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Two Ways of Solving Environmental Problems: A Comparative Study of Industrial Releases Into the Rhine and the Great Lakes

von
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Two Ways of Solving Environmental Problems: A Comparative Study of Industrial Releases Into the Rhine and the Great Lakes*

In 1859, John Stuart Mill asserted: ”in an imperfect state of the human mind, the interests of the truth require a diversity of opinions”.[1] In other words, decision-making benefits from the expression of, and comparison between, alternative viewpoints. Behind this idea is the assumption that within each political sphere various perspectives are typically in competition, between which it is unwise to decide *a priori*. In some times and places certain perspectives may capture reality more accurately, while in other periods and regions other perspectives may be more relevant. This assumption implies something else as well. It is not so much the expression of diverse viewpoints that may count, but a fruitful and open-minded discussion between defenders of different faiths that may be important.[2]

A branch of the research tradition that goes by the name of ”the new institutionalism”[3] has picked up on this idea. This branch cannot properly be called ”novel”, but has grown a number of new leaves in recent years.[4] According to this institutionalist perspective, one way in which institutions influence policy outcomes is by shaping the interaction between advocates of alternative viewpoints. Institutions do so by: (1) distributing power resources among those who espouse alternative policy beliefs; (2) regulating the access that defenders of different viewpoints have to the processes of problem-definition, information gathering and decision-taking; and (3) affecting the extent to which those who favour alternative perspectives are open to each other’s arguments. In this literature there is often a preference for more participatory institutions.

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1 Mill 1974 (1859), 114.

2 On this, Elster 1998.

3 Introductions to the new institutionalism are March and Olsen 1989; Powell and DiMaggio 1991; Hall and Taylor 1996; and Immergut 1998. On the need to apply the new institutionalism in the study of international relations see Keck 1991 and March and Olsen 1998.

4 Among the leaves: Kriesi *et.al.* 1992; Bohman 1996; Guttman and Thompson 1996; Nino 1996; Hendriks 1999.

In the comparative study that I will report here the focus will be on this third effect: the ways in which institutions either divide or unite perspectives. Some institutions, or so I will argue, bring about a dialogue and mutual understanding between actors, while other institutions tend to sustain antagonisms and miscomprehension between adherents to different ways of thinking – with far-reaching consequences for both domestic and transboundary common goods.[5]

I will instance this argument with a comparison between the discharges of toxic substances by the industrial firms that are bordering the river Rhine with the same polluting activities of the enterprises situated at the United States side of the Great Lakes. A study of the industrial effluents in these two regions is relevant as both water basins not only encompass vulnerable ecosystems, but also harbour tremendous economic activity. Some salient details illustrate the latter point. The Rhine flows from the Bodensee in Switzerland, through France and Germany, before scattering all over the Netherlands. Along its shores, some 18% of the world's chemical industry has been located. The 1,320 km long river also connects the biggest seaport in the world (Rotterdam) with the largest inland port on the globe (Duisburg – at the heart of the German Ruhr area). Nearly 50 million people live presently in the Rhine valley.[6] The Great Lakes region in North America (encompassing Lake Superior, Lake Michigan, Lake Huron, Lake Erie and Lake Ontario) is also of paramount economic importance. Of the Fortune 500 largest industrial companies within the United States, almost half have their headquarters within the Great Lakes states (Minnesota, Wisconsin, Illinois, Ohio, Indiana, Michigan, Pennsylvania and New York).[7] The Canadian part of the Great Lakes area contains extensive industrial and agricultural production as well. Around 33 million people live in the Great Lakes basin.[8] In sum, both the Rhine valley and the Great Lakes basin form sites where ecological values and huge economic interests come together.

In my research, I have followed Arend Lijphart's 'comparative cases strategy'.[9] According to this strategy, one has to choose cases: (a) without prior knowledge of the dependent variable; (b) that vary significantly on the independent variable; and (c) that are as similar as possible regarding all other potentially explanatory factors. In selecting the cases of the industrial effluents into the Rhine and Great Lakes I have followed these rules. The dependent variable of this research is the toxicity of industrial discharges into water basins. When I started the research, I did not know how the toxicity of the effluents from U.S. firms in the Great Lakes basin would compare to the toxicity of discharges from enterprises in the Rhine area. If anything, I expected the opposite of what I found: during the period 1970 up to present the discharges from U.S. firms into the Great Lakes have remained substantially more toxic than the industrial effluents into the Rhine. I was aware of

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5 An introduction to the literature on adversarial versus consensual institutions is McRae 1997.

6 International Commission for the Protection of the Rhine against Pollution 1998.

7 Erdevig 1991, 26.

8 Environment Canada 1995.

9 Lijphart 1971.

significant variation on the independent variable, *i.e.*, the institutional setting. The institutions that regulate the industrial emissions from the U.S. side into the Great Lakes flow from two sources. Partly, these institutions derive from the international regime to restore the environment of the Great Lakes. This regime is well-known for its huge amounts of public participation - something which cannot be said for the international regime to protect the Rhine. Other relevant institutions are part of the relationships between the executive, judiciary, legislature, business community and environmental movement within the United States - again areas that are quite differently organised in Western Europe.

Many other factors that could conceivably provide an explanation for the differences between the cases fall into either of two categories. Various of these potentially explanatory variables have quite similar values across the two cases. During the period of investigation (1970 up to the present), the countries that are represented in both water basins have all been stable democracies, have all experienced high levels of economic prosperity, have shared comparable levels of environmental concern, and have all tried to regulate water protection in basically similar ways. These factors can therefore be ignored in the explanation. Other elements would lead one to expect the exact opposite of what I concluded. A number of factors would easily lead one to assume that the industrial effluents from the U.S. firms into the Great Lakes would have to be less toxic than the discharges of their European counterparts into the Rhine. These factors include the following. In the Great Lakes basin, a very well-organised and influential epistemic community has existed, something which has been absent in the Rhine area. The international agreements covering the protection of the Great Lakes have also been much more stringent than the Rhine conventions. Moreover, the international organisation assigned to overview the environmental restoration of the Great Lakes (the International Joint Commission - IJC) has had many more means to influence policy than its counterpart in the Rhine, the International Commission for the Protection of the Rhine against Pollution (ICPR). Even more importantly, the domestic water protection laws have been stricter in the United States than in any of the Rhine countries. Arguably as well, with regard to water protection the federal and state authorities in America have been more innovative in their policy-making than their counterparts in the Rhine countries.

The puzzle of this article can therefore be formulated as follows: *how is it possible that the discharges by U.S. firms into the Great Lakes have been more polluting than the industrial effluents into the Rhine, despite the existence of many factors that would lead one to expect the opposite?* I will formulate an answer in terms of the institutions that have regulated the relationships between the relevant government agencies, legislature, courts, environmental groups, industrial firms and international organisations. I will complement this argument in two ways. First, by pointing out that the U.S. authorities have not levied fees for the (legal) emissions of firms, whereas the authorities in the Rhine countries have done so. Second, by explaining how the role played by the International Joint Commission has amplified some of the adverse effects that U.S. domestic institutions have had on water protection. My research will mainly focus on the years 1970-1998.

one conclusion: the discharges into the Rhine had already been greatly and *voluntarily* reduced by the mid-1980s.

So, two opposing images emerge. In the Rhine valley, the relations between firms and government departments concerning water protection issues have (relatively speaking!) been rather consensual. Firms have frequently invested more in water protection than government policies have required, while ministries have often made sure not to adopt regulations that would have been viewed as grossly unfair by the business sector. In the U.S. part of the Great Lakes basin, the relationships between firms and government agencies have been more strenuous. Corporations have made fewer voluntary measures, and have usually attempted to reverse government policies. These developments form an initial answer to the puzzle of this essay: *in the Rhine basin industrial effluents have been less toxic than in the Great Lakes watershed, because Rhine firms have made extensive voluntary investments in water protection, while Great Lakes corporations have tried to halt implementation of U.S. water laws.*

Telling in this respect are the different responses that American and West European business executives gave to my question 'why has your firm invested in water protection measures?'. In the United States most executives literally and immediately answered: 'to keep us out of jail'. The other American business employees all gave the same answer, using slightly different words. By contrast, the typical reaction of representatives from Rhine firms involved a lengthy exposé of the social responsibilities of enterprises, the need to preserve present environmental values for future generations, the wish to live in harmony with surrounding communities, and so on. These factors were only seldom mentioned by Great Lakes managers. In short, from the interviews it appears that Great Lakes business leaders have been much more single-mindedly focused on company profits and shareholder value (the infamous 'bottom line'), while managers in the Rhine region have also taken other values into account. These different motivations are important elements of the more adversarial politics of water protection in the Great Lakes area and the more consensual politics in the Rhine valley.[42]

An institutional explanation

The finding above begs the question: why have only the Rhine companies been willing to make extensive voluntary investments in water protection, and not the Great Lakes firms as well? My answer to this question will be couched in institutional terms. I will describe how various sets of institutions in the United States have destroyed any willingness that Great Lakes firms might have developed for taking voluntary (or even obligatory) water

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[42] My findings are compatible with those of Wilson 1985; Brickman, Jasanoff and Ilgen 1985; Badaracco 1985; and Vogel 1986. These studies also attest to the antagonisms that have characterized American environmental politics, as compared to the relatively more cooperative European and Japanese processes.

protection measures. At the same time, I will show how a number of European institutions did not block the willingness of corporations to make large-scale voluntary investments in pollution prevention. I will also consider developments at the international level. I will argue that certain elements of the international regime for the Great Lakes have tended to add to the antagonistic pressures emanating from domestic institutions.

I will follow Ronald Jepperson's understanding of the term institutions.[43] In his view, institutions are collective patterns of thought and behaviour that people take for granted. In Jepperson's words: their persistence is:

> not dependent, notably, upon recurrent collective mobilisation, mobilisation repetitively reengineered and reactivated in order to secure the reproduction of a pattern. That is, institutions are not reproduced by 'action', in this strict sense of collective intervention in a social convention. Rather, routine reproductive procedures support and sustain the pattern, furthering its reproduction - unless collective action blocks, or environmental shock disrupts, the reproductive process.[44]

Most people accept institutions simply as the ways in which things are done. They need not morally condone or prefer existing institutions, but will still subject to them, albeit sometimes grudgingly. Institutions, in this view, are background variables. They are widespread and long-standing patterns of thought and behaviour that steer and shape the more fleeting daily actions and ideas of people, including their political ideals and positions. In treating institutions as background variables, my research falls outside of what Hall and Taylor have dubbed the "sociological version of the new institutionalism". In considering institutions to be more than formal procedures, it also remains outside the purview of the "rational version of the new institutionalism". In fact, my study falls squarely into Hall and Taylor's third category: the "historical version of the new institutionalism", which treats institutions as background variables, different from, and influencing, the mindsets, policy beliefs, moralities and interests that people have.[45] In this study, institutions work on the rifts that divide the various actors involved in environmental politics. In some institutional settings, these rifts are opened up, and grow into abysses. Communication and trust between actors, let alone common ground, become very difficult to achieve. Everybody sticks to their singular perspective, and defends their perceived interests as hard as they can. In other institutional settings, bridges can still be built across the cracks that divide organisations. Mutual understanding of each other's concerns and perspectives becomes achievable under these circumstances.

Which cracks, then, have divided the numerous organisations involved the protection of both the Rhine and the Great Lakes? A content analysis of the 101 interviews I have

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43 Jepperson 1991.

44 Jepperson 1991, 145.

45 Hall and Taylor 1996.

undertaken in both cases (see the appendix) reveals clear disagreements concerning both goals and means of water protection between the involved business firms, government agencies and environmental groups. Companies tend to underplay the effects that chemicals can have on watersheds. They often do not believe that small amounts of a chemical substance within a water basin can have harmful effects on flora and fauna. Therefore, they tend to endorse only those water protection measures that are based on scientific certainty. And even if the toxicity of a chemical is scientifically established, corporations will often still insist that any decision to ban a substance will also be based on a cost-benefit analysis. To firms, it does not make a lot of sense to invest in water protection in one place, if much larger ecological improvements can be had in other places for less money. With regard to the means of water protection, companies tend to reject strict command-and-control policies and the imposition of technology standards, which they often see as too inflexible and static. All of this is very suspect in the eyes of environmental groups. The latter tend to believe that most chemicals are harmful to the environment, even in small doses. Only after it has been scientifically established that a chemical substance does not impact flora and fauna should firms be allowed to use and discharge the chemical. This is an absolute version of the ”precautionary principle”. Regarding means, environmental groups often plead for a complete reorganisation of society along more ”ecocentric” lines. In the meantime, they usually prefer strict command-and-control policies. Government agencies often, but not always, take up a middleposition between these two extremes. Public servants acknowledge that scientific certainty about the toxicity of all chemicals released into open waters is an impossibly ambitious aim. Instead, they often opt for ”objective risk analysis”, i.e., an attempt to calculate the health and environmental risks of releasing chemicals into the aquatic environment. Typically, this leads to a list of suspected chemicals that is bigger than that used by firms and smaller than that favoured by environmental groups - a less absolute version of the precautionary principle. Also, although they are sympathetic to command-and-control policies, they are also willing to entertain other policy instruments, such as market-based solutions.

Broadly speaking, these differences of opinion have been prevalent in both the Rhine valley and the Great Lakes basin.[46] However, two sets of institutions, as well a string of decisions taken by the IJC, have greatly widened these cracks in the case of the Great Lakes, as compared to events in the Rhine basin. The politics of the protection of the Great Lakes have therefore been very conflictual, which has destroyed a large part of the willingness of U.S. firms to invest in the restoration of the Lakes, voluntarily or otherwise. Below, I will first discuss these two sets of adversarial institutions, the values and practices that make up ”American exceptionalism” and the relations between the executive, judiciary, legislature, citizens’ groups and business firms in the United States, as well as show how these

[46] Two differences were conspicuous. EPA tended to side more with the U.S. environmental groups than the governmental agencies in the Rhine countries with the European environmental groups. Furthermore, the European environmental movements appeared much more bent on the overhaul of capitalism than their American counterparts.

institutions have impaired the protection of the Great Lakes, as compared to the Rhine river. Thereafter, I will bring on the IJC.

American exceptionalism

Compared to the populations of European and Asian countries, Americans are 'individualistic, anti-statist, populistic, and egalitarian'.[47] More than other nations, Americans value liberty, equality, individualism, constitutionalism and democracy.[48] These are the roots of 'American exceptionalism' - a phrase coined by de Tocqueville as far back as 1835.[49] The American nation does not define itself in primordial terms, but in terms of its attachment to achieving the ideals of liberty, equality, individualism and constitutional democracy. As such, Americans are moralistic utopians.

The basic American values are not fleeting. Despite tremendous cultural change of all sorts, the main components of American exceptionalism have been in place for several centuries. It may be argued that the elements that make up 'America's exceptionalism' are not necessarily compatible. Still, they are held together by one overriding passion: a dislike and distrust of central government. This anti-authoritarian thrust is what is common to all the different elements of the American Creed (to use Huntington's preferred phrase).

How can American exceptionalism be linked with the comparatively adversarial nature of water protection politics in the United States? I see at least two ways. The story[50] begins of course with the rise of concern for environmental issues, and the environmental movement, from the late 1960s onwards. These developments did not only take place in the United States, but also in Western Europe and Japan. What was different in America was that the demands for a cleaner environment were not accompanied by a desire to expand government. The anti-statism within both the environmental groups themselves and other organisations prevented this. Thus the paradoxical situation occurred in which the U.S. government was asked to bring about many far-reaching changes (in order to save the environment), without being offered sufficient means to do so. This paradox has been particularly relevant for the implementation of the Clean Air and Clean Water Acts. During the formulation of both these acts, environmental organisations effectively lobbied Congress. As a result, both acts included very strict environmental standards. The acts also increased the budget and responsibilities of EPA, but not nearly enough to implement and enforce the unrealistically strict environmental goals. This process is a vicious circle, one of the several that have kept American environmental politics adversarial. Forced to achieve impossibly strict environmental aims, and not having enough means at its disposal,

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47 Lipset 1991, 16.

48 Huntington 1981, 33.

49 Besides de Tocqueville 1991 [1835], the classics on American exceptionalism are Hartz 1955; Huntington 1981; Shafer 1991; and Lipset 1996.

50 Told in Vogel 1986, 253-54; Wildavsky 1991; and Kagan 1994.

1992 sparked a debate among Great Lakes firms to lobby for the abolishment of this (by now) 90-years-old, official international organisation.

In reaction to the 'chlorine controversies' created by the IJC, Environment Canada and EPA decided to sideline the International Joint Commission somewhat - at least for the time being. Since 1994 progress under the Great Lakes Water Quality Agreement has been discussed at the State of the Lakes Environmental Conferences (SOLECs) under the auspices of the Binational Executive Committee. Firms have been included in this process from the outset, and feel that their arguments have received a much fairer hearing at the SOLECs than at the IJC conferences.

In sum, the International Joint Commission has taken a rather one-sided view of the environmental issues in the Great Lakes area. This is fully understandable within an adversarial setting, and (within that setting) probably beneficial for the environment too. However, the IJC actions have at the same time deepened the rifts that already existed between the actors in the Great Lakes regime. Thus IJC has greatly reinforced the adversarial system of water protection in the (United States side of) the Great Lakes area. This has not been inevitable, as precisely the IJC has had first-hand experience with a more consensual way of protecting the environment, namely through their experiences with Canadian water politics. So, the IJC has missed a chance to bring firms, environmental groups and government departments closer together. In my view, this has also been harmful to the environmental protection of the Great Lakes, as ultimately the adversarial relations that have existed between Great Lakes firms, environmental organisations and EPA have been the main cause of the (relative) lack of willingness among Great Lakes corporations to invest in water protection.

Summary and conclusions

The puzzle of this article has been: how has it been possible that the waste water discharges from U.S. firms into the Great Lakes have remained more toxic than the emissions of firms located at the borders of the Rhine, despite the existence of many factors that would have led one to expect the opposite? The initial answer to this question has been: because the firms in the Rhine catchment area have made extensive voluntary investments in water protection, while the U.S. firms in the Great Lakes watershed have not only refrained from making extensive voluntary investments in water protection, but have also opposed legal requirements to take environmental measures. But this answers begs the question: why have companies behaved so differently? I have given a predominantly institutional answer, arguing that a variety of institutional differences between the Rhine valley and the Great Lakes basin have made it possible for organisations in the former area to cooperate and have obstructed such concertation in the latter region. Two sets of institutional differences are relevant. The first one consists of the anti-hierarchical norms and values that make up America's exceptionalism. These have lent themselves to an American appreciation of 'standing up for yourself', and 'not bowing to authority'. This must have made it easier for

corporate leaders in the Great Lakes region to reject governmental measures. Moreover, American exceptionalism also prevented the expansion of government in the early 1970s - a time when the U.S. government was asked to ensure strict environmental protection. The inevitable failures that resulted from this can only have increased the dislike and rejection of central government. Yet, as I argued on the basis of the case of consensual Switzerland, a widespread negation of hierarchy and central regulation does not necessarily lead to antagonistic politics. It only constitutes a force that push actors towards such politics. Other, possibly countervailing, forces exist as well. Such other forces are the historically specific institutions that regulate the relations between the executive, legislature, judiciary and private organisations. I have shown that the specific forms that these institutions have taken in the United States have differed from those in the Rhine countries in such ways as the make environmental politics in the former area much more adversarial than in the latter. And, still, this may not have been enough. Even combined, American exceptionalism and the historically specific forms of the links between public and private organisations in the United States may not have been fully sufficient for the creation of highly antagonistic relations in the Great Lakes watershed. Especially the old, once venerated International Joint Commission had an opportunity to bring minds together. However, the IJC chose to 'play hard', American-style, and thereby (until quite recently) quelled any opportunity for the evolvement of more consensual relations. A non-institutional factor also needs to be mentioned: in the Great Lakes states, firms have not paid a fee on discharges, contrary to their European brethren. Together, these four elements (American exceptionalism, the relations between public and private actors, the actions of the IJC, and the European pollution fee) form my explanation of why the Rhine is presently cleaner than the Great Lakes.

One issue remains: do more cooperative institutions lead to more comprehensive environmental protection than institutions that polarise? The issue seems clear-cut, judging by the evidence presented here. The more consensual politics of the Rhine countries have led to cleaner industrial effluents than the antagonistic policy processes in the Great Lakes watershed. Yet a number of reservations must be made. First, it needs to be remembered that I have only compared two environmental regimes, which does not allow for overly strong inferences. In addition, I have only focused on one circumscribed aspect of these two regimes, namely industrial discharges into water. I have not considered industrial discharges by air, efforts to reduce polluted sediments, agricultural emissions, or the restoration of habitat. I am not sure how including any of these factors would have affected my conclusions.

It also important to realise that my research has reached somewhat different conclusions than four other comparative studies of environmental politics on both sides of the Atlantic: those of Vogel (1986); Badaracco (1985); Wilson (1985); and Brickman, Jasanoff and Ilgen (1985). These studies compare various other aspects of environmental politics in the United States with regulation in European countries (including Britain, France and Germany). They reach quite similar conclusions concerning the 'independent variable' of this study, namely that America's political institutions give rise to much more adversarial environmental policy processes than European institutions. But they reach dissimilar conclusions regarding the

‘dependent variable’, *i.e.*, the level of environmental protection that has been achieved. They estimate that in their cases the environmental protection that was achieved in the United States roughly equalled that of European countries. So, in their cases, similar environmental results were reached via two contrasting ways: an adversarial path in America and a more consensual route in Europe (and Japan). This puts into doubt any easy conclusion that antagonistic institutions provide for less environmental protection than more consensual ones.

One possible explanation for the different results of my study and theirs is that I have had the opportunity to look at a longer time period. Their studies were published in the mid-1980s. I have been able to incorporate the ten years after 1986 as well. Environmental policy processes are usually played out over the long-term. Perhaps the full effects of institutions on environmental protection can only be discovered in the long run. If this reasoning had some truth to it, it would make my analysis somewhat more revealing. In this respect, it is significant that Richard Andrews has recently concluded that water pollution in the United States has probably grown slightly worse over time.[96]

Last, a main advantage of the American system needs to be acknowledged. The American system of environmental protection creates a lot of scientific knowledge and debate. American organisations constantly engage in scientific research, partly in an effort to show that their particular view of the environment is the right one. The fruits of this scientific research and debate are often used as guidelines for environmental protection policies in Europe.[97]

When empirical evidence is not sufficient, issues can also be tackled deductively. A rationale can be set up suggesting that consensual institutions benefit environmental protection more than divisive ones. Ecological issues are truly *cross-boundary*. These issues cross both territorial and scientific borders, and also cut across different segments of society, as usually both their causes and solutions lie in a variety of social processes. It can be argued that ecological issues are so complex that their resolution need the cooperation of all involved organisations. Each of these organisations has unique skills and knowledge. Firms have detailed knowledge of their cost structure, and are well-positioned to find efficient, practical solutions to environmental problems. Environmental groups are useful ‘watchdogs’. They tend to perceive ecological problems before other organisations do. Government agencies can be useful in scientifically assessing the claims made by environmental groups, as well as by acting as the ‘objective’, neutral arbitrator between the contradictory opinions of environmental groups and firms. They can also exert pressure on firms that stubbornly resist the implementation of environmental agreements, thus ensuring a level playing field. Furthermore, government agencies can set priorities, overview implementation, as well as integrate and coordinate different environmental measures. Under institutions that do not pit these various organisations against each other, the positive contributions that all these organisations may have to offer to environmental protection are allowed to come out.

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96 Andrews 1997, 27.

97 Brickman, Jasanoff and Ilgen 1985, 309.

Under adversarial institutions, everyone is busy discrediting the claims of everyone else, thereby reducing the constructive contributions that each could make. This line of reasoning clearly favours more cooperative institutions for effective and efficient environmental protection. But the final verdict, of course, remains open.

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Appendix

Interviews with stakeholders in the environmental protection of the Rhine

(* signifies an interview over the telephone)

Governmental organisations:

<u>The Netherlands:</u>

Ministery of Transport, Public Works and Watermanagment, The Hague, 14 March 1996; and Haarlem, 4 April 1996.

Ministery of the Environment, The Hague, 14 March 1996.

Ministery of Foreign Affairs, The Hague, 25 March 1996; The Hague, 4 April 1996; and Amsterdam, 8 April 1996.

Ministery of Agriculture, Nature and Fishery, The Hague, 11 April 1996.

Port of Rotterdam, Rotterdam, 12 April 1996.

Dr Pieter Winsemius, former Minister of the Environment, presently director of McKinsey Consultancy Amsterdam, Amsterdam, 5 July 1996.

Institute for Inland Water Managment and Wastewater Treatment (RIZA), Lelystad, 1 August 1996; and Lelystad, 24 January 1997.*

Ms. Neelie Kroes, former Minister of Transport, Public Works and Watermanagment, Nijenrode, 20 August 1996.

Federal Republic of Germany:

Ministerium für Umwelt, Energie, Jugend, Familie und Gesundheit des Landes Hessen, Wiesbaden, 11 July 1996.

Ministerium für Umwelt des Landes Nordrhein-Westfalen, Düsseldorf, 23 July 1996.*

Ministerium für Umwelt des Landes Rheinland-Pfalz, Mainz, 24 July 1996.

Bundesministerium für Umwelt, Bonn, 5 August 1996.

Ministerium für Umwelt und Verkehr des Landes Baden-Württemberg, Stuttgart, 11 November 1996.

Municipality of Bonn, Bonn, 11 March 1997.*

Municipality of Mannheim, Mannheim, 7 April 1997 (written answers).

Municipality of Frankfurt, Frankfurt, 11 April 1997.*

Luxembourg:

Administration de l'Environnment, Luxembourg, 12 July 1996.

France:

Agence de l'Eau Rhin-Meuse, Metz, 13 November 1996.

Ministère de l'Agriculture, de la Pêche et de l'Alimentation, Paris, 19 November 1996.

Ministère de l'Environnement, Paris, 19 November 1996.

Switzerland:

Bundesamt für Umwelt, Wald und Landschaft, Bern, 14 November 1996.

International Organisations:

European Commission, Directorate General 11, Brussels, 2 April 1996; and Brussels 3 April 1996.

European Parliament, Brussels, 2 April 1996.

International Commission for the Protection of the Rhine against Pollution (ICPR), Koblenz, 8 July 1996; Delft, 30 July 1996; Koblenz, 5 August 1996; and The Hague, 8 November 1996.

Central Commission for the Navigation of the Rhine, Strasbourg, 15 November 1996.

Business:

European Chemical Industry Council (CEFIC), Brussels, 3 March 1996.

Shell Pernis BV, Rotterdam, 18 March 1996.

Internationale Arbeitsgemeinschaft der Wasserwerke im Rheineinzugsgebiet (RIWA), Amsterdam, 5 April 1996.

Dr Pieter Winsemius, former Minister of the Environment, presently director of McKinsey Consultancy Amsterdam, Amsterdam, 5 July 1996.

Verband der Chemischen Industrie (VCI), Frankfurt, 10 July 1996.

Hoechst AG, Frankfurt, 11 July 1996.

BASF AG, Ludwigshaven, 24 July 1996.

Bayer AG, Leverkussen, 1 August 1996.*

Mines de Potasse d'Alsace, Mulhouse, 12 November 1996.

Sandoz Pharma AG, Basel 14 November 1996.

Ciba-Geigy AG, Basel, 14 November 1996.

Agriculture:

Landbouwschap, The Hague, 25 March 1996.

Deutscher Bauernverband, Bonn, 10 November 1996.

Federation Nationale des Syndicats d'Exploitants Agricoles, Paris, 17 March 1997.*

Environmental organisations:

Stichting Reinwater, Amsterdam 20 March 1996; Amsterdam, 26 March 1996*; and Amsterdam, 12 April 1996.

World Wide Fund for Nature Germany, Rastatt, 11 July 1996.

Naturschutzbund Deutschland, Kranenburg, 12 July 1996.

Bundesverband Bürgerinitiativen Umweltschutz, Freiburg, 11 November 1996.

Bund für Naturschutz Baselland, Basel, 15 November 1996.

Total number of interviews: 54.

Total number of interviewees: 58.

Interviews with Stakeholders in the Environmental Protection of the Great Lakes

(* signifies an interview over the telephone)

Governmental and tribal organisations:

United States

New York Department of Environmental Conservation, Albany, New York, 27 May 1997.*

Department of Agriculture, Natural Resources Conservation Service, Madison, Wisconsin, 29 May 1997.

Great Lakes Environmental Research Laboratory, Department of Commerce, Ann Arbor, Michigan, 3 June 1997.

Great Lakes Commission, Ann Arbor, Michigan, 6 June 1997.

Environmental Protection Agency, Great Lakes Regional Office, Chicago, Illinois, 6 June 1997.

Federal Reserve Bank of Chicago, Chicago, Illinois, 20 June 1997.

Environmental Protection Agency, Washington DC, 23 June 1997.

Wisconsin Department of Natural Resources, Madison, Wisconsin, 7 July 1997.

Army Corps of Engineers, Chicago, Illinois, 7 July 1997.*

Fish and Wildlife Service, East Lansing, Michigan, 8 July 1997.*

State Department, Washington DC, 9 July 1997.*

Michigan Department of Natural Resources, Great Lakes Office, East Lansing, Michigan, 15 July 1997.*

Environmental Protection Agency, Washington DC, 16 July 1997.*

Great Lakes Indian Fish and Wildlife Commission, Adena, Wisconsin, 17 July 1997.*

Council of Great Lakes Governors, Chicago, Illinois, 25 July 1997.

Canada

Ministère de l'Environnement et de la Faune, Gouvernement du Québec, Québec, Québec, 28 May 1997.*

Agriculture Canada, Guelph, Ontario, 11 June 1997.

Ontario Minister of Environment and Energy, Guelph, Ontario, 11 June 1997.

Environment Canada, Downsview, Ontario, 12 June 1997.

Ontario Ministery of Environment and Energy, Toronto, Ontario, 24 July 1997*

Canadian Center for Pollution Prevention, Industry Canada, Sarnia, Ontario, 10 July 1997.*

International organisations:

Great Lakes Fishery Commission, Ann Arbor, Michigan, 3 June 1997.

International Joint Commission, Great Lakes regional office, Windsor, Ontario, 5 June 1997.

International Joint Commission, U.S. section, Washington DC, 24 June 1997.

International Joint Commission, Canadian section, Ottawa, 17 July 1997.*

Business:

Council of Great Lakes Industries, Ann Arbor, Michigan, 4 June 1997.

Chemical Manufacturers Association, Arlington, Virginia, 24 June 1997.

Chlorine Chemistry Council, Arlington, Virginia, 24 June 1997.

American Forest and Paper Association, Washington DC, 25 June 1997.

LTV Steel, Cleveland, Ohio, 8 July 1997.*

Canadian Chlorine Coordinating Committee, Ottawa, 17 July 1997.*

Inland Steel, East Chicago, Indiana, 18 July 1997.*

Xerox Company, Buffalo, New York, 21 July 1997.*

Wisconsin Manufacturers and Commerce, Madison, Wisconsin, 21 July 1997.

Ford Motor Compay, Dearborn, Michigan, 30 July 1997.*

Eastman Kodak Company, Rochester, New York, 4 August 1997.*

Great Lakes Water Quality Coalition, Chicago, Illinois, 4 August 1997.*

Canadian Vehicle Manufacturers' Association, Toronto, 5 August 1997.*

Environmental organisations

Nature Conservancy, Chicago, Illinois, 2 June 1997.

National Wildlife Federation, Ann Arbor, Michigan, 4 June 1997.

Pollution Probe, Toronto, Ontario, 13 June 1997.

Sierra Club - Great Lakes Office, North Henry Street, Madison, Wisconsin, 19 June 1997.

Greenpeace, Great Lakes Office, Chicago, Illinois, 20 June 1997.

Environmental Defense Fund, Washington DC, 27 June 1997.

Great Lakes United, Buffalo, New York, 9 July 1997.*

Great Lakes Tomorrow, Toronto, Ontario, 10 July 1997.*

Canadian Institute for Environmental Law and Policy (CIELAP), Toronto, Ontario, 14 July 1997.*

Total number of interviews: 47.

Total number of interviewees: 51.