id.*

13. See *id.* (stating that the United States military purposefully manipulated the environment in order to make it less hospitable to guerilla warfare).

14. *Id.* The Vietnam War afforded the United States the opportunity to test many new weapons and strategies. *Id.*

15. *Id.*

16. See *infra* section B(1) (explaining the Iraqi military objectives of the oil spills); see also *infra* notes 146-148 and accompanying text (articulating the theory that the oil well fires were created to defend retreating Iraqi troops and to destroy Kuwait's economic base); see also Jennifer Parmalee, *Kuwaiti Emir Snuffs Out Last Iraqi-Lit Oil Fire*, WASH. POST, Nov. 7, 1991, at A1 [hereinafter Parmalee] (noting that the oil well fires were set by retreating Iraqi soldiers).

17. See Renner, *supra* note 3, at 31 (observing that military vehicles placed major burdens on the desert ecosystem). Tanks and other heavy vehicles disturbed the soil and uprooted plants with root systems close to the surface, thereby adding to erosion. *Id.* See also Barnaby, *supra* note 1, at 171 (explaining that carpet bombing, the movement of military equipment, and the use of bulldozers to create trenches, all severely

it takes extensive time for a desert ecosystem to recover from such disruption.<sup>18</sup> By setting fire to oil wells and refineries, and by releasing millions of barrels of crude oil into the Persian Gulf, the Iraqi military created what has been called "the worst man-made environmental disaster in history."<sup>19</sup>

### 1. Fires

At the end of the Gulf War approximately 600 oil wells were on fire in Kuwait, and another 80, while not burning, were releasing large amounts of oil.<sup>20</sup> In the Greater Burgan region alone, 350 wells were aflame.<sup>21</sup> At that time, fires consumed about three million barrels of oil per day and smoke spread as far as 800 miles south of Kuwait.<sup>22</sup> The dense smoke drastically affected regional weather, and caused significant drops in temperature.<sup>23</sup> The smoke emitted from the fires blocked sunlight and released vast quantities of pollutants into the atmo-

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affected the desert). These operations loosened the surface of the desert, greatly increasing the likelihood of sandstorms. *Id.* See also John H. Cushman, *Environmental Toll Mounting in Kuwait as Oil Fires Burn On*, N.Y. TIMES, June 25, 1991, at C4 [hereinafter Cushman] (stating that, to a large extent, the oil well fires also directly harmed the desert). Oil residue from the fires coated the desert, decreasing soil permeability and affecting seed germination and microbes. *Id.* Additionally, plants died because sunlight was obscured by smoke, and because oil coated their leaves, reducing their ability to absorb carbon dioxide. *Id.*

18. See Renner, *supra* note 3, at 31 (extrapolating from damage estimates of past desert military operations). Deserts in Libya are still recovering from World War II, and the Negev Desert in Israel still shows the scars of warfare in 1967 and 1973. *Id.* The Mojave Desert in California also remains damaged from military operations carried out during the 1940s. *Id.* Judging by these examples, the Kuwaiti desert will face a similarly slow recovery. *Id.*

19. Michael Ross, *Experts Blame Saudis, Kuwaitis As Spill, Oil Fires Go Unchecked*, L.A. TIMES, Apr. 12, 1991, at A10 [hereinafter Ross]. Destroyed Kuwaiti oil wells and refineries released approximately 3,000 barrels of crude oil per day into the Persian Gulf. *Id.*

20. See Cushman, *supra* note 17, at C4 (explaining the environmental impact of the oil well fires); see also Parmalee, *supra* note 16, at A1 (reporting that approximately 650 oil well fires had been set by Iraqi troops).

21. See Cushman, *supra* note 17, at C4 (delineating the extent of the oil well fires). Greater Burgan is Kuwait's largest oil production complex. *Id.* It includes the oil fields of Ahmadi, Magwa, and Burgan. *Id.*

22. Bob Davis, *U.S. Scientists Play Down Effect of Fires in Kuwait, Angering Environmentalists*, WALL ST. J., June 25, 1991, at A3 [hereinafter Davis].

23. See *id.* (addressing climate changes in the Persian Gulf region). Bahrain, 250 miles south of Kuwait, reported its coldest May in 35 years with temperatures 7.5 degrees Fahrenheit below the normal average. *Id.* Scientists predicted that once the fires were extinguished, the climate would again change. *Id.* Temperatures were expected to rise due to the absorption of heat by the oil covering the desert. *Id.*

sphere.<sup>24</sup> In addition to environmental damage, smoke from these fires threatened human health.<sup>25</sup>

Scientific opinion has differed on the global effects of the smoke.<sup>26</sup> While "black snow," the fallout of atmospheric sulfur dioxide, was reported over areas of Iran,<sup>27</sup> it is not entirely clear if the smoke caused a significant impact outside the Persian Gulf region. Despite the conflicting opinions of scientific authorities, air samples as far away as Hawaii contained unusually high levels of soot presumed to have come from

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24. See Abdullah Toukan, *The Gulf War and the Environment: The Need for a Treaty Prohibiting Ecological Destruction as a Weapon of War*, 15 FLETCHER F. OF WORLD AFF. 95, 98 (1991) [hereinafter Toukan] (elaborating on the extent of the air pollution problem). Toukan's article estimated that at the end of the Gulf War, approximately 400,000 tons of crude oil per day were burning, creating roughly 10,200 tons of sulphur dioxide, 2,550 tons of nitrogen dioxide, 42,840 tons of carbon monoxide, and 285,600 tons of carbon dioxide on a daily basis. *Id.*

When sulphur and nitrogen oxide are released into the atmosphere, they react with water to form sulfuric acid and nitric acid. *Id.* This mixture falls back to earth as acid rain, causing soil contamination, groundwater pollution, and vegetation destruction. *Id.*

25. See John Travis, *A Legacy of War*, 140 SCI. NEWS 24, 25-26 (1991) [hereinafter Travis] (indicating the way in which smoke from oil well fires may damage human health). Small soot particles can easily become trapped in the lungs causing or exacerbating respiratory problems. *Id.* at 25. Measurements taken by the United States Environmental Protection Agency showed high soot levels in the Kuwaiti air, consisting mainly of small particles. *Id.* See also Matthew L. Wald, *Experts Worried by Kuwait Fires*, N.Y. TIMES, Aug. 14, 1991, at A7 [hereinafter Wald] (examining the short-term and long-term effects of the Kuwaiti population's exposure to smoke from the oil well fires). The article states that 50,000 persons in Kuwait will have their life expectancy shortened because of the pollution. *Id.*

26. See Matthew L. Wald, *No Global Threat Seen From Oil Fires*, N.Y. TIMES, June 25, 1991, at C5 [hereinafter *No Global Threat*] (discussing allegations made by the environmental group Friends of the Earth). Scientists at the National Science Foundation and members of the Environmental Protection Agency (EPA), including Administrator William Reilly, downplayed the global effects of the smoke, while environmental groups claimed that National Science Foundation estimates were too conservative. *Id.* Friends of the Earth claimed that the federal government intentionally understated Kuwait's environmental problems so as not to detract from the American military success in the Gulf War. *Id.* See also Davis, *supra* note 22, at A3 (noting similar allegations). Brent Blackwelder, Vice President of Friends of the Earth, disagreeing with pollution reports compiled by the United States Environmental Protection Agency, stated that "the situation is out of control." *Id.*

27. See Travis, *supra* note 25, at 26 (acknowledging the predictions of the British Meteorological Office of widespread pollution and noting black snow reports). Acid rain and smog was likely to be found up to 2,000 kilometers downwind of the Kuwaiti fires. *Id.* See also Frederick Warner, *The Environmental Consequences of the Gulf War*, 33 ENV'T 7, 9 (1991) [hereinafter Warner] (noting unusual weather conditions in the Persian Gulf region).

the Kuwaiti fires.<sup>28</sup> Significantly, it took a monumental eight month effort to quench the oil well fires in Kuwait.<sup>29</sup>

## 2. Oil Spills

In addition to the climatic and atmospheric modifications caused by burning oil facilities, several extensive oil spills caused severe damage to the Persian Gulf environment.<sup>30</sup> The amount of oil released into the Gulf was estimated at two to three million barrels.<sup>31</sup>

It is assumed that Iraq created these spills to interfere with the Allies' naval operations, such as amphibious landings on the shores of Kuwait.<sup>32</sup> By setting fire to the oil slicks, the Iraqis would have driven

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28. See *Soot Over Hawaii Presumed to Come from Kuwait*, 14 Int'l Envtl. Rep. (BNA) No. 9, at 268 (May 8, 1991) (speculating that the effects of Kuwaiti oil well fires may have reached the Pacific Ocean). Air samples taken in Hawaii from February to April 1991 contained twenty times the normal concentration of soot, and the high levels are believed to be the result of the fires in Kuwait. *Id.* See also *U.N. Virtually Out of Money to Pay to Combat Pollution from Gulf Oil Fires*, 10 Int'l Envtl. Rep. (BNA) No. 14, at 401 (July 17, 1991) [hereinafter Int'l Envtl. Rep., July 17, 1991] (indicating the extent of environmental effects from the Gulf War). The World Health Organization and the World Meteorological Organization reported that the pollution's effects reached Chad and the South Pacific. *Id.*

29. See Parmalee, *supra* note 16, at A1 (reporting the success of fire-fighting operations). The last oil well fires were extinguished after an eight-month effort, employing approximately 10,000 workers from 16 companies. *Id.* But see William Booth, *Fires in Kuwait Not a Threat to Global Climate*, WASH. POST, June 25, 1991, at A3 [hereinafter Booth] (speculating on the length of time it would take to put out the fires in Kuwait). Oil well firefighter Red Adair testified before Congress in June 1991 that it could take up to five years to quench the fires if efforts remained at their current level. *Id.*

30. *The Spoils of War*, 28 U.N. CHRON., June 1991, at 17 [hereinafter *Spoils of War*]. The first spill, on January 22, 1991, emanated from two Iraqi oil tankers in the northern Persian Gulf. *Id.* See also Toukan, *supra* note 24, at 96 (listing the sources and chronology of the oil spills). A subsequent spill occurred in an oil terminal near Khafji, followed by two others at Kuwait's Sea Island terminal and Iraq's terminal at Mina Al Bakr. *Id.*

31. See Toukan, *supra* note 24, at 96 (describing the sources and extent of the oil spills). But see *Spoils of War*, *supra* note 30, at 17 (voicing Saudi Arabia's charge that Iraq actually spilled over 10 million barrels of oil into the Persian Gulf). See also Renner, *supra* note 3, at 30 (describing the size of the oil spills in the Persian Gulf). The spills in the Persian Gulf were roughly equivalent in size to the Ixtoc oil well catastrophe in 1979 in the Gulf of Mexico, the largest oil spill in history. *Id.* The Persian Gulf spill was ten times larger than the Exxon Valdez spill. *Id.*

32. See Toukan, *supra* note 24, at 97 (speculating on Iraq's motives in creating the oil spills). In the opinion of Abdullah Toukan, the Science Advisor to King Hussein of Jordan, and Secretary General of the Jordanian Higher Council for Science and Technology, Iraq released large amounts of oil into the Persian Gulf to thwart Allied naval maneuvers and to interfere with Saudi Arabian water supplies. *Id.* Saudi Arabia blamed Iraq for all oil releases into the Persian Gulf. *Id.* But see *Spoils of War*, *supra* note 30 (asserting that Iraq blamed the United States for the first oil spill by alleging that the American military bombed the Iraqi tankers).

ships away from the coast.<sup>33</sup> Moreover, it is believed that these spills were created to clog desalination plants in Saudi Arabia in order to limit the supply of fresh water to troops and civilians, and to ruin the water source for power plants and industrial centers.<sup>34</sup> The Iraqis achieved neither goal.<sup>35</sup> Nevertheless, these tactics resulted in the widespread destruction of the marine habitat.<sup>36</sup> Estimates show that the renewal process may take anywhere from one to four years.<sup>37</sup>

## II. LEGAL ANALYSIS

### A. INTERNATIONAL TREATIES PERTAINING TO ECOLOGICAL DESTRUCTION DURING MILITARY HOSTILITIES

Despite the massive environmental destruction resulting from the Gulf War, rules of international law exist to protect the environment during military hostilities.<sup>38</sup> The need for such rules became apparent as a result of American military activities during the Vietnam War.<sup>39</sup>

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33. See Toukan, *supra* note 24, at 97 (expanding on the reasons for creating the oil slicks). Lighting the oil in the Persian Gulf would have created a massive wall of fire, forcing the retreat of Allied naval forces to a safer location farther from shore. *Id.*

34. See *id.* (analyzing Iraqi goals of clogging desalination plants with oil). Kuwait, Saudi Arabia, Bahrain, Oman, Qatar, and the United Arab Emirates all rely on desalinated sea water for drinking water, power plants, and industrial centers. *Id.* Successful interference with desalination plants could have caused suffering throughout the Persian Gulf region. *Id.*

35. See *id.* (speculating that in order to obstruct Allied naval operations, an oil spill of over 15 million barrels would have been required). The estimated 3 million barrels of oil spilled realized no military objective, but severely damaged the marine ecosystem. *Id.*

36. See Warner, *supra* note 27, at 26 (detailing the extent of losses in marine plant and animal species). The oil slicks killed nearly 20,000 wading birds and affected populations of other marine animals, including sea turtles. *Id.* See also *Spoils of War*, *supra* note 30, at 17 (stating that tortoises, sea turtles, marine birds, coral reefs, beaches, lagoons, and other sections of the ecosystem were threatened by the oil spills). The United Nations Environment Programme (UNEP) sent a scientific team to the region in February 1991. *Id.* Their report stated that the spills had caused "extensive damage" to mangroves, fish breeding grounds and the habitats of endangered species. *Id.*

37. See Warner, *supra* note 27, at 26 (noting that the natural circulation and geography of the Persian Gulf may aid its rapid renewal, but that the impact of the spill may still reach the Indian Ocean). But see Barnaby, *supra* note 1, at 170 (describing the geography of the Persian Gulf). The Persian Gulf is small, shallow, and nearly land-locked. *Id.* It is 1,000 kilometers long and 300 kilometers wide, with an average depth of 35 meters. *Id.* Its only outlet is the 62-kilometer-wide Straits of Hormuz. *Id.* Consequently, it may take a long time for the oil to disperse. *Id.*

38. See *infra* notes 41-42 and accompanying text (citing treaties designed to safeguard the environment during warfare).

39. See Jozef Goldblat, *The ENMOD Convention Review Conference*, 7 DISARMAMENT 93, 93 (1984) [hereinafter Goldblat] (stating that interest in new environmental methods of warfare arose partially from rainmaking and mass destruction of vegetation in Vietnam).



In the 1970s, concern over the potential use of the environment for military purposes, and fear that increasing military technology would decimate the environment during modern military actions, spurred the United Nations to develop two multilateral treaties which specifically address these problems.<sup>40</sup> The two treaties are Protocol (I) Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of International Armed Conflicts (Protocol I)<sup>41</sup> and the Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques of 1977 (ENMOD Convention).<sup>42</sup>

Unfortunately, Iraq is not a party to Protocol I or the ENMOD Convention.<sup>43</sup> Iraq never signed or acceded to Protocol I, and thus it has no legal duty to follow its provisions.<sup>44</sup> Similarly, because Iraq is only a signatory to the ENMOD Convention, it cannot be bound by the convention.<sup>45</sup> As neither Protocol I nor the ENMOD Convention is a part of customary international law, Iraq can in no way be bound by the

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40. See *id.* at 94 (establishing the sequence of events which led the United Nations to develop laws to protect the environment during warfare). A good example of the development of these laws is the ENMOD Convention. *Id.* On July 11, 1973, the United States Senate acknowledged the destructive potential of environmental modification activities and adopted a resolution calling for the United States to enter agreements with other nations to forbid such actions during warfare. *Id.* at 93-94. On July 3, 1974, the United States and the Soviet Union jointly called for an end to the threat of environmental modification for military purposes. *Id.* at 94. On August 21, 1975, after meetings between the two nations, the Soviet Union and the United States submitted the same draft convention to the Conference of the Committee on Disarmament (CCD) of the United Nations. *Id.* The CCD formed these proposals into the ENMOD Convention. *Id.*

41. Protocol (I) Additional to the Geneva Convention of 12 August 1949, 6 U.S.T. 3516, T.I.A.S. No. 3364, signed Dec. 12, 1977 [hereinafter Protocol I].

42. Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques, G.A. Res. 31/72, 31 U.N. GAOR Supp. (No. 39) 37, U.N. Doc. A/31/39 (1977) [hereinafter ENMOD Convention].

43. See *Saddam: Eco-Criminal?*, ENVTL. F., Mar. - Apr. 1991, 10, 10-11 [hereinafter *Saddam: Eco-Criminal?*] (noting that Iraq is not a party to Protocol I or the ENMOD Convention).

44. See LOUIS HENKIN, ET AL., INTERNATIONAL LAW 408-12 (1987) [hereinafter L. HENKIN] (explaining differences between signing and ratifying a treaty). There is an important difference between signing and ratifying a convention. *Id.* A nation may show an intent to be bound by a treaty by signing it. *Id.* However, ratification by a certain number of states, which requires formal approval by a national legislative body, may be necessary for the treaty to come into force. *Id.*

45. See U.N. DEP'T FOR DISARMAMENT AFFAIRS, THE UNITED NATIONS DISARMAMENT YEARBOOK 1984, at 457 n.10, U.N. Sales No. E.85.IX.4 (1985) [hereinafter DISARMAMENT YEARBOOK 1984] (listing the parties and signatories to the ENMOD Convention). Several Middle Eastern nations are involved with the treaty, including Democratic Yemen and Egypt as parties, and Iran, Turkey, and Iraq as signatories. *Id.* See also L. HENKIN, *supra* note 44, at 408-12 (explaining the difference between signature and ratification of a treaty).

conventions without being a party.<sup>46</sup> Nevertheless, taking Iraqi actions as an example, a party to Protocol I or the ENMOD Convention will likely be bound if it acts similarly in future military hostilities.

### 1. Protocol I

The 1949 Geneva Conventions<sup>47</sup> do not directly address the problem of environmental warfare. In 1977, in light of the Vietnam War, the United Nations revised the 1949 Geneva Conventions by adding Protocol I which includes specific provisions aimed at limiting ecological destruction during armed conflicts.<sup>48</sup> Article 35 of Protocol I forbids the use of weapons and methods of warfare that may cause undue injury to humans or the environment.<sup>49</sup> Article 54, among other things, prohibits

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46. See *Saddam: Eco-Criminal?*, *supra* note 43, at 11 (stating the opinion of the United States Department of State). According to the Office of Legal Adviser in State, Protocol I is not included in customary international law. *Id.* See also RESTATEMENT (THIRD) OF FOREIGN RELATIONS LAW § 102 (1986) [hereinafter RESTATEMENT] (maintaining that customary law is a source of international law). Section 102 states that:

customary international law results from a general and consistent practice of states followed by them from a sense of legal obligation. [I]nternational agreements create law for the states parties thereto and may lead to the creation of customary international law when such agreements are intended for adherence by states generally and are in fact widely accepted.

*Id.* In creating customary law, the length of practice may be rather short, and can be considered generally accepted if it is widely followed among nations; universal acceptance is not necessary. *Id.* at comment b. See also GOLDBLAT, *infra* note 59, at 197 (delineating the text and basic information about Protocol I). Signed in 1977, Protocol I has 33 parties. *Id.* See also DISARMAMENT YEARBOOK 1984, *supra* note 45, at 457 (presenting the text of the Final Declaration of the 1984 ENMOD Convention Review Conference). Article IX notes that 45 nations have become parties to the ENMOD Convention, and that 19 other nations have become signatories. *Id.* Article IX adds, however, that the Conference is concerned that the treaty has not yet gained universal acceptance. *Id.*

47. Geneva Conventions of 1949, Aug. 12, 1949, 6 U.S.T. 3516, T.I.A.S. No. 3365, 75 U.N.T.S. 287.

48. See Protocol I, *supra* note 41, art. 49 (defining the scope of application of the treaty). Protocol I applies to all attacks, whether by sea, air, or land, which may affect civilian populations or civilian objects. *Id.* "Attacks," defined as offensive or defensive acts of violence against the adversary, include those carried out in any territory. *Id.* Such territory may include the national territory of a party to the conflict which is under the control of an adverse party. *Id.* Article 49 of the Protocol describes a situation similar to that in Kuwait. For a brief history of the Geneva Conventions see JOZEF GOLDBLAT, AGREEMENTS FOR ARMS CONTROL: A CRITICAL SURVEY 84-89 (1982).

49. See Protocol I, *supra* note 41, art. 35 (limiting the right of parties to choose their weapons). Parties in armed conflicts may only use weapons which do not cause "superfluous injury or unnecessary suffering." *Id.* Article 35 also states that parties are forbidden to use "methods or means of warfare which are intended or may be

the attack and destruction of drinking water installations.<sup>50</sup> Article 55 imposes broader prohibitions against environmental damage.<sup>51</sup> The language of Article 56 forbids attacks on certain peacetime facilities having dangerous potential.<sup>52</sup>

On its face, Protocol I appears to be directly applicable to environmental destruction similar to that resulting from the Gulf War. The protocol's language restricts its application to the most serious circumstances, and the damage thresholds created by the terms "widespread," "long-lasting," and "severe" are very high.<sup>53</sup> It appears, however, that ecological damage like that inflicted on Kuwait and the Persian Gulf could conceivably meet such threshold requirements.<sup>54</sup>

expected, to cause widespread, long-term and severe damage to the natural environment." *Id.*

50. See *id.* art. 54 (prohibiting, *inter alia*, the attack or destruction of objects critical to the survival of the civilian population). Article 54 states, in part, that:

[i]t is prohibited to attack, destroy, remove or render useless objects indispensable to the survival of the civilian population, such as foodstuffs, agricultural areas for the production of foodstuffs, crops, livestock, drinking water installations and supplies and irrigation works, for the specific purpose of denying them for their sustenance value to the civilian population or to the adverse Party, whatever the motive . . . .

*Id.* See also Barnaby, *supra* note 1, at 169 (noting damage to crops in the Gulf War). Iraqi actions in Kuwait ruined a number of these protected items, especially agricultural areas. *Id.* Agriculture was hampered by the oil spills, and by the oil well fires which caused temperature drops and acid rain. *Id.*

51. See Protocol I, *supra* note 41, art. 55 (reiterating the need expressed in Article 35 to protect the environment during warfare). Article 55 states, in part, that "[c]are shall be taken in warfare to protect the natural environment against widespread, long-term and severe damage." *Id.* This protection includes a prohibition on techniques of warfare intended or expected to harm the natural environment in such a way that the health or survival of the population is threatened. *Id.*

52. See *id.* art. 56 (characterizing the types of facilities that are prohibited as objects of military attack). Article 56 states, in part, that "[w]orks or installations containing dangerous forces, namely dams, dykes and nuclear electrical generating stations, shall not be made the object of attack, even where these objects are military objectives, if such attack may cause the release of dangerous forces and consequent severe losses among the civilian population." *Id.*

53. See U.N. DEP'T FOR DISARMAMENT AFFAIRS, THE UNITED NATIONS AND DISARMAMENT: A SHORT HISTORY 88-90, 89 (1988) [hereinafter U.N. AND DISARMAMENT: A SHORT HISTORY] (detailing the thresholds for the terms widespread, long-lasting, and severe). Under the Conference of the Committee on Disarmament's definition of these terms, "widespread" means that the destruction must include at least "several hundred square kilometres;" "long-lasting" means that it must last for "a period of months, or approximately a season;" and "severe" is interpreted such that it "should involve serious or significant disruption or harm to human life, natural and economic resources or other national assets." *Id.*

54. See Renner, *supra* note 3, at 29 (delineating the geographical scope of smoke dispersion from the oil well fires). The thickest smoke was found over Kuwait, eastern Iraq, and southwest Iran. *Id.* High smog levels, caused by the oil fires, were measured up to 1,000 miles away in Bulgaria, Turkey, Romania, and the Soviet Union. *Id.*

Because Kuwait's economy is based primarily on oil exports, it is undeniable that the oil well destruction disrupted the nation's economic resources.<sup>55</sup> Thus, had Iraq been a party to the convention, it would have violated Articles 35 and 55 of Protocol I.<sup>56</sup> Also, Iraq would have violated Article 35 because pollutants released from oil well fires jeopardized public health, especially the health of the young and those individuals with respiratory problems.<sup>57</sup> In addition, Iraq would have violated Article 54 by attempting to disrupt desalination plants with oil slicks. That action was an effort to interfere with civilian water supplies which, if successful, would have caused severe hardship to the population.<sup>58</sup>

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*See also* Barnaby, *supra* note 1, at 170 (articulating the damage caused by the oil spills). The Persian Gulf, already one of the world's most polluted bodies of water, is further threatened by the spills. *Id.* Several species of birds and fish are in jeopardy, and coastal industries, such as fisheries, are threatened. *Id.* The worst long-term problem from the spills is the possible destruction of oxygen-supplying plants in the Gulf. *Id.*

The effects of the oil spills are likely to be felt for a long time because the Persian Gulf's only outflow is the Straits of Hormuz, only 62 kilometers wide. *Id.* *See also* Davis, *supra* note 22, at A3 (elaborating on temperature changes in Bahrain); *see also* Barnaby, *supra* note 1, at 169 (recognizing similar climate changes in Kuwait). Temperatures in Kuwait were 10 to 15 degrees Celsius lower than average, due to the absorption of the sunlight by smoke clouds. *Id.* *See also* Parmalee, *supra* note 16, at A1 (reporting that it took eight months to quench the oil well fires).

55. *See* ABDUL-REVA ASSIRI, KUWAIT'S FOREIGN POLICY, 143-46 (1990) (detailing basic facts about Kuwait's population, lifestyle, geography, and economy). Based on 1987 statistics, Kuwait produced approximately 1,215,000 million barrels of oil per day and required only 88.4 thousand barrels per day for domestic consumption. *Id.* at 144. Kuwait, with 94.5 billion barrels of proven crude oil reserves, holds approximately 10.3 percent of the world's oil reserves. *Id.* Its total annual exports amounted to \$7.4 billion, with crude oil accounting for 81 percent of that total. *Id.* at 145.

56. *See supra* note 49 (citing the prohibitions under Article 35 of Protocol I); *see also* Cushman, *supra* note 17, at C4 (noting the extent of damage to Kuwaiti oil facilities). It is clear that the extensive damage to Kuwaiti oil production centers was "superfluous injury" and that it caused "widespread, long-lasting, and severe" damage to the environment. *See also supra* note 51 (citing prohibitions under Article 55 of Protocol I).

57. *See* Barnaby, *supra* note 1, at 169 (analyzing the health impact of the oil well fires). Kuwaiti citizens with asthma, bronchitis, and other respiratory ailments suffered the greatest harm from the pollution. *Id.* Further, a number of components of the smoke are cancer-causing agents. *Id.* at 164-70. Kuwaiti doctors recommended that persons with respiratory difficulties who fled Kuwait should not return. *Id.* at 170. *See also supra* note 49 (declaring the prohibitions of Article 35 of Protocol I). Such damage to public health may be seen as "superfluous injury" and "unnecessary suffering." *Id.*

58. *See supra* note 50 (describing prohibitions under Article 54 of Protocol I); *see also supra* note 34 (analyzing military goals of the oil slick and its ramifications had it been successful). Because so many nations in the Persian Gulf region rely on desalination plants for their civilian water supply, Article 54 was violated by the attempt to interfere with such operations. *Id.*

## 2. *The ENMOD Convention*

Just before the adoption of Protocol I, the United Nations adopted the ENMOD Convention which similarly prohibits environmental modification warfare.<sup>59</sup> Like Protocol I, the ENMOD Convention emerged from the anxiety over environmental destruction during wartime at the end of the Vietnam War.<sup>60</sup> The ENMOD Convention also responded to general concern about international environmental protection expressed in the Declaration of the United Nations Conference on the Human Environment in 1972.<sup>61</sup> Cooperation between the superpowers hastened the development of the ENMOD Convention, which the General Assembly passed in 1976.<sup>62</sup>

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59. See JOZEF GOLDBLAT, *ARMS CONTROL AGREEMENTS: A HANDBOOK* 197-211 (1983) [hereinafter GOLDBLAT] (restating the text and relevant information about Protocol (I) Additional to the Geneva Conventions of 12 August 1949). Protocol I was signed on December 12, 1977 at Bern, Switzerland, and entered into force on December 7, 1978. *Id.* See also Goldblat, *supra* note 39, at 95 (detailing the negotiating history of the ENMOD Convention). The ENMOD Convention was signed on May 18, 1977, and came into force on October 5, 1978. *Id.*

60. See Goldblat, *supra* note 39, at 93 (indicating the influence of the Vietnam War on the creation of the ENMOD Convention). Actions against the environment during the Vietnam War sparked an interest in environmental modification techniques, and consequently, a recognition of the need to control such manipulations through international agreements. *Id.*

61. See *Declaration of the United Nations Conference on the Human Environment*, U.N. Doc. A/CONF. 48/14 (1972) [hereinafter *Declaration of Human Environment Conference*] (articulating the principles agreed upon at the United Nations Conference on the Human Environment held at Stockholm, Sweden, June 5-16, 1972). This document proclaims, *inter alia*, that the earth's natural resources, including land, air, water, flora, and fauna must be protected. *Id.* at Principle 2. Nations must take action to prevent marine pollution that may harm human health or marine life, or interfere with acceptable uses of the sea. *Id.* at Principle 7. Further, in relation to war, nations must ensure that their actions do not harm the environment of other states or regions beyond their national jurisdiction. *Id.* at Principle 21. See generally U.N. DEP'T FOR DISARMAMENT AFFAIRS, *THE UNITED NATIONS AND DISARMAMENT: 1945-1985* at 125, U.N. Sales No. E.85.IX.6 (1985) [hereinafter *DISARMAMENT: 1945-1985*] (elaborating on the history of the United Nations' involvement in regulating environmental modification techniques). The goal of many nations was to create an international convention prohibiting artificial manipulation of the environment for military purposes before the technology for such actions had been fully developed. *Id.* See also, *DISARMAMENT YEARBOOK 1984*, *supra* note 45, at 453-54 (noting that in 1975, Sweden suggested that the Conference of the Committee on Disarmament (CCD) examine ways to prevent the military use of meteorological change techniques).

62. See *DISARMAMENT YEARBOOK 1984*, *supra* note 45, at 454 (detailing the creation of the ENMOD Convention); see also *supra* note 40 (establishing the sequence of events that led to the creation of the ENMOD Convention). Cooperation between the United States and the Soviet Union was central to the smooth development of the ENMOD Convention. *DISARMAMENT YEARBOOK 1984*, *supra* note 45, at 454. The General Assembly adopted the convention under Resolution 31/72. *Id.* at 455. It was opened for signature and ratification on May 18, 1977 at which time 34 nations became signatories. *Id.* The ENMOD Convention entered into force on October 5, 1978

The ENMOD Convention is unique because it is the first multilateral disarmament agreement for which the Secretary-General of the United Nations acts as the depositary.<sup>63</sup> This gives the Secretary-General a definitive role in verifying adherence to the terms of the convention.<sup>64</sup>

The terms of the ENMOD Convention are broader than the provisions of Protocol I.<sup>65</sup> Article I of the ENMOD Convention prohibits parties from using hostile techniques which may cause "widespread, long-lasting or severe effects" on the environment.<sup>66</sup> Article II defines "environmental modification techniques."<sup>67</sup>

The damage thresholds for "widespread, long-lasting or severe" are the same as those under Protocol I.<sup>68</sup> Thus, environmental damage like that in the Persian Gulf region would fall under this convention more readily than under Protocol I, because the damage must satisfy only one of the three requirements under Article I of the ENMOD Convention.<sup>69</sup> Although no party state has ever brought a violation of this treaty to the attention of the United Nations,<sup>70</sup> the accepted interpretation of ENMOD forbids only the use of the environment as a weapon,

after ratification by 20 nations. *Id.* As of December 31, 1984, 47 nations, including Kuwait, Egypt, and the United States, had ratified it. *Id.* at 457, n.10.

63. *Id.* at 455.

64. *Id.* See also ENMOD Convention, *supra* note 42, art. V. Article V of the ENMOD Convention allows the Secretary-General, at the request of a party, to convene a Consultative Committee of Experts to investigate claims. *Id.* This committee must report its findings to the Secretary-General, who in turn distributes the report to all parties. *Id.*

65. GOLDBLAT, *supra* note 59, at 199.

66. See ENMOD Convention, *supra* note 42, art. I (delineating the terms of the agreement). Article I states that parties may not "engage in military or any other hostile use of environmental modification techniques having widespread, long-lasting or severe effects as the means of destruction, damage or injury to any other state party." *Id.*

67. *Id.* art. II. The definition of "environmental modification techniques" under Article II includes any method of altering the environment "through the deliberate manipulation of natural processes - the dynamics, composition or structure of the earth, including its biota, lithosphere, hydrosphere and atmosphere, or of outer space." *Id.*

68. See U.N. AND DISARMAMENT: A SHORT HISTORY, *supra* note 53, at 89 (delineating the thresholds for widespread, long-lasting, and severe).

69. ENMOD Convention, *supra* note 42, art. I.

70. See DISARMAMENT YEARBOOK 1984, *supra* note 45, at 463-65 (reiterating The Final Declaration of the Review Conference of the Parties to the Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques). Article V of this document notes that no party has found it necessary to enforce the provisions of Article V dealing with complaints and verification. *Id.* at 464. Article IX of the Final Declaration also states that six years that have passed since the Convention entered into force has shown its strength. *Id.* at 465.

rather than simply prohibiting the destruction of the environment.<sup>71</sup> Due to this narrow interpretation, the ENMOD Convention may not apply to situations like the Persian Gulf War.<sup>72</sup>

Further, even among the parties to the ENMOD Convention, it is unclear what type of reprimand or sanctions would be imposed for a breach of the convention. The convention itself only loosely describes the procedure for lodging a complaint and merely states that an investigation may follow.<sup>73</sup> As the parties have never enforced the ENMOD Convention, there is no precedent on dispute resolution or the implementation of sanctions against violators.<sup>74</sup>

Despite the apparent weaknesses of the ENMOD Convention, parties to the agreement appear generally satisfied with its terms and effectiveness.<sup>75</sup> Article VIII of the ENMOD Convention permits the parties to hold review conferences.<sup>76</sup> Accordingly, the parties held a

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71. See *Saddam: Eco-Criminal?*, *supra* note 43, at 11 (discussing the scope of application of the ENMOD Convention). The article notes that the ENMOD Convention is meant to forbid the use of the environment as a weapon, such as creating floods to kill troops, rather than to forbid harming the environment itself. *Id.* Therefore, although the oil well fires and intentional oil spills during the Gulf War indisputably had effects on the climate and ecosystems, the treaty does not apply. *Id.*

72. *Id.*

73. See ENMOD Convention, *supra* note 42, art. V (establishing steps to be taken in the event that a party breaches the convention). Article V provides that any party may lodge a complaint against another party with the Security Council. *Id.* The Council may then call for an investigation of the charges. *Id.* The treaty does not specify, however, what may happen if the accusations prove to be true. *Id.* Article V, paragraph 2 simply states that the Depositary, within one month of receiving a complaint, must convene a Consultative Committee of Experts. *Id.* Any state party may select an expert for the Committee. *Id.* The Committee must report its findings to the Depositary, who will then distribute the report to all the parties. *Id.* The annex to the ENMOD Convention describes the guidelines for the Consultative Committee of Experts, but does not mention how information from their report is to be used to enforce the convention. *Id.* at annex.

74. See DISARMAMENT YEARBOOK 1984, *supra* note 45, at 463-64 (restating the Final Declaration of the 1984 ENMOD Convention Review Conference). Article I of the Final Declaration notes that all parties have carried out their obligations under the ENMOD Convention, and articulates the parties' conviction that the convention will continue to be successful in preventing hostile use of environmental modification techniques. *Id.* See also *supra* note 70 and accompanying text (noting that no party has ever called for enforcement of the treaty).

75. See DISARMAMENT YEARBOOK 1984, *supra* note 45, at 463-64 (noting the Review Conference members' contentment with the ENMOD Convention). In addition to the parties' satisfaction with success of the ENMOD Convention in preventing hostile environmental modification, they are similarly pleased with the terms of the agreement. *Id.* at 464. Article II of the Final Declaration of the Review Conference specifically articulates the parties' satisfaction with the definition of "environmental modification techniques" and its relation to the understandings of Articles I and II of the ENMOD Convention. *Id.*

76. See ENMOD Convention, *supra* note 42, art. VIII (specifying the timing and method of holding review conferences). According to Article VIII, review conferences

conference to evaluate the convention in September 1984, during which they reviewed the document and prepared a final declaration.<sup>77</sup> Despite a number of complaints by some parties as to certain details of the convention,<sup>78</sup> the final declaration stated that the ENMOD Convention remains an effective means to prevent the use of environmental modification techniques. Consequently, the parties reaffirmed their support for the convention and its definitions.<sup>79</sup>

## B. WHO IS RESPONSIBLE FOR CLEANING UP?

The weaknesses in Protocol I and the ENMOD Convention left a large question looming in the aftermath of the Persian Gulf War: who is responsible for cleaning up the environmental damage?

Despite its inability to hold Iraq to any existing treaty governing environmental damage during military actions, the United States, through congressional action,<sup>80</sup> and the international community,

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are to be held "with a view to ensuring that its purposes and provisions are being realized, and shall in particular examine the effectiveness of the provisions of paragraph 1 of article I in eliminating the dangers of military or any other hostile use of environmental modification techniques." *Id.* See also DISARMAMENT YEARBOOK 1984, *supra* note 45, at 465 (reiterating the Final Declaration of the 1984 ENMOD Convention Review Conference). Article VIII of the Final Declaration notes the importance of review conferences and states that another review conference should be held in Geneva no earlier than 1989. *Id.*

77. See DISARMAMENT YEARBOOK 1984, *supra* note 45, at 457-58 (detailing the conference agenda and participants). A diverse group of parties, signatories and organizations participated in the conference, which consisted of debate and a review of the convention's details. *Id.* Thirty-five parties, including Kuwait, the United States, and the Soviet Union, attended the conference. *Id.* Four signatory nations, Brazil, Ethiopia, Iran, and Turkey, along with four observer nations, Algeria, Peru, Switzerland, and Argentina, also participated. *Id.* Representatives from the World Meteorological Organization (WMO) and the United Nations Environmental Programme (UNEP) also attended the review meetings. *Id.*

78. See *id.* at 461-62 (discussing complaints by Sweden, Australia, Japan, Egypt, and New Zealand that the terms of the convention were inadequate to ensure protection of the environment). Sweden agreed that the convention was valuable, but stated that the point at which damage is considered to be a breach of the convention was too high, and thus would allow perpetrators to carry on extensive environmental warfare without violating the treaty. *Id.* Australia maintained that the scope of the convention was too narrow. *Id.* Japan believed that some terms were ambiguous and noted the lack of a clear definition of "environmental modification techniques" when the convention was originally negotiated. *Id.* Egypt noted that the methods of handling complaints and verification were unsatisfactory. *Id.* at 462. New Zealand also complained about inadequacies in the scope, verification, and compliance provisions. *Id.*

79. See *id.* at 463-65 (restating the Final Declaration of the Review Conference).

80. See H.R. Res. 108, 102d Cong., 2d Sess. (1991), (recommending the use of a portion of Iraq's oil profits to pay for the clean up efforts in the Persian Gulf region).



through the United Nations,<sup>81</sup> called for Iraq to make monetary reparations which are intended to be compensatory in nature.<sup>82</sup> Iraq is to pay for the services of the international teams who cleaned up the oil spills and extinguished the oil well fires.<sup>83</sup>

### 1. Clean Up Operations

Various organizations participated in the cleanup efforts in the Persian Gulf region.<sup>84</sup> In early March 1991, the United Nations sent special missions to Kuwait to investigate war damage, including health and environmental problems stemming from the Iraqi invasion.<sup>85</sup> Later, the United Nations Environmental Programme (UNEP) created a task force to conduct a detailed 90-day study of the environmental destruction.<sup>86</sup>

Several American groups also studied the impact of the war on the environment.<sup>87</sup> The National Science Foundation sent a team of investigators to the region, as did the environmental public interest group

81. See S. Res. 687, U.N. Doc. S/RES/687, 7, 7 (1991) [hereinafter Resolution 687] (declaring Iraq's liability for environmental damage and other injuries stemming from the invasion and occupation of Kuwait).

82. See S. Res. 674, U.N. Doc. S/RES/674, 3, 3 (1990) [hereinafter Resolution 674] (invoking injured states to collect relevant information for claims against Iraq). Paragraph 9 states that this data is to be used for "restitution or financial compensation by Iraq" within the scope of international law. *Id.* See also Resolution 687, *supra* note 81, at 7 (reaffirming that Iraq must pay for environmental damages and the loss of natural resources caused by its role in the Persian Gulf War). Paragraph 18 calls for the creation of a fund to compensate victims who were harmed by Iraq. *Id.*

83. See *infra* notes 118-25 and accompanying text (describing the United Nations compensation plan); see also H.R. Con. Res. 108, 102d Cong., 2d Sess. (1991) (insisting that Iraq pay 20 percent of its future oil revenues to reimburse parties for certain costs of the Persian Gulf War).

84. See *infra* notes 90-93 and accompanying text (describing the array of groups that aided in clean up operations).

85. See *War in Persian Gulf Area Ends*, 28 U.N. CHRON., June 1991, at 5 [hereinafter *War in Persian Gulf Area Ends*] (reporting that missions were sent to investigate the environment, health conditions and other issues in both Kuwait and Iraq); see also *Special Missions Assess War Damage*, 28 U.N. CHRON., June 1991, at 15 [hereinafter *Special Missions*] (addressing the findings of two United Nations missions sent to Kuwait in March and April 1991). The first mission, led by Under-Secretary-General Martti Ahtisaari, studied the immediate humanitarian needs of the Kuwaiti people. *Id.* The second mission, headed by former Under-Secretary-General Abdulrahim A. Farah, sought information on deaths, infrastructure damage, and Iraqi actions against Kuwaiti civilians. *Id.*

86. See *Spoils of War*, *supra* note 30, at 17 (delineating the focus of the study). The investigation included a study of oil pollution, smoke emissions, and terrestrial damage. *Id.* The task force included experts from the United Nations Environmental Programme (UNEP), the World Health Organization, the Regional Organization for the Protection of the Marine Environment, and various regional governments. *Id.*

87. See Davis, *supra* note 22, at A3 (observing that the National Science Foundation and Friends of the Earth visited the Persian Gulf to assess the ecological damage).

Friends of the Earth.<sup>88</sup> Furthermore, William Reilly, the Administrator of the United States Environmental Protection Agency, visited Kuwait in early June 1991.<sup>89</sup>

Many groups also participated in the effort to fight oil well fires and clean up oil spills. On April 10, 1991, the European Community Commission unveiled a \$20 million plan to combat oil well fires and protect wildlife.<sup>90</sup> The International Maritime Organization (IMO) launched a Gulf Oil Pollution Disaster Fund.<sup>91</sup> Several American companies worked to bring the oil well fires under control.<sup>92</sup> Additionally, Canada sent equipment and experts to Kuwait to assist with oil cleanup in the Gulf.<sup>93</sup>

Despite the wide range of international efforts, commentators complained about the poor efforts on the part of the Saudi Arabian and

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88. See *Reports Clash Over Extent of Damage Resulting From Oil Fires in Kuwait*, 14 Int'l Env'tl. Rep. (BNA) No. 13, at 369 (July 3, 1991) (citing differences in the pollution reports of the National Science Foundation and Friends of the Earth). While these groups differed on estimates of the level of pollution caused by the oil well fires, both agreed that the fires had "wreaked havoc on Kuwait's environment." *Id.*

89. See William K. Reilly, Briefing on the Environmental Situation in Kuwait and Saudi Arabia 5 (June 10, 1991) (transcript available from Heritage Reporting Corporation) (detailing the findings of Environmental Protection Agency Administrator Reilly's trip to the Gulf region and stressing that the results of his study were not final). Reilly stated that although the air pollution was bad, it had not caused the acute respiratory problems originally feared by scientists. *Id.* Reilly also mentioned that other departments in the federal government were working to assess the long-term and short-term effects of the pollution. *Id.* These groups include the Department of Defense, the Army Corps of Engineers, the National Centers for Atmospheric Research, the Centers for Disease Control, and the Public Health Service. *Id.*

90. See *Commission Announces \$20 Million Plan to Help Fight Pollution in Persian Gulf*, 14 Int'l Env'tl. Rep. (BNA) No. 8, at 222 (Apr. 24, 1991) (outlining the European Community Commission plan). The program included training, and the creation of a model sanctuary, with a five-stage restoration plan. *Id.* The sanctuary plan involved cleaning a heavily polluted zone, then creating a buffer zone around it. *Id.* Training was provided to allow others to repeat the process in other areas. *Id.* Approximately \$12 million of the money was earmarked for fire-fighting operations. *Id.*

91. See *International Maritime Organization Launches Gulf Oil Pollution Disaster Fund*, 14 Int'l Env'tl. Rep. (BNA) No. 5, at 127 (Mar. 13, 1991) (detailing the IMO's establishment of an environmental fund). The fund received pledges totalling \$5 million from three undisclosed nations. *Id.*

92. See *U.S. Giving "High Priority" to Requests for Help to Stem Gulf War Damage, EPA Says*, 14 Int'l Env'tl. Rep. (BNA) No. 12, at 339 (June 19, 1991) (naming the United States' Red Adair Company as one of several fighting oil well fires in Kuwait). The United States Environmental Protection Agency reported that the United States considered the Kuwaiti environment a high priority. *Id.* The United States moved from an emergency operation to a long-term assistance program. *Id.*

93. See *Canada Contributes to Persian Gulf Clean Up Efforts*, 14 Int'l Env'tl. Rep. (BNA) No. 9, at 268 (May 8, 1991) (reporting the use of Canadian bioremediation expertise). Canada sent airborne remote sensing devices and experts to help with the oil spill clean up. *Id.* The Canadian contribution amounted to approximately \$1.3 million, in response to aid requests from Bahrain and Qatar. *Id.*

Kuwaiti governments in the cleanup operations.<sup>94</sup> In addition, problems arose when the United Nations almost ran out of funds to extinguish oil well fires.<sup>95</sup>

## 2. U.S. Congressional Actions

In January 1991, the United States Congress began calling for Iraq to take action in environmental rebuilding.<sup>96</sup> Several members of the House of Representatives introduced a resolution condemning Iraq's environmental destruction in the Persian Gulf.<sup>97</sup> Other resolutions called for holding Iraq legally, morally, and financially responsible for acts against the environment during the Gulf War.<sup>98</sup> Still other resolutions specifically advocated earmarking a portion of Iraq's oil profits as

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94. See Ross, *supra* note 19, at A10 (voicing experts' and senators' dissatisfaction with Kuwaiti and Saudi Arabian clean up participation). Brent Blackwelder, vice president of Friends of the Earth, testified before Congress that Exxon spent over \$2 billion, and employed more than 11,000 persons, to clean up the 260,000 barrels of oil spilled from the Exxon Valdez. *Id.* In contrast, only \$60 million, and approximately 400 persons, were recruited to clean up the 2 to 4 million barrels of oil spilled into the Persian Gulf during the war with Iraq. *Id.* Oil spill expert Richard Golob blamed Saudi Arabia's unwillingness to provide continuing financial support for the clean up as a major reason for the slow progress. *Id.* Golob noted Saudi Arabia's hesitation in spending more money on the clean up activities, and the Kuwaiti government's failure to stem the flow of oil into the Persian Gulf. *Id.* Senator John Chafee publicly blamed the Kuwaiti government for continuing to allow crude oil to leak into the Persian Gulf. *Id.*

95. See Int'l Env'tl. Rep., July 17, 1991, *supra* note 28 (describing the funding problems of the clean up in Kuwait). Peter Schroeder, director of the Oceans and Coastal Areas Activity Center of UNEP, stated in a press conference on July 5, 1991, that the program to fund the clean up of the Kuwaiti oil well fires had only received about one-tenth of the necessary funding. *Id.* The fund had received only \$1.1 million of the \$10 million needed to fund the program. *Id.* At that time, Japan was the only actual contributor, while Norway and the Netherlands had pledged \$1 million and \$500,000 respectively. *Id.*

96. See H.R. Con. Res. 55, 102d Cong., 2d Sess. (1991) (condemning Iraq's ecoterrorism); see also H.R. Con. Res. 57, 102d Cong., 2d Sess. (1991) (denouncing the oil spills caused by Iraq and calling for Iraq to assume financial responsibility for its actions against the environment). Both of these resolutions were presented to the House of Representatives on January 29, 1991. *Id.*

97. H.R. Con. Res. 55, 102d Cong., 2d Sess. (1991). The resolution condemns Iraq's "eco-terrorism" in the Persian Gulf. *Id.* It was sent to the House Committee on Foreign Affairs. *Id.* The resolution was sponsored primarily by Representative Lagomarsino. *Id.*

98. H.R. Con. Res. 57, 102d Cong., 2d Sess. (1991). This concurrent resolution deplored the massive oil spill in the Persian Gulf and proclaimed that Saddam Hussein and Iraq should be held "legally, morally, and financially" liable for this act. *Id.* The chief sponsor was Representative Goss. *Id.* The resolution was sent to the House Committee on Foreign Affairs. *Id.*

funds for the environmental remediation of the region.<sup>99</sup> Several senators proposed similar actions.<sup>100</sup>

In addition, the Senate designated a Gulf Pollution Task Force to monitor the clean up.<sup>101</sup> Other senators urged a trial for Iraq's President Saddam Hussein for crimes against the environment.<sup>102</sup>

### 3. United Nations Actions

The United Nations played a key role in the Persian Gulf War from its onset in August 1990,<sup>103</sup> with the Security Council at the forefront of conflict resolution activity.<sup>104</sup> The Security Council's commitment to preventing ecological destruction in the region began long before the

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99. H.R. Con. Res. 108, 102d Cong., 2d Sess. (1991). This resolution, sponsored by Senator Fields, called for "the President, in planning and negotiating Iraq's postwar settlements with the United States and its allies, [to] insist that 20 percent of Iraq's future oil revenues be used to pay various costs of the Persian Gulf War." *Id.* The resolution was sent to the House Committee on Foreign Affairs. *Id.*

100. See S. Con. Res. 23, 102d Cong., 2d Sess. (1991) (declaring that Saddam Hussein and the Iraqi government should be held liable for environmental damage under United Nations Security Council Resolution 686). This resolution was sponsored by Senator Mack and Senator Graham. *Id.* It was sent to the Senate Committee on Foreign Relations for consideration. *Id.*

101. Ross, *supra* note 19, at A10; See *Gulf Pollution Task Force Assesses Linger- ing Aftermath of Damage from War*, 14 Int'l Env'tl. Rep. (BNA) No. 8, at 230 (Apr. 24, 1991) (stating the purpose of the Gulf Pollution Task Force). This group was designed to examine the environmental damage created by Iraq and to assess the long-term and short-term costs associated with the pollution. *Id.*

102. See David Freed, *Hussein Trial Urged Over Oil Damage*, L.A. TIMES, Mar. 18, 1991 at A1 (voicing the opinions of several senators that Saddam Hussein should be tried for crimes against the environment). Senator John Kerry from Massachusetts noted his belief that the environmental damage undertaken by Iraqi troops was a "new category of war crime." *Id.*

103. See *The U.N. Acts*, 27 U.N. CHRON., Dec. 1990, at 9-17 (detailing the chronology of United Nations actions in response to the Iraqi invasion of Kuwait). On August 2, 1990, only hours after the Iraqi invasion, the Security Council convened an emergency meeting. *Id.* at 9. During this meeting, the Council passed Resolution 660 calling for Kuwait and Iraq to commence immediate negotiations to solve their problems. *Id.* When this resolution proved unsuccessful, the Security Council, on August 6, 1990, imposed mandatory economic sanctions on Iraq through Resolution 661. *Id.* at 12. The Security Council acted more strongly on August 25, 1990, when it adopted Resolution 665. *Id.* at 17. This resolution called for states supporting Kuwait to create a naval blockade to maximize the effectiveness of economic sanctions against Iraq. *Id.*

104. See Resolution 674, *supra* note 82, at 3 (announcing that the Security Council would actively oversee the problems in the Persian Gulf until Kuwait regained peace and independence). Paragraph 11 of the Resolution stated that the Security Council would "remain actively and permanently seized of the matter until Kuwait has regained its independence and peace has been restored in conformity with the relevant resolutions of the Security Council." *Id.* See also S. Res. 686, U.N. Doc. S/RES/686, at 3 (1991) [hereinafter Resolution 686] (restating that the Security Council remained actively seized of the matter); see also Resolution 687, *supra* note 81, at 10 (reiterating the same position).

fires and oil spills.<sup>105</sup> This involvement first emerged in Security Council Resolution 670, adopted on September 25, 1990, in which the Council reminded Iraq of its obligations under the Fourth Geneva Convention.<sup>106</sup> As noted in Part II, however, while Iraq is a party to the Fourth Geneva Convention, it has never ratified or acceded to Protocol I.<sup>107</sup>

In Resolution 674 of October 29, 1990, the Security Council stated in more specific terms how the Fourth Geneva Convention would bind Iraq.<sup>108</sup> It also invited states to begin collecting data for claims that their nationals and corporations could make against Iraq.<sup>109</sup> This data would serve as a basis for compensation under international law.<sup>110</sup>

In Security Council Resolution 686, adopted March 2, 1991, the Council again called for Iraq to accept its obligation under international law to compensate parties for losses incurred as a result of its invasion of Kuwait.<sup>111</sup> However, the language of the resolution was weak, calling for Iraq to accept the burden of liability in principle only.<sup>112</sup> The Security Council also asked the international community

105. See *infra* note 106 and accompanying text (explaining the early role of the Security Council in preventing ecological damage).

106. See S. Res. 670, U.N. Doc S/RES/670, at 3 (1990) (describing Iraq's duties as a party to the Fourth Geneva Convention). Paragraph 13 states that the:

Fourth Geneva Convention applies to Kuwait, and that as a High Contracting Party to the Convention, Iraq is bound to comply fully with all its terms, and in particular is liable under the Convention in respect of the grave breaches committed by it, as are individuals who commit or order the commission of grave breaches.

*Id.*

107. See *Saddam: Eco-Criminal?*, *supra* note 43, at 10 (concluding that Iraq is not legally accountable under Protocol I). Iraq neither signed nor acceded to the agreement, and thus cannot be held liable as a party. *Id.* Consequently, although the Geneva Convention as a whole prohibits Iraqi military use of environmental destruction, Protocol I does not hold Iraq liable under any of the articles specifically prohibiting such destruction. *Id.* See also *supra* note 44 (explaining the differences between signing and ratifying a convention).

108. See Resolution 674, *supra* note 82, at 3 (defining Iraq's compensatory obligations under international law). The resolution served, *inter alia*, to remind Iraq that it would be held liable under international law for any destruction to Kuwait or third party states, their people, and businesses as a result of the invasion. *Id.*

109. *Id.* Paragraph 9 suggests that states collect relevant information for future claims against Iraq. *Id.*

110. *Id.*

111. See Resolution 686, *supra* note 104, at 2 (demanding that Iraq assume responsibility for losses stemming from its invasion of Kuwait).

112. *Id.* The language of this resolution is weaker than that in Resolution 674, because Paragraph 2(b) calls for Iraq only to "accept in principle its liability under international law." *Id.*

to aid in Kuwait's reconstruction.<sup>113</sup> This request for aid was honored by many United Nations member states.<sup>114</sup>

The Security Council strengthened its language regarding compensation in Resolution 687 of April 3, 1991, which outlined the terms for ending the hostilities in the Gulf region.<sup>115</sup> Resolution 687 again proclaimed Iraqi liability for any direct loss or damage arising from the invasion of Kuwait.<sup>116</sup> The Council noted for the first time that this harm included environmental damage and the depletion of natural resources.<sup>117</sup> To further the compensation process, the resolution created a fund to handle all claims for loss, including environmental claims.<sup>118</sup> The resolution directed the Secretary-General to develop a structure for the fund pending final approval by the Security Council.<sup>119</sup> Iraq

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113. *Id.* at 3. The Council, in preparation for the end of the hostilities, began to call on member states, the United Nations and its agencies, and other international organizations, to cooperate and aid Kuwait in reconstruction efforts. *Id.*

114. *See supra* notes 84-93 and accompanying text (explaining international actions to help the reconstruction effort in Kuwait). Aid has come in a variety of forms, including donations of money, equipment, expertise, and help with fire-fighting and cleaning up oil spills. *Id.*

115. *See* Resolution 687, *supra* note 81, at 4-7 (detailing the terms of the cease-fire agreement). This resolution, *inter alia*, called on the Secretary-General to help establish a border between Kuwait and Iraq, deploy United Nations observers to monitor a demilitarized zone along the border, and establish a mechanism by which Iraq may compensate for injuries to claimant parties. *Id.*

116. *See id.* at 7 (reiterating Iraq's liability for losses due to its invasion of Kuwait). Paragraph 16 of Resolution 687 states that the Council:

[r]eaffirms that Iraq, without prejudice to the debts and obligations of Iraq arising prior to 2 August 1990, which will be addressed through normal mechanisms, is liable under international law for any direct loss, damage, including environmental damage and the depletion of natural resources, or injury to foreign Governments, nationals and corporations, as a result of Iraq's unlawful invasion and occupation of Kuwait.

*Id.*

117. *See id.* (detailing the terms of the cease-fire agreement). Section E, paragraph 16 states that Iraq is responsible under international law for any environmental damage and depletion of natural resources. *Id.*

118. *Id.* Paragraph 18 creates a fund to pay compensation for claims and establishes a commission to manage the money. *Id.* In view of the fact that Iraq wreaked such vast havoc on the Kuwaiti oil industry, these claims could serve as a method to compensate for the environmental destruction as well as economic losses. Because such claims would seek compensation for the costs of cleaning up the oil fields and spills necessary to restore the infrastructure of the oil industry, the environmental recovery would be indirectly included in these costs.

119. *Id.* Section E, paragraph 19 calls on the Secretary-General to develop plans for a compensation fund, taking into account the needs of the Iraqi people and economy, and to develop appropriate methods to evaluate losses and verify claims. *Id.* The resolution allows the Secretary-General 30 days to make a recommendation for the fund. *Id.* This recommendation must include decisions on matters of administration of the fund, methods for determining the proper contribution by Iraq based on a percentage of its oil revenues, and the appropriate methods for estimating losses. *Id.*

grudgingly accepted Resolution 687 when it was presented on April 6, 1991.<sup>120</sup>

Under Resolution 692, the Security Council established the Governing Council of the United Nations Compensation Commission.<sup>121</sup> This commission set standards to govern compensation for parties injured by Iraqi actions during the Persian Gulf War.<sup>122</sup> In addition, the commission developed a scheme to ensure that Iraq makes the required payments to the compensation fund.<sup>123</sup> This plan incorporates the advice of the United Nations Secretary-General,<sup>124</sup> as called for in Security Council Resolution 687.<sup>125</sup>

The course of action by the United Nations Security Council strictly followed established guidelines of international law in holding Iraq responsible for damaging the environment. It noted the obligations of states regarding the common environment and relating to responsibility for marine pollution, as outlined in the Restatement of Foreign Rela-

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120. See *War in Persian Gulf Area Ends*, *supra* note 85, at 5 (reiterating the statement of Iraqi Foreign Minister Ahmed Hussein). Mr. Hussein stated that Iraq had "no choice but to accept this resolution." *Id.*

121. S. Res. 692, U.N. Doc. S/RES/692, at 2 (1991).

122. See *Letter Dated 2 August 1991 from the President of the Governing Council of the United Nations Compensation Commission to the President of the Security Council*, U.N. Doc. S/22885 1, 1 (1991) (explaining the course of action taken by the Governing Council of the United Nations Compensation Commission since its formation on May 20, 1991). At its fourth meeting on July 25, 1991, the commission adopted a structure for compensation procedures. *Id.* These lengthy guidelines are set out in Annex I and II of this document. *Id.* at 3-9. The Commission set criteria for urgent claims, payments of fixed amounts of damages, consolidated claims, and claims for actual losses up to \$100,000 per person. *Id.* at 5-9.

123. See *id.* at 10 (outlining decisions made by the Governing Council of the United Nations Compensation Commission in its meeting of August 2, 1991). The commission decided to convene a working group of its members in September 1991 to develop a proposal to ensure that Iraq makes payments to the compensation fund. *Id.* The proposal was to be presented to the Governing Council in October 1991. *Id.*

124. See *id.* (describing the sources that the working group should examine). Annex III(c) notes that the working group should heed, *inter alia*, the report of the Secretary-General, as requested in Security Council Resolution 687. *Id.* See also *Letter Dated 30 May 1991 from the Secretary-General Addressed to the President of the Security Council*, S/22661 2, 3 (detailing that Secretary-General Javier Perez de Cuellar's suggested Iraqi contribution to the compensation fund should not exceed a certain percentage of its oil revenues). The Secretary-General reported that, based on a price of \$20.04 per barrel for Iraqi crude oil, Iraq's export earnings are expected to be approximately \$21 billion in 1993. *Id.* at 2. Based on this calculation, the Secretary-General recommended that Iraq pay 30 percent of its annual petroleum-based export earnings into the compensation fund. *Id.* at 3. This figure takes into account the need for civilian imports into Iraq at a level of \$8 billion. *Id.* It also accommodates Iraq's other foreign debts, totaling \$42,097 million as of December 31, 1990, which must be repaid according to the original terms of the loans. *Id.*

125. See Resolution 687, *supra* note 81, at 7 (reaffirming that Iraq is responsible for compensating injuries stemming from its invasion and occupation of Kuwait and calling for the Secretary-General to devise a compensation plan).

tions Law.<sup>126</sup> Under Resolution 687, the Security Council followed the proper method for determining remedies for violations of these environmental obligations and for marine pollution.<sup>127</sup> Further, the Security Council followed the general method for redressing breaches of international law as prescribed by the Restatement of Foreign Relations Law.<sup>128</sup>

### III. RECOMMENDATIONS

The Gulf War caused ecological damage on a scale unequalled by any other conventional military conflict.<sup>129</sup> As a result, the international community is now aware of the grave implications of such destruction on the environment and the huge expense of undertaking cleanup activities. Consequently, it is incumbent upon states to prevent such destruction in the future. Because it played an integral part in ending the hostilities in the Persian Gulf, oversaw the cleanup operations, and established a program for compensating victims of environmental damage, the United Nations is the appropriate international body to prescribe preventative measures to protect the environment during future military actions.

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126. See RESTATEMENT, *supra* note 46, § 601 (asserting that states have obligations to the environment). Among other things, Section 601 notes that a nation is liable for any serious damage resulting from a violation of its obligations, whether to the environment of another nation or to its property, or to persons or property within that nation's territory, jurisdiction, or control. *Id.* See also *id.* § 603 (explaining a state's liability for polluting the marine environment). Section 603 notes that a nation is required to take the necessary measures practicable under the circumstances, either individually or collectively with other nations, to avert, diminish, and control pollution causing or threatening to cause serious injury to the marine environment. *Id.*

127. See *id.* § 602 (explaining remedies for environmental damage). This section states, *inter alia*, that a nation liable to another state for violation of Section 601 is subject to general interstate remedies (Section 902) to avert, diminish, or cease the activity threatening or causing the violation, and to make reparations for the injury. *Id.* See also *id.* § 604 (stating remedies for marine pollution). Among other things, Section 604 states that a nation liable to another nation state for a violation of the principles of Section 603 is subject to general remedies (Section 902) to avert, diminish, or discontinue the action threatening or causing pollution, and to make reparations for the injury. *Id.*

128. See *id.* § 901 (explaining the remedy for a breach of international law). Section 901 states that under international law, a state that violates a legal duty to another nation is obligated to cease the violation and, in most cases, to make reparation, including restitution or compensation for loss or injury. *Id.*

129. See Barnaby, *supra* note 1, at 168 (declaring that the Persian Gulf War was the most environmentally destructive war in history).



## A. ACTIONS THE UNITED NATIONS SHOULD HAVE TAKEN

The United Nations supervised the cease-fire agreement that ended hostilities in the Gulf War. Among other things, it directed Iraq to compensate victims of the war and invited Iraq to make stronger commitments to certain treaties. However, the United Nations elected to forego the opportunity to exact tougher concessions from Iraq.

Security Council Resolution 687 called on Iraq to comply with its duties as a party to the 1925 Geneva Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare.<sup>130</sup> In addition, the United Nations invited Iraq to become a party to the 1972 Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, a treaty which it had not previously joined as a party.<sup>131</sup>

The resolutions sponsored by the Security Council demonstrated the Council's concern about possible Iraqi chemical and biological weapon attacks, and the environmental destruction already perpetrated during the Gulf War.<sup>132</sup> This concern should have prompted the United Nations to require Iraq to become a party to Protocol I. This step would have followed logically from the United Nations' other requests for Iraqi treaty ratification. Because Iraq was already a party to the 1925 Geneva Protocol banning the use of poisonous gases and bacteriological warfare, and because the United Nations asked Iraq to ratify the related 1972 Convention against the development of bacteriological weapons, it follows that as a party to the 1949 Geneva Conventions, Iraq should now become a party to Protocol I.

The United Nations should have called upon Iraq to ratify both Protocol I and the ENMOD Convention as conditions of the cease-fire under Resolution 687. Ratification would help to ensure that Iraq will not further damage the environment in future military conflicts. These treaty ratifications, however, would not be useful in sanctioning Iraq

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130. See Resolution 687, *supra* note 81, at 4 (stating that Iraq should unconditionally heed its responsibilities under this convention). Paragraph 7 of Resolution 687 "invites Iraq to reaffirm unconditionally its obligations under the Geneva Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare, signed at Geneva on 17 June 1925 . . . ." *Id.*

131. *Id.* at 5. Paragraph 7 invited Iraq "to ratify the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction, of 10 April 1972." *Id.*

132. Resolution 687, *supra* note 81, at 7 (declaring Iraqi responsibility for environmental damage and the depletion of natural resources). The United Nations believed the damage was serious enough to hold Iraq monetarily responsible for the cleanup under Resolution 687. *Id.*

for its role in the Gulf War. Because Protocol I and the ENMOD Convention are not generally considered customary international law,<sup>133</sup> the obligations these treaties entail cannot be triggered until a nation becomes a party. Therefore, ratifying Protocol I and the ENMOD Convention as part of the cease-fire agreement would only provide a means by which to sanction Iraq's actions in future conflicts.<sup>134</sup>

## B. STEPS TO MAKE CURRENT TREATIES MORE EFFECTIVE

The actions of the United Nations may suffice to compensate victims for the environmental damage stemming from this particular military action. The international community, however, should strive to avoid such monumental destruction during future armed conflicts.

It is clear that nations in the Persian Gulf region, and the international community in general, regard the Middle East as a sensitive area in need of peace and preservation. This was clearly stated in the 1977 General Assembly Resolution calling for a Nuclear-Weapon-Free Zone in the Middle East.<sup>135</sup> Consequently, it follows that Middle Eastern

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133. See *supra* note 46 and accompanying text (noting that neither the ENMOD Convention nor Protocol I is part of customary international law).

134. But see L. HENKIN, *supra* note 44, at 364, 366 (providing an example of liability when an action violates customary international law). The International Military Tribunal in the Nuremberg Trials, concluding that genocide, a crime against humanity, was a product of common international law, held Nazi war criminals accountable for the knowledge that their genocidal acts were wrong while they were committing them. *Id.* Consequently, the tribunal held that the acts were punishable when they were carried out. *Id.* Along this line of reasoning, the principle of *nullem crimen sine lege*, or no crime without law, is not applicable because the norms of common international law, rather than a particular statute, made the Nazis' actions criminal. *Id.* Therefore, no bar existed against the prosecution of the Nazi war criminals. *Id.*

Similarly, because international law consists of conventions, treaties, judicial rulings, and internationally accepted customs, rather than statutes, the theory of *ex post facto*, applicable to domestic statutes, cannot be applied to international law. *Id.* at 365. The application of the *ex post facto* principle to common international law would thwart the development of common international law. *Id.* This same reasoning could have been used to hold Iraq responsible for environmental damage if Protocol I and the ENMOD Convention were part of customary international law. Iraq could thus have been held liable under the treaties even though it had not become a party to them.

135. See *Establishment of a Nuclear-Weapon-Free Zone in the Region of the Middle East*, 1977 U.N.Y.B. 32, U.N. Sales No. E.79.I.1, 32-33 (delineating the text and basic information about the resolution). The resolution was sponsored by a group of nations in the Persian Gulf region, including Kuwait, Bahrain, Qatar, and Yemen. *Id.* at 32. A wide range of nations throughout the world voted in favor of the resolution, including many in the Middle East, such as Iraq, Iran, Jordan, Oman and Syria. *Id.* The resolution urges, *inter alia*, that all parties involved heed the Treaty on the Non-Proliferation of Nuclear Weapons as a means of fostering the objectives of the resolution. *Id.* at 33.

states wish to avoid debilitating destruction to the environment and to the oil industry as a result of conventional warfare.<sup>136</sup>

The United Nations can achieve this goal by strengthening the current provisions of Protocol I and the ENMOD Convention. The creation of a new resolution is unnecessary because the United Nations has not yet tested the full effect of these existing conventions. It is possible that the United Nations could sufficiently modify Protocol I and the ENMOD Convention to satisfactorily prevent environmental damage in future conflicts.

### 1. Protocol I

In light of the environmental destruction and the threat to human health Iraq created by destroying and sabotaging Kuwaiti oil facilities, it is clear that oil fields and terminals can unleash extremely dangerous forces. It is therefore advisable that the United Nations revise Article 56 of Protocol I to add oil facilities to the existing list of potentially dangerous peacetime installations which currently includes only dams, dikes, and nuclear electrical generating stations.<sup>137</sup> The inclusion of oil facilities would serve the multiple purposes of protecting the environment from fires and oil spills, safeguarding the major industry of the Persian Gulf region from destruction during wartime, and keeping petroleum supplies flowing to the world during conflicts.

Further, adding oil facilities to the list in Article 56 would allow compensation for environmental damage under Protocol I without having to satisfy the "widespread, long-lasting and severe" requirements under Articles 35 and 55.<sup>138</sup> If a state violated Article 56 through the destruction of oil wells or terminals, compensation for loss could

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136. See ALI EL-HAKIM, *THE MIDDLE EASTERN STATES AND THE LAW OF THE SEA* 22-24 (1979) (enunciating regional and international steps to establish laws to control marine pollution in the Middle East). On the international level, Jordan, Lebanon, Kuwait, Saudi Arabia, Democratic Yemen, Egypt, and Syria are parties to the International Convention for the Prevention of Pollution of the Sea by Oil. *Id.* at 22-23. On the regional level, Bahrain, Iran, Kuwait, Oman, Iraq, Qatar, Saudi Arabia, and the United Arab Emirates adopted and signed the Kuwait Regional Convention for Co-operation in the Protection of the Marine Environment from Pollution and a Protocol Concerning Regional Co-operation in Combating Pollution by Oil and Other Harmful Substances in Cases of Emergency. *Id.* at 23.

137. See Protocol I, *supra* note 41, art. 56 (limiting the scope of peacetime installations covered under the treaty to dams, dikes, and nuclear power plants). Under Article 56, armed forces are forbidden to attack these facilities "even when these objects are military objectives, if such attack may cause the release of dangerous forces and consequent severe losses among the civilian population." *Id.*

138. See *supra* note 53 and accompanying text (defining the criteria of widespread, long-lasting, and severe).

foreseeably include reparations for the actual monetary value of oil lost and for the cost of the cleanup effort. This would result in a back-handed form of compensation for environmental loss.<sup>139</sup>

## 2. ENMOD Convention

The United Nations should revise the ENMOD Convention to make it applicable to situations like that of the environmental destruction in the Gulf War. In its present form, the convention prohibits only the use of the environment as a weapon of destruction, rather than prohibiting devastation of the environment itself.<sup>140</sup> "Environmental modification techniques," forbidden under the treaty, require purposeful manipulation of the earth and atmosphere.<sup>141</sup> One could argue that such manipulation occurred during the Gulf War. The destruction caused major disruption in the composition of the air in Kuwait and changed the climate throughout the Persian Gulf region.<sup>142</sup> One may also argue that the oil spills altered the composition of the hydrosphere.<sup>143</sup> As mentioned earlier, it is clear that the degree of devastation would meet the long-term, severe or widespread criteria.<sup>144</sup>

The ENMOD Convention could apply to the Gulf War situation if nations view the destruction of the oil wells and creation of the spills as the use of a natural part of the environment, crude oil, for hostile military purposes. This is not, however, the common interpretation of the situation. Rather, the popular view is that Iraq used man-made oil

139. See *id.* art. 91 (defining responsibility for violations of the treaty). Article 91 allows for the compensation of losses created by a breach of Protocol I. *Id.* This section states that "[a] party to the conflict which violates the provisions of the Conventions of this Protocol shall, if the case demands, be liable to pay compensation. It shall be responsible for all acts committed by persons forming part of its armed forces." *Id.*

140. See *Saddam: Eco-Criminal?*, *supra* note 43, at 11 (explaining that the ENMOD Convention is meant only to forbid the use of the environment as a weapon).

141. See ENMOD Convention, *supra* note 42, art. II (defining environmental modification techniques). Under the ENMOD Convention the term "environmental modification techniques" means "any technique for changing — through the deliberate manipulation of natural processes — the dynamics, composition or structure of the Earth, including its biota, lithosphere, hydrosphere and atmosphere, or of outer space." *Id.*

142. See *supra* notes 23-25 and accompanying text (describing climatic and air quality changes in the Persian Gulf region). See also Goldblat, *supra* note 39, at 108 (noting the review committee's interpretation of the terms in Article II of the ENMOD Convention). The Review Committee cited several examples as representative of phenomena resulting from environmental modification techniques, including: "an upset in the ecological balance of the region," "changes in weather patterns," and "changes in climatic patterns." *Id.*

143. See *supra* notes 36-37 and accompanying text (describing the extent of, and the destruction from, the oil spills in the Persian Gulf).

144. See *supra* note 53 and accompanying text (defining the ENMOD criteria of widespread, long-lasting and severe).

wells, and not naturally occurring crude oil as its weapons, thus rendering the ENMOD Convention inapplicable.<sup>145</sup>

There are two ways to characterize Iraq's military actions in the Gulf: offensive and defensive. If one argues that Iraq created the oil spills to advance the military objective of wiping out Saudi Arabian desalination plants,<sup>146</sup> and began the oil well fires to cause destruction of the Kuwaiti economy and its industrial base,<sup>147</sup> then the ENMOD Convention would clearly apply because the Iraqis carried out the destruction of the environment for hostile purposes. Conversely, if one portrays Iraqi operations strictly as a defense tactic,<sup>148</sup> it may be argued that the fires were protection for retreating Iraqi troops, and the oil spills were a defense against potential Allied amphibious invasions on the Kuwaiti shoreline. Under this interpretation hostile intent is more difficult to prove, and thus the ENMOD Convention may not be applicable.

If the environment is the focus of concern, these slight distinctions should not dictate whether or not the ENMOD Convention is enforceable.<sup>149</sup> The level of environmental damage, rather than the underlying excuse for the destruction, should be the decisive factor. Under its current form, the ENMOD Convention allows for enforcement only if the state causing the damage admits a hostile intent behind its actions.<sup>150</sup> The parties should alter the convention to exclude the need for hostile intent, thus allowing the convention to apply to military environmental destruction, both offensive and defensive.<sup>151</sup> In addition, ENMOD

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145. See *Saddam: Eco-Criminal?*, *supra* note 43 (explaining that the ENMOD Convention is not applicable to the Persian Gulf situation). The article states that "the convention is meant to proscribe using the environment as a weapon - creating floods to wipe out troops, for instance - rather than merely damaging the environment. Therefore, although the oil well fires or any deliberate spills in the gulf undoubtedly had climatic and ecological effects, the treaty would not apply." *Id.* at 11.

146. See *supra* note 34 and accompanying text (explaining that the oil spills were created to destroy desalination plants).

147. See *Parmalee*, *supra* note 16, at A1 (detailing the major destruction to the Kuwaiti oil industry).

148. See *supra* note 32 and accompanying text (speculating that the oil spills were designed to thwart an Allied amphibious landing on the shores of Kuwait); see also *Parmalee*, *supra* note 16, at A1 (stating that the oil well fires were set by retreating Iraqi troops).

149. See *Westing*, *supra* note 7, at 664 (discussing the ENMOD Convention's requirement of hostile intent). The ENMOD Convention prohibits environmental alterations only when carried out with the intent to disrupt natural processes for hostile objectives. *Id.*

150. *Id.* Purposeful hostile intent may be hard to prove without an admission by the perpetrator. *Id.*

151. *Id.* *Westing* suggests that the convention be amended to include "any hostile environmental manipulation that could reasonably be expected to result in a prohibited

should cover all environmental damage, whether caused by natural or man-made instruments. Subtle differences of opinion as to the cause of the damage should not be consequential for enforcement purposes.

Further, the United Nations should repeal the threshold requirements of "widespread, long-lasting or severe." If the ENMOD Convention is truly intended to protect the environment, the destruction should not have to rise to a monumental level before the treaty becomes enforceable.<sup>152</sup> The United Nations Security Council should determine the required environmental destruction on a case-by-case basis. No claim should be automatically excluded because of its magnitude under the terms of the convention alone. This same reasoning should apply to Protocol I to eliminate the requirements of "widespread, long-lasting and severe" because that treaty applies the terms more narrowly.<sup>153</sup>

To further the implementation of these changes to the ENMOD Convention, a party-state, most appropriately Kuwait, should attempt to persuade a majority of the parties to convene a conference to strengthen this treaty.<sup>154</sup> In light of the fact that the first review occurred in 1984, the member states should now convene a second review of the convention. Even if a majority in favor of a conference in the near future cannot be achieved, a tenth-year review conference will be possible in 1994. Under the rules of the convention, fewer parties are required to call for a ten-year review than are required to call for a review in other cases.<sup>155</sup>

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effect even if the environmental modification was not meant as the primary form of attack." *Id.*

152. *See id.* at 663-64 (suggesting that the damage thresholds be dropped from the ENMOD Convention). Allowing lower levels of hostile environmental modification permits preparation for the use of these techniques. *Id.* These limits to enforcement were originally designed to prevent the convention from becoming the basis for frivolous complaints. DISARMAMENT YEARBOOK 1984, *supra* note 45, at 458. It is, however, equally important that the required destruction not be as immense as that in the Persian Gulf to be covered by the ENMOD Convention.

153. *See supra* note 53 and accompanying text (noting the seriousness of environmental destruction necessary for the application of Protocol I).

154. *See* ENMOD Convention, *supra* note 42, art. VIII (explaining the requirements for a five-year review). Article VIII, paragraph 2 states that "at intervals of not less than five years thereafter, a majority of the States Parties to this Convention may obtain, by submitting a proposal to this effect to the Depositary, the convening of a conference with the same objectives." *Id.* Consequently, a majority of the party-states may propose a conference meeting to review the effectiveness of the ENMOD Convention. *Id.*

155. *See id.* (explaining the requirements for a ten-year review). Article VIII, paragraph 3 provides that if no review has been called for within ten years of the initial review (1984), the Depositary shall ask parties if a new review is necessary. *Id.* If either ten or one-third of the parties, whichever is a lesser number, wish to convene a review, then one will be arranged. *Id.*

## CONCLUSION

Although the United Nations developed a plan under which Iraq is required to pay compensation for its acts of environmental destruction,<sup>156</sup> this is hardly the ideal method to dissuade future perpetrators of ecological devastation. Reliance on oil revenues, or a state's future earnings from other sources, will not be practicable in all situations. Under such a scheme, poorer nations may be able to avoid compensating for their acts of environmental destruction during armed conflicts due to their inability to pay. More appropriately, parties to the ENMOD Convention and Protocol I should strengthen these treaties so that their provisions may have a deterrent effect on states inclined to destroy the environment during military hostilities.

Just as the Vietnam War acted as a catalyst for the development of the ENMOD Convention and Protocol I,<sup>157</sup> the events of the Gulf War should trigger efforts to fine tune these treaties so that they can truly prevent environmental destruction during future military conflicts. In addition, the treaties should create effective mechanisms to sanction the perpetrators of environmental destruction and compensate victims who incur losses. Finally, Protocol I and the ENMOD Convention must be modified to allow parties to apply them in a broader range of less drastic circumstances. The international community is in need of a deterrent to environmental destruction during warfare, rather than simply a remedial plan after nations carry out such devastation.

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156. *See supra* notes 118-122 and accompanying text (detailing the United Nations compensation plan).

157. *See supra* notes 39, 40 & 48 and accompanying text (delineating the history of the development of Protocol I and the ENMOD Convention).